

IBM Cognos Analytics - Reporting
Version 11.2

User Guide



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Product Information

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Chapter 1. Getting started in IBM Cognos Analytics - Reporting

IBM® Cognos® Analytics - Reporting is a web-based report authoring tool that professional report authors and developers use to build sophisticated, multiple-page, multiple-query reports against multiple databases.

With Cognos Analytics - Reporting, you can create any reports that your organization requires, such as invoices, statements, and weekly sales and inventory reports.

The user interface

You enter IBM Cognos Analytics - Reporting by creating a new report or by opening an existing report in the Cognos Analytics portal.

The following table describes where you can find features and functions in Cognos Analytics - Reporting.
















| Cognos Analytics - Reporting icon | Description |
|---|--|
|  | Navigation menu. See “Navigation menu” on page 4. |
|  | Data sources. See “Sources tab” on page 4. |
|  | Data items. See “Data items tab” on page 4. |
|  | Toolbox. See “Toolbox tab” on page 4. |
|  | Save as Convert to Template Convert to Active Report |
|  | Toggle between editing the report and viewing the report. Tip: These two states are referred to as "edit mode" and "view mode". |
|  | Undo and redo the last change you made to the report |
|  | Specify run options for the report and run the report. Run options include output format, orientation of the report, how much data to return, language, rows per page, accessibility features, bidirectional support, and performance details. Appears only in edit mode. |
|  | Run the report using the current run options. The data is refreshed (database re queried) only if you change the output format from the last time you ran the report. To change the output format, click the down arrow. Appears only in view mode. The run option is also available when you are on the Pages tab in a report. You can run an individual page with the output format you require. |

Table 1. Cognos Analytics - Reporting function mapping (continued)

| Cognos Analytics - Reporting icon | Description |
|---|--|
|  | Refresh the report using the same prompt values. Appears only in view mode. Note: To ensure that the data is refreshed, disable the Use local cache property in the properties for the query. |
|  | Clear all parameters |
|  | Toggle between locking and unlocking objects on the canvas. |
| Page design  | Switch between page design, page preview, or page structure view |
|  | Open report from clipboard Copy report to clipboard Visual aids Find. See “Find objects in a report” on page 12. Validate report Validate options Auto correct Layout component cache Manage conditional styles Show generated SQL/MDX Add shared set report Manage Shared Set Reports Manage Shared Set References Show specification Options. See “Options in Reporting” on page 15. |
|  | Toggle between showing and hiding the Properties pane for the active object. The properties that are displayed are different, depending on the object. For a list of the available properties for a report, see “Properties pane” on page 6. |

On-demand toolbar


The on-demand toolbar (formerly known as the report object toolbar) contains the actions you can perform on an object.

You can disable the on-demand toolbar. For more information, see [“Disabling the on-demand toolbar” on page 9.](#)

The following list shows the actions that are available from the on-demand toolbar. The actions that appear depend on the type of object that is active on the canvas:

Pin , Unpin

When the on-demand toolbar is pinned, it stays at the upper left corner of the canvas, regardless of which object is active. When it's unpinned, it floats near the object that is active.

You can also control the display of the on-demand toolbar by setting the **Show on demand toolbar on right-click** option. Click the **More** icon . Select **Options > View**. When the **Show on demand toolbar on right-click** check box is selected, the on-demand toolbar displays when you right-click an object. When cleared, the on-demand toolbar displays when you click an object. If the on-demand toolbar is pinned, it appears at the top left corner of the canvas, regardless of the setting of the **Show on demand toolbar on right-click** option.

11.1.0 Cut , Copy , Paste , and Delete

Cut, copy, paste, or delete an object

Filters

Click the down arrow to add, edit, or delete filters or add filter text to the visualization

Swap rows and columns

In a table, switch the row and columns around

Apply style

Apply a custom or default style

Font

Edit the font for an object

Border

Apply a border. You can choose the style, width, and color.

Background color

Apply a background color 

Horizontal alignment

Change the horizontal alignment 

Vertical alignment

Change the vertical alignment

Style current selection

Create and apply a custom style to the selected object

Apply layout

Select a different layout for the report

Insert table

Insert a table


Select ancestor

Select an ancestor of the current object

More

Other actions that vary, depending on the type of object that is active. For example, for a visualization, you can change the headers and footers. For a table, you can apply a table style. For a table cell, you can build a prompt page.

Sources tab


The **Sources** tab  contains items from the package selected for the report, such as data items and calculations. When you drag an item to the canvas, the visualization recommender chooses a visualization to represent the data. If you don't like the visualization, you can change it.

Search through the sources by typing a value in the **Find** field. As you type, the items that match your search string appear in the tab.




Data items tab

The **Data Items** tab  shows the queries in the report.

Toolbox tab

The **Toolbox** tab  contains various objects that you can add to a report, such as visualizations, text, layout objects, and prompts. You can also add advanced objects such as custom controls and hyperlinks. Depending on the type of object, you can drag it from the Toolbox to the canvas or double-click it to open a window in which you define values for the object. When the object is placed on the canvas, its properties are displayed in the **Properties** pane.

Search through the objects by typing a value in the **Find** field. As you type, the items that match your search string appear in the tab.

Toolbox items are organized into groups. Click  to show all of the items available in each group or  to collapse the groups. Click  to toggle between a list view or a tree view of the items in the groups.

Add items that you use often to the **PINNED** group. Items in the **PINNED** group appear on the canvas when you create a new report. To add a toolbox item to the **PINNED** group, right-click the item and click **Add to pinned toolbox items**. To remove an item from the **PINNED** group, right-click the item and click **Remove from pinned toolbox items**.

Active reports

If you are authoring an active report, you can use the following features:

Active report controls

Shows the controls and active report variables inserted in a report and their relationships to one another. You can click a control in this tab to quickly locate the control in the report and set default values for variables.

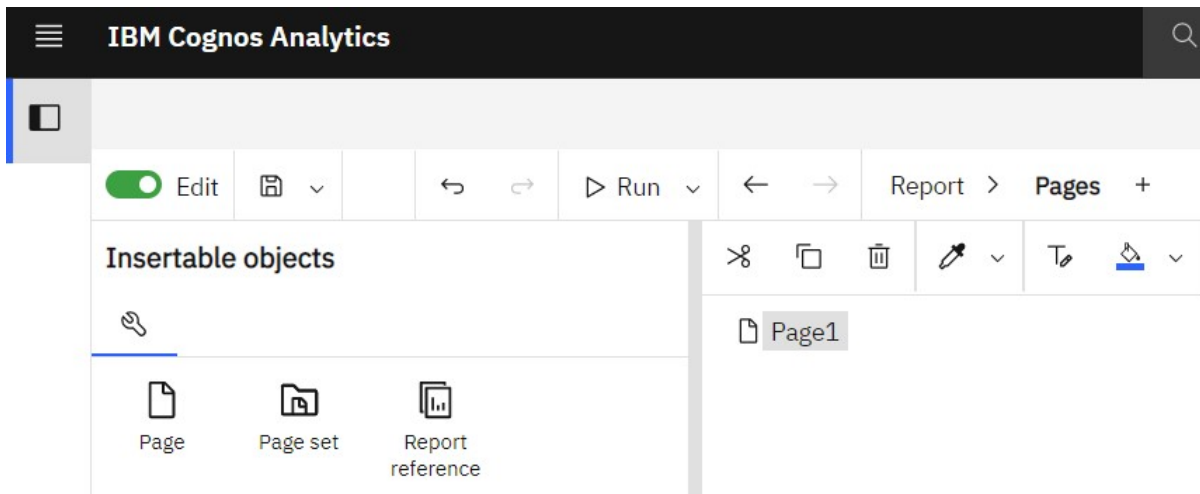
Active report variables

Shows the active report variables defined in a report. Use this tab to create new variables and set default values.

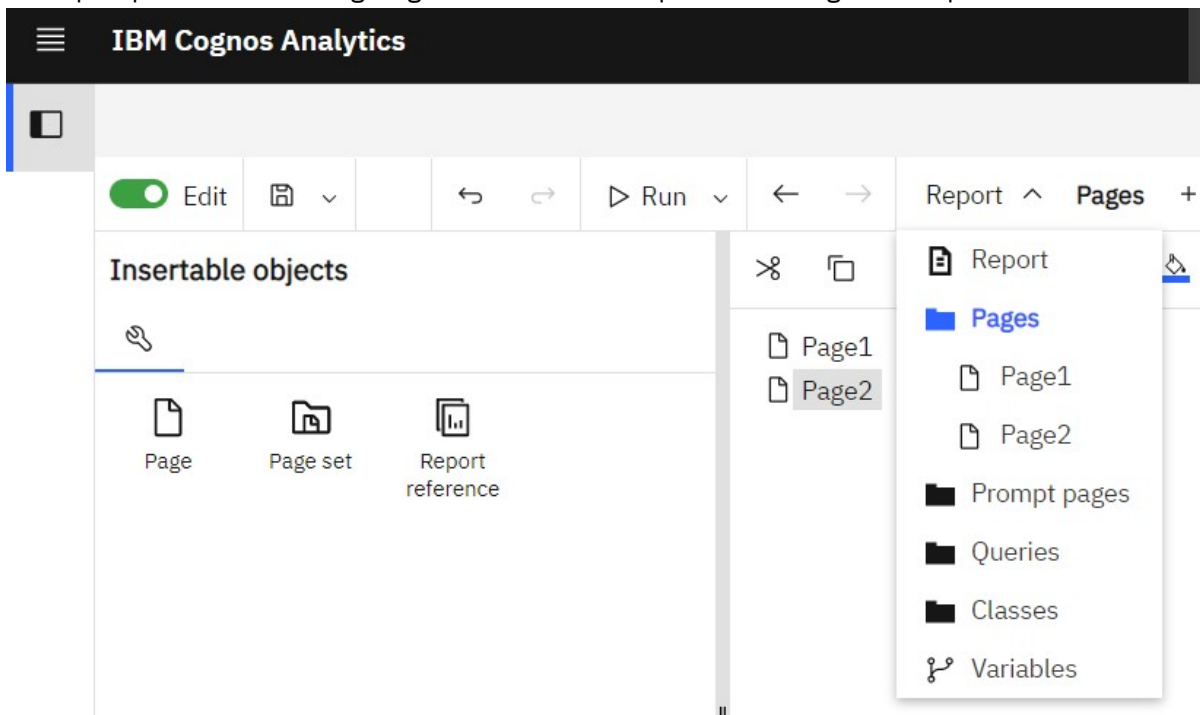
Navigation menu

You can quickly navigate through the pages, prompt pages, queries, classes, and variables in a report by selecting an item in the navigation menu.

The following diagram shows an example of the navigation menu:




Select an item in the navigation menu to see a navigation drop-down menu. Select an object in the navigation drop-down to see the properties for the object on the canvas. For example, click **Report** to see the report pane. The following diagram shows an example of the navigation drop-down:



Tip: Another way to access the objects in a report is to click → or ← to navigate through the last objects you viewed.


Report overview pane

Click  **Report** in the navigation drop-down to see the following information:


- A description of the report
- Data sources used in the report
- The parameters used in the report
- Number of report objects
- Number of page objects

Click **Validate report** to validate the report specification.

Pages pane


Click  **Pages** to view or create new report pages and prompt pages, and to create and modify classes. You can insert a page, a set of pages, or a reference to a report from the pages pane.

Queries pane


Click  **Queries** to create or modify queries in relational reporting or dimensional reporting and to perform complex tasks, such as defining joins, unions, intersects, excepts, and writing SQL and MDX statements.

Click a specific query to add a calculation, detail or summary filter, or a set expression.


Classes pane

Click  **Classes** to define a style. For example, you can define a style for the title of an axis. You can then apply the style to all axis titles in the report.

Variables pane

Click  **Variables** to add a variable that has values in a different language, values as strings, and values in boolean.

Filters pane

The **Filters**  pane is available in View mode. It displays all filters that are created by the report consumer on the report output. When you click a filter in this pane, all data containers that use the selected filter are automatically highlighted in the report. When a data container is selected, the filter pane is updated instantly to display only filters that are applied to the selected data container. You can edit or delete the filter directly in the pane.

You can resize the filter pane, and pin or unpin the pane depending on the screen resolution. Report authors can also make an authored filter visible to report consumers so that they can interact with it in this pane.

The pane cannot be used to create or view low-level filter expressions that are manually created in the expression editor. By default, interactive filtering is disabled for filters that were created in earlier versions of Cognos Analytics.

Note: Low-level filters, such as ones defined in the expression editor, cannot be changed in the viewer.

This feature is not available for active reports.

Properties pane

The properties pane lists the properties that you can set for an object in a report or for the entire report. The properties that are displayed vary depending on the type of object. When you specify a value for a property, press **Enter**, click another property, or save the report to ensure that the value is saved. Click



to show or hide the properties pane.

At the report level, you can set the following properties:

Burst options

Specifies the data item on which to burst reports. Specify recipients.

Run with full interactivity

Enable users to change the report

Theme

Apply local and global styles from another report

Language

Specifies the language package

Name

Name of the report, specified when you save it

Report styles

Specifies the product classes used to format objects. You can select between ReportNet, 8.x, 10.x, 11.x, and simplified styles.

Page break for interactive HTML

For reports with multiple data containers, specifies whether to render the default number of rows of each data container on each page.

View pages as tabs

In HTML output, specifies whether to show each report page in its own tab, and the location where the tabs appear in the browser.

Paginate saved HTML output

Specifies whether to create multiple pages or one scrollable page

Use 1.x CSV export

For Cognos ReportNet, specifies whether to create CSV report output.

Group repeating cells - export to Excel

Group repeating cells - export to Excel

PDF page setup

Sets PDF page options

Conditional layouts

Add layouts to a report based on conditions

Data formats

Specifies the default data format properties for each type of data

Package-based drill-through source


Enable or disable the report to be used as the source during a package drill-through. This property can also be set in the Basic tab of the Advanced drill behavior property.

Dynamic filtering


When the report is a drill-through target, specifies whether to apply more filtering when names from the context in the source report match names of items in the target report. This property can also be set in the Basic tab of the Advanced drill behavior property.

For other types of objects, like containers, you can set conditional styles, queries, pagination, margins, color and background, font and text, and many other properties.

Visual aids


Visual aids include the following options to help you when you are designing reports in the layout. You can enable and disable visual aids by accessing the **Visual aids** menu item from the **More** icon  in the toolbar. You must be in **Page design** or **Page preview** mode.

| Option | Description |
|----------------------------|--|
| Show Boundary Lines | Shows all boundary lines around objects |
| Show Repeating | Repeats objects when you insert them. For example, when you insert a data item in a crosstab, the data item appears in each row or in each column of the crosstab. |

| Option | Description |
|---|---|
| Show Page Header & Footer | Shows the page header and page footer |
| Show Drag & Drop Padding | Shows drag-and-drop zone when the Padding property for an object is set to 0 . If the Padding property is set to a value that is greater than the minimum padding that IBM Cognos Analytics - Reporting uses to show drag-and-drop zones, only the minimum padding is shown. |
| Show Hidden Objects | Shows objects for which the Box Type property was set to None or for which the Visible property was set to No . |
| Show Sorting | Shows the sorting icon for data items for which a sort order was specified. For more information about sorting data, see “Sorting Relational Data” on page 296 or “Sorting Dimensional Data” on page 338. |
| Show Grouping | Shows the grouping icon for grouped data items |
| Show Source Type | Shows the icon for the source type of objects, such as layout calculation |
| Show Data Item Type | Shows the icon for the type of data item, such as query item, member, or measure |
| Show Drill-through Definitions | Shows data items for which the drill-through definition was defined as a hyperlink |
| Show Table of Contents Entries | Shows table of contents entries inserted in the report |
| Show Bookmarks | Shows bookmarks inserted in the report |
| Show Master Detail Relationships | Shows master detail relationships defined in the report Tip: Pausing the pointer over the master detail relationship icon shows the relationship |
| Show No Data Contents Tab Control | Shows tabs if the data container's No Data Contents property is set to Yes |
| Show Repeater and Singleton Containers | Shows repeater and singleton containers inserted in the report |
| Show Deck Controls | Show the deck controls for active reports. For more information, see “Adding Controls to a Report” on page 260 and “Recommendation - use master detail relationships when authoring decks” on page 270. |
| Show Container Selectors | Shows a small selector (three orange dots) for the following container objects: list, crosstab, repeater table, table of contents, table, and active report application objects. You can click to select all the objects within a container. |
| Show Empty Text | Shows empty text item objects that were inserted in the report |
| Show Insertion Icons | Shows the Add circular menu  |

Page layers area


When you are working with dimensional data, use the page layers area to create sections, or page breaks, in a report to show values for each member on a separate page. For example, you can drag **Northern**

Europe sales territory from the **Sources** tab  to the Page layers area. The report is broken into a separate page for each territory within northern Europe. Each page's context appears in the report header.

For more information, see [“Create page layers” on page 468](#).

Context filter area

When you work with dimensional data, use the **Context filter** area to filter your report to show values, or context, for only a specific data item. This technique is also known as a slicer filter. For example, you can

drag **Sales Territory** from the **Source** tab  to the **Context filter** area. When you click a specific territory from the list, the values in the crosstab change to represent data for that territory.

For more information, see [“Create a context filter” on page 336](#).

Disabling the on-demand toolbar

If you do not want to allow users to performance interactions on report output that uses the toolbar, you can disable the on-demand toolbar.


You can disable the toolbar based on role as well as per report.

If either of the options are set to disable the on-demand toolbar, the toolbar is not available.

About this task

Turning off the on-demand toolbar causes certain aspects of certain reports to become unavailable in HTML view. For example, if a report has both drill-through and drill-down enabled, only drill-through is available to anyone that uses the report who has the on-demand toolbar disabled through either means.

Procedure

1. To disable the on-demand toolbar in a report:
 - a) In your report, click the **Report** tab.
 - b) Click the **Show properties** icon .
 - c) In the **REPORT** section, set the option **Enable on-demand toolbar** to **No**.
2. To disable the on-demand toolbar based on role/group/user, see the *Restricting users from viewing the on-demand toolbar* topic in the *IBM Cognos Analytics with Watson Managing User Guide*.

Results

The on-demand toolbar is removed from the HTML Run view. The on-demand toolbar remains visible and available on both edit and preview modes in a report regardless of any settings.

Work in design, preview, or structure view

IBM Cognos Analytics - Reporting has three views in which you can author reports: Page design view, Page preview view, and Page structure view.

You choose a report authoring view by selecting one of them on the application bar. Different options are available in each view, so you often need to use all views. For example, you must use the Page design and Page structure views to remove sections in relational reporting.

Page design view

The default view in Cognos Analytics - Reporting. In this view, you can see what your report will look like after you run it.

Page preview view

Shows you the current report page with live data. In this view, you can edit the report, such as inserting data items into empty data containers.

When you are authoring an IBM Cognos Active Report, the page preview view shows you live data as you format the report.

Page structure view

Displays an overview of all of the report objects in your report in a tree structure, which is organized by page.

Report layout and queries

All reports have two components: a layout component that defines the report appearance and a query component that defines report data. Understanding these components will help you design effective reports.

Layout

A layout is a set of pages that defines the appearance and formatting of a report.

When you design the layout of a report, you

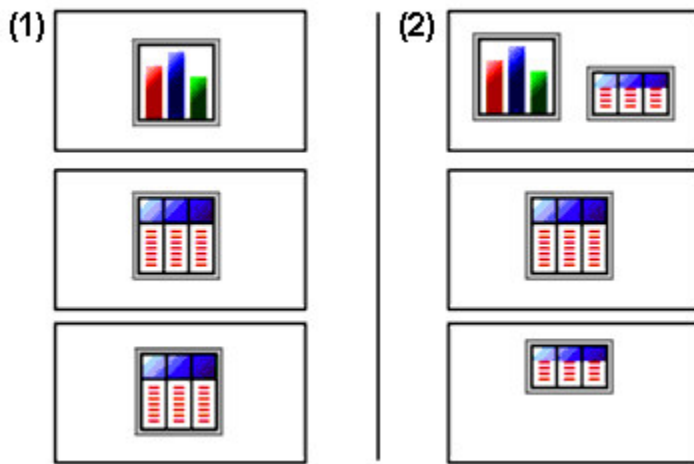
- Present the data in a meaningful way by using lists, crosstabs, charts, and maps
- Add formatting, such as borders, color, images, and page numbers
- Specify how the data flows from one page to the next

Pages

Pages are containers for the layout objects that you use to build a report. A page is made up of the following mandatory and optional components:

- Page header (optional)
- Page body (mandatory)
- Page footer (optional)

When you run a report, the amount of data queried often exceeds one page. As a result, a page will repeat until all the data is shown. You have control over how data flows from one page to the next. For example, here are alternative representations of a report that contains a chart and a lengthy list.



1 The chart appears on its own page. The list begins on the next page and fills subsequent pages until all rows appear.

2 The chart and the first few rows of the list appear on the first page. The rest of the data in the list appears on the subsequent pages.

Objects

You add layout objects to a page when you create a report. Below are objects that you will use often when building reports in IBM Cognos Analytics - Reporting:

- list

Add a list to show data in rows and columns.

- crosstab

Add a crosstab to show data in a grid with dimensions along the rows and columns and measures in the cells or intersection points.

- chart
- map
- repeater

Add a repeater to show each instance of a certain column or data item in a separate frame.

- text
- block

Add a block to hold text or other information. Blocks are often used to lay out horizontal bands of information.

- table

Guided report layout

Guided report layout helps you to create a report layout more quickly and dynamically by simplifying the process of adding objects to the canvas.

Here are some of the features of guided report layout:

- Visual indicators that show you where an object is going to be placed before you drop it on to the canvas
- You can place objects on the left, center, right, top, or bottom of a container with one gesture
- Tables use percentage sizing which ensures that different screen resolutions are supported
- You can resize an object by dragging one of its grippers
- You can't drop a crosstab space object on to the canvas

Guided report layout is enabled by default for the benefit of users that are new to report authoring. If you prefer not to use guided report layout, you can disable it.

1. Click : > **Options**, and then click the **Report** tab.
2. Clear the **Enable guided report layout** check box.
3. Click **OK**.

Note: Guided report layout does not work with active reports.

Queries

Queries determine what data items appear in the report. Sometimes you want detailed rows of data, which you obtain by using a simple SELECT statement. Other times you must calculate totals or averages using summary functions and grouped columns or must apply filters to show only the data you want.

IBM Cognos Analytics - Reporting automatically creates the queries you need as you build reports. However, you can modify these queries or create your own custom queries to get the results you want.

Report objects

You build reports by adding objects and manipulating them to obtain the results you want. To understand how to work with objects in IBM Cognos Analytics - Reporting, you must be familiar with the following concepts:

Objects as containers

Objects, such as tables, blocks, and any report frame, are containers in which you can insert other objects. For example, you can insert a list in one cell of a table and a chart in another.

You can also nest objects to create a sophisticated layout. For example, you can insert a table in a cell of another table.

Locking and unlocking objects

To manipulate the contents of some objects, you must first unlock the object. For example, you have a list that contains the column Product Name. You want to insert a graphic inside the Product Name column to show an image of each product. Unlock the list to insert the image object inside a list column.

To unlock a report, click the **Lock page objects**  icon. All layout objects in a report are unlocked. Note that this setting is not saved with the report.

Hierarchy of objects

In IBM Cognos Analytics - Reporting, objects are organized hierarchically. For example, a list contains list columns, and each list column contains a text item, which is the name of the inserted data item.

The hierarchy of objects is useful to remember when you apply formatting because formatting is applied to the child objects of the object. For example, you can specify that all list column titles in a list have red as the background color. The formatting is automatically applied to any new columns you add to the list because the formatting is applied to the list and is therefore applied to the objects in the list. If you apply formatting to a specific object, it will override the same formatting specified for the parent object.

Find objects in a report

You can quickly locate specific objects in a report by using **Find**.

Procedure

1. Click the More icon :

2. Click **Find**.
3. Click **Find what** and choose the type of object to find.
4. In the **Options** box, specify the search criteria.

For example, if you want to find the objects that reference a specific data item, you must specify the query that contains the data item and the data item name.

5. To search for objects that are hidden in the report, in the **View** box, select the **Show hidden objects** check box.
6. Click **Find All** or **Find Next**.

Results

All objects that meet the search criteria are listed under **Results**. The first object that meets the search criteria is highlighted in the list. Continue clicking **Find Next** to show all other objects that meet the search criteria.

Note: In some cases, such as searching for a data item that is used to define a conditional style, IBM Cognos Analytics - Reporting cannot directly select the object in the report. Instead, Reporting selects the object that uses the object for which you are searching.

Relational and dimensional reporting styles

You can create reports in IBM Cognos Analytics - Reporting using either a relational reporting style or a dimensional reporting style.

The Reporting tools and query language are the same for both styles. However, it is important to choose a reporting style to ensure that you are making the most of your data and to avoid mixing dimensional and relational concepts.



How to choose a reporting style

When authoring a report, first choose your preferred reporting style for working with data: relational or dimensional. You can choose a reporting style from your viewpoint:

- If you think about your data as tables and columns, you have a relational viewpoint and should use a relational reporting style.
- If you think about your data as a number of dimensions intersecting at cells, you have a dimensional viewpoint and should use a dimensional reporting style.

Relational reporting style

The relational reporting style consists of lists. You focus the data with filters and summarize with header and footer summaries.

- If your data is purely relational, then only query subjects and query items appear in the **Source** tab , and you must use the relational reporting style.
- If your data is dimensional, then dimensions appear in the **Source** tab , and you can still use a relational reporting style, but instead of query items (columns) and query subjects (tables), you use measures, levels, and level properties.

To see an example of relational style reporting with dimensional data, see the Manager Profile sample report in the GO Data Warehouse (analysis) package.

The relational reporting style is similar to report authoring in IBM Cognos Query Studio.

Dimensional reporting style



The dimensional reporting style consists of measures and members from different hierarchies arranged in a crosstab with cell values at the intersections. You focus the data with set expressions that navigate from specific members in the hierarchy and summarize with set summaries.

To see an example of dimensional style reporting with dimensional data, see the GO Balance Sheet as at Dec 31, 2012 sample report in the GO Data Warehouse (analysis) package.

The dimensional reporting style is similar to report authoring in IBM Cognos Analysis Studio.

Guidelines for each reporting style

This user guide is divided into relational and dimensional reporting sections so that you can follow the best practices for using this product with the reporting style that you have chosen. The following table outlines the best practices for both reporting styles.

| Item | Relational reporting | Dimensional reporting |
|----------------|--|--|
| Report type | <p>Lists</p> <p>Crosstabs pivoted from lists</p> <p>Charts created from lists</p> <p>Maps created from scratch or from lists</p> | <p>Crosstabs</p> <p>Charts created from scratch or from crosstabs</p> <p>Maps created from scratch or from crosstabs</p> |
| Package tree | <p>In the Source tab , click the Options icon , and then click View members tree.</p> <p>If you are using dimensional data, hide members in the source tree by right-clicking the tree, clicking Package Tree Settings, and clearing the check boxes for Members and Members for each level.</p> <p>The view will include the following:</p> <ul style="list-style-type: none"> package folder namespace query subject query item measure level | <p>In the Source tab, click the Options icon, and then click View members tree.</p> <p>Ensure that the option Create sets is selected.</p> <p>The view will include the following:</p> <ul style="list-style-type: none"> package folder measure member named set |
| Inserting data | <p>From the package tree, add query items or levels to the report.</p> <p>Avoid using hierarchies directly in the report.</p> <p>Avoid using named sets.</p> | <p>From the package tree, add sets of members to the report.</p> <p>You can also choose to insert just the member, just the children of the member, or the member and its children.</p> |

| Item | Relational reporting | Dimensional reporting |
|-------------------------|---|---|
| Calculating data | Add query calculations using only relational and common constructs. Choose only Other expression . | Add query calculations using only dimensional and common constructs. Use Other expression only for value calculations. Avoid Common functions that are marked with an exclamation mark (!) because they have limited support. |
| Summarizing data | Headers and footers in lists Crosstab member summaries; for example, aggregate within detail | Member set summaries; for example, aggregate within set |
| Focusing data | Add detail or summary filters to view only the data you want to see. For example, add the Quarter query item to a list and filter by Q3 . | Add only the relevant members to an edge of the crosstab or to the context filter. For example, only add the Q3 member to your report. Use a set expression such as Topcount or Filter . |
| Drilling | Drilling through by value | Drilling through by member Drilling up and down |
| Page and section breaks | Simple page breaks Page sets Sections Master detail relationships using parameterized filters | Simple page breaks Page sets Page layers Master detail relationships using parameterized edge or slicer expressions |

Options in Reporting

You can set various options that control the appearance and behavior of IBM Cognos Analytics - Reporting (**More icon** , **Options**).

View Options

| <i>Table 2. Descriptions of the options on the View tab of the Options window</i> | |
|---|--|
| Option | Description |
| Show new data container dialog | Shows the new data container dialog boxes when the Show this dialog in the future check box was previously cleared. |
| Reuse IBM Cognos Viewer window | Reuses the same IBM Cognos Viewer window when you rerun a report without first closing the window. |

Table 2. Descriptions of the options on the **View** tab of the **Options** window (continued)

| Option | Description |
|--|--|
| Show on demand toolbar on right-click | Show the report object toolbar only when you right-click the object. The default setting is to show report object toolbars when you highlight an object. You can control when you want to see these toolbars by enabling this feature, which is also used for accessibility. When you author reports with accessibility features enabled, the Show on-demand UI on right click option is automatically selected. As a result, report object toolbars do not appear. To show an object's toolbar, navigate to the object and press the Enter key. |
| Start page view | Enables you to start Reporting in Design , Structure , or Preview view. For the change to take effect, you must close and then restart Reporting. |

Edit Options

Table 3. Descriptions of the options on the **Edit** tab of the **Options** window

| Option | Description |
|---|---|
| Wrap text in editors | Automatically wraps text in all editors where you can define expressions. |
| Automatically populate values list | When building expressions in the expression editor, automatically shows values when you browse the data of a data item. |
| Automatically validate expressions | Automatically validates calculations, such as filters, created in the expression editor. For more information, see “Using relational calculations” on page 306 or “Using Dimensional Calculations” on page 354 . |
| In-place edit | Enables the editing of text in place when double-clicking. |
| Allow crosstab nesting beside individual items | Specifies to create a crosstab node when a data item is inserted in a crosstab. This option allows nesting under individual items instead of only on the entire crosstab edge. |
| Enable drill-up or drill-down links | For data items where drill-up or drill-down is possible, enables drill-up or drill-down links. When you select a data item, it becomes a link that you can click to drill up or down. Also, you can still double-click data items to drill up and down. By default, this option is enabled. You can also control drill options in the Properties pane. At the report level, in the Data section. |

Table 3. Descriptions of the options on the **Edit** tab of the **Options** window (continued)

| Option | Description |
|---|---|
| Drop replace on crosstab and chart nodes | When you use drag-and-drop techniques, this setting determines the behavior for replacing an item. |
| Double-click on member action | When working with dimensional data, specifies what happens when you double-click a member data item. By default, you drill down or up on the item that you double-click. |
| Layout dimensions | Specifies the width and height of the area where you will create reports. |

Report Options

Table 4. Descriptions of the options on the **Report** tab of the **Options** window

| Option | Description |
|--|---|
| Alias member unique names | When working with a dimensional data source, creates an alias when you add a member to the report or to an expression. |
| Delete unreferenced query objects | Automatically deletes query objects linked to another object. For example, if you delete a list, the query linked to the list is deleted as well. |
| Delete unreferenced conditional styles and palettes | Automatically deletes conditional styles or palettes when the last data item that refers to the conditional style or palette is also deleted. |
| Table Style inheritance | When a table style is applied to a list or crosstab, specifies whether new objects inserted in the list or crosstab should inherit the style. For more information, see “Apply a Table Style” on page 389 . |
| Automatic group and summary behavior for lists | When working with lists, automatically adds an overall aggregate summary in the list footer and a summary for any groups in the list. When grouping a column, automatically makes it the first column in the list. |
| Automatically create crosstab headers for sets | When adding sets in a crosstab that uses a dimensional data source, automatically adds header labels on new columns and rows. The headers help consumers of the report to understand where the data is in the hierarchy. |
| Enable recommended visualizations | Enable or disable the visualization recommender. See “Recommended visualizations” on page 80 . |


Table 4. Descriptions of the options on the **Report** tab of the **Options** window (continued)

| Option | Description |
|---|---|
| Enable guided report layout | Enable or disable guided report layout. See “Guided report layout” on page 11. |
| Limit on inserted individual members | When working with a dimensional data source, limits the number of child members that are inserted. For example, you specify 3 for this option and, in the toolbar, you specify the option to insert children when you drag a member to a data container. You then drag the Camping Equipment member to the rows of a crosstab. What you see as rows are the child members Cooking Gear, Tents, and Sleeping Bags and a row named Others (Camping Equipment) for the remaining child members of Camping Equipment. |

Advanced Options

Table 5. Descriptions of the options on the **Advanced** tab of the **Options** window

| Option | Description |
|--|---|
| Use operating system clipboard | Uses the Microsoft Windows (or other operating system) clipboard instead of the internal Reporting clipboard. |
| Enable external clipboard | Use the external clipboard to copy and paste content between different reports. |
| Use legacy chart authoring | Enables you to create new reports using the legacy charts instead of the default charts and disables the automatic upgrade of charts in existing reports to the current default charts. Select this check box if you do not want to upgrade the charts in your existing reports. |
| Disable previews | <p>When editing properties such as date and number formatting, does not display a sample of the formatting that is applied to data. When this option is not enabled, either sample data or data from your data source is displayed with formatting options applied.</p> <p>Additionally, when in Page Design view, displays a static image for a chart instead of updating the chart with a preview of your chart, using simulated data.</p> |
| Active Report validation of visualization | Specifies whether to validate visualizations in an active report when the report is run from Reporting. |

| Option | Description |
|--|--|
| Report styles used for new reports | Specifies which report styles to use by default when creating new reports. For more information about report styles, see “Create and modify report and object styles” on page 397. |
| Map feature display limit | When working with maps, specifies the maximum number of features that can appear in a map. |
| Member display count limit (in source tree) | When working with dimensional data, specifies the maximum number of members that can appear in the Source tab  before you must perform a search. |
| Delay time in milliseconds for searching the source tree. | Throttles the user input resulting in searches. Sets the minimum time between metadata tree searches, searches may be further apart, but they can't be closer together. The longer the delay, the fewer searches occur while typing. This is better for slow / big systems. The shorter the delay, the more searches occur while typing. This is better for smaller systems with less data. If you search for entries containing bank as we type b and then type a, if the delay between b and a is big enough for the search to start Cognos Analytics - Reporting will: <ul style="list-style-type: none"> • Search for everything with b. • Draw the probably large result. • Throw it away and then start it over searching for ba. |

Web browser settings

IBM Cognos Analytics - Reporting can be used with different web browsers.

To review an up-to-date list of the web browsers that are supported by IBM Cognos Analytics on Cloud run the [Cognos Analytics on Cloud Software Product Compatibility report](#) (<https://www.ibm.com/software/reports/compatibility/clarity-reports/report/html/prereqsForProduct?deliverableId=BE691D30C50C11E9B0F2505999809CBE>).

Browser settings required for Cognos Analytics

The following table shows the settings that must be enabled.

| Browser | Setting |
|--------------|--|
| All browsers | Allow pop-ups for all Cognos Analytics pages |

Table 6. Enabled browser settings (continued)

| Browser | Setting |
|---------------|---|
| Firefox | Allow Cookies Enable Java™ Enable JavaScript Load Images |
| Edge | Allow Cookies Enable JavaScript Load Images |
| Safari 5 | Enable Java Enable JavaScript Block Cookies: Never |
| Google Chrome | Cookies: Allow local data to be set Images: Show all images JavaScript: Allow all sites to run JavaScript |

Limitations for the Safari web browser on Apple iPadOS 13 operating system

There are some limitations to reporting functionality for Safari web browser on Apple iPad that is running the iPadOS 13 operating system. The following issues can occur:

"Run as PDF" produces HTML output

A report that you expect to see in PDF format is displayed in HTML format. To fix this problem, see below.

When you click the Open menu icon , and then click **+**, the Report option is available.

Although you can create a report, this functionality is not supported. Disable it as explained below.

Edit mode () is available for a report

Although you can use edit mode, it is not supported. Disable it as explained below.

Unable to select multiple values on prompt page

You can select all values, but not multiple values. Disable it as explained below.

To prevent the previously listed issues, go to the settings for Safari, scroll to the Settings for Website section, and disable the **Request Desktop Website** option.

Standard modes HTML replaces quirks mode HTML

The Cognos Analytics portal portal, Cognos Analytics - Reporting, and HTML viewers and reports use standard HTML. Reports have moved from quirks to standard HTML, so there might be small differences in item sizes. These differences do not affect most of the reports that were created in previous versions of Cognos Analytics. However, minor changes might be required in existing reports, such as reports that are printed on forms. For more information, see [Cognos Analytics conversion to Standards Mode](https://www.ibm.com/support/pages/node/277333) (https://www.ibm.com/support/pages/node/277333).

Language settings

You can select the language for the IBM Cognos Analytics with Watson user interface. If your data and reports are available in multiple languages, you can also select the language for the content.

The following settings affect the language used for authoring and viewing reports:

Product language

You set the product language in **Profile and settings**. The product language controls the language of the user interface and all messages, including error messages.

Content language


You set the content language in **Profile and settings**. The content language consists of the language and region combinations that are supported for Content Manager objects, Framework Manager objects, Content Manager data formatting, report data formatting, report text (titles), and database data (if the database tool is configured to use locale). The data in a report is displayed in the content language, regardless of what the product language is set to. When you create a new report, the report language is set to this value.

Report language

You can set the report language in the report properties for a specific report. It determines model binding and literal data formats. The report language must be supported by the metadata model on which the report is based. It is used when a report or query specification is created. The report language appears as the *expressionLocale* in the report specification.

Chapter 2. Creating a report

With Cognos Analytics - Reporting, you can create any reports that your organization requires, such as invoices, statements, and weekly sales and inventory reports.

Click the **Open menu** icon , and then click **+ New** and then click **Report**.

When you create a report, you are actually creating a report specification. The report specification defines the queries and prompts that are used to retrieve data and the layouts and styles used to present the data. For simplicity, the report specification is named by the same name as the report.

Templates and themes

IBM Cognos Analytics with Watson includes several basic report templates and color themes that you can choose from when you create a new report.

The templates and themes are stored in the `Templates.zip` deployment file. If you do not see the list of templates and themes when you create a new report, ask your administrator to import the deployment file into Cognos Administration. After the deployment file is imported, the templates appear in the **Templates** folder in **Team content**.

You can also create your own report templates and themes, and make them available to other users. Save the templates in the **Templates** folder in **Team content**, and save themes in the **Style Reference Reports** folder in the **Templates** folder. When saving your own template or theme, do not use the name of an existing Cognos Analytics template or theme. Otherwise, your template or theme might be overwritten when Cognos Analytics is upgraded to a later version. Any report or theme that is saved in the **Templates** folder appears in the list of templates or themes when you create a new report.

You can also convert a report to a template by clicking **Save > Convert to Template**.

Note: When you select a template in the Templates and themes window, you can see a preview of the template in the right pane. The preview applies only for the Style Reference Reports in the template folder. Any styles you apply outside the Style Reference Reports (the default layout style sheet) do not display in the preview pane.

Tip: By default, templates or themes that you create are identified by a blank icon in the list of available templates and themes. You can associate your own icon to a template or theme. Save the icon as an SVG with the same name as the template or theme, replacing any blank spaces in the name with the underscore (`_`) character. For example, if you create a template that is named `My template`, save the icon as `My_template.svg`. Then, ask your administrator to add the icon to the folder `install_location\webcontent\bi\pat\images\templateReports` for templates or `install_location\webcontent\bi\pat\images\themeReports` for themes.

Adding data

Add data to a report by loading packages or data modules in IBM Cognos Analytics - Reporting.

About this task

You can add data from multiple packages that use the dynamic query mode, from a single package that uses the compatible query mode, or from multiple data modules. However, you cannot combine data modules and packages as sources in the same report.

The following list specifies the conditions and limitations that exist when authoring reports that reference multiple packages or data modules.

- One of the packages or data modules must be set as the default.



The first package or data module that you add to a report automatically becomes the default. You can change this default. When a report is run, Cognos Analytics checks the capabilities of only the default package or data module. You cannot delete the default package or data module from the report, but you can replace it.

- A query can reference only one package or one data module.
- Query set operations (join, union, intercept, except) are supported only for the default package or data module.
- Authored drill-through and master-detail relationships are supported only for the default package or data module.
- Navigation paths in data modules are not available when creating a union, except, intersect, join, or custom SQL query in Reporting.

The navigation paths for these types of queries must be created directly in data modules. For more information, see *"Creating navigation paths" in the IBM Cognos Analytics with Watson Data Modules Guide*.

Note: There are limitations to using dimensional data sources in a report. For more information, see Appendix A, "Limitations when using dimensional data sources," on page 483.

Procedure

1. Click the **Sources** icon .
2. Click the **Add report data** icon .
3. Select the package or data module that you want.
4. If you added multiple packages or data modules, and want to specify a different package or data module as the default one, right-click it, and select **Set default package** or **Set default data module**.
5. To delete a non-default package or data module, right-click it, and select **Delete package** or **Delete data module**.
6. To replace a package or data module, right-click it and select **Replace package** or **Replace data module**.

If queries exist that use the package or data module that you are replacing, model paths in the queries are updated to the new package or data module.

Tip: You can also change the package or data module that is used by a query by modifying the **Data source** query property.

Inserting a single data item

You can insert a single data item anywhere in your report using the singleton object. The singleton object retrieves only the first row value for that query. Inserting a single data item is useful when you want to show a value that is independent from the rest of the values in the report or when you want to insert some boilerplate text, such as a company name and address. For example, you can add the total revenue value in the header of each page in a report.


You can associate multiple singleton objects with a single query in relational reporting and dimensional reporting to optimize performance, such as when all the data items in the singleton are from the same database table. In addition, two or more singletons can reference data items from the same query. This is useful when using a single query is more efficient to display a set of single values than using multiple queries.

You can also filter the data item in the singleton. For example, you can show the total revenue for only the year 2012.


Queries that are associated to a singleton object are not supported when producing report output in delimited text (CSV) format.

Tip: The Returns by Damage, Failed Orders and Complaints in 2012 sample report in the GO Data Warehouse (analysis) package includes a singleton.


Procedure

1. Click the **Toolbox** icon  and drag **Singleton** to the report.

An empty data container is created.

2. From the **Source** tab , drag a data item into the **Singleton** container.

Tip: To create a singleton, you can also drag a measure data item anywhere in your report layout. When you drag a measure on to the canvas, you get a summarized text item with a descriptive label and formatting. If you drag a categorical data item in your report layout, a list will be created.

3. To change the query associated to the singleton object, select the singleton, click the **Show properties** icon , and in the **Properties** pane, double-click the **Query** property and make changes.





Results

When the report is run, the first row value for the data item is retrieved.

Including output from a notebook

If IBM Cognos Analytics for Jupyter Notebook is enabled in IBM Cognos Analytics with Watson, you can embed the output from a notebook code cell in a report.

Procedure

1. In edit mode, click the **Toolbox**  icon, expand **ADVANCED**, and then double-click  **Notebook**.
2. If you are in **Page design** view, double-click **Double click here to select a notebook cell**.
3. If you are in **Page preview** view, click **Select a notebook**.
4. Select a notebook, and then click **Open**.
5. Select one of the notebook cells, and click **OK**.
6. If you are in **Page design** view, switch to **Page preview** view to see the contents of the notebook cell.
7. To see when the notebook cell was last updated, hover your cursor over the time stamp  icon.
8. You can hide or show the time stamp  icon by doing the following steps:
 - a) Click the notebook cell.
 - b) In the **Properties** pane, under **Miscellaneous**, toggle the **Show timestamp** property.

Results

Note: When you run the report, the output is updated from the last time the notebook was run. Notebook output appears only in HTML output in the interactive viewer.




Enabling a report to automatically refresh

Add an HTML item with a **<meta>** element to set the auto-refresh interval of a report.

About this task

If you are using a Cognos report as a dashboard, you must use the auto-refresh capability to enable the report to automatically load the data at specific intervals.

Procedure

1. Open a report in edit mode.
2. Click the **Insertable objects** icon , then click the **Toolbox** icon .
3. Navigate to the **Advanced** section, then drag **HTML item** to the top of the report.
4. Click the **Properties** icon , and in the **Properties** pane, double-click the **HTML** property.
5. In the **HTML** window, type the following text to add a meta element and specify the `http-equiv="refresh"` attribute:

```
<meta http-equiv="refresh" content="time_in_seconds">
```

For the content attribute, specify the refresh interval in seconds.

The following example refreshes the report every 5 seconds.

```
<meta http-equiv="refresh" content="5">
```




6. For all queries in the report, set the **Use Local Cache** property to **No**.

Validating a report

Validate your report to ensure that it contains no errors.

When you open a report created in a previous version, it is automatically upgraded and validated.

Procedure

1. Click the **Manage** icon , and click **Validate Report** .
A message box appears indicating whether any errors were found in the report.
2. If you require more detail from the validation process, click the **Show properties** icon , navigate to the report level, click the **Validate options** property, and do the following:
 - Click one of the following validation levels.

| Validation level | Description |
|---------------------------|--|
| Error | Retrieves all errors returned from the query. |
| Warning | Retrieves all errors and warnings returned from the query. This is the default validation level. |
| Key Transformation | In addition to errors and warnings, retrieves informational messages describing important transformation steps from the report specification to the native query sent to the data source. These messages can show the cause of errors and warnings returned from the query. |
| Information | Retrieves errors, warnings, key transformations, and other information related to query planning and execution. |

Tip: Your administrator can change the default validation level. For more information, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

- Select the **Interactive data** check box to specify that no query optimization is to be used.

The **Interactive data** check box controls how queries will be processed during validation.

Clear the **Interactive data** check box to set the query property **Execution optimization** property to **All Rows**.

A message box appears indicating whether any errors were found in the report.

- To view messages that result from the conversion of your report to use the dynamic query mode instead of the compatible query mode, select the **Dynamic Query Migration** check box.

For more information about using the dynamic query mode, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

- Revalidate your report.
3. If you encounter validation errors and want Cognos Analytics - Reporting to identify incorrect objects in your report, right-click the **Report** icon and click **Auto Correct**.

Cognos Analytics - Reporting provides a list of such objects that you can remove individually to successfully run your report.

In some cases, the information or error message is linked to the location of the issue in your report. To go to the location of the issue, click the message, and then click **Select**. If only warnings and information appear in the dialog box, these will disappear when you click **OK**.

Running a report

Run your report to see the data that is retrieved. Save time by validating it first to check for errors.


You can also run a report or a group of reports in the IBM Cognos Analytics with Watson portal.

You can specify not to render a report page if it does not contain any data.

When you run a report in an export format such as PDF, delimited text (CSV), Microsoft Excel spreadsheet software (XLS), the IBM Cognos report name is used as the exported file name.

If you run a report that uses functions or features not supported by the data source, an error message appears. We recommend that you periodically test your reports while you author them in IBM Cognos Analytics - Reporting to ensure that you do not encounter multiple error messages when you run the report.

Procedure

1. Open a report in edit mode.
2. If you want to clear parameter values stored on the IBM Cognos Analytics with Watson server, click the **More** icon  and click **Clear all parameters**.

Parameter values stored by the IBM Cognos Analytics with Watson server include sign-on, validation, and prompt information. For example, if you define two data source connections in the Cognos Analytics portal that point to the same data source, you are prompted to choose one when you run a report. This information is stored so that you are not prompted each time you run the report.

3. If you want to view only the tabular data for a query, do the following:

a) Click the **Toolbox** icon .

b) Click the **Queries** icon .

c) Right-click the query.

d) Click **View tabular data**.

Use this command to ensure that the right results appear. For example, you create a calculation and you want to ensure it is giving you the results you want.

4. If you want to set run options, click the **Run options** icon  and click **Show run options** property.

Note: The run options that you set apply only to the current session. When you close Cognos Analytics - Reporting, the options return to the default settings.

5. Change any values for the current session.

| Option | Description |
|---------------------------------------|--|
| Paper size | Specify only if the output format is PDF. |
| Paper orientation | Specify only if the output format is PDF. |
| Data mode | <p>Specify how much data is returned:</p> <ul style="list-style-type: none"> • All Data returns all data. • Limited Data limits the amount of data returned based on design mode filters defined in the package. • No Data returns artificial data instead of actual data from the data source. <p>For more information about design mode filters, see the <i>IBM Cognos Framework Manager User Guide</i>.</p> |
| Language | The content language sets the preferred language for the data, IBM Cognos Viewer, dates, and so on. |
| Rows per page | <p>Specifies the number of rows to appear on each page.</p> <p>A Rows Per Page property exists in the Properties pane for lists and crosstabs. If you set this property, the setting overrides the same-named run option. This property applies to both HTML and PDF outputs. For more information about this property, see “Controlling the Rows Per Page for Multiple Containers in HTML and PDF” on page 30.</p> |
| Prompt | <p>Select to be prompted for each prompt defined unless the prompt is defined in a report page.</p> <p>If you clear the Prompt check box, you are prompted only if the report cannot run without user intervention. For example, if a report has a single parameterized filter that is optional, you are not prompted when you run the report.</p> |
| Include accessibility features | <p>Specifies whether accessibility features, such as alternate text on images and charts and summary text in tables, are included in the report output.</p> <p>This option is also used for conditional layouts in Reporting. When the option is selected, you can specify that a crosstab is rendered as an accessible alternate to a chart.</p> |
| Enable bidirectional support | <p>Specifies whether to enable bidirectional support in the report output.</p> <p>Tip: You can also enable bidirectional support in Cognos Analytics portal by modifying your user preferences (My Preferences link). If you enable bidirectional support in Cognos Analytics portal, this run option will be automatically selected.</p> |

| Option | Description |
|------------------------------------|---|
| Include performance details | <p>Specifies whether to include performance details.</p> <p>The option Include performance details is designed for authors that want to interactively view the performance of their reports. You can use Include performance details while you are designing your page by running as HTML or by using the preview mode within the authoring mode.</p> |

6. Click the **Run options** icon and click one of the format options.

You can produce a report in HTML, PDF, [CSV](#), and various [Microsoft Excel formats](#). You cannot produce a report in CSV format if you have more than one query defined in the report, unless the additional queries are used for prompts.

Restriction: The formats that are available depend on the capabilities set by the administrator for each user. You may not be able to run reports in all formats. For more information, see the *IBM Cognos Analytics with Watson Administration and Security Guide* or contact your administrator.

Results

The report runs in the report viewer. Once the report has finished running, you can run the report again in the same format or in a different format. If you run the report again in CSV or XLS format, the report will appear in a new browser window.

Note: Cognos Analytics - Reporting, HTML viewers, and reports use standard HTML. Because reports have moved from quirks to standard HTML, there might be small differences in item sizes. These differences do not have an impact on the majority of reports that were created in previous Cognos versions. However, minor changes might be required in a small number of existing reports, such as reports that are printed on forms.








Limited and fully interactive reports





Reports can run in limited interactivity or full interactivity mode.


You specify the interactivity mode by setting the report property **Run with full interactivity**.

When a report is set to run with limited interactivity, the report runs in the IBM Cognos Business Intelligence (BI) Viewer, also known as IBM Cognos Viewer. Report consumers can drill up, drill down, and drill through. Any JavaScript or prompt API that is contained in the report is run. By default, Cognos BI reports run with limited interactivity.

When a report is set to run with full interactivity, the report runs in the Cognos Analytics interactive viewer. By default, reports that are created in Cognos Analytics are set to run with full interactivity. By clicking various icons in the report toolbar that appears when an object is selected, report consumers can do the following tasks in the interactive viewer:

- Sort data .
- In lists, group data .
- Summarize data .
- Convert a list or crosstab to a chart, or change a chart to a different chart type .
- In crosstabs and charts, suppress columns or rows  or swap columns and rows .
- Drill through to another report.
- Add calculated members .

- Drill up, drill down, and perform dimensional operations, such as top/bottom filtering .
- Run the report as Excel or CSV output.
- Select and interact with the elements of a chart, such as the bars in a bar chart.
- View lineage information for a data item .
- Access a business glossary, such as the IBM InfoSphere® Information Governance Catalog, for a data item .
- Create, edit or remove filters .
- Share or embed report output, preserving the context of the current view of the report, such as prompt values.

To share or embed report output, click the **Share** icon .

- Run a report as the report owner or with the capabilities granted to the owner.

In the Cognos Analytics portal, access the **Properties** slideout of the report, click the **Report** tab, and then open the **Advanced** section.

You can also start the Cognos Analytics interactive viewer by using URLs. You can open reports and pass parameters to a report. For more information, see the *IBM Cognos Analytics with Watson Getting Started Guide*.

Important: The following limitations apply to interactive reports:

- JavaScript in HTML items is removed when the report is run with full interactivity. Instead, you can add a **Custom control** object to add custom JavaScript to your report.
- Reports with the **Run with full interactivity** property turned on, as well as any reports with custom controls, are not supported for booklets. For more information, see [“Creating a report booklet” on page 473](#).

Specify Not to Render a Page If It Does Not Contain Data

You can specify not to render a report page if the page does not contain any data when the report is run.

Procedure

1. In the report page, click a data container.
2. Click the **Show properties** icon , click the **Select ancestor** icon , and click the data container type.

For example, if the data container is a list, click **List**.

Tip: You can also click the container selector (three dots) of the container to select it.

3. Set the **Render Page when Empty** property to **No**.
4. Repeat steps 1 to 3 for all other data containers in the page and any table of contents objects.

Results

When you run the report, if no data is produced in any data containers or table of contents objects that have the **Render Page when Empty** property set to No, the page is not rendered. The page is not rendered even if it contains other objects, such as text items or images.

Controlling the Rows Per Page for Multiple Containers in HTML and PDF

If you have more than one data container in a report, such as a list and a crosstab, you can control how the report is rendered in HTML and PDF by setting the **Rows Per Page** property for each container.

For HTML output, the report property option **Page break for interactive HTML** controls whether the default number of rows is rendered for each data container on each page.

IBM Cognos Analytics with Watson uses the following rules when rendering reports in HTML and PDF:

- If the **Rows Per Page** property is not set for any of the data containers, 20 rows per page are rendered in HTML and each page is completely filled in PDF. The first data container is rendered until there is no more data, followed by the next container, and so on.

Tip: The number of rows that appear on a PDF page depends on the font size set in the report.

- If the **Rows Per Page** property is set for each data container, the specified numbers of rows are rendered in HTML and PDF on each page until there is no more data.
- If the property is set for only some of the containers, the specified numbers of rows are rendered in HTML and PDF on each page until there is no more data. For the remaining containers, 20 rows per page are rendered on each page in HTML and each page is completely filled in PDF.

For example, you have two lists, List1 and List2. You set the **Rows Per Page** property to 5 for List1. When you run the report in HTML, the first page contains the first 5 rows from List1 followed by the first 15 rows of List2.

- If no data is returned for a data container, an empty container is rendered.

Producing a Report in CSV Format

IBM Cognos Analytics with Watson can produce reports in CSV format so you can open them in other applications, such as Microsoft Excel spreadsheet software.

Reports saved in CSV format

- support Unicode data across many client operating systems
- are UTF-16 Little Endian data encoded
- include a BOM (Byte Order Mark) at the beginning of the file
- are tab-delimited
- do not enclose strings in quotation marks
- use a new line character to delimit rows

You can open reports saved in CSV format using a variety of spreadsheet software applications. By default, reports produced in CSV format will appear in the application associated with the .csv file type.

You cannot produce the following in CSV format:

- maps
- charts that do not have at least one category or series
- reports that have more than one query defined in the report, unless the additional queries are used for prompts

In the IBM Cognos Analytics with Watson portal, you can configure the CSV output to suit your environment. For example, you can specify the character used to delimit fields. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Producing a Report in Microsoft Excel Format

You can export your report output to several different Microsoft Excel spreadsheet software formats.

Excel and **Excel data** formats render report output in native Excel XML format, also known as XLSX. This format provides a fast way to deliver native Excel spreadsheets to Microsoft Excel 2002, Microsoft Excel 2003, and Microsoft Excel 2007. Users of Microsoft Excel 2002 and Microsoft Excel 2003 must install the Microsoft Office Compatibility Pack, which provides file open and save capabilities for the new format.

Excel provides fully formatted reports for use in Microsoft Excel version 2007.

The output is similar to other Excel formats, with the following exceptions:

- Charts are rendered as static images.

- Row height can change in the rendered report to achieve greater fidelity.
- Column widths that are explicitly specified in reports are ignored in Microsoft Excel 2007.
- Merged cells are used to improve the appearance of reports.
- The default size of worksheets is 65 536 rows by 256 columns.

Your IBM Cognos administrator can enable larger worksheets and change the maximum number of rows in a worksheet, up to a maximum of 16,384 columns by 1,048,576 rows, by using advanced server properties. For more information, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

Excel data provides data for use in Microsoft Excel version 2007. These reports only contain minimal formatting. Default data formatting is applied to the data based on data type and assumes that each column has a single data type.

The output is similar to other Excel formats, with the following exceptions:

- The generated output includes only the first list query in the report. Other queries are ignored. If a report contains only multi-dimensional queries for crosstabs or charts, an error message is displayed when the report runs.
- Nested frames and master-detail links are not supported.
- Cells in the Microsoft Excel file have a default width and height. You must adjust the column width and height if the data is larger than the default size.
- Style specifications are not rendered, including color, background color, and fonts.
- Borders are not rendered.
- User-specified data formatting in the report specification are not applied, including exception highlighting and color rules for negative numbers.

Producing a Report in XML Format

XML report outputs save the report data in a format that conforms to an internal schema, `xmldata.xsd`.

You can find this schema file in `installation_location\bin`.

This format consists of a dataset element, which contains a metadata element and a data element. The metadata element contains the data item information in item elements. The data element contains all the row and value elements.

You can create models from reports and other data that conform to the `xmldata.xsd` schema. This is useful if you want to use a report as a data source for another report, or if you use a database that cannot be read by IBM Cognos Framework Manager. In this case, export the data from the data source to an XML file, in conformance with the `xmldata` schema, and then open the XML file in Framework Manager.

For more information, see the *Framework Manager User Guide*.

You cannot produce the following in XML format:

- maps
- charts that do not have at least one category or series
- reports that have more than one query defined in the report, unless the additional queries are used for prompts

If a report contains more than one data container, such as a crosstab and a list, and both containers use the same query, only the output for the list is produced. If a report contains multiple lists, only the output for the first list is produced. If a report contains multiple crosstabs and multiple lists, only the output for the first list is produced.


Viewing performance details

With the option **Include performance details**, you can view query and rendering performance on report objects in IBM Cognos Analytics with Watson.


The option **Include performance details** is designed for authors that want to interactively view the performance of their reports. You can use this option while you are designing your page by running as HTML or by using the preview mode within the authoring mode.

The following illustration shows the performance details for a crosstab.


| | |
|----------|---------------|
| Bachelor | 7,782.3298969 |
| Doctora | 26 |
| High Sch | 87 |

Execution Time: 1194 ms 

Render: Crosstab1, 22 ms
Query: Query1, 1172 ms

The **Execution Time** in milliseconds is displayed for each data container, including prompt controls, in the report. When you hover over the information icon  a flyout shows the following information:

- **Render:** The amount of time to generate the query, process any data that is returned from the database and generate the data container report objects. It does not include query time.
- **Query:** The amount of time that is required to plan the query, run it and retrieve the data.

The **Total Execution Time** is displayed at the end of the report. The total execution time is the time to render logic layout of the report, excluding the device time. When you hover over the information icon  a flyout shows the following information:

- **Host:** The name of the server where the report ran.
- **Process ID:** The process ID of the BIBusTKServerMain that rendered the report.
- **Session ID:** The client's unique identifier for his IBM Cognos session, from login to logout.
- **Request ID:** The report session's unique identifier through the duration of the report execution.
- **Hop Count:** The number of service nodes that the request communicated with during the report execution.

Note: To get additional information on why the report object is working the way that it is, your Cognos Administrator can use the Request ID as a search parameter within the logs.

Objects that use the same query show different execution times. The last run of performance details on an object uses cached information and does not have to rerun a query.

IBM Cognos Analytics with Watson retrieves rows as they are required in the interactively run HTML reports. Because of this, you will not see an accurate representation of the runtime of the report, when you scroll to the bottom of a long report, as you would see when you schedule it.

If you want to see the actual runtime by using performance details, then set the rows per page for your report object to a high enough number to retrieve all rows for the object. Click the object, such as a list, and then click **Show Properties**. The **Rows per page** option is in the **DATA** section.

Performance details are not available for the following output formats:

- XLS
- PDF
- Scheduled reports
- Active reports


Downloading PDF reports

You can download a PDF report and save it to your computer.

The PDF viewer in IBM Cognos Analytics - Reporting provides two options for downloading PDF reports:

- The **Download** button .

This is the recommended option because it generates the original, highest-quality PDF.

- The **Save to PDF** option from the print menu .

The PDF quality depends on the browser. For example, scaling of the PDF to the output page size, such as **Letter**, or the positioning of the PDF in the physical page might be affected by the browser specifications and is not controlled by IBM Cognos Analytics - Reporting.

Sharing content

If an administrator connects Cognos Analytics to Slack or Microsoft Teams, or enables email sharing, you can send Cognos Analytics report content to other users. You can also share your Cognos Analytics content via URL links and embedded html in web pages.

You can share content from two locations:

- your [Cognos Analytics canvas](#)
- the [Team content folder](#)

Sharing content from the canvas


In Cognos Analytics, you can send Cognos Analytics content that you are currently viewing on your Reporting or Dashboard canvas to your colleagues via Email, Microsoft Teams, or Slack.



Before you begin

Your administrator must configure a mail server and/or a collaboration platform before you can use this feature.

Procedure

1. While viewing your Cognos Analytics content in the Reporting or Dashboard component, click the

Share icon .

Tip: A different **Share** icon  appears in a context menu, after you click the More icon *** for a content folder or on the **Welcome** page. However, the **Share** panel that you invoke from a context menu only allows you to share saved report outputs or dashboards. To share an image of an asset that is open and that you are currently viewing, you must click the **Share** icon  in the application bar.

The **Share** panel appears.

2. In the **Share** panel, do one of the following to choose your sharing platform:

- Click **Email**. Then click **Send**, and go to step “3” on page 35.

Tip: If **Email** does not appear as a platform, your administrator did not enable content sharing by email.

- Click **Microsoft_Teams_platform_name**. Then click **Send**, and go to step “4” on page 35.

Tip: If a **Microsoft Teams** platform appears grayed out, your administrator has disabled the platform. If you are not part of a team in Microsoft Teams, you can join it through the pop-up window and then click on the *Microsoft_Teams_platform_name* again in Cognos Analytics to continue sharing your content.

If a **Microsoft Teams** platform doesn't appear, and your administrator had enabled it, your administrator may also need to [update an advanced setting](#).

- Click **Slack_platform_name**. Then click **Send**, and go to step “5” on page 35.

Tip: If a **Slack** platform appears grayed out, your administrator has disabled the platform. If you are not part of a slack workspace, you can join it through the pop-up window and then click on the workspace again in Cognos Analytics to continue sharing your content.


3. If you selected **Email**, in the **Share with email** panel, perform these steps:


a) Search for a recipient name, group, role, distribution list, or contact and then click **Search directory**. Repeat this step as necessary.


Tips:

- For external email accounts, enter the full email address, and then press Enter.
- If you start typing someone's name that you emailed recently, the full name quickly appears and you can select it.
- You can narrow the search results and speed up retrieval time by typing more characters in the recipient fields.
- Search results appear for all namespaces that you are logged into. You may need to scroll to see results for a different namespace.
- You can also browse for a recipient, by clicking **Directory > namespace**.

To quickly find an entry:

– Type text in the  **Find** field.

You can click the Search Method icon  to find entries that either contain, start with, or are an exact match with the text that you type.

– Click the filter  icon to narrow the view of entries.

b) Enter the email subject.

c) Enter the message that you want to send.

Tip: To format your message, use the **Styles** and **Format** buttons.

4. If you selected a Microsoft Teams platform in the **Share** panel, perform these steps:

a) Enter and select up to 10 channels, group chats, or recipient names.

Tips:

- For each recipient, start typing either a Teams channel name (starting with the hashtag symbol (#) or a Teams user name if you want to send a Direct Message in Teams. As you type, the list of possible choices is filtered, until you can select the one you want.
- If you entered multiple recipients, each one will receive the content in an individual Direct Message.

b) Enter the message that you want to send.

Tip: You must include some text in your message.

5. If you selected a Slack platform in the **Share** panel, perform these steps:

a) Enter a channel or recipient name.

Tip: Start typing either a Slack channel name (starting with the hashtag symbol (#) or a Slack user name if you want to send a Direct Message in Slack. As you type, the list of possible choices is filtered, until you can select the one you want.

b) Enter the message that you want to send.

Tip: You must include some text in your message.

6. Select **Include link** if you want your recipient to click a link to your content.

Tip: **Include link** appears only if your content is located in the **Team content** folder. Other users cannot link to content located in **My content**.

7. Select **Include image** if you want to attach an image of your content to your Email or Slack message.

8. If you selected the **Include image** option, you can edit the image before you send it: it. At the bottom of the **Share with platform_name** window, click the image before you send it.

a) At the bottom of the **Share with platform_name** window, click the image.

- b) Follow the steps to edit the image before you share it.
9. Click **Send**.

Results

Your message (and your image, if applicable) is sent to your selected recipients via email, Microsoft Teams, or Slack. You are then notified that the selected recipients received your message successfully. You are also notified of any recipients who do not receive the message.

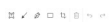





Editing canvas content for sharing


You can annotate a screen shot image of your Cognos Analytics content before you share it via email, Microsoft Teams, or Slack.


Before you begin

Follow steps [“1” on page 34](#) to [“8.a” on page 35](#) in [Sharing content from the canvas](#).


Procedure




1. To add text, an arrow, or a freehand line to your image, follow these steps:
 - a) Go to the toolbar  of the **Modify your image (optional)** pane and click one of these icons:
 - The Textbox icon 
 - The Arrow icon 
 - The Pen icon 
 - b) Select a color.
 - c) Type your text or draw an arrow or line.
 - d) Click **Done**.
2. To add a rectangle to your image, follow these steps:
 - a) Go to the toolbar of the **Modify your image (optional)** pane and click the Rectangle icon .
 - b) Click the Border icon , and then select the border color.

Tip: If you previously selected a border color, the Border icon appears in that color.
 - c) Click the Fill icon , and then select the fill color.

Tip: If you previously selected a fill color, the Fill icon appears in that color.
 - d) Hover over the image and click, drag, and then release to draw a rectangle.
 - e) Click **Done**.
3. To edit any text, arrow, freehand line, or rectangle that you added, follow these steps:
 - a) Ensure that you selected **Done** in the previous steps so that the Modify your image toolbar appears .
 - b) Click on the image.
 - c) To select an object, click on it.

A rectangle with drag handles appears around the object.

Tip: You can also press **Tab** successively to select each object that you created in the order that you created them. For more information, see [“Keyboard commands to edit canvas content” on page 37](#).
 - d) To move a selected object, move your cursor over the selected object so that the cursor changes to the Move cursor icon  and then drag the object to the position you want.

- e) To resize a selected object, select and drag one of its handles.
 - f) To delete one or more selected objects, click the Delete icon .
 - g) To delete every object that you added to the image, from the Modify your image toolbar , click **Clear**.
4. To crop your image, follow these steps:
- a) Go to the toolbar of the **Modify your image (optional)** pane and click the Crop icon .
 - b) On the image, click, drag, and then release to draw a highlighted rectangle over the area that you want to crop.
 - c) Click **Done**.
5. If necessary, complete any remaining steps to send a message [via email, Microsoft Teams, or Slack](#).

Results

Your message and edited Cognos Analytics content are shared with the recipients via your selected collaboration platform.

Keyboard commands to edit canvas content

You can use keyboard shortcuts as an alternative way to invoke a command by pressing a combination of keyboard keys.

The following tables list keyboard shortcuts to edit an image on your canvas that you plan to share with your colleagues.

| PC keyboard command | Macintosh keyboard command | Description |
|---------------------|----------------------------|---|
| t | t | Activate the Textbox Tool |
| a | a | Activate the Arrow Tool |
| p | p | Activate the Pen Tool |
| r | r | Activate the Rectangle Tool |
| c | c | Activate the Crop Tool |
| q | q | Rotate object(s) clockwise 10 degrees |
| Shift + Q | Shift + Q | Rotate object(s) counter-clockwise 10 degrees |
| Delete/Backspace | Delete | Delete object(s) |
| [| [| If the active select object is a textbox, shrink the word-wrapped area horizontally by 5 px. |
| Shift + { | Shift + { | If the active select object is a textbox, shrink the word-wrapped area horizontally by 50 px. |
|] |] | If the active select object is a textbox, expand the word wrapped area horizontally by 5 px. |

| PC keyboard command | Macintosh keyboard command | Description |
|----------------------------|-----------------------------------|---|
| Shift + } | Shift + } | If the active select object is a textbox, expand the word wrapped area horizontally by 50 px. |
| Ctrl + z | Ctrl + z / Command + z | Undo Previous Action |
| Ctrl + y | Ctrl + y / Command + y / | Redo Previous Action |
| Escape | Escape | Close Entire Panel |

| PC keyboard command | Macintosh keyboard command | Description |
|----------------------------|-----------------------------------|---|
| Tab | Tab | Move the tool selection on the toolbar from Left to Right one at a time. If you press Tab on the final tool (for example, Clear/ Done) the focus moves from the toolbar to the image. |
| Shift + Tab | Shift + Tab | Move the tool selection on the toolbar from Right to Left one at a time. Pressing Shift + Tab on the First tool moves the focus from the toolbar to the parent element. |
| Enter | Enter/Return | Activate the selected tool/color |

| PC keyboard command | Macintosh keyboard command | Description |
|----------------------------|-----------------------------------|--|
| Up Arrow | Up Arrow | Scroll the image up (If applicable) |
| Down Arrow | Down Arrow | Scroll the image down (If applicable) |
| Left Arrow | Left Arrow | Scroll the image left (If applicable) |
| Right Arrow | Right Arrow | Scroll the image right (If applicable) |
| Up Arrow | Up Arrow | Move the selected Object(s) up by 5 px. |
| Down Arrow | Down Arrow | Move the selected Object(s) down by 5 px. |
| Left Arrow | Left Arrow | Move the selected Object(s) left by 5 px. |
| Right Arrow | Right Arrow | Move the selected Object(s) right by 5 px. |
| Shift + Up Arrow | Shift + Up Arrow | Move the selected Object(s) up by 50 px. |
| Shift + Down Arrow | Shift + Down Arrow | Move the selected Object(s) down by 50 px. |

| PC keyboard command | Macintosh keyboard command | Description |
|----------------------------|-----------------------------------|---|
| Shift + Left Arrow | Shift + Left Arrow | Move the selected Object(s) left by 50 px. |
| Shift + Right Arrow | Shift + Right Arrow | Move the selected Object(s) right by 50 px. |
| Shift + Alt + Up Arrow | Alt + Up Arrow | Scale the selected Object(s) up by 5 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Down Arrow | Alt + Down Arrow | Scale the selected Object(s) down by 5 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Left Arrow | Alt + Left Arrow | Scale the selected Object(s) left by 5 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Right Arrow | Alt + Right Arrow | Scale the selected Object(s) right by 5 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Up Arrow | Shift + Alt + Up Arrow | Scale the selected Object(s) up by 50 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Down Arrow | Shift + Alt + Down Arrow | Scale the selected Object(s) down by 50 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Left Arrow | Shift + Alt + Left Arrow | Scale the selected Object(s) left by 50 px. Bottom Right Corner is selected for scaling. |
| Shift + Alt + Right Arrow | Shift + Alt + Right Arrow | Scale the selected Object(s) right by 50 px. Bottom Right Corner is selected for scaling. |
| Tab | Tab | Press successively to select each object that you created in the order that you created them. If the final object is already selected, hitting Tab will move focus from the image to the Share Panel. |
| Shift + Tab | Shift + Tab | Press successively to select each object that you created in the order that you created them. If the first object is already selected, hitting Shift + Tab will move the focus from the image to the toolbar. |
| Enter | Enter/Return | Enter Textbox Editing Mode if the active select object is a textbox. |
| Escape | Escape | Deselect any active object. If the selected object is a textbox and is currently in Textbox Editing |

| PC keyboard command | Macintosh keyboard command | Description |
|---------------------|----------------------------|--|
| | | Mode, it exits Textbox Editing Mode. |
| Escape | Escape | Deselect the active object and stop drawing. If the active select object is a textbox, exit Textbox Editing Mode |
| Enter | Enter/Return | Begin drawing an object with the virtual cursor by simulating a mouse down event. |
| Enter | Enter/Return | End drawing an object with the virtual cursor by simulating a mouse |
| Up Arrow | Up Arrow | Move the Virtual Cursor up by 5 px. |
| Down Arrow | Down Arrow | Move the Virtual Cursor down by 5 px. |
| Left Arrow | Left Arrow | Move the Virtual Cursor left by 5 px. |
| Right Arrow | Right Arrow | Move the Virtual Cursor right by 5 px. |
| Shift + Up Arrow | Shift + Up Arrow | Move the Virtual Cursor up by 50 px. |
| Shift + Down Arrow | Shift + Down Arrow | Move the Virtual Cursor down by 50 px. |
| Shift + Left Arrow | Shift + Left Arrow | Move the Virtual Cursor left by 50 px. |
| Shift + Right Arrow | Shift + Right Arrow | Move the Virtual Cursor right by 50 px. |

Sharing assets from the Team content folder

You can share with your colleagues report outputs or dashboards that are located in the **Team content** folder.


Sharing assets from Team content via email


You can share Cognos Analytics report outputs or dashboards in the **Team content** folder by Email.

Before you begin

Your administrator must configure a mail server before you can use this feature.

About this task

Cognos Analytics allows you to select  **Share** in an asset's context menu from several access points:

- the **Team content** folder
- the **Home**  page, in the list of recently opened assets


- the **Search results**  pane


Note: The following task describes accessing the context menu from the **Team content** folder. However, you can use any of the access points listed above.


Procedure


1. Save your dashboard or report output in the **Team content** folder.


Tip: Other users are not authorized to open content in your **My content** folder.

2. Navigate to the saved asset in the **Team content** folder.
3. Click the More icon  for the asset and then, in the context menu, click **Share**.

Tip: A different **Share** icon  appears in the application bar at the top of your window when you are viewing content on your canvas:

- If you are editing a new report or dashboard on your canvas and you click the **Share** icon  in the application bar, the **Share** panel only allows you to share the content from your current view.

Previously saved report output cannot be shared by clicking the **Share** icon  in the application bar.

- If you are viewing a saved report output PDF and you click the **Share** icon  in the application bar, the **Share** panel only allows you to share the saved PDF version as a link or an attachment.

4. In the **Share** panel, click the **Send** tab.

Tip: If the **Send** tab does not appear, the administrator did not configure a mail server and did not configure a collaboration platform.

5. Click **Email**.

Tip: If **Email** does not appear as a platform, your administrator did not enable content sharing by email.


The **Share with email** panel appears.


6. Search for a recipient name, group, role, distribution list, or contact and then click **Directory**. Repeat this step as necessary.


Tips:

- To add an external email address, enter the full address and then press Enter.
- If you start typing someone's name that you emailed recently, the full name quickly appears and you can select it.
- You can narrow the search results and speed up retrieval time by typing more characters in the recipient fields.
- Search results appear for all namespaces that you are logged into. You may need to scroll to see results for a different namespace.
- You can also browse for a recipient, by clicking **Directory** > **namespace**.

To quickly find an entry:

- Type text in the  **Find** field.

You can click the Search Method icon  to find entries that either contain, start with, or are an exact match with the text that you type.

- Click the filter  icon to narrow the view of entries.

7. Keep the default subject or enter a new one.
8. Enter the message that you want to send.

Tip: To format your message, use the **Styles** and **Format** buttons.

9. Select **Include link** if you want your recipient to click a link to your content.

Tip: **Include link** appears only if your content is located in the **Team content** folder. Other users cannot link to content located in **My content**.

10. If report output exists in a valid attachment format, you can attach one or more outputs to your email.

Tip: For more information, see [“Valid report output formats for email attachments” on page 42](#).

a) Select **Attach report output**.

b) Click **Add**.

The **Pick report output** panel appears. Each output option appears only if it already exists as a saved report output. However, [HTML format cannot be attached to an email](#).

c) Select a report version.

d) Select a burst key, if the field appears in the panel.

e) Select a format.

f) Select a language.

g) Click **Add**.

h) If there are additional version outputs that you want to attach, repeat steps [“10.b” on page 42](#) to [“10.g” on page 42](#).

i) Click **Done**.

11. Click **Send**.

Results

Your message is sent to your selected recipients via email.

Valid report output formats for email attachments

Most formats of saved report outputs can be attached to an email that you send to your colleagues.

You can attach report output versions that were saved in the following formats:

- Excel
- Excel Data
- PDF
- CSV
- XML

Note: A report output saved in HTML format cannot be attached to an email. Although HTML output can be viewed in Cognos Analytics, it is not compatible as an email attachment.


Sharing assets from Team content via Microsoft Teams or Slack



In Cognos Analytics, you can send Cognos Analytics report outputs or dashboards in the **Team content** folder via Microsoft Teams or Slack.



Before you begin

Your administrator must configure a collaboration platform before you can use this feature.

About this task

Cognos Analytics allows you to select  **Share** in an asset's context menu from several access points:

- the **Team content**  folder
- the **Home**  page, in the list of recently opened assets


- the **Search results**  pane
- the **Recent**  pane


Note: The following task describes accessing the context menu from the **Team content** folder. However, you can use any of the access points listed above.


Procedure


1. Save your Cognos Analytics dashboard or report output in the **Team content** folder.


Tip: Other users are not authorized to open content in your **My content** folder.

2. Navigate to the saved asset in the **Team content** folder.
3. Click the More icon  for the asset and then, in the context menu, click **Share**.

Tip: A different **Share** icon  appears in the application bar at the top of your window when you are viewing content on your canvas:

- If you are editing a new report or dashboard on your canvas and you click the **Share** icon  in the application bar, the **Share** panel only allows you to share the content from your current view.

Previously saved report output cannot be shared by clicking the **Share** icon  in the application bar.

- If you are viewing a saved report output PDF and you click the **Share** icon  in the application bar, the **Share** panel only allows you to share the saved PDF version as a link or an attachment.

The **Share** panel appears.

4. In the **Share** panel, do one of the following to choose your sharing platform:

- Click **Email**. Then click **Send**, and go to step [“5” on page 43](#).

Tip: If **Email** does not appear as a platform, your administrator did not enable content sharing by email.

- Click **Microsoft_Teams_platform_name**. Then click **Send**, and go to step [“6” on page 44](#).

Tip: If a **Microsoft Teams** platform appears grayed out, your administrator has disabled the platform. If you are not part of a team in Microsoft Teams, you can join it through the pop-up window and then click on the *Microsoft_Teams_platform_name* again in Cognos Analytics to continue sharing your content.

If a **Microsoft Teams** platform doesn't appear, and your administrator had enabled it, your administrator may also need to [update an advanced setting](#).

- Click **Slack_platform_name**. Then click **Send**, and go to step [“7” on page 44](#).

Tip: If a **Slack** platform appears grayed out, your administrator has disabled the platform. If you are not part of a slack workspace, you can join it through the pop-up window and then click on the workspace again in Cognos Analytics to continue sharing your content.

5. If you selected **Email**, in the **Share with email** panel, perform these steps:


- a) Search for a recipient name, group, role, distribution list, or contact and then click **Search directory**. Repeat this step as necessary.


Tips:


- For external email accounts, enter the full email address, and then press Enter.
- If you start typing someone's name that you emailed recently, the full name quickly appears and you can select it.
- You can narrow the search results and speed up retrieval time by typing more characters in the recipient fields.

- Search results appear for all namespaces that you are logged into. You may need to scroll to see results for a different namespace.
- You can also browse for a recipient, by clicking **Directory > namespace**.

To quickly find an entry:

Type text in the  **Find** field.

You can click the Search Method icon  to find entries that either contain, start with, or are an exact match with the text that you type.

Click the filter  icon to narrow the view of entries.

- Enter the email subject.
- Enter the message that you want to send.

Tip: To format your message, use the **Styles** and **Format** buttons.

6. If you selected a Microsoft Teams platform in the **Share** panel, perform these steps:

- Enter a channel or recipient name.

Tip: Start typing either a Slack channel name (starting with the hashtag symbol (#) or a Slack user name if you want to send a Direct Message in Slack. As you type, the list of possible choices is filtered, until you can select the one you want.

- Enter the message that you want to send.

Tip: You must include some text in your message.

7. If you selected a Slack platform in the **Share** panel, perform these steps:

- Enter a channel or recipient name.

Tip: Start typing either a Slack channel name (starting with the hashtag symbol (#) or a Slack user name if you want to send a Direct Message in Slack. As you type, the list of possible choices is filtered, until you can select the one you want.

- Enter the message that you want to send.

Tip: You must include some text in your message.

8. Select **Include link** if you want your recipient to click a link to your content.

Tip: Include link appears only if your content is located in the **Team content** folder. Other users cannot link to content located in **My content**.

9. Select **Include image** if you want to attach an image of your content to your Email or Slack message.

10. If you selected the **Include image** option, you can edit the image before you send it: it. At the bottom of the **Share with platform_name** window, click the image before you send it.

- At the bottom of the **Share with platform_name** window, click the image.

- Follow the steps to edit the image before you share it.

11. Click **Send**.

Results

Your message is sent to your selected recipients via Slack.

Linking to saved content


In Cognos Analytics, you can create a URL for any view in your dashboard or report. You can then send the URL by email or embed the URL in a web page or another dashboard or report.


You can share content objects, such as reports and dashboards, with a URL that opens the content object directly, instead of having to browse to the content object from the Cognos Analytics welcome screen. You can also embed Cognos Analytics content objects (except for data modules) in customized web pages. An embedded content object does not display the application or navigation bars.

Procedure

1. Save your Cognos Analytics dashboard or report output in the **Team content** folder.

Tip: Other users are not authorized to open content in your **My content** folder.


2. Navigate to the view that you want to send to a co-worker.
3. Click the More icon  for the asset and then, in the context menu, click **Share**.

Tip: A different **Share** icon  appears in the application bar at the top of your window if you are viewing content on your canvas. However, if you click that icon, the **Share** panel only allows you to share the content from your current view, not previously saved output.

4. In the **Share** panel, click the **Link** tab.

Tip: You can modify the URL to perform other actions, such as opening a report for editing instead or running the report, or changing the output format of the report. For more information, see *Creating custom URLs to display and run Cognos Analytics content in IBM Cognos Analytics with Watson Getting Started User Guide*.

5. If you want to send the link to a co-worker by email, do the following:

- a) In the **Link** section, click the **Copy** icon .

The URL is copied to your clipboard.

- b) Paste the URL into your email and send the email.

6. If you want to embed the html code for your view in a web page, go to the **Embed code** section, and follow these steps:

- a) If you want to change the height and width of the iframe that will contain the code, adjust the values in the **Width** and **Height** fields.

- b) click the Copy icon .

The URL is copied to your clipboard.

- c) Paste the URL into the html text of your web page.

Authentication sample with embedded content

The embedded content sample shows how to use the IBM Cognos Analytics with Watson REST API to sign in a user and then display embedded content.

Procedure

1. Copy the `embedded_content` folder from the `<installation_location>\samples` folder to the `<installation_location>\webcontent` folder.
2. Open the `\webcontent\embedded_content\preLoginSample.html` file in a text editor, and locate the `<select>` element:

```
<select size="1" name="namespace">
  <option value="CognosEx">CognosEx (Example)</option>
  <option value="LDAP">LDAP (Example)</option>
</select>
```

3. For any of the configured namespaces that you want to see as a selection in the login page, define the `<option>` element within the `<select>` element, using the following syntax:

```
<option value="namespace_ID">namespace_name</option>
```

The `namespace_ID` corresponds to the **Namespace ID** property, as defined for the namespace in Cognos Configuration, under **Security > Authentication**. The `namespace_name` can be any word; however, the name defined in Cognos Configuration is preferred.

4. Open the `\webcontent\embedded_content\iFrameSample.html` file, and replace the `iFrame` objects with **Embed** `iFrame` objects from your Cognos Analytics installation.
5. In a web browser, type `http://<server_name>:<port>/embedded_content/preLoginSample.html`

Results

A sign-in web page is displayed. After you sign in, the embedded content objects are shown.

Embedding a report in Microsoft Teams

You can add a tab in Microsoft Teams that displays a report from your Cognos Analytics environment to other Teams users. To achieve this, you upload a Cognos Analytics app to Microsoft Teams. This allows you to connect to an external Cognos Analytics server from within Teams.

Note: You can run your Teams application on any platform: Windows, Macintosh, or the Web.

Before you begin

Ensure that these requirements are met:

- Cognos Analytics version 11.2.4 or later is configured as follows:
 - SSL is enabled
 - You have set the advanced configuration parameter `Configuration.cookieSameSite` with a value of `None`.
- For more information, see [Setting the SameSite attribute on cookies](#)
- You have administrator privileges in your Teams environment.
 - If you are running Teams on Firefox, you may need to turn off the Enhanced Tracking protection option.

Note: You don't need to be a Cognos Analytics administrator. If you can access a report in Cognos Analytics, you can embed a report in Teams.

Procedure

1. In a browser window, enter the Cognos Analytics URL, appended with `msteamsapp/download`, as follows:
`https://host_name:port_number/bi/v1/msteamsapp/download`
or
`https://web_server_name:443/virtual_directory/bi/v1/msteamsapp/download`
A .zip file, `cognosanalyticsmsteams.zip`, is downloaded to your computer.
2. Start Microsoft Teams.
3. Click **Apps**, then click **Manage your apps**.
4. If you installed a version of `cognosanalyticsmsteams.zip` prior to release 11.2.4, click **Uninstall an app** and uninstall the old version of `cognosanalyticsmsteams.zip`. Before going to the next step, clear the cache in your browser.
5. Click **Upload an app**, and then and select **Upload a custom app**.
6. Browse to the `cognosanalyticsmsteams.zip` file that you downloaded in step “1” on page 46, select it, and then click **Open**.
7. Do one of the following to specify where the report tab will appear in Teams:
 - Click **Add to a team**, then type a team or channel name.
 - or
 - Click **Add to a chat**, then type the name of a person or a chat.

8. Click **Set up tab**.
9. Enter the Cognos Analytics URL, as follows:
`https://host_name:port_number/bi/`
or
`https://web_server_name:443/virtual_directory/bi/`
10. Click **Confirm**.
11. Log into Cognos Analytics.
Note: OIDC authentication is not supported.
12. Browse the **Team content** folder, select a report, and then click **Select**.
13. Click **Save** to confirm your selection.

Results

The Cognos Analytics report tab is added to Microsoft Teams.

View lineage information for a data item

View lineage information of a data item to see what the item represents.

Before you begin

Before you can access lineage information for a report, your administrator must configure lineage in IBM Cognos Administration. Also, the administrator must enable the lineage capability and grant read permission for you on the report.

Note: The IBM Cognos Analytics with Watson lineage tool shows lineage on a report at its highest level. The lineage does not change after you drill down on a report. Because the selection context used to launch lineage can be affected by drill-down operations, we recommend that you always launch lineage at the highest report level before drilling down on the report. Otherwise, the lineage may not start properly.

About this task

Lineage information traces the metadata of an item back through the package and the data sources used by the package. Lineage also displays any data item filters that were added by the report author or that were defined in the data model. Viewing lineage information ensures that you add the correct data items to a report. For example, you can view the lineage information of a model calculation to see how it was created.

Note: Lineage is available only after your administrator has configured it. In addition, lineage is not supported in reports that are not linked to packages.

You can use the lineage tool that comes with IBM Cognos Analytics with Watson, or you can use another lineage tool by specifying the URL to the tool in IBM Cognos Administration. Note that if the URL source is secured, the source must be able to prompt users for a password because IBM Cognos Analytics with Watson does not pass security information. IBM Cognos Analytics with Watson also supports the IBM Metadata Workbench as a lineage tool.

You cannot use lineage information to troubleshoot queries. For example, lineage information will not explain why a data item is double counted. Also, you cannot view lineage information when running a report from a mobile device.



There are several ways in which you can view lineage information.

- You can view lineage information for a data item before you add it to a report.
- You can view lineage information in IBM Cognos Viewer after you run a report.

For example, you can click a cell in a crosstab to see how the cell value was calculated.

- You can view lineage information in the Cognos Analytics interactive viewer after you run a report.
- In the page preview view, you can view lineage information for a data item that was added to a report.

Procedure

1. To view lineage information for a data item before you add it to a report:
 - a) From the **Data items** tab , right-click the data item and click **Lineage**.
2. To view lineage information in IBM Cognos Viewer, right-click an item in the report and then click **Lineage**.
3. To view lineage information in the Cognos Analytics interactive viewer or in the page preview view, select an item in the report, and in the report object toolbar, click the **Explore** icon  and then click **Lineage**.

Results

The lineage tool opens showing the lineage information of the selected data item.

The IBM Cognos Analytics with Watson lineage tool

The IBM Cognos Analytics with Watson lineage tool includes two views: the business view and the technical view.

The business view displays high-level textual information that describes the data item and the package from which it comes. This information is taken from IBM Cognos Analytics portal and the IBM Cognos Framework Manager model.

The technical view is a graphical representation of the lineage of the selected data item. The lineage traces the data item from the package to the data sources used by the package.

When you click an item, its properties appear below it. If you click an item in the **Package** area, you see the model properties of the item. If you click an item in the **Data Sources** area, you see the data source properties of the item.

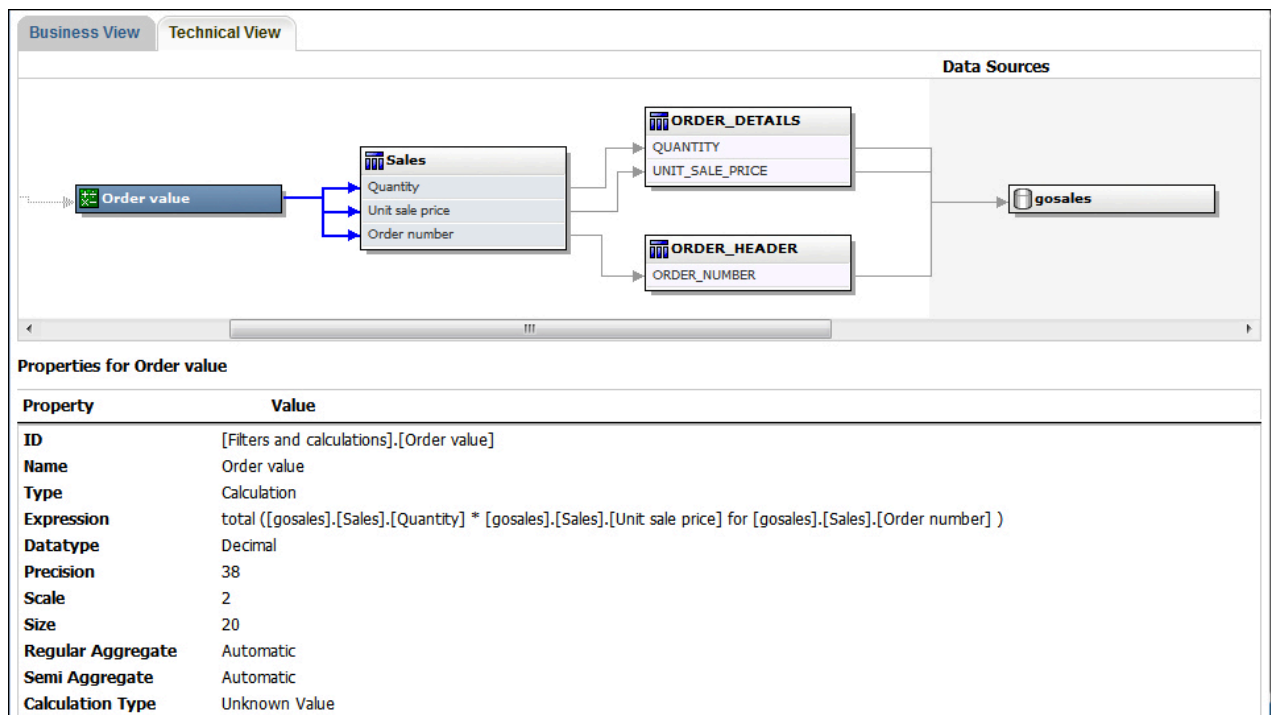


Figure 1. The technical view in the IBM Cognos Analytics with Watson lineage tool

If you or an administrator runs a saved report with the IBM Cognos Analytics with Watson lineage tool, both the business view and the technical view are visible. Report consumers can see only the business view. In addition to the **Package** and **Data Sources** areas, a **Report** area exists when looking at the technical view.

Access the IBM InfoSphere Information Governance Catalog

If you use the IBM InfoSphere Information Governance Catalog, you can access the catalog from various data objects in a report.

Before you begin

To access the IBM InfoSphere Information Governance Catalog, your Cognos administrator must specify the URI of the Catalog web page in Cognos Administration. For more information, see the *IBM Cognos Analytics Administration and Security Guide*.


About this task

Business glossaries help you manage and share an enterprise vocabulary and classification system.

If you use the IBM InfoSphere Information Governance Catalog, you can access the catalog from any of the following data objects:

- Query subject
- Query item
- Measure
- Dimension
- Hierarchy
- Level
- Property or attribute
- Top node member
- Member
- Level item

Procedure

1. Open an HTML report or report view in the IBM Cognos Viewer or in the Cognos Analytics interactive viewer.
2. If you are in the IBM Cognos Viewer, right-click the data item and click **Glossary**.
3. If you are in the Cognos Analytics interactive viewer, select the data item, and in the report object toolbar, click the **Explore** icon  and then click **Glossary**.

Results

The IBM InfoSphere Information Governance Catalog appears.

Support for bidirectional languages

You can author reports that support bidirectional languages. You can specify base text direction, digit shaping, and container direction.

Arabic, Hebrew, Urdu, and Farsi are languages written from right to left, using the Arabic or Hebrew scripts. However, numbers in those languages, as well as embedded segments of Latin, Cyrillic, or Greek

text, are written from left to right. Using the bidirectional settings in IBM Cognos Analytics - Reporting, you can control the direction in this type of text in reports.

Note: Arabic is not supported as a report language for report authoring. That is, you can't author a report in Arabic but if a report contains data that is in Arabic, the Arabic data is displayed. For more information about languages used in reporting, see [“Language settings” on page 21](#).

Report formats

Bidirectional languages are supported for reports produced in HTML, PDF, and Microsoft Excel. IBM Cognos Active Report also supports bidirectional languages.

Enabling bidirectional support

To enable support for bidirectional languages when a report is run, in the IBM Cognos Analytics with Watson portal, users must open their **Update profile and settings** page and select the **Bidirectional language support** check box.

To enable support for bidirectional languages when a report is run from Cognos Analytics - Reporting, select the **Enable bidirectional support** check box in the **Run options** window.

Tip: If you enable bidirectional support in the Cognos Analytics portal and you then start Cognos Analytics - Reporting, the bidirectional support run option in Cognos Analytics - Reporting is selected. If you disable bidirectional support in the Cognos Analytics portal and you then start Cognos Analytics - Reporting, the run option in Cognos Analytics - Reporting is cleared.

Base text direction

Base text direction sets the text direction as left-to-right or right-to-left. You can specify the base text direction for any text object in a report. You specify the base text direction for text by clicking the **Direction & justification** property for the text or for the object that contains the text, such as a list column.

A contextual option also exists in the **Direction & justification** property that sets the text direction based on the first letter in the text.

For compound objects that contain text, you specify the base text direction of the text contained in the object by clicking the **Contained text direction** property for the object. Examples of compound objects are charts, prompts, and active reports.

Digit shaping

Digit shaping allows users to consume reports with numbers that they can read after they select the content language in the Cognos Analytics portal. You can specify digit shaping at the following levels:

- Report
- Container (except for charts and maps)
- Text
- Number

You specify digit shaping for an object by clicking the **Data format** property for the object. To specify digit shaping at the report level, click the report property **Data formats**.

Tip: Digit shaping has no impact on reports produced in Excel format, since the shaping of digits in Excel depends on Windows regional settings.

Container direction

Container direction sets the direction of container objects in a report as left to right or right to left. You specify container direction for an object by clicking the **Direction & justification** property for the object.

Tip: Container direction is not supported in reports produced in Excel format. Excel spreadsheets do not natively support mirroring at the container level.

Reports for workspaces in Cognos Workspace

When building a workspace in IBM Cognos Workspace, business users can insert an entire IBM Cognos Analytics - Reporting report or insert only individual objects from within a report.

To create effective reports for use in workspaces in Cognos Workspace:

- Ensure that all the objects and pages within the report have meaningful names.

For some objects, such as data containers, Reporting gives the object in a report a default name such as List 1, List2, and so on. In Cognos Workspace, these names appear in the **Content** tree. To help business users recognize the report objects, rename them to something more meaningful (**Properties** pane, **Name** property).

If you do not want an object to be added in a workspace, clear the **Name** property for that object. The object will not appear in the **Content** tree. However, you cannot clear the name of data containers. Reporting requires that data containers have names.

Note: Cognos Workspace does not support tables and blocks. Unsupported objects do not appear in the **Content** tree in Cognos Workspace, even if you specify a name for the object.

- Create a container report that includes all the report objects that workspace users might want to add in a report. Such a report is not meant to be run and does not need to show report objects in a proper layout. It is only used as a container for the various report parts. Each page of a report appears as a folder within the Cognos Workspace **Content** pane.

For example, on one page named Prompts you can insert all the possible prompts that users might want to add to a workspace, and give each prompt a useful business name, such as Value Prompt for Region. On a second page named Charts, you can insert a number of charts useful for workspaces.

- Ensure that the titles and labels used in your report are understandable by business users.
- Ensure that you use report objects that are well suited for dashboards. They convey the most information in as little space as possible. For example, if you include a chart, use bullet charts, microcharts, line charts, or column and bar charts. Use conditional blocks to show business indicators.
- If your report includes charts, customize the font sizes so that the charts appear correctly in a dashboard. You may need to reduce the font sizes.
- If your report includes embedded objects, such as a list with an embedded chart and crosstab, the embedded objects do not appear in the Cognos Workspace **Content** pane, unless the embedded objects are in a table object. When you insert an object that contains embedded objects, the embedded objects will be inserted in the workspace.

When embedded objects are in a table object, the embedded objects appear in the **Content** pane. Table objects do not appear in the **Content** pane because Cognos Workspace does not support Cognos Analytics - Reporting table objects. Consequently, you can insert the embedded objects in a workspace, but not the table.

- If your report includes a map, customize the colors of the map in Reporting so that they match the color palette of the dashboard. You cannot edit the color palette of a map from within a workspace in Cognos Workspace.
- If your report is using a dimensional data source and you enable drill-up and drill-down, in the **Drill Behavior** window, specify that the column title uses member caption values.

Cognos Workspace does not support drill up and drill down with level label values as the column titles. Cognos Workspace always uses member captions.

Prompts in workspaces in Cognos Workspace

A prompt control, when assigned a **Name** property in IBM Cognos Analytics - Reporting, appears as an object that you can insert from the **Content** pane in a workspace in IBM Cognos Workspace.

If a workspace includes reports and report parts from the same model, prompts automatically filter the appropriate data item in all the widgets in the dashboard. For example, a prompt filters on Product Line. Any widget in the dashboard that includes the Product Line data item is filtered when you select a value from this prompt control. If you do not want a prompt to control a widget in the dashboard, you can disable communication between the two widgets.






If a dashboard includes prompted reports or report parts from different models, ensure that the prompts use the same parameter names. For example, a year prompt should use the same parameter **p_Years** in reports from both models. Otherwise, the prompt control is unable to control reports from another package.

Enable filters in workspaces in Cognos Workspace

You can include a data item in the query of the report, but not show that data item in the actual report. This is useful for creating calculations and filters. If you want IBM Cognos Workspace users to filter content in a workspace based on a data item that is not visible in the report, you must include this data item in its own query and name it **_BusinessInsight_** within the IBM Cognos Analytics - Reporting report. Therefore, the data item must exist in both the query used for the data container (such as the list, crosstab, or chart) and in this separate query.

For example, a chart shows the revenue for the product lines for each region. You want to filter the chart to show only data for the year 2012. When you author the report, in addition to including Year in the Query1 used for the chart data container, you create a new query named **_BusinessInsight_** that includes Year.

Procedure

1. Click the **Queries** icon , and then click **Queries**.
2. Click the **Toolbox** icon , and drag a **Query** object to the work area.
3. Click the **Query** object, click the **Show properties** icon , and in the **Properties** pane, in the **Name** box, type **_BusinessInsight_**.
4. Double-click the **Query** object, click the **Data** icon , and from the **Source** tab , add the data item to use as a filter.

Ensure that the same data item also exists in the query used for the data container.

Creating Reports for IBM Cognos for Microsoft Office

IBM Cognos for Microsoft Office provides an integrated environment for IBM Cognos products and Microsoft Office. You can use IBM Cognos for Microsoft Office to select pieces of reports to embed in Microsoft Excel workbooks, Microsoft Word documents, or Microsoft PowerPoint presentations, including data, metadata, headers, footers, and charts. You can use predefined reports or you can create new content using IBM Cognos PowerPlay® Web, IBM Cognos Query Studio, or IBM Cognos Analytics - Reporting.

Note: Note that to access PowerPlay content, your administrator must configure PowerPlay to work with IBM Cognos Analytics with Watson. PowerPlay content that is published only to Upfront is not available to IBM Cognos for Microsoft Office.

Because IBM Cognos for Microsoft Office cannot fully convert highly formatted reports into Excel or other Microsoft document output types, you may not get the results that you want.

To create effective reports for IBM Cognos for Microsoft Office, follow these recommendations:

- Create content to meet specific Microsoft Office integration needs.

For example, in IBM Cognos Analytics with Watson, many options are available to format data. Use less formatting to make data more accessible to Office applications.

- Organize reports.

You can publish workbooks to the Cognos Analytics portal and organize them with your reports in **Team content** or **My content**. For more information, see the *IBM Cognos Analytics with Watson Getting Started Guide*. By organizing your content, you can quickly retrieve the information that you want.

Tip: Workbooks, documents, and presentations that are enabled for IBM Cognos for Microsoft Office are identified by their own unique icons, helping you to distinguish them from other types of files.

- Optimize report templates for Microsoft Office.

If you rely on IT personnel or other report authors to create content, request report templates that are optimized for your Microsoft Office integration needs. You may want to request only the data elements or queries that you need and request minimal formatting so that you can more easily use Microsoft Office formatting capabilities with the IBM Cognos content. For example, reports authored in Cognos Analytics - Reporting can contain list objects embedded within list objects with specific formatting applied. When converted to the tabular representation available in Excel, these reports may not be rendered in the same way in which they appear in IBM Cognos Analytics with Watson.

- Format elements in the Office application.

Instead of formatting objects in IBM Cognos Analytics with Watson, add the formatting in the Office application. By applying less formatting in IBM Cognos Analytics with Watson, you can import more data into the desired locations.

- Label report elements using descriptive names.

This practice makes them more easier to find after you import them. Examples of report elements include lists, crosstabs, and charts.

- Do not nest report objects.

If you nested report objects, some objects may not appear in the correct location, or they may not appear at all. In addition, nesting report objects may cause the following error message to appear:

RDS-ERR-1000 Report Data Service could not process from the content provider.

For example, this error occurs if a repeater or repeater table is inside a block or table. It also appears when layout objects, such as lists, crosstabs, and charts, are in a conditional block that is inside another block or table.

- Keep table sizes small.

For example, because of the size of slides, the maximum number of rows and columns that you can have in Microsoft PowerPoint tables is 25. Although Word and Excel permit larger tables, it takes more time to download and render them.

- Use images with transparent backgrounds.

The background will show through the image in the Office application, making the image look like part of the presentation. If you want, you can then supply your own background color.

- Specify the height and width of images in a list.

This practice ensures that the image appears in the correct size in the Office application.

- Remember that graphs and charts are imported as images.

Images in IBM Cognos Analytics with Watson have image maps associated with them to enable tooltips and hotspots. IBM Cognos Analytics with Watson for Microsoft Office cannot import tooltips and hotspots into Office applications.



- Consider the additional limitations that exist when producing reports in Excel format.

Creating Reports for Cognos Analytics Mobile Reports

You can send IBM Cognos Analytics - Reporting reports to mobile devices that have Cognos Analytics Mobile Reports installed, or that are using the Cognos Analytics Mobile Reports Web portal.

The IBM Cognos Software Development Kit

When you create a report, you are creating a report specification.

A report specification is an XML file that you can view (Click the **More** icon , and click **Show Specification** .

You can also programmatically create or modify reports by using an editing tool to work with report specifications. You then use the IBM Cognos Software Development Kit to implement the reports in your IBM Cognos Analytics with Watson environment. This is useful if, for example, you must make the same modification in many reports. Rather than opening each report and making the change, you can automate the process using the Software Development Kit, thereby saving you time. For more information about the Software Development Kit, contact your local sales office.

Tips

- When you are viewing the report specification, you cannot modify or copy parts of it.
- You can also modify the XML code in a report specification by saving the report specification on your computer.

Relative date analysis

The relative date feature makes it easier to do as-of-date analysis. For example, you can quickly add year-to-date or previous month values to a data container, such as a visualization, cross tab, list, and so on.

To do relative date analysis, a modeler must create a data module in which your data references a calendar. You use this data module as a source for relative date analysis in your data container.

Before you can do as-of-date analysis, the following tasks must be completed:

Administrator

Import the Calendars sample. For information about the Calendars sample, see "Importing the base samples" in the *IBM Cognos Analytics with Watson Samples Guide*.

Optionally, create an as-of-date global parameter and share it with users. You can use this parameter to ensure that a data container always reports as of a specific date. Without this parameter, the data container reports as of the current date.

Modeler

Associate a date column in your data with one of the calendars and associate measures to this date column.

For more information about how to do the previously listed tasks, see *Data Modeling* in IBM Cognos Analytics with Watson IBM Knowledge Center .

The calendar data modules contain the following filters:

- Prior week
- Prior month (not available in the retail calendar)
- Prior quarter
- Prior year
- Current week
- Current month

- Current quarter
- Current year
- WTD (week to date)
- MTD (month to date)
- QTD (quarter to date)
- YTD (year to date)
- Prior WTD
- Prior MTD
- Prior QTD
- Prior YTD
- Same week last year
- Same month last quarter
- Same month last year
- Same quarter last year
- Same MTD last quarter
- Same MTD last year
- Same QTD last year


You can do relative date analysis in the following ways:

- Include relative date filtered measures in the data container. In the following example, you would select one of the child measures of the Service Requests measure that references a relative date filter:

- Service Requests
 - Prior Week [Service Requests]
 - Prior Month [Service Requests]
 - Prior Quarter [Service Requests]
 - Prior Year [Service Requests]
 - Current Week [Service Requests]
 - Current Month [Service Requests]
 - Current Quarter [Service Requests]
 - Current Year [Service Requests]
 - Prior WTD [Service Requests]
 - Prior MTD [Service Requests]
 - Prior QTD [Service Requests]
 - Prior YTD [Service Requests]
 - WTD [Service Requests]
 - MTD [Service Requests]
 - QTD [Service Requests]
 - YTD [Service Requests]
 - Same Month Last Quarter [Service Requests]
 - Same Week Last Year [Service Requests]
 - Same Month Last Year [Service Requests]
 - Same Quarter Last Year [Service Requests]
 - Same MTD Last Quarter [Service Requests]
 - Same MTD Last Year [Service Requests]
 - Same QTD Last Year [Service Requests]

- Add a relative date filter to a query by using the predefined date filters.

If your administrator defined an as-of-date global parameter for your role, all data containers that contain relative date filters or filtered measures report as of the value of this parameter. You can set the value in

My parameters . For more information about global parameters, see "Using customized parameters" in the *IBM Cognos Analytics with Watson Reporting Guide*.

Relative date measure displays with incorrect label

You use a relative date filtered measure in a report. The label that appears when you run the report doesn't match the label that appears in **Page design**.

About this task

Note: This information applies to version 11.1.2 and earlier.

The label that appears is the measure ID. To fix this problem, you can customize the label.

Procedure

1. In **Page design** mode, open the query that contains the relative date measure.

Tip:

Use the navigation menu to quickly select the query you want.

2. In the **Data Items** pane, click the measure whose label you want to change.
3. In the **Properties** pane, enter the text for the label in the **Label** property.
4. Run the report or select **Page preview**.

Now the label that you specified for the relative date measure displays.

5. Save the report.

Creating a color palette

As a report, dashboard, or story author, you can create custom color palettes while you work on the canvas.

About this task

You can create the following types of color palettes:

Categories

Used for visualizations that support discrete colors, like a bar or pie chart.

Continuous

Used for visualizations that support color transitions, like a map or a heat map.

Some visualizations support both types of color palettes. For example, if you drop a measure on to the color slot of a bar chart, you can add a color gradient to the bars for that measure. The following visualizations support both types of color palettes:

- Bar, floating bar, stacked bar
- Floating column, stacked column
- Bubble, packed bubble, hierarchical packed bubble
- Marimekko
- Radial
- Scatter plot
- Tree map

Color palettes are grouped into the following categories:

Custom

Created by a user (report, dashboard, or story author). Available only to the user who created them.

Global



Created by the system administrator. A global palette is available to all users but only an administrator can modify it. A user can duplicate a global palette and then modify the duplicated version. For more information about global palettes, see *Creating a global color palette* in the *Managing User Guide*.

System

Default palettes available in IBM Cognos Analytics with Watson. A system palette can't be changed but a user can duplicate it and then modify the duplicated version.

Procedure

1. Make sure that a visualization is selected on the canvas.
2. Do one of the following things, depending on your role:

| Role | Action |
|---------------------------|---|
| Report author | Click Show properties . Under COLOR PALETTE , click the 3 dots icon for a property. Click Change custom palette  . |
| Dashboard or story author | Click Properties . The visualization can have one or both of a categorical color palette or a continuous color palette. Click Change custom palette  . |

If you're working on a visualization that uses discrete colors, like a bar or pie chart, then the **Create categorical color palette** window opens. If you're working on a visualization that uses color transitions, like a map or a heat map, then the **Create continuous color palette** window opens.

3. Enter a name for your palette.
4. Click the **Grid** or **Wheel** tab.

In the **Grid** tab, you can select colors from a grid of color swatches. In the **Wheel** tab, you can select a color by doing one of the following things:

- Clicking the color wheel
- Typing the color in HSB (hue, saturation, brightness) or RGB (red, green, blue) notation
- Typing the color in hex code




5. Under **Color guide**, click **Automatic** or **Custom**.

Categorical color palette

Contains a set of swatches. In **Automatic**, when you select a color from the grid or wheel, all swatches in the palette are filled with colors that are related to the color you selected, starting from the currently selected swatch. In **Custom**, you must select each swatch and then select a color for it.

Continuous color palette

Contains one continuous swatch. In **Custom**, when you select a color from the grid or wheel, the swatch is filled with the color you selected. The color gradually increases in intensity from one end of the swatch to the other. **Automatic** is not available for a continuous color palette.

6. To undo a selection, click **Remove swatch** .
7. To add more swatches to the palette, click **Add swatch** .
8. To reverse the colors in the palette, click **Reverse palette** .
9. Click **Save** when you are finished.


Results

The color palette appears under **Custom**. You can now apply it to visualizations.

Reusing a style from another object


To reuse a style, you define a style for one object, save it, and then apply the style to another object of the same type.

About this task


You can create and reuse styles for almost any object, other than a visualization. For example, create a style for a header, save it, and then apply it to other headers in your report. Use the **Style current selection** icon  in the on-demand toolbar to see the styles for an object, all in one place.

Note: You can also apply style to an object by changing individual object properties through the on-demand toolbar or the **Properties** pane.

Procedure

1. On the canvas, select the object to which you want to apply a style.
2. In the on-demand toolbar, click **Style current selection** and select **New style**.
3. In the **Style name** field, enter a name for the style.
4. In the **Style** window , define the style by setting values for the elements in the style. The elements that are available depend on the type of object that you are styling. For example, for a crosstab, you can define how the text, size and position, background, and the border looks. You can also customize the style for cells, rows, and other elements.
5. To apply the style to the current object, click **Apply**.
6. To save the style so that you can apply to other objects, click **Save style**.
7. Click **Close**.

Results

When you select an object, you can click the **Style current selection** icon , and the style you created appears in the list. You can apply it to other objects of the same type, edit, or delete it.

Copying and pasting objects between reports

The copy and paste functionality allows you to reuse report objects within the same report and between different reports, preserving the object styles, properties, and metadata references. Some examples of objects that you can copy and paste are pages, queries, visualizations, tables, lists, and other objects.

When copying from a source report and pasting to a target report, both reports must be opened in the same browser, on the same tab, on different tabs, or in different windows of the same browser. The reports must also reside on the same instance of the Cognos Analytics installation.

Note: You can also copy and paste objects between reports, dashboards, stories, and explorations. For more information, see "Copying and pasting assets" *IBM Cognos Analytics with Watson Getting Started Guide*.

Before you begin

Ensure that the reports that you are copying from (source report) and pasting to (target report) are in edit mode.

About this task

When you paste multiple objects in a report, a dialog box is displayed to allow pasting the objects in a new table.

Would you like to create a table for your pasted assets? ×

Number of assets:

Table size

Number of columns:

Number of rows:

Table style

Maximize width

Show borders

No
Yes

By default, the table has two columns with the number of rows that matches the number of objects that are being pasted. You can override the number of rows and columns. If the table does not have enough cells, you see the following message: **The table is too small for the number of assets.** If you click **No**, the table is not created and the objects are pasted one below the other. If you close the dialog box by clicking the **x** icon, the paste action is canceled.

Data items that do not match the slot type in the report visualization are dropped.

When you copy and paste from a report to another report, referenced objects, such as queries referencing other queries, are pasted in the target report. For detailed information, see [“Copy and paste behavior” on page 60.](#)



Note: Cognos Analytics might change the name of the source object to avoid name conflict with objects that are already present in the target report.

When you copy and paste from a report to another report, and you select the page body or a table, all items within the page body or the table are copied to the target report. For example, you have a table with 10 cells, and each cell has a list, crosstab, and visualization. You do not need to select the items in each cell one by one. Instead, select the whole table and perform the copy action. A message informs you that one asset is copied. In reality, Cognos Analytics copied all assets, 10 in this example.

Copying and pasting elements of a page works in the same way.

You can paste multiple times in the same or different report.

Procedure

1. Select one or more objects in the report.
2. In the source report, click the copy icon  in the toolbar, or use the keyboard shortcut for your operating system to copy.
A message is displayed that the objects are copied.
3. In the target report, select the location, such as a table cell or the page body, and click the paste icon . If you use the **Paste to** option, you can paste the object before, after, or inside the selected area.

You can also use the keyboard shortcut for your operating system to paste.

Copy and paste behavior

This article provides details about the copy and paste behavior in Cognos Analytics - Reporting. Note that the source and target reports must be valid before the copy and paste operations are performed.

Pasting pages

- Only a single page can be copied at once. Multiple pages must be copied one-by-one.
- Pasted items are not shared in the target report. If you paste an item twice, its dependent items are also copied twice.
- Pages might be copied partially. For example, a detail page is copied without its page set.

Pasting prompt pages

- You can copy a report page and paste it into the prompt pages section, as well as copy and paste a prompt page into the pages section. However, prompt pages can contain only a page element. Page sets and report references (booklets) are not included in prompt pages. Otherwise, the same behavior applies as when pasting pages, as documented earlier in this topic.

Pasting queries

- Queries cannot be pasted if they reference models that cannot be loaded. The paste operation is canceled with a message for users.
- Queries with circular references cannot be pasted. The paste operation is canceled with a message for users.

Note: The paste circular reference message is similar to the message that you receive from the query engine. However, the query engine message focuses on data items, while the query paste message focuses on queries and shows multiple cycles for the query.

Pasting sub-page layouts with query dependencies

- When pasting, non-layout dependencies are included. However, the parent items of the dependent items are not included.
- The pasted, dependent item might need additional authoring to function in the target report.
- Pasting some dependent items into the target report might remove relationships with their containers. For example, pasting a dependent detail list might remove the master-detail relationship from the pasted list in the target report.
- Some dependent items, such as data item references without the layout containers, cannot be pasted in some target locations.

Pasting sub-page layouts with conditional style dependencies

- Conditional styles might be copied partially if they contain a report expression that references a query data item. If you paste a conditional style into the target report, you will likely need to update the report.

Pasting sub-page layouts with variable dependencies

- You cannot paste a variable directly from one report to another. A message is displayed when attempting to paste.

Pasting local class definitions

- You cannot paste a class directly from one report to another. A message is displayed when attempting to paste.

Copying and pasting layout component references

- When pasting the **Layout component reference**, the referenced component is not automatically pasted to your target report. If the **Component location** is set to **This report**, you will likely need to copy and paste the underlying referenced component as well, or update the reference as necessary.

Chapter 3. Lists

Use lists to show detailed information from your database, such as product lists and customer lists.

A list shows data in rows and columns. Each column shows all the values for a data item in the database or a calculation based on data items in the database.

| Product line | Quantity |
|--------------------------|-------------------|
| Camping Equipment | 27,301,149 |
| Golf Equipment | 5,113,701 |
| Mountaineering Equipment | 9,900,091 |
| Outdoor Protection | 12,014,445 |
| Personal Accessories | 34,907,705 |
| Overall - Summary | 89,237,091 |

You can specify whether to automatically add an overall aggregate summary in the list footer and a summary for any groups in the list by selecting **Automatic group and summary behavior for lists** in the IBM Cognos Analytics - Reporting [options](#). The default aggregation as specified in your enterprise data source is used.

Tip: The Order Invoices - Donald Chow, Sales Person sample report in the GO Sales (query) package includes a list.

Related concepts

[Limitations When Using Set Expressions in List Reports](#)

Related tasks

[Change a List into a Crosstab](#)

[Creating a data list](#)




Set list properties

Format lists to give them the appearance you want. You can specify formatting for individual column titles or bodies or for all columns in a list. When you specify formatting for all columns in a list, the formatting is automatically applied to new columns you subsequently add.

You can also quickly format lists by applying table styles.

Formatting for specific columns overrides formatting for entire columns. For example, you specify red as the background color for a specific column body and green as the background color for all columns. When you run the report, the specific column body is red and the remaining columns in the list are green. New columns added to the list will be green.

Procedure

1. To format an individual column, do the following:
 - a) Click the column title or column body.
 - b) To format the text in the column title or the data in the column body, click the context menu icon , then the **Locked** icon , and then the title or body.
 - c) To format the whole column, click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **List column**.
 - d) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background color** and choose the color.

2. To format all columns, do the following:

- a) Click a column in the list.
- b) To format list column bodies, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns body style**.
- c) To format list column titles, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns title style**.
- d) To format entire columns, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **List columns**.
- e) To format the entire list, click the select ancestor button in the title bar of the **Properties** pane and click **List**.

Tip: You can also click the container selector (three orange dots) of the list to select it.

- f) In the **Properties** pane, set the property value.

For example, to specify a background color, click **Background color** and choose the color.


Related concepts

[Laying Out a Report](#)

Hide columns in list reports

You can hide columns from the output of list reports. If you select to hide a column, the query for that column is still executed.

Procedure

1. Select the column that you want to hide.
2. Click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **List column**.
3. Switch the **Render** property off.


Results

When you run your report, the column is hidden in the report output.

Creating a scrollable list

Create a scrollable list so that column headings remain visible when the list contains many rows of data.

Procedure

1. Select the entire list by clicking the container selector of the list.
2. In the IBM Cognos Analytics with Watson toolbar, click the **Show properties** icon .
3. In the properties sheet of the list, specify the height of the scrollable area, in pixels, that you want by typing a value in the **Scrollable area height** property.



Attention: Setting the height of a Scrollable area can cause other control instances, such as prompt controls and custom controls, to be lost.

Using Repeaters

Use repeaters to repeat items when you run the report. For example, you can use repeaters to create mailing labels, including customer names and addresses.

To build a repeater, drag the **Repeater** or **Repeater table** object from the **Toolbox** tab to the work area. Use repeaters to repeat items across a single row without a particular structure. For example, you want to create a list that contains Year, and Product line. For each year, you want all product lines to appear

in a single row. To do this, create a list with Year as a column and with a repeater as a second column. Then insert Product line into the repeater. Use repeater tables to repeat items in a table structure. Drop the items in the repeater, and modify the properties of the repeater to obtain the results you want. For example, you can specify how many frames appear per page in a repeater table by typing values in the **Across** and **Down** properties.

Horizontal pagination is not supported for data containers, such as lists or crosstabs, that are nested in repeater tables.

Chapter 4. Data tables



Use data tables to show detailed information from a source. Similar to lists, the data tables show data in rows and columns. However, unlike in lists, the data is rendered on the browser side, and not on the server side.

Each column shows all the values for a data item in the database, or a calculation that is based on data items in the database.

You can group and summarize data in data table columns, expand and collapse rows, apply filters to columns, and add custom indicators instead of numbers in measure columns.

The following animation shows an example of a data table report, and the data table interactions, such as expanding and collapsing rows, resizing columns, and filtering data.

| Year | Retailer country | City | Product line | Quantity | Revenue | |
|----------------|------------------|-------------------------|--------------------|-----------|------------------|---|
| – 2014 - Total | | | | 6,063,095 | \$240,435,999.08 | |
| 2014 | – Canada - Total | | | 1,407,293 | \$57,044,348.07 | |
| | Canada | – Banff - Total | | 11,487 | \$391,783.50 | |
| | | Banff | Personal Access... | 11,487 | \$391,783.50 | ☀ |
| | | – Calgary - Total | | 60,656 | \$2,590,173.41 | |
| | | Calgary | Camping Equip... | 33,678 | \$2,201,806.88 | ☁ |
| | | | Personal Access... | 12,017 | \$280,914.01 | ☀ |
| | | | Outdoor Protection | 14,961 | \$107,452.52 | ☀ |
| | | – Charlottetown - Total | | 5,054 | \$215,955.28 | |
| | | Charlottetown | Camping Equip... | 4,897 | \$215,013.28 | ☁ |
| | | | Outdoor Protection | 157 | \$942.00 | ☀ |
| | | – Fredericton - Total | | 9,402 | \$351,382.95 | |
| | | Fredericton | Personal Access... | 9,402 | \$351,382.95 | ☀ |
| | | – Halifax - Total | | 89,358 | \$3,095,625.27 | |

To add a data table to a report in the **Page design** view, click the **Toolbox** pane , and expand the **DATA CONTAINER** tab. Drag or double-click the **Data table** object. The data table is added to the report work area. From the **Sources** pane , drag or double-click data times to add them to the data table.

Setting data table properties

Use the data table properties to customize the table appearance and functionality.


You can specify formatting for individual column titles or bodies, or for the whole data table. When you specify formatting for the whole table, the formatting is automatically applied to new columns that are added later.

About this task


The properties can be specified in the **Page design** or **Page preview** view.

Procedure

1. Select an object in the data table for which you want to specify properties. To select the whole table, click the upper-left corner of the table.

2. In the application bar, click the **Show properties** icon  .
The properties pane is opened.

Depending on the object that you select, the related properties are shown in the properties pane. Read the title at the top of the properties pane to be sure that you're viewing properties for the expected object.

You can also click the **Select ancestor** icon  in the title bar of the properties pane, and click the related item in the list of objects to view their properties.

3. Specify the properties as required.



If you're unsure what some properties mean, click the property name and read its description at the bottom of the properties pane.

Expanding and collapsing rows

You can group columns in a data table, and then expand and collapse rows in the grouped columns.

The data in the grouped columns can be summarized in the header or footer. The expand and collapse functionality is available only for group headers.

Procedure

1. In the **Page preview**, select the whole data table. For more information, see [“Setting data table properties”](#) on page 65.
2. In the application bar, click the **Show properties** icon  . The properties pane is opened.
3. Under **DATA** properties, select the **Grouping & summary** property, and click its context menu icon  .
The **Grouping & summary** dialog box is opened. The columns in the dialog box are organized into **Groupable columns** and **Detail columns**.
4. Expand the **Groupable columns**.
5. Select the **Group header** checkbox for each column, and the type of data aggregation, such as **Total** or **Count**.
6. Select the **Enable expand & collapse** checkbox at the top of the dialog box, and click **OK**.

Note: If you selected the **Group footer** checkbox for any column in the previous step, the **Enable expand & collapse** checkbox is disabled.

The selected columns are grouped, and a summary header row is added for each grouped column. You can expand and collapse rows in the grouped columns.

7. To further modify the appearance of the data table, you can use the following properties.

Initially collapsed

Change this property value to **Yes** to collapse the rows every time when a user opens the report for the first time. This property is listed under the **DATA** properties.

Collapsed values text

Use the **Specified text** option to provide a custom text when a group of values is collapsed. The default is **Automatic**, which represents 4 number sign symbols (####).

Expand/collapse indicator shape

Specifies the shape of the icon that appears with the **Group header** label. The shapes include the plus and minus, chevron, and triangle icons. This property is listed under the **GENERAL** properties.

Expand/collapse indicator color


Specifies the color of the icon that is specified for the **Expand/collapse indicator shape**. This property is listed under the **GENERAL** properties.

Enabling filters on columns

When filtering is enabled, users can filter data directly on the column header in the authoring interface and in the viewer.

Because the data is stored in the browser, the data is retrieved fast when you select the different filters.

Procedure

1. In the **Page preview**, select the whole data table. For more information, see [“Setting data table properties” on page 65](#).
2. In the application bar, click the **Show properties** icon .
The properties pane is opened.
3. Under **GENERAL** properties, select the **Show column filters** property, and switch it on.

Results

A filter is added on the column header of each grouped column. The filter values are listed in the drop-down list that the users can interact with. The same filter options are available to authors and users. To view an example of a data table with filters, see [Chapter 4, “Data tables,” on page 65](#).

Use the **Deselect all** option to exclude all values from the column. Use the **Remove filter** option to remove any filter applied to the column.

Adding custom indicators


You can use colors, icons, shapes or custom images as visual indicators of performance or trends in the data. The indicators represent positive, negative, or 0 values.

The product includes built-in icons and shapes that you can use as indicators. You can also provide your own, custom images or text to use in this role.

About this task

If you specify custom indicators for a column, the values in the column are replaced by the indicators. To add indicators to the data table and retain the numeric values, add the same measure column to the data table twice. Then, apply the indicators to one column, and leave the other column unchanged.

Procedure

1. Choose a measure column in the data table for which you want to add custom indicators. Click the column heading.
2. In the application bar, click the **Show properties** icon .
The properties pane is opened.
3. Under **GENERAL** properties, select the **Custom indicators** property, and click its context menu icon .
The **Custom indicators** dialog box is opened.
4. Specify one of the following types of indicators:


Colored

This indicator is a combination of icons, such as circles or up and down arrows, and colors. You can choose from the built-in icons and colors to represent the positive, negative, and 0 values. The icon size doesn't change depending on the value.

Sized

This indicator is a combination of shapes, such as circles or squares, and colors. You can choose from the built-in shapes and colors to represent the positive, negative, and 0 values. The shape size changes depending on the value.

HTML

Use this option to provide a custom image or text as an indicator. Click the edit icon  for the positive, negative, and 0 values, and insert an HTML code snippet into the area provided. For example, the weather-related icons from the example in the [Chapter 4, "Data tables,"](#) on page 65 topic are based on the following HTML code.

For the positive values, the following code was used:

```
<svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" width="55px" height="55px" viewBox="0 0 55 55" style="enable-background:new 0 0 55 55;" xml:space="preserve">
<style type="text/css">
  .st0S{fill:#FDD600;stroke:#FF7832;stroke-miterlimit:10;}
  .st1S{fill:#FF5003;}
</style>
<g id="sunny">
  <path class="st0S"
d="M27.4,14.4c-7.2,0-13,5.8-13,13c0,7.2,5.8,13,13,13c7.2,0,13-5.8,13-13C40.5,20.3,34.6,14.4,27.4,14.4z"/>
  <rect x="26" class="st1S" width="2" height="11.8"/>
  <rect x="26" y="43" class="st1S" width="2" height="11.8"/>
  <rect x="41.6" y="6.3" transform="matrix(-0.7071 -0.7071 0.7071 -0.7071 64.1155 50.9717)" class="st1S" width="2" height="11.8"/>
  <rect x="11.2" y="36.7" transform="matrix(0.7066 0.7076 -0.7076 0.7066 33.7401 3.8618)" class="st1S" width="2" height="11.8"/>
  <rect x="43" y="26" class="st1S" width="2" height="2"/>
  <rect x="26" class="st1S" width="11.8" height="2"/>
  <rect x="36.7" y="41.6" transform="matrix(0.7072 0.707 -0.707 0.7072 42.6052 -17.6459)" class="st1S" width="11.8" height="2"/>
  <rect x="6.3" y="11.2" transform="matrix(-0.7071 -0.7071 0.7071 -0.7071 12.2134 29.4762)" class="st1S" width="11.8" height="2"/>
</g>
</svg>
```

For the 0 value, the following code was used:

```
<svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" width="55px" height="55px" viewBox="0 0 55 55" style="enable-background:new 0 0 55 55;" xml:space="preserve">
<style type="text/css">
  .st0C{fill:#FF5003;}
  .st1C{fill:#FDD600;}
  .st2C{fill:#C0E6FF;}
</style>
<g id="partly-cloudy">
  <rect x="18.6" y="1.8" class="st0C" width="2" height="8.2"/>
  <rect x="29.6" y="6.3" transform="matrix(-0.7071 -0.7071 0.7071 -0.7071 44.9432 39.4708)" class="st0C" width="2" height="8.2"/>
  <rect x="0" y="20.4" class="st0C" width="8.2" height="2"/>
  <rect x="4.5" y="9.4" transform="matrix(-0.7071 -0.7071 0.7071 -0.7071 7.3475 23.8765)" class="st0C" width="8.2" height="2"/>
  <circle class="st1C" cx="19.6" cy="21.5" r="9.7"/>
  <path class="st2C"
d="M47.6,37.7c0.1-0.7,0.1-1.3,0.1-2c0.2-2.0,4.4-2.1-6.1c-1.6-6.3-8.6-11.1-16.9-11.1c-7.8,0-14.4,4.2-16.6,9.9

1-0.1,0c-6.4,1-9.6,5.9-9.6,11.8c0,1,0.1,1.9,0.4,2.8C1.7,43.4,0,45.3,0,47.6c0,2.6,2.1,4.5,4.7,4.5c0,0,0.1-0.1,0.1-0.1h10.6

c0.1,0,0.2,0,0.2,0c0.1,0,0.2,0,0.3,0h14.7c0.1,0,0.2,0,0.3,0s0.2,0,0.2,0h16.2c0,0,0.1,0.1,0.1,0.1c4.1,0,7.4-3.2,7.4-7.2
C54.9,40.9,51.6,37.8,47.6,37.7z"/>
</g>
</svg>
```

For the negative values, the following code was used:

```
<svg version="1.1" id="Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" width="55px" height="55px" viewBox="0 0 55 55" style="enable-background:new 0 0 55 55;" xml:space="preserve">
<style type="text/css">
  .st0R{fill:#7CC7FF;stroke:#1D3649;stroke-miterlimit:10;}
  .st1R{fill:#264A60;}
</style>
```



```

</style>
<path class="st0R"
d="M47.9,26.1c0.1-0.7,0.1-1.3,0.1-2c0-9.1-6.2-16.5-16.8-16.5c-6.5,0-12.2,3.7-15,9.1c-0.1,
0-0.2,0-0.3,0

c-8.1,0-12.2,5.4-12.2,12c0,1,0.1,1.9,0.4,2.8C2,31.8,0.3,33.7,0.3,36c0,2.6,2.1,4.7,4.7,4.7
c0,0,0.1,0,0.1,0,0.1,0,144.1-0.1
c3.4-0.7,5.9-3.6,5.9-7.1C55.2,29.4,52,26.2,47.9,26.1z"/>
<rect x="16.1" y="36.5" transform="matrix(0.7071 0.7071 -0.7071 0.7071 32.332 -3.1173)"
class="st1R" width="7.7" height="2"/>
<rect x="28.1" y="36.5" transform="matrix(0.707 0.7072 -0.7072 0.707 35.849 -11.5901)"
class="st1R" width="7.7" height="2"/>
<rect x="40.1" y="36.5" transform="matrix(0.707 0.7072 -0.7072 0.707 39.3651 -20.0764)"
class="st1R" width="7.7" height="2"/>
<rect x="14.1" y="41.5" transform="matrix(0.7071 0.7071 -0.7071 0.7071 35.2818 -0.2386)"
class="st1R" width="7.7" height="2"/>
<rect x="26.1" y="41.5" transform="matrix(0.7071 0.7071 -0.7071 0.7071 38.7965 -8.7238)"
class="st1R" width="7.7" height="2"/>
<rect x="38.1" y="41.5" transform="matrix(0.707 0.7072 -0.7072 0.707 42.315 -17.1969)"
class="st1R" width="7.7" height="2"/>
</svg>

```

5. Click **OK**.

Results

The numbers in the measure column are replaced by the indicators that you specified.

Chapter 5. Crosstabs

Use crosstab reports, also known as matrix reports, to show the relationships between three or more query items. Crosstab reports show data in rows and columns with information summarized at the intersection points.

For example, the following crosstab shows the gross profit and revenue by product line for each year.

| | | 2013 | | | 2012 |
|--------------------------|----------------------|-----------------|-----------------|--------------------|-----------------|
| | | Gross profit | Revenue | Cost of Goods Sold | Gross profit |
| Mountaineering Equipment | Climbing Accessories | \$15,110,667.58 | \$29,483,205.87 | \$14,372,538.29 | \$15,286,177.75 |
| | Tools | \$18,683,965.74 | \$44,578,458.74 | \$25,894,493.00 | \$21,981,831.82 |
| | Rope | \$12,487,333.44 | \$39,444,903.89 | \$26,957,570.45 | \$14,677,667.24 |
| | Safety | \$10,436,847.43 | \$28,014,081.20 | \$17,577,233.77 | \$12,287,850.59 |
| Outdoor Protection | First Aid | \$450,357.59 | \$846,984.93 | \$396,627.34 | \$923,995.66 |
| | Sunscreen | \$930,913.91 | \$1,561,978.22 | \$631,064.31 | \$2,006,172.66 |

Tip: The Same Month Prior Year sample report in the Sales and Marketing (cube) package includes a crosstab.

Crosstab Nodes and Crosstab Node Members

When you add data items to crosstabs, you create crosstab nodes and crosstab node members. These objects allow you to easily create crosstabs, by dragging data items to crosstabs.

Crosstabs are dimensional objects that have row edges and column edges. Each edge is composed of a set of crosstab nodes. Each crosstab node contains the following:

- One or more crosstab node members.
- Zero or one nested crosstab node, which contains one or more crosstab node members or nested crosstab nodes.

Each crosstab node member refers to a data item that contains an expression to define the members in the crosstab.

The following crosstab contains four crosstab nodes.

(4)

| | | Revenue | | <#Year#> | <#Year#> |
|-----|--------------------------------------|-----------|----------|-----------|----------|
| | | <#Month#> | Total | <#Month#> | Total |
| (1) | Total | <#1234#> | <#1234#> | <#1234#> | <#1234#> |
| (2) | <#Product line#> <#Product type#> | <#1234#> | <#1234#> | <#1234#> | <#1234#> |
| | | <#1234#> | <#1234#> | <#1234#> | <#1234#> |
| (3) | Average | <#1234#> | <#1234#> | <#1234#> | <#1234#> |

1 Crosstab node 1 contains a single node member for the total. This node refers to the data item Total(Product line).

2 Crosstab node 2 contains a crosstab node member that refers to the data item Product line. This member has a nested crosstab node containing a crosstab node member that refers to the data item Product type.


3 Crosstab node 3 contains a single node member for the average. This node refers to the data item Average(Product line).

4 Crosstab node 4 contains a crosstab node member that refers to the data item Order year. This member has two nested crosstab nodes. The first node contains a crosstab node member that refers to the data item Order month. The second node contains a crosstab node member for the total. This node refers to the data item Total(Order month).


Tip: Nodes are also created when you add data items to charts.

Moving Crosstab Nodes


Crosstab nodes can be placed anywhere in the crosstab. For example, in the previous diagram, you can drag **Order month** under **Average** to create a row edge.

To move nested items from one edge to another, ensure that you select the crosstab node and not the crosstab node member. For example, in the previous diagram, you want to move **Product line** and **Product type** to the column edge. To do this, click **Product line** and, in the **Properties** pane, click the select ancestor button  and click **Crosstab Node**. Both **Product line** and **Product type** are selected.

Crosstab Node Creation Option

The IBM Cognos Analytics - Reporting option **Allow crosstab nesting beside individual items** (More icon , **Options, Edit** tab) affects the drag-and-drop behavior in crosstabs. When the option is turned on and you add a data item to a crosstab, the item is created as a crosstab node. In addition, you can nest items under individual items instead of only on the entire crosstab edge. If the option is turned off, the item is created as a crosstab node member to an existing crosstab node.

For example, in the previous diagram, if the option is turned on and you drag **Country or Region** from the

Sources tab  to beneath **Product line**, **Country or Region** becomes a new peer node to **Product line**. If the option is turned off, **Country or Region** becomes a new peer node to **Product line** and has **Product type** as a nested crosstab node. This happens because instead of adding a new node, you are adding a new member to the existing node that already contains **Product line**.

Tip: To create discontinuous crosstabs, turn the option on. If you want the items on the edges of crosstabs to be related (contain the same nested items), turn the option off.

Set Crosstab Properties

Format crosstabs to give them the appearance you want. You can specify formatting for rows, columns, and fact cells in a crosstab or for the entire crosstab. When you specify formatting for all rows, columns, fact cells, or the crosstab, the formatting is automatically applied to any new items you add.

If you apply the same styles, such as font color, to crosstab rows, columns, and crosstab intersections, the styles are applied in the following order:



1. crosstab fact cells
2. fact cells in the outermost rows
3. fact cells in the innermost rows
4. fact cells in the outermost columns
5. fact cells in the innermost columns
6. crosstab intersections

The style applied to the last object in the list overrides styles applied to previous objects. In addition, class styles are applied before styles that you apply manually.

You can also quickly format crosstabs by applying table styles and add white space to a crosstab by inserting crosstab space objects.

Tip: In cases where fact cell formatting applied to rows conflicts with fact cell formatting applied to columns, you can set the **Fact Cells Precedence** property in the **Properties** pane to determine whether the row formatting or the column formatting has precedence. To set this property, click anywhere in the crosstab, click the **Select ancestor** icon in the title bar of the **Properties** pane, and click **Crosstab**. Or you can click the container selector (three orange dots) of the crosstab to select it.

Procedure

1. To format the entire crosstab, do the following:
 - a) Click anywhere in the crosstab.
 - b) Click the **Select ancestor** icon  in the title bar of the **Properties** pane and click **Crosstab**.
 - c) In the **Properties** pane, set the property value.
For example, to specify a background color, click **Background Color** and choose a color.
2. To format all rows, columns, or fact cells, click a row, column, or fact cell in the crosstab and then do the following:
 - a) If you clicked a row, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Rows**.
 - b) If you clicked a column, click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Columns**.
 - c) If you clicked a fact cell, click the select ancestor button in the title bar of the **Properties** pane and click **Crosstab Fact Cells**.
 - d) In the **Properties** pane, set the property value.
For example, to specify a background color, click **Background Color** and choose the color.
Tip: You can also right-click the row or column and click **Select Fact Cells**.
3. To format all crosstab cells for a specific row or column, do the following:
 - a) Click the row or column.
 - b) Click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Member Fact Cells**.
Tip: You can also right-click the row or column and click **Select Member Fact Cells**.
 - c) In the **Properties** pane, set the property value.
For example, to specify a background color, click **Background Color** and choose the color.
4. To format all row or column titles, do the following:
 - a) Click a row or column title.
 - b) Click the **Select ancestor** icon in the title bar of the **Properties** pane and click **Crosstab Rows** or **Crosstab Columns**.
 - c) In the **Properties** pane, set the property value.
For example, to specify a background color, click **Background Color** and choose the color.
5. To format an individual row, column, or intersection, do the following:
 - a) Click the row, column, or intersection.
Tip: To format the data in a row, column, or intersection, click the **Locked** icon , and then click the text item to format.
 - b) In the **Properties** pane, set the property value.
For example, to specify a background color, click **Background Color** and choose the color.



Related concepts

[Laying Out a Report](#)

Create a Single-Edge Crosstab

Create a single-edge crosstab report to show data in a list-like form. For example, to show the quantity of products sold for each year and for each order method, you could create a crosstab with **Order Year** and **Order Method** as rows and **Quantity** as the measure.

Procedure

1. Click the **Toolbox** icon , and drag a crosstab object to the work area.
2. From the **Sources** tab , drag data items to the **Rows** or **Columns** drop zone.
A black bar indicates where you can drop the data item.
3. Repeat step 2 to insert additional data items:
 - If you dragged the data item in step 2 to the **Rows** drop zone, drag the additional items above or below the first item.
 - If you dragged the data item in step 2 to the **Columns** drop zone, drag the additional items to the left or right of the first item.
4. To add measures to the crosstab, drag the measures to the **Measures** drop zone.

Results

When you run the report, a crosstab is produced that has only one edge.

Create a Nested Crosstab

Nest data in a crosstab report to compare information by using more than one data item in a column or row. For example, a report shows the number of sales by product line for the past fiscal year. You decide to add a data item to further break down the number of sales by quarter.

When nesting columns in a crosstab report, there are four distinct drop zones where you can insert a new data item. The drop zone you choose will define the relationship between the data item and the column.

The following relationships are created when you insert a data item as a row:

- Inserting a data item to the left or right of a column creates a parent-child relationship between them.

When you insert a data item to the left of a column, the data item becomes a parent to the column.

When you insert a data item to the right of a column, the data item becomes a child of the column.

- Inserting a data item above or below a column creates a union relationship between them.

The following relationships are created when you insert a data item as a column:


- Inserting a data item to the left or right of a column creates a union relationship between them.
- Inserting a data item above or below a column creates a parent-child relationship between them.

When you insert a data item above a column, the data item becomes a parent to the column. When you insert a data item below a column, the data item becomes a child of the column.

For example, you have a crosstab with Product line as rows and Quantity and Revenue as nested rows. For columns, you have Order method with Country or Region as a nested column. In this crosstab,

- Product line is a parent to Quantity and Revenue.
- Quantity and Revenue are peers.
- Order method is a parent to Country or Region.

Procedure

1. From the **Sources** tab , click the data item to add.
2. Drag the data item to the report as a nested column or nested row.

A black bar indicates where you can drop the data item.

3. Repeat steps 1 to 2 to add other nested columns or rows.


Tip: If you add more than one measure to a crosstab, all measures appear as columns. You cannot have one measure appear as a row and another as a column. To make all measures appear as rows, swap columns and rows.

Creating headers automatically for sets in crosstabs

You can automatically add header labels on columns and rows when working with sets in a crosstab that uses a dimensional data source. The headers help consumers of the report to understand where the data is in the hierarchy.

Header labels are added only when you add new sets to your crosstab. The labels are not added to existing sets. After you enable this option, it remains on until you disable it, and applies to any new crosstabs that you create.

Procedure

1. Click the **More** icon , click **Options**, then click the **Report** tab.
2. Select **Automatically create crosstab headers for sets**.
3. Click **OK**.

Results

Header labels are created in the rows and columns in a crosstab.

Showing crosstab values as percentages

When you work with dimensional data sources, you can show crosstab values as a percentage of a summary instead of the actual values. When you show values as a percentage, you can compare the contribution of an item to the whole.

About this task

You can show crosstab values as a percentage of a summary on the rows, the columns, or the rows and columns. For example, a crosstab has Product line as rows, Year as columns, and Revenue as the measure. You can show the following crosstab values:

- The actual values of Revenue
- A percentage of a summary on Product line
- A percentage of a summary on Year
- A percentage of a summary on Product line, Year

By default, the summary type that is used to calculate the percentages is Automatic summary.

When you show values as a percentage, a percentage measure data item is created.


You can also create a custom percentage calculation. For example, you can show values as a percentage of an intersection (tuple). Or you can show values as a percentage of a different summary type, such as Maximum.

When you show values as a percentage, the fact cells are formatted with the percent data format. When you show the actual values, the fact cells are formatted with the number format. If you modify the data

format of the actual values, the change is lost when you switch between showing the actual values and percentage values.

You can show values as a percentage only in crosstabs. If you insert a chart, you cannot fill the chart with data from a crosstab that shows values as a percentage. If you create a chart from a crosstab that shows values as percentages, an empty chart is created in the report.

Procedure

1. Select the measure for which you want to show values as a percentage.
If there is only one measure in the crosstab, click the crosstab corner.
2. From the report object toolbar, click the **Show Value As** icon , and click the percentage values that you want to show.
3. If you click **Custom**, provide the information that is required to calculate the percentage values.
 - a) To change the default name of the percentage data item that you are creating, type the new name in the **Name** field.
 - b) In the **Percentage based on** box, choose to build the percentage data item based on a summary of sets in the crosstab or based on an intersection (tuple).
 - c) If you choose to build the percentage data item based on a summary of sets, in the **Choose sets** box, click the sets that you want to use. Then, click **Summary type** and select the summary that you want to use to calculate the percentage values.
If there is more than one data item on the crosstab edge that you chose for the sets, select which data item that you want to use.
 - d) If you choose to build the percentage data item based on an intersection (tuple), click the ellipsis and select the items that you want to use to create the intersection.
 - e) Click **OK**.
4. To edit a measure percentage data item, follow these steps.
 - a) Select the measure.
 - b) From the report object toolbar, click the **More** icon, click **Show Value As > Edit**.
 - c) Modify the information for the data item as described in step 3.
 - d) If you replaced a set in the crosstab with a different set, in the **Choose sets** box, click **Existing sets** when you want to base the percentage values on the set that you replaced.

Related tasks


[Create an intersection \(tuple\)](#)

Specify the Default Measure

You can specify the default measure for crosstabs and certain chart types. Specify the default measure to be used when the measures cannot be determined by what is on the edges. For example, you create a crosstab with Order method as rows and Product line as columns. You add Quantity and Revenue as nested rows, making Order method their parent. You then add Country or Region under Order method. Since there is no measure specified for Country or Region, you specify the default measure so that data is returned for each country or region.

Note: In crosstabs, IBM Cognos Analytics - Reporting automatically sets the default measure when you insert a measure into the crosstab cells.

Procedure

1. To specify the default measure for a crosstab, do the following:
 - Click any part of the crosstab, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.

- Click **Crosstab**.

Tip: You can also click the container selector (three orange dots) of the crosstab to select it.


- Set the **Default Measure** property to the default measure.
2. To specify the default measure for a chart, drag the measure to the **Default measure** box in the chart.

Swap Columns and Rows

Swap columns and rows to look at information from a different perspective. This may help you discover high and low points in the data that you hadn't previously noted.

You can only swap columns and rows in a crosstab or chart. In a chart, you swap the x- and y-axes.

Procedure

From the toolbar, click the swap rows and columns button .

Results

In the report, the rows become the columns and the columns become the rows.

Indent Data

You can indent crosstab node members to set them apart from surrounding data.

When you insert a hierarchy in rows, all members are automatically indented according to their level. By default, the first member in a set is not indented. If you insert a hierarchy in columns, the members are not automatically indented. You can change the indentation properties of members in the report.

Relative indentation means that the member will shift by one tab when the member's level increases relative to the previous member in the hierarchy.

Indenting based on the level in the hierarchy means that the member will shift the number of tabs equivalent to the level in the hierarchy.

You can also indent objects by applying padding.

Procedure

1. Click the crosstab node member to indent.
2. In the **Properties** pane, set the **Level indentation** property to your indentation type, length, and direction.

Change a List into a Crosstab

Change a list into a crosstab to view your data from a different perspective.

Procedure

1. Click the columns to appear as columns or nested columns in the crosstab.
2. From the report object toolbar, click the **Pivot List to Crosstab** icon.

Results

The list becomes a crosstab with the columns you selected in step 2 appearing as columns and nested columns. The unselected columns, except for measures, appear as rows and nested rows. If you have one measure, it becomes the cells of the crosstab. If you have more than one measure, they appear as columns.

Tip: To make all measures appear as rows, swap columns and rows.

Chapter 6. Visualizations version 11.x

IBM Cognos Analytics - Reporting has a new visualization technology as of version 11.x.

In the **Visualization gallery** window, you can choose from the following groups of visualizations:

11.1 visualizations

Visualizations introduced in Cognos Analytics 11.1 and existing visualizations that have been updated.

All visualizations support browser-side data storage for improved performance and interactivity.

Note: Some 11.1 visualizations support only HTML output. If you see the **Use 11.0 visualization** check box in the **Visualization gallery** window, you can select it to use the 11.0 version of the visualization, which has more output options.

11.1 visualizations are supported only when the report interactivity is set to yes. For more information, see [“Limited and fully interactive reports”](#) on page 29.

For more information about 11.1 visualizations, see [“Visualization types version 11.1”](#) on page 87.

11.0 visualizations

Visualizations introduced in Cognos Analytics 11.0 and existing visualizations that have been updated.


For more information, see [“Visualization types version 11.0”](#) on page 121.


Legacy visualizations

Includes visualization bundles that you can upload and customize by changing the json source files. For more information about visualization bundles, see [Cognos Business Intelligence & Cognos Analytics All Visualizations Deployment](#). For more information about legacy visualizations, see [Chapter 8, “Legacy visualizations,”](#) on page 233.

Creating visualizations

Before creating visualizations, review the available visualizations to select the best type for your needs.

Tip: To view the available visualization types, add a **Visualization** object from the **Toolbox** pane  to an existing report. In the **Visualization gallery** window, select **11.1 Visualizations** from the menu.

To create charts, drag data items from the **Source** tab  to the measures, data series and categories drop zones.

Note: When you are working with dimensional data sources, do not insert member properties in the series or categories of a chart. By default, IBM Cognos Analytics - Reporting groups items that are inserted in these areas. Grouping member properties produces a warning when you validate the report.

To help you when creating visualizations, you can do the following:

- Preview your visualization style changes.

As you author your visualization and edit the visualization properties, IBM Cognos Analytics - Reporting provides you with a preview of your visualization, using simulated data. This allows you to view your style changes without running your report. You need to run your report to see the visualization with your actual data. You can disable the visualization preview in the options.

- Resize your visualization.
- Move the visualization drop zones into flyouts so that they appear only when you pause your pointer over the visualization.

After you create a basic visualization, modify the various chart objects to customize your visualization.

Recommended visualizations

IBM Cognos Analytics with Watson provides a number of recommended visualizations based on the data that you are working with.

Using a machine learning pipeline that is derived from training data and the input from visualization specialists, Cognos Analytics matches your data with the visualizations that illustrates your data.

When you drag a measure or column on to the canvas, Cognos Analytics chooses a recommended visualization for you. You can change it by selecting another visualization from either **Recommended** or from **More**.

Adding a custom visualization to a report

You can add custom visualizations to your IBM Cognos Analytics with Watson report.

About this task

For more information on developing custom visualizations, see the *Developing custom visualizations* documentation in the *IBM Cognos Analytics with Watson Custom Visualizations Developer Guide*.

Procedure

1. Create a report.
2. In the **Visualization gallery** window, select **11.1 Visualizations** from the menu.
3. Click the **Custom** section.
If there are no custom visuals available, then you can add a custom visual via the **Add a custom visual** button.
4. Select the custom visualization that you want to use.

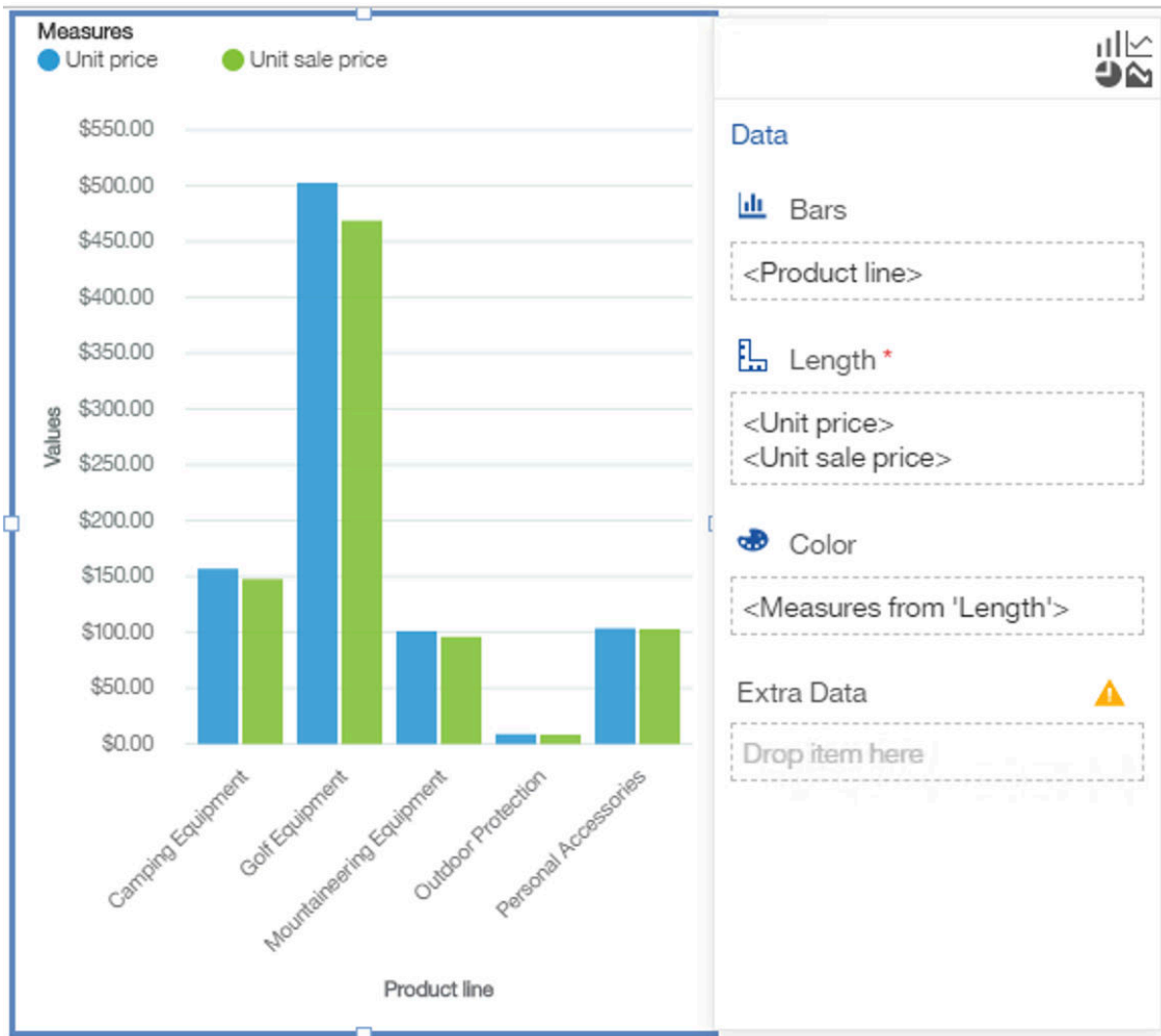
Comparing measures in a visualization

You can compare measures from the same category in a visualization by adding multiple measures to the measure field.

For example, you can compare the unit price with the unit sale price.

Note: Comparing measures is only available for the following visualizations:

- Area
- Bar
- Column
- Hierarchical packed bubble
- Packed bubble
- Point
- Clustered combination
- Stacked combination
- Line
- Tiled map
- Pie
- Radar
- Treemap
- Waterfall
- Wordcloud



Procedure

1. Create a bar or column visualization.
2. Drag a member to the **Bars** field.
3. Drag two or more measures to the **Length** field.

The visualization display different bars for the measures. The coloring is determined by the measures from the **Length** field.

Adding a schematic to a report

You can add schematics to your IBM Cognos Analytics with Watson report.

About this task

Before you can import a schematic, author it first. For more information, see the *Authoring schematics - tutorial* documentation in the *IBM Cognos Analytics with Watson Custom Visualizations Developer Guide*.

Schematics are visualizations that can map data directly onto an arbitrary graphic representation. Schematics can, for example be floor plans, seating arrangements, mechanical drawings, or schematic geographical representations.


Procedure

1. Create a report.
2. In the **Visualization gallery** window, select **11.1 Visualizations** from the menu.
3. Click the **Custom** section.
If there are no custom visuals available, then you can add a custom visual via the **Add a custom visual** button.
4. Select the schematic that you want to use.
5. A schematics package can contain several different SVGs. The first SVG is displayed. You can select other SVGs from the schematic package from **Properties > Schematics > SVG reference**.

Adding points and regions to a schematic

You can enhance IBM Cognos Analytics with Watson schematics by using point or region information. Use point and region information by adding a layer on the schematic to display the additional information.

Procedure

1. Create a report.
2. From the **Insertable objects** tab, drag **Visualizations** on the canvas.
3. Click the **Custom** section.
4. Select the schematic that you want to use.
5. In the left pane, click the **Add a source** icon  , select report data that contains region or point data.
6. On the data slot pane, click the down arrow and select:
 - **Regions**
 - **Points**
7. In the left pane, expand your data items and drag point or region data to the **Locations** data slot.
8. Drag a measure to the **Location color** or **Point color** data slot.
9. Select **Page preview** to run the report.

Note: You can also click **Run options > Run HTML** to run the report.

10. Select **Page design** to return to page design mode. If you ran the report from **Run options**, close the tab, which returns you to page design mode.


Example

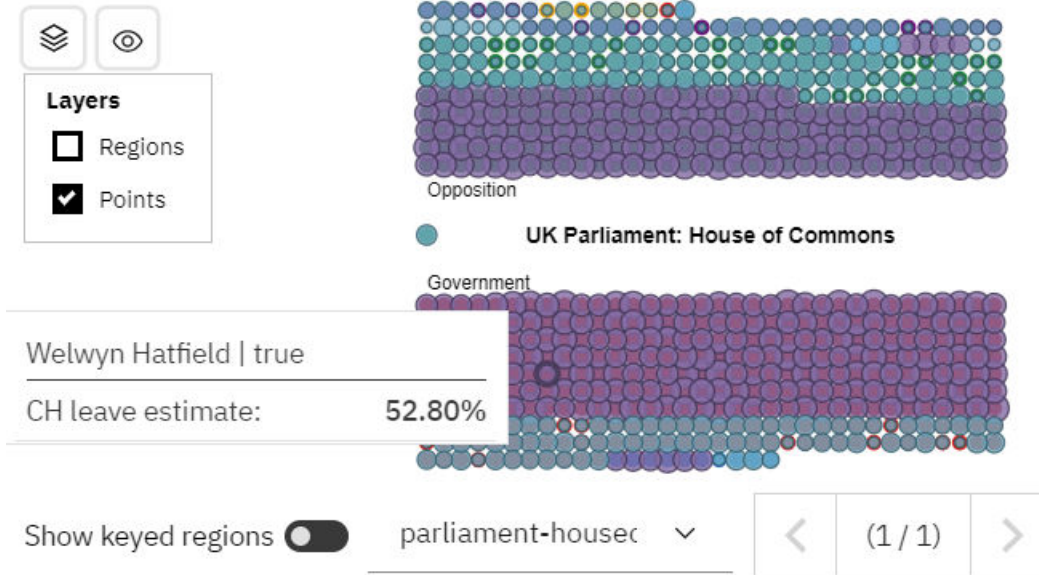
A schematic example that displays a UK Parliament House of commons SVG. Seat keys are mapped to constituencies.

The **Regions** layer shows a leave or stay. The **Points** layer shows the leave estimate.

Constituency, CH leave estimate, Constituency, CH leave estimate, Leave_bool

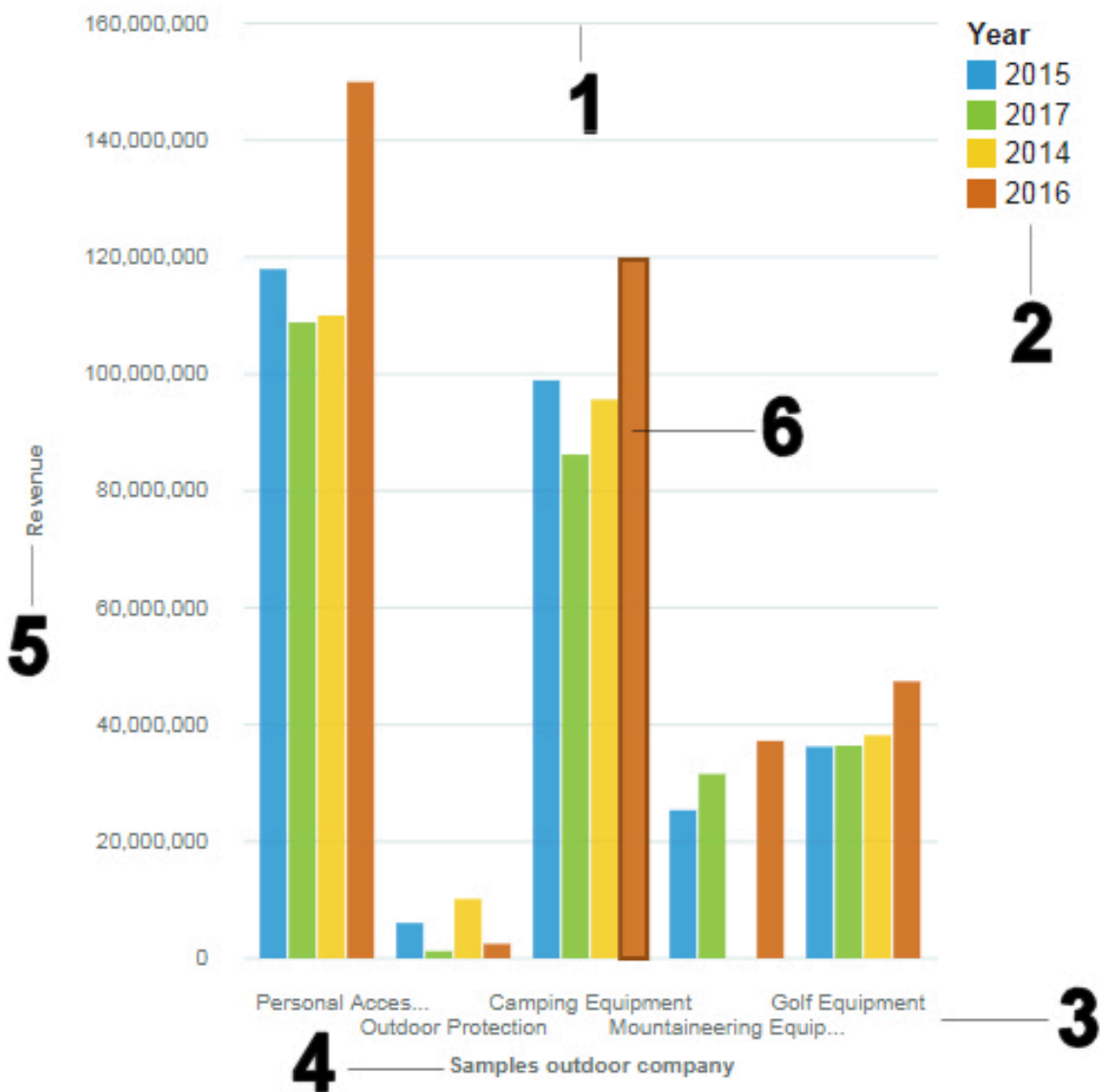


 This is a preview. The visualization has not been added to the product yet.



Visualization objects

The following shows the most common visualization objects as they appear in your report output in IBM Cognos Analytics - Reporting.



- 1 Grid lines
- 2 Legend
- 3 x-axis labels
- 4 Title
- 5 y-axis title
- 6 Categories

Data series

A data series is a group of related data points that are plotted in a visualization. Each series has a unique color or pattern and is described in the legend. You can plot one or more data series in a visualization; pie visualizations have only one data series.

In the example visualization, the data series are order years 2014, 2015, 2016, and 2017.

Categories

Categories are groups of related data from the data series that are plotted on the x-axis. Categories of multiple data series are shown together using clustered and stacked data markers.

In the example visualization, the categories are the product lines of The Sample Outdoors Company in clustered columns.

Axes

Axes are lines that provide references for measurement or comparison.

The primary axis (or Y-axis) refers to measures of quantitative data, such as sales figures or quantities. Visualizations can have more than one primary axis.

The category axis (X-axis or ordinal axis) plots qualitative data, such as products or regions. It runs horizontally, except in bar charts.

The z-axis is the vertical axis in a 3-D chart.

Major grid lines extend from the tick marks on an axis and run behind the data markers.



Legend

A legend is a key to the patterns or colors that are assigned to the data series or categories in a visualization.

The legend appears, by default at the top of the visualization, and has a compact size.

If there are too many items in the legend to be displayed an ellipsis is displayed.

You can change the properties for legends, such as the background color, size, position, font, and so on.

1. Click the visualization and click .
2. In the **Properties** pane, scroll to the **Legend** section and select the required values.
3. Click  to close the **Properties** pane.

You can also resize the legend for a visualization by dragging the splitter which appears when you hover over the legend.



Columns, lines, and areas

Visualizations use graphical elements such as columns, horizontal bars, points, bubbles, lines, and areas as visual representations of data points.

Extra data field

Use the **Extra Data** field to add data that is not displayed in the visualization but can be used to create, for example, a filter.

Adding a baseline to a visualization

Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data.

About this task

For example, you can add a baseline to show a sales quota or break-even point.

In visualizations, you can define baselines by values on the numeric axis or the category axis.


Each baseline represents a value on an axis.


Depending on the type of visualization, you can use the following options to position the baseline.

Note: If you use queries in baselines that are based on report expressions and query calculations, then these queries and query calculations must come from the same data source as the visualization itself.

| Option | Description |
|----------------------------|--|
| Numeric Value | Uses a static numeric value. |
| Category Index | Uses the index value of the data item in the categories axis. For example, a Category index value of 1 indicates that the baseline is at the first data item. This is the default. |
| Percent on Axis (%) | Uses a percentage of the full range of the axis. For example, if the axis range is -500 to 1100, a Percent on Axis value of 25% puts the baseline at -100 (25% of the range, 1600). |
| Query calculation | Uses a query calculation to determine the position of the baseline. For more information, see Insert a Query Calculation . |
| Layout calculation | Uses a layout calculation to determine the position of the baseline. For more information, see Create a Layout Calculation . |

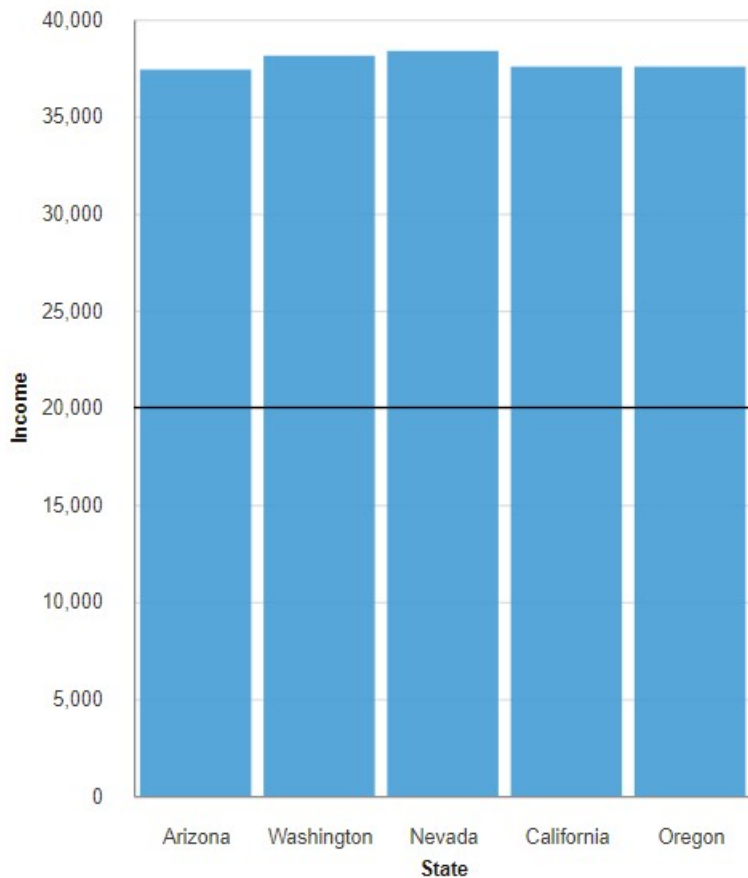
Procedure

1. Click the visualization in a report.
2. Depending on your chart and the type of baseline you want to add, in the **Properties** pane, under **Visualizations > Annotations**, select the **Baselines**.
3. Click the **New** icon  and choose the type of baseline from the list.
4. Specify the necessary criteria for the baseline position.
5. Under **Baseline Properties**, type a label for the baseline and specify the line style and color and the position of the label from the **Baseline caption** menu.

The new baselines appear in the **Baselines** box.
6. To delete a baseline, select the baseline in the **Baselines** box and click the delete .

Example

A bar visualization with a baseline.



Visualization types version 11.1

IBM Cognos Analytics - Reporting provides many types of visualizations for presenting your data in a way that is meaningful for your users.

You can select from a variety of visualization types (such as pie, bar, line, gauge, scatter, and so on) and you can select from a variety of visualization configurations (such as stacked columns, 3-D pies). Combination charts allow you to use more than one chart type within your chart.

Some chart types are not supported for Microsoft Excel output or appear differently in Excel. For more information, see [Appendix B, “Limitations When Producing Reports in Microsoft Excel Format,”](#) on page 499.

Area

Use an area visualization to emphasize the magnitude of change over time.

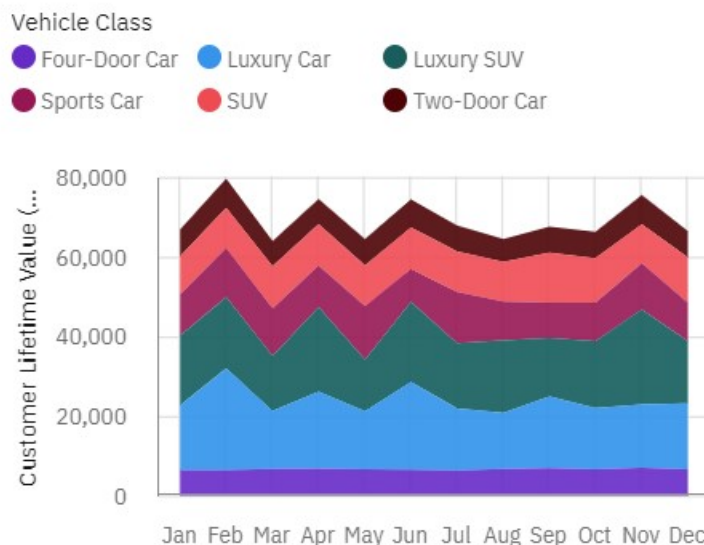
Area charts are like line charts, but the areas below the lines are filled with colors or patterns. Stacked charts are useful for comparing proportional contributions in a category. They plot the relative value that each data series contributes to the total.

Because an area visualization stacks the results for each column or item, the total of all results is easily seen.

For example, an area visualization is excellent for looking at revenue over time across several products.

For example, this area visualization shows the customer lifetime value for each vehicle class per month. Because the area visualization stacks the results, you see the totals for each month.

Customer Lifetime Value by Expiry Month colored by Vehicle Class



The area visualization was created by dragging the following data items from the Sources panel:

- Drag **Expiry Month** type onto the **x-axis** field.
- Drag **Vehicle Class** onto the **Color** field.
- Drag **Customer Lifetime Value** onto the **y-axis** field

Samples

You can see an example of a word cloud visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Reports > Standard reportsCustomer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Box plot

You can use box plots for identifying outliers and for comparing distributions.

You can create a box plot to show the median, quartiles, and outlier and extreme values for a variable. The inter-quartile range is the difference between the 75th and 25th percentiles and corresponds to the length of the box. The middle line is the 50th percentile.

Above and under each box whiskers give additional information about the spread of the data.

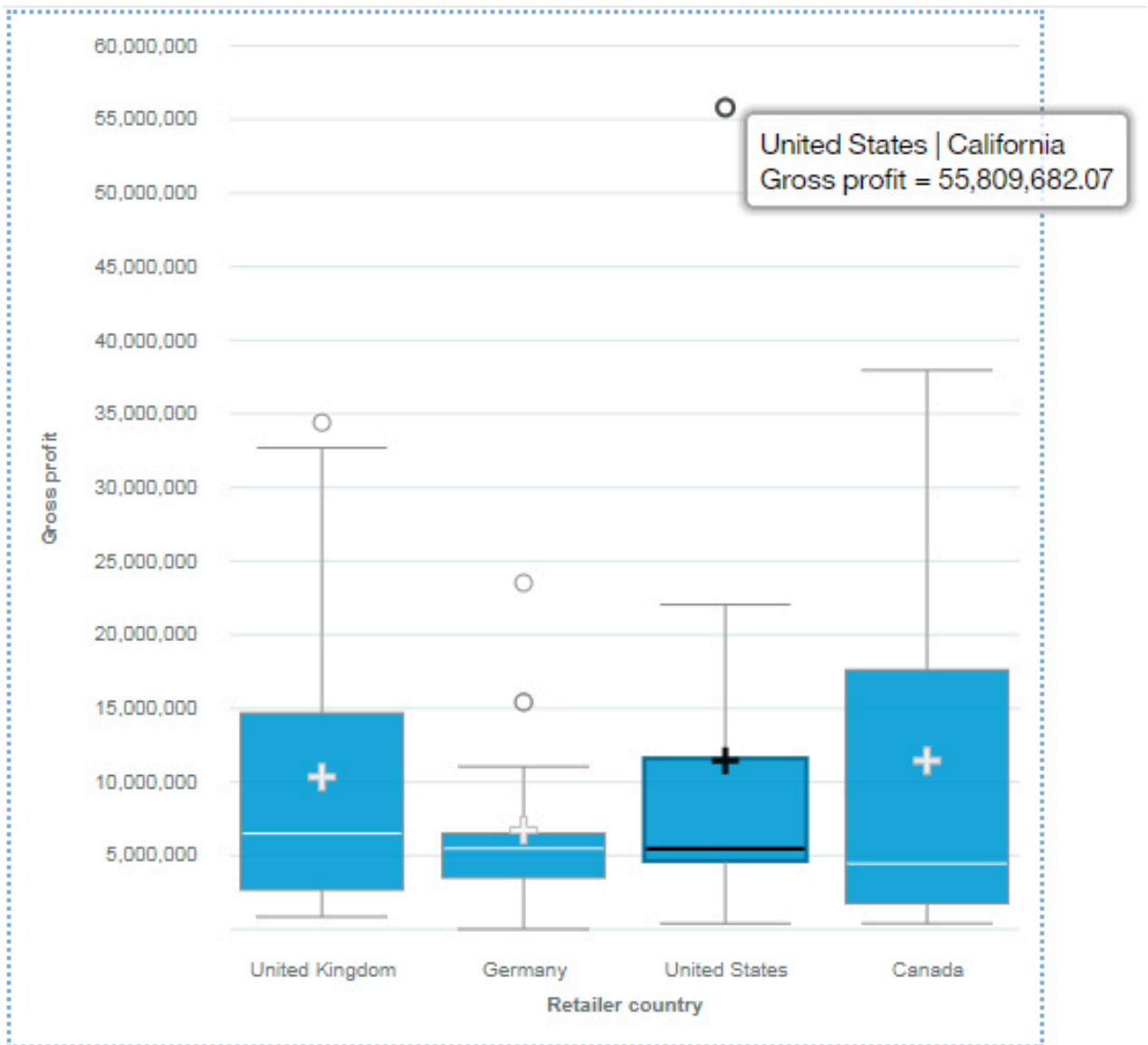
Far out values are represent by adding "o" signs beyond the whiskers.

The mean score in a box plot is presented by a "+" sign.

Use the key field in a box plot visualization to determine for which items you want to identify outliers and compare distributions. In our example, we use **Province or State** from the GOSales data source.

The next box plot shows the gross profit statistics for various markets.

Note: Drill-through is not available for a box plot visualization.



Bubble

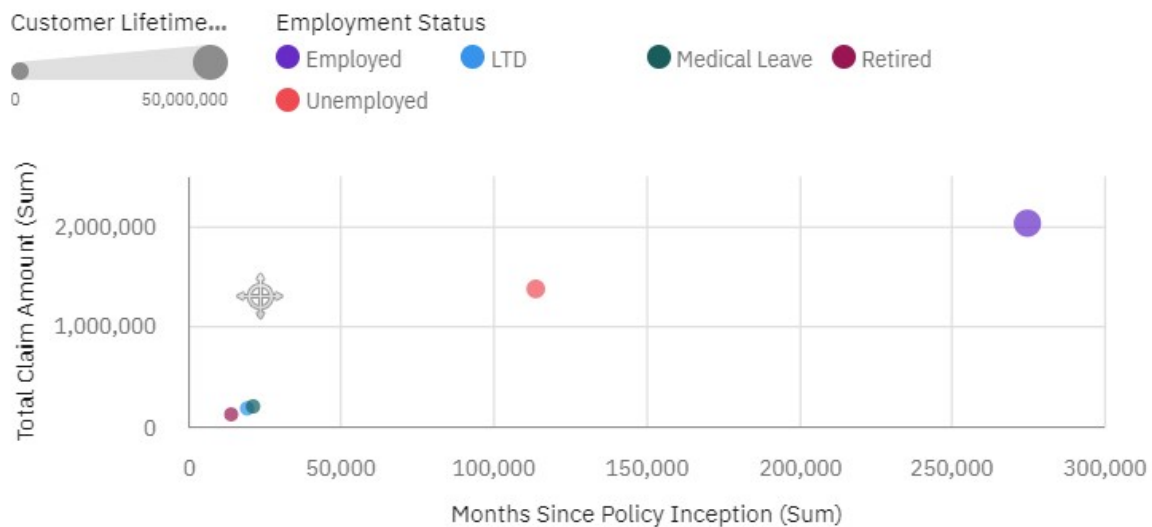
Use a bubble visualization to show relationships among columns that contain numeric values, such as revenue and profit.

A bubble visualization uses data points and bubbles to plot measures anywhere along a scale. One measure is plotted along each axis. The size of the bubble represents a third measure. Use bubble visualizations to represent financial data or any data where measure values are related.


The bubbles are in different sizes and colors. The x-axis represents one measure. The y-axis represents another measure, and the size of the bubbles represents the third measure. In the example shown below, color is represented by an identifier.

The example that is shown represents the months since the policy inception.

Months Since Policy Inception by Total Claim Amount colored by Employment Status and sized by Customer Lifetime Value





Create the Bubble visualization by dragging the following data items from **Customer Analysis** in the

Sources pane  :


- Drag **Months Since Policy Inception** onto the **x-axis** field.
- Drag **Total Claim Amount** onto the **y-axis** field.
- Drag **Customer Lifetime Value** onto the **Size** field.
- Drag **Employment Status** onto **Color**

You can customize the bubble chart. For example, to make the x-axis of the bubble chart appear as it does in the sample, do the following steps:

1. Click the visualization, then in the **Data** pane, click the **<Total Claim Amount>** data item.
2. Click .
3. Next to **Value data format**, click  and set the following options:
 - **Format type:** Currency
 - **Currency symbol:** K
 - **Currency symbol position:** End
 - **Number of decimal places:** 0
 - **Scale:** -3 (this presents values in thousands).
4. Click **OK**.

To change the size of the visualization, click the visualization, then set the following option in the properties pane:

- **Size - Width:** 700 px, **Height:** 300 px

Click  to close the **Properties** pane.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Bullet

Use bullet charts to show measures that need to be compared against a target value.

In a call center, a bullet chart can be used to measure metrics like call volume, call answer speed, and percentage of abandoned calls.

In manufacturing, a bullet chart can be used to track metrics like number of defects and orders that are shipped.

In a fitness context, a bullet chart can be used to measure metrics like steps that are taken and calories that are burnt.

Bullet visualizations compare an actual measure (the bullet) to targeted measure (the target). Bullet visualizations also relate the compared measures against colored regions in the background that provide more qualitative measurements, such as good, satisfactory, and poor. Bullet visualizations can be shown at small sizes while still effectively conveying information.

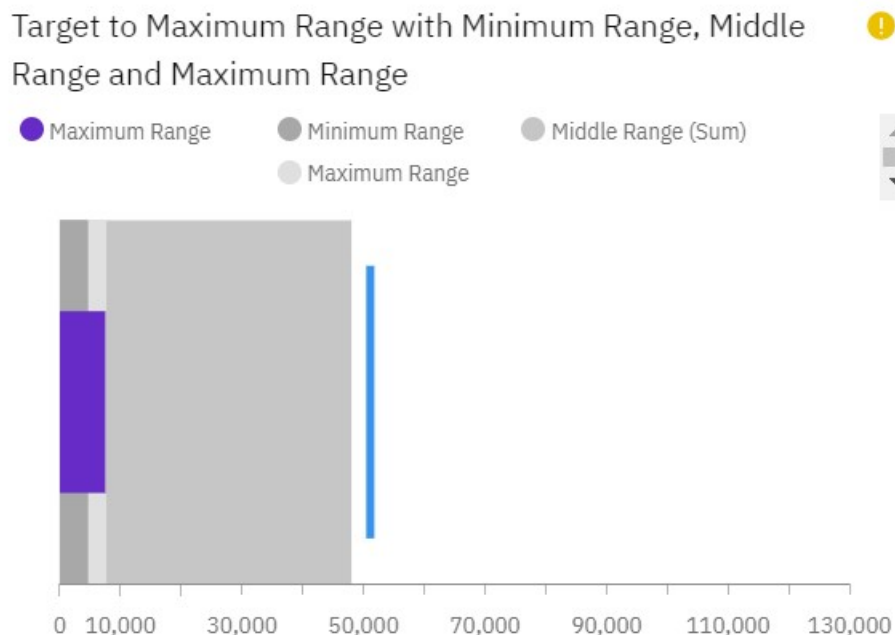
A bullet visualization features a single, primary measure. For example, current year-to-date revenue. And compares that measure to one or more other measures to enrich its meaning. For example, compared to a target. The primary measure is displayed in the context of a qualitative range of performance, such as poor, satisfactory, and good.

If you select a bullet visualization, then specify the following fields:

- The **Actual bar** field specifies the actual measure.
- The **Target** field specifies the target measure.
- The **Minimum range** field specifies the minimum qualitative range.
- The **Middle range** field specifies the middle qualitative range.
- The **Maximum range** field specifies the higher qualitative range.

Note: Drill-through is not available for a bullet visualization.

Make sure the minimum, middle, and maximum ranges relate to the actual and target measure.



The bullet visualization was created by dragging the following data items from the Sources panel:

- Drag **Minimum Range** onto the **Minimum Range** field.

- Drag **Middle Range** onto the **Middle Range** field.
- Drag **Maximum Range** onto the **Maximum Range** field
- Drag **Maximum Range** onto the **Actual Bar** field
- Drag **Target** onto the **Target** field
- Drag **Vehicle class** onto the **Extra Data** field

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

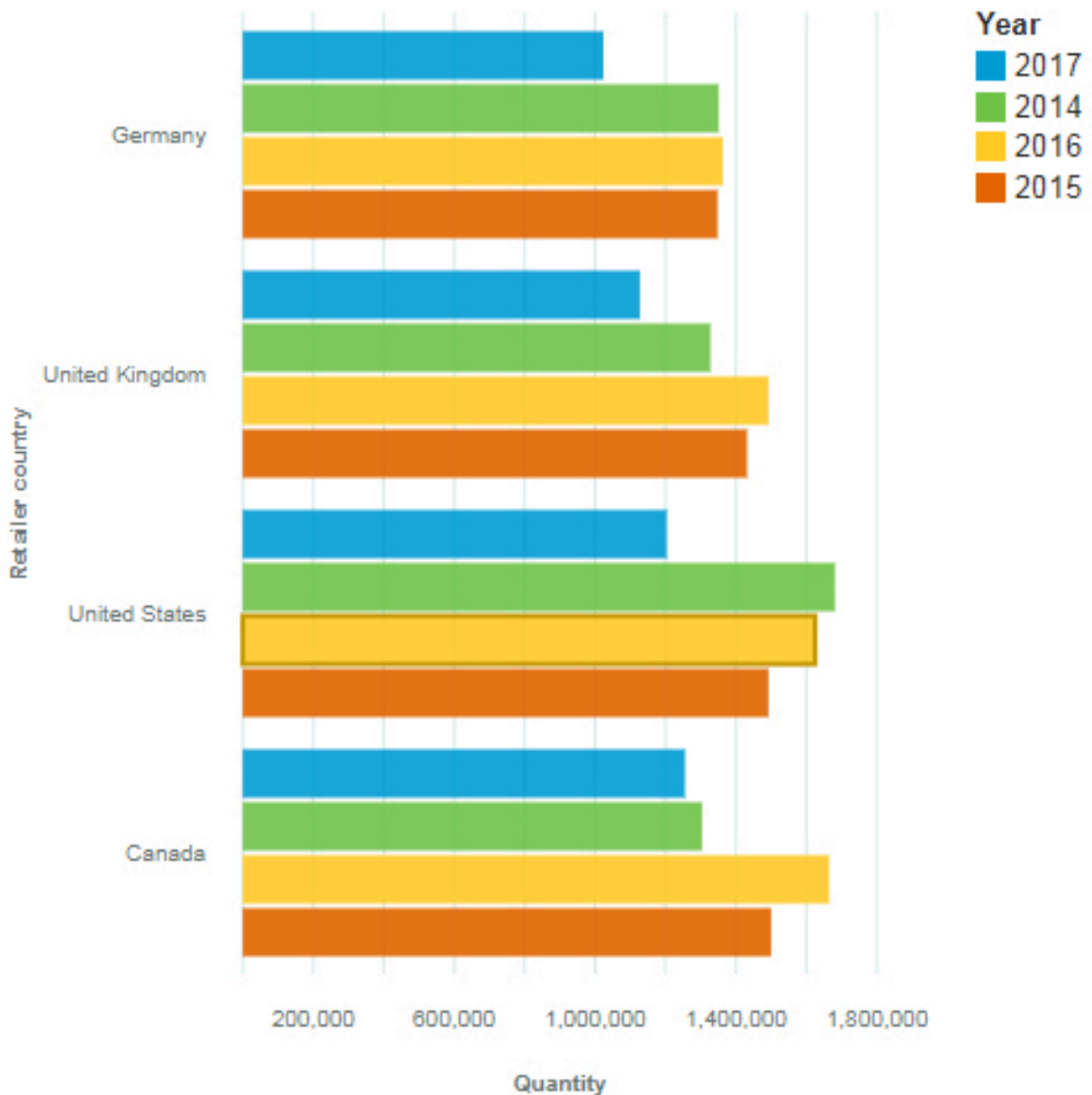
If any of the sample objects are missing, contact your administrator.

Clustered bar

Use a clustered bar visualization to compare values by one or more columns, such as sales for products per country.

Clustered bar visualizations use horizontal data markers that are arranged in groups to compare individual values. You can use clustered bar visualizations to compare discrete data or to show trends over time.

A clustered bar visualization can show changes over a specific time period or can compare and contrast two or more columns in a time period or over time. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

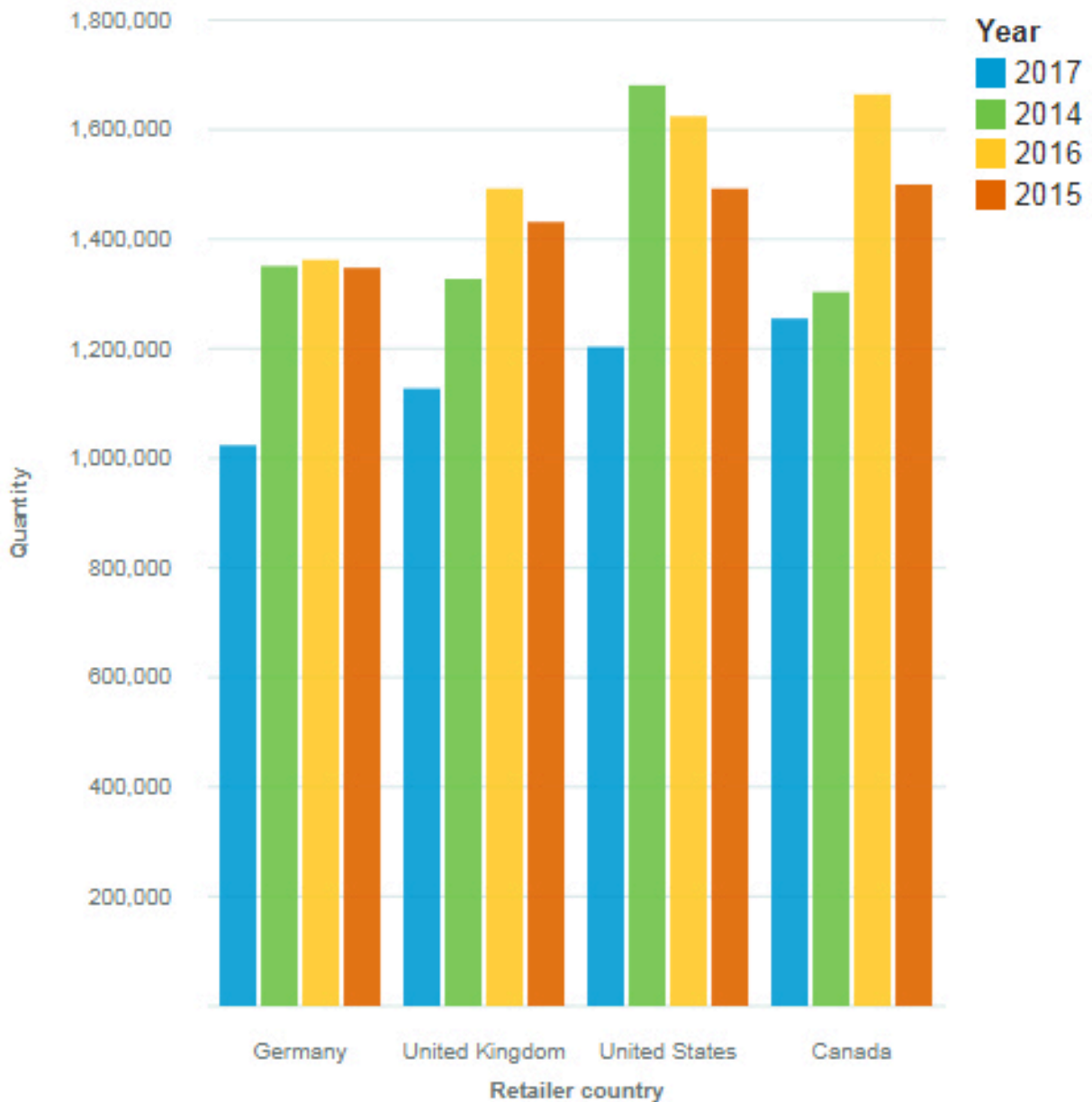


Clustered column

Use a clustered column visualization to compare values by one or more columns, such as sales for products per country.

Clustered column visualizations use vertical data markers that are arranged in groups to compare individual values. You can use clustered column visualizations to compare discrete data or to show trends over time.

A clustered column visualization shows change over a specific time period or can compare and contrast two or more columns in a time period or over time. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



Clustered combination

Use a clustered combination visualization to compare values by one or more columns, such as sales for products per country and use lines to highlight relationships between multiple data series.

For example, this clustered combination visualization shows the relationship between revenue and gross profit.

Use the **Line position** field to apply a comparison line.



Floating bar

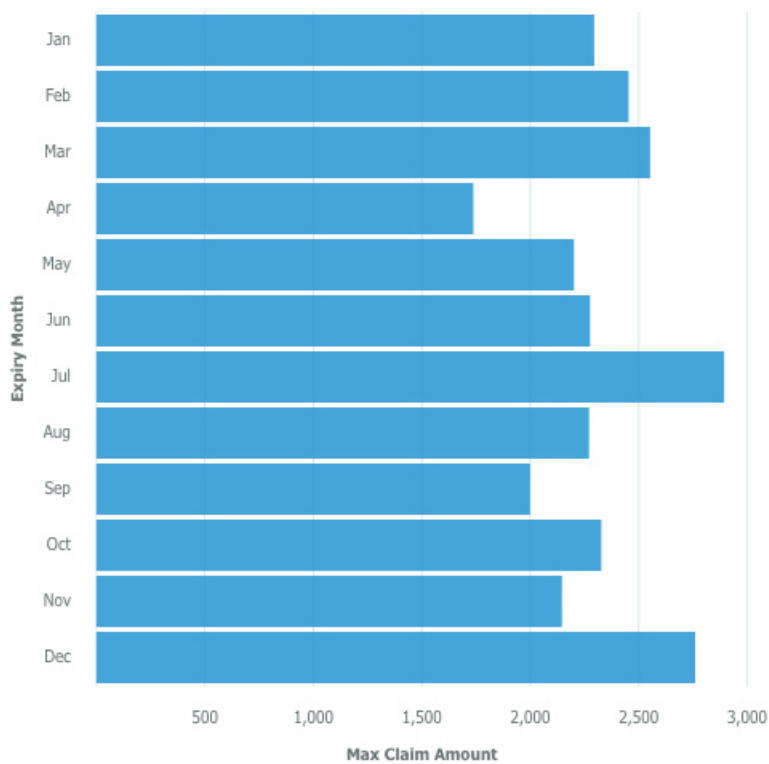
Use a floating bar visualization to display the minimum and maximum value of your data.

The series of the chart does not connect to an axis but next to the axis, which views as floating.

Floating bar visualizations use horizontal data markers to compare individual values. You can use floating bar visualizations to compare discrete data or to show trends over time.

A floating bar visualization can show changes over a specific time period. If the visualization has so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

For example, this floating bar visualization shows the claim amount range per month.



Create the floating bar visualization by dragging the following data items from the **Customer Analysis**

section in the **Sources**  pane:

- Drag **Expiry Month** onto the **Bars** field.
- Drag **Total Claim Amount** onto the **Length** field.
- Drag **Premiums over claim** onto the **y-start** field.

Use the **y-start** field to define where the measure must start.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Floating column

Use a floating column visualization to display the minimum and maximum value of your data.

The series of the chart does not connect to an axis but next to the axis, which views as floating.

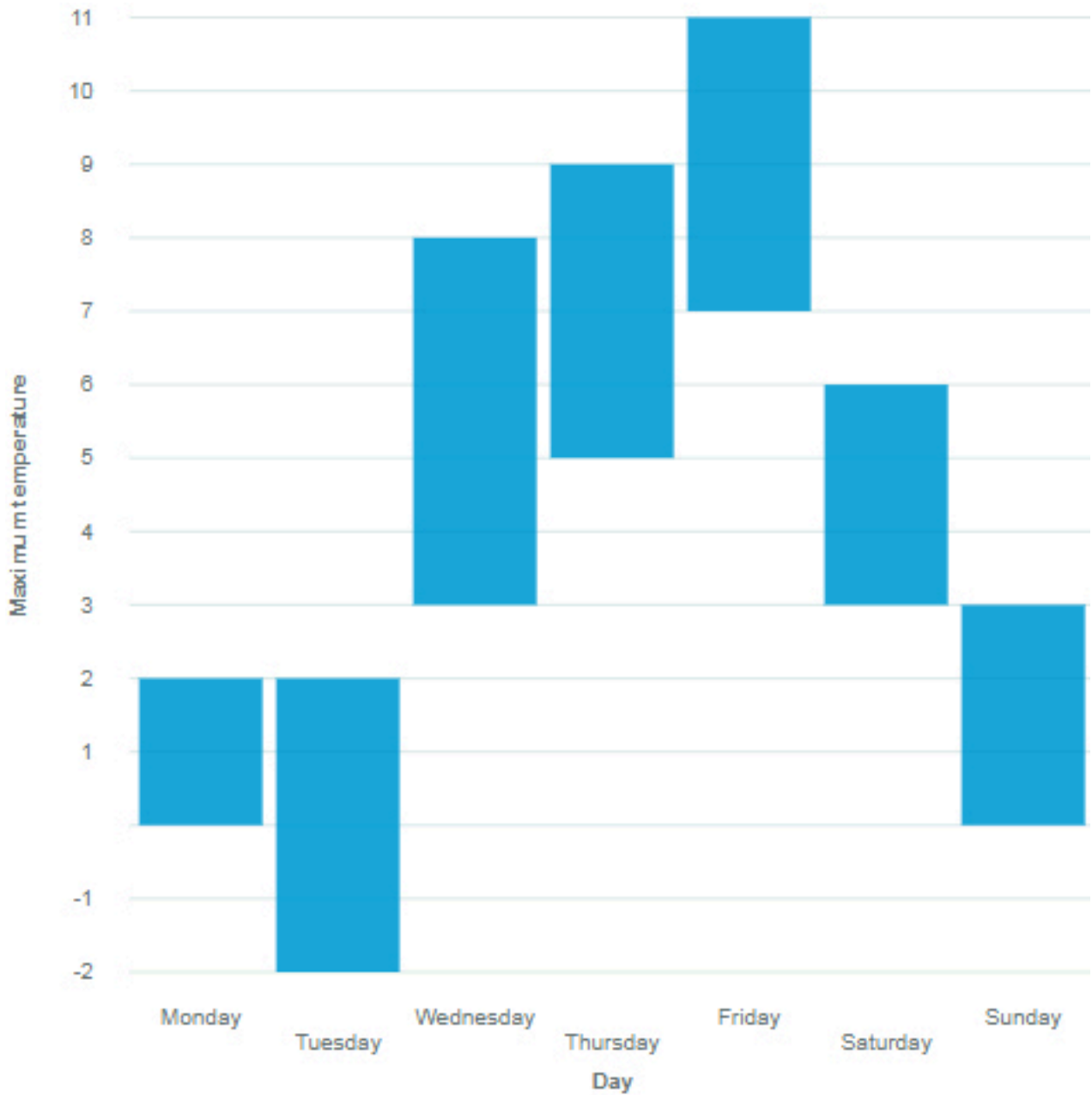
Floating column visualizations use horizontal data markers to compare individual values. You can use floating column visualizations to compare discrete data or to show trends over time.

A floating column visualization can show changes over a specific time period. If the visualization has so many columns that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

Suppose that you have the following data from the next table.

| Day | Maximum temperature | Minimum temperature |
|-----------|---------------------|---------------------|
| Monday | 2 | 0 |
| Tuesday | 2 | -2 |
| Wednesday | 8 | 3 |
| Thursday | 9 | 5 |
| Friday | 11 | 7 |
| Saturday | 6 | 3 |
| Sunday | 3 | 0 |

Use the **y-start** field to define where the measure must start.



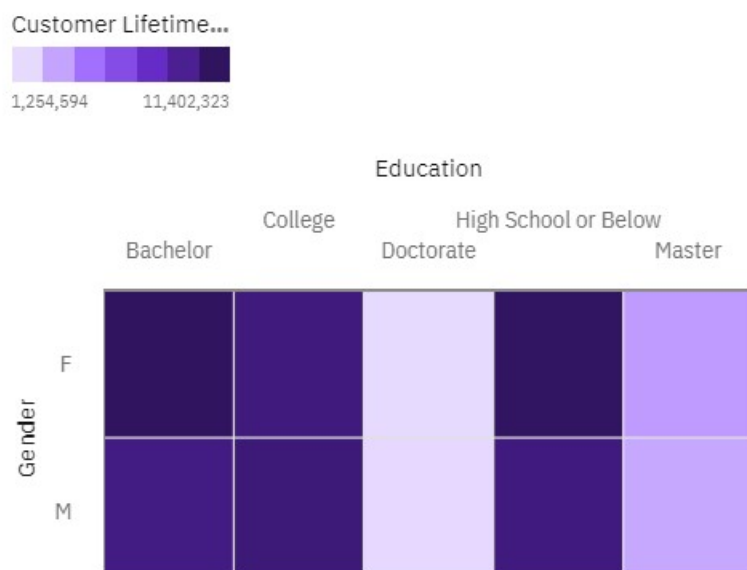
Heat map


Use a heat map visualization to visualize the relationship between columns, represented in a matrix type view.

A heat map visualization uses color and intensity of the color to show the relationship between two columns.

For example, this heat map visualization shows the average customer lifetime value by gender and education.

Customer Lifetime Value by Gender and Education



Create the heatmap visualization by dragging the following data items from the **Sources** panel :

- Drag **Gender** onto the **Rows** field.
- Drag **Education** onto the **Columns** field.
- Drag **Customer Lifetime Value** onto the **Heat** field.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Hierarchy bubble

Use a hierarchy bubble visualization when you want to show relationships among columns that contain values, such as net loss. It is similar to the bubble visualization but the bubbles are tightly packed instead of spread over a grid. The bubbles use nesting to represent the hierarchy. A hierarchy bubble visualization shows a large amount of data in a small space.

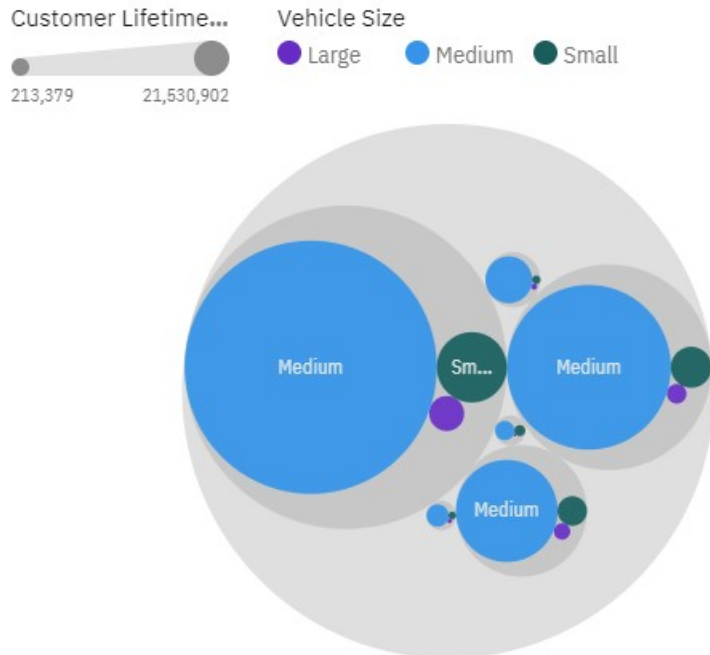
The size of each bubble shows a quantitative dimension of each data point. It shows many levels within a hierarchy and relationships between groups based on assigned attributes. It uses bubble size and color to convey comparative information about categories.

The bubbles are in different sizes and colors.

For example, this hierarchy bubble visualization shows customer lifetime value by vehicle class per vehicle size. Each bubble is a different vehicle class in one of the three vehicle size. The size of each bubble is determined by the customer lifetime value of that vehicle class. The colors of the bubbles are determined by the vehicle size.

Vehicle Class and Vehicle Size hierarchy colored by Vehicle

Size and sized by Customer Lifetime Value



The hierarchical packed bubble visualization was created by dragging the following data items from the

Sources panel :

- Drag **Vehicle Class** and **Vehicle Size** onto the **Bubbles** field.
- Drag **Customer Lifetime Value** onto the **Size** field.
- Drag **Vehicle Size** onto the **Color** field

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content** > **Samples** > **Dashboards** > **Standard dashboards** > **Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

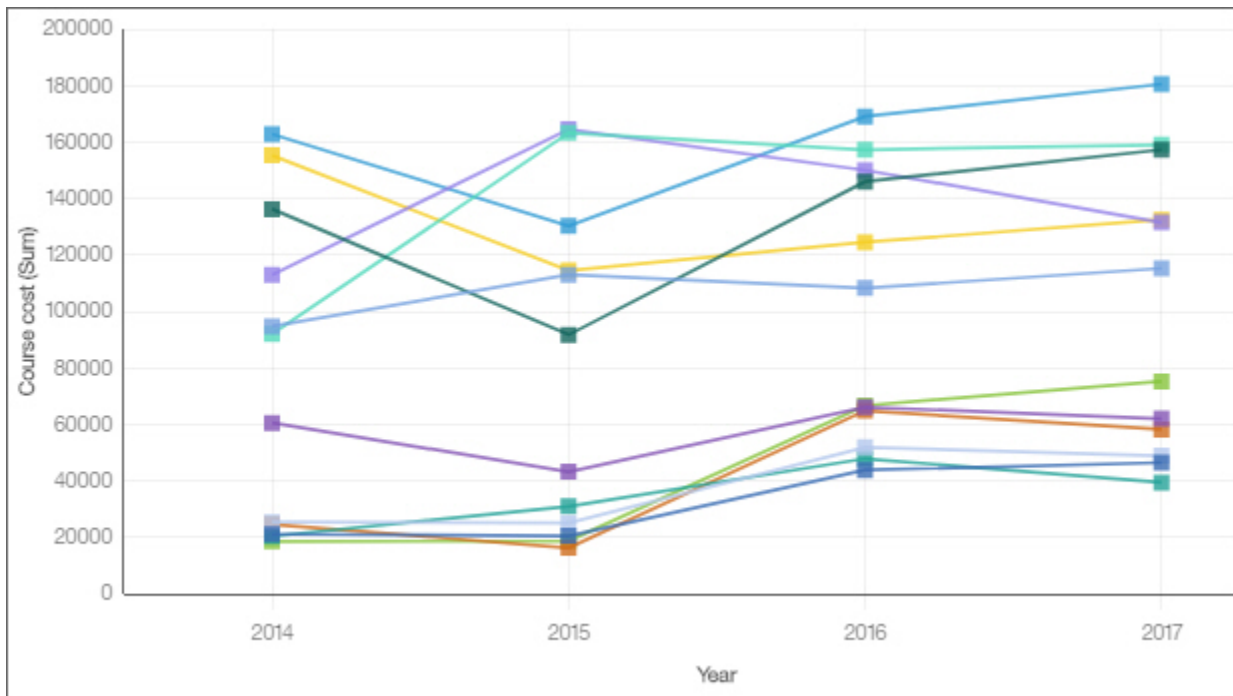
Line

Use a line visualization to show trends over time.

A line visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this line visualization shows the trend in course costs by department over year.



Map

Use a map when you want to see patterns in your data by geography.

Your data asset must contain geographical data, such as countries, states, provinces, or continents.

Note: Maps do not show animations if you set your ease of access system settings to not display animations.

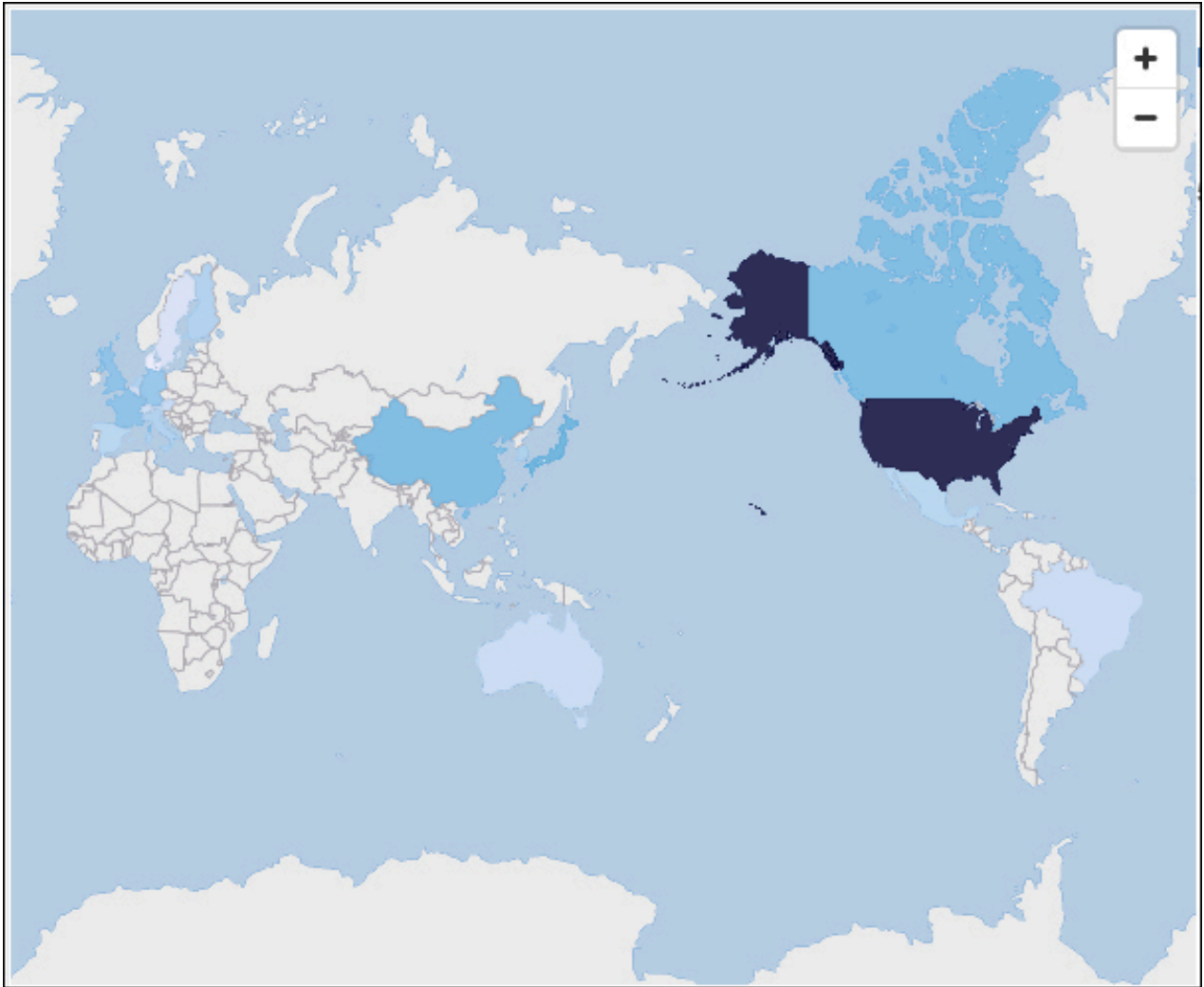
Maps in Cognos Analytics support the following continents:

- North America
- South America
- Africa
- Asia
- Europe
- Antarctica
- Oceania

To determine whether a column is mappable, Cognos Analytics analyzes a sample of 2000 values in the location column, looking for recognizable place names. If 80% or more are recognized as map values, Cognos Analytics produces a map.

For example, you have four countries in your location column: Brazil, China, India, and Russia. The typographical error for India means that only 75% of the values are recognizable place names and you will not see a map as a starting point. But if you have five countries and one has a typographical error in it, you see a map.

For example, this map visualization shows revenue by retailer country with the darker color indicating higher revenue.



Marimekko

A marimekko visualization is similar to a stacked column visualization. It shows data through varying heights and includes an added dimension of data through varying column widths. The width of the columns is based on the value that is assigned to the width field. Individual segment height is a percentage of the respective column total value.

You can quickly spot large segments, such as a specific vertical that has a large share of a region. You can also identify white space such as an under-represented vertical in a specific region.

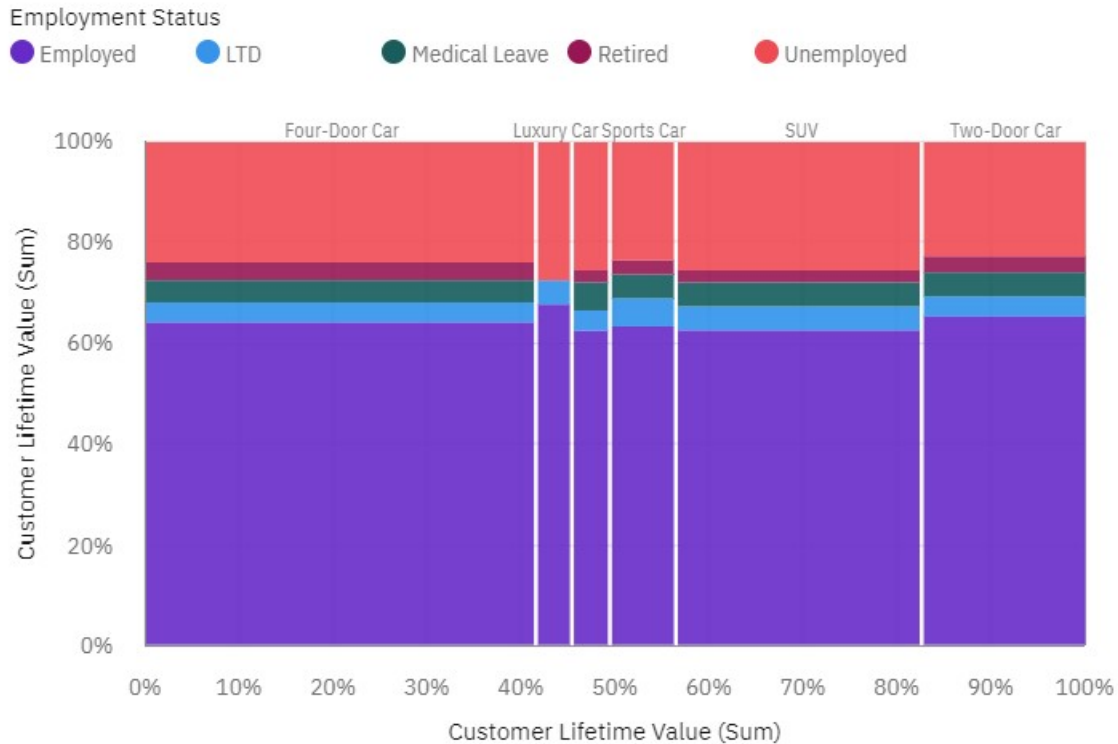
The marimekko visualization is useful for part-to-whole comparisons, where you need to show an extra measure/variable.

The marimekko visualization allows data to be depicted along two dimensions simultaneously. For example, market segments are often arrayed along the x-axis, with the width of each column corresponding to the financial value of a segment. You use marimekko visualizations in cases, for example, where you want to show the revenue contribution per product line. Or the gross domestic product per country.

The marimekko visualization can display total or partial number. If you want to use stacked percentages instead of number, then use the **Display as stacked percentage chart** option.

The following example shows the contribution of customer lifetime value and employment status in different vehicle classes with the option **Display as stacked percentage chart** enabled.

Customer Lifetime Value for Vehicle Class colored by Employment Status



The marimekko visualization was created by dragging the following data items from the **Sources** panel



- Drag **Vehicle Class** type onto the **Bars** field.
- Drag **Customer Lifetime Value** onto the **Length** field.
- Drag **Employment Status** onto the **Color** field

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Network

Use a network visualization when you want to see the connections among columns in your data asset. A network visualization is a good choice to show connections, networks, and points of intersection.

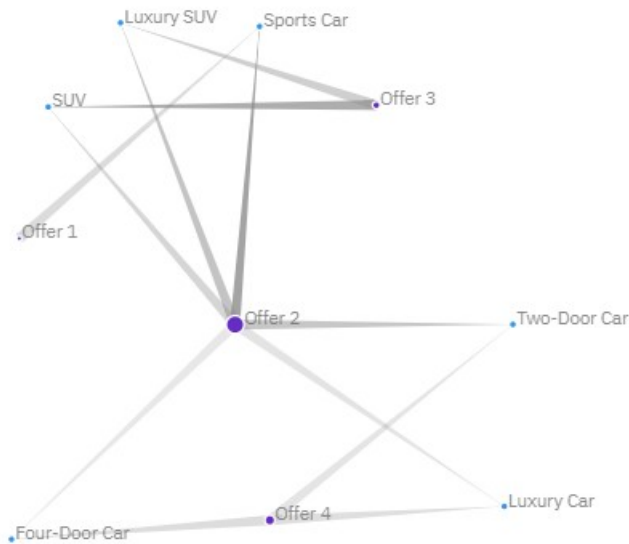
Network visualizations display a set of nodes, represented by symbols, and links, represented by paths, to show the relationship between entities or items.

Use the **From** and **To** fields to define the relationship that you want to investigate.


For example, a network visualization can show offer acceptance by Vehicle Class.

Offer to Vehicle Class with line width Accepted

From To
● Offer ● Vehicle Class





Create the Network visualization by dragging the following data items from the **Offers** section in the

Sources pane :

- Drag **Offer** onto the **From** field.
- Drag **Vehicle Class** onto the **To** field.
- Drag **Accepted** onto the **Line width** field.

Next, set the size and node properties.

1. Click the visualization, then click . Set the following options in the **Properties** pane:
 - **Size - Width:** 500 px, **Height:** 300 px
 - **Nodes minimum size:** 20
 - **Nodes maximum size:** 100
2. Click  to close the **Properties** pane.

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

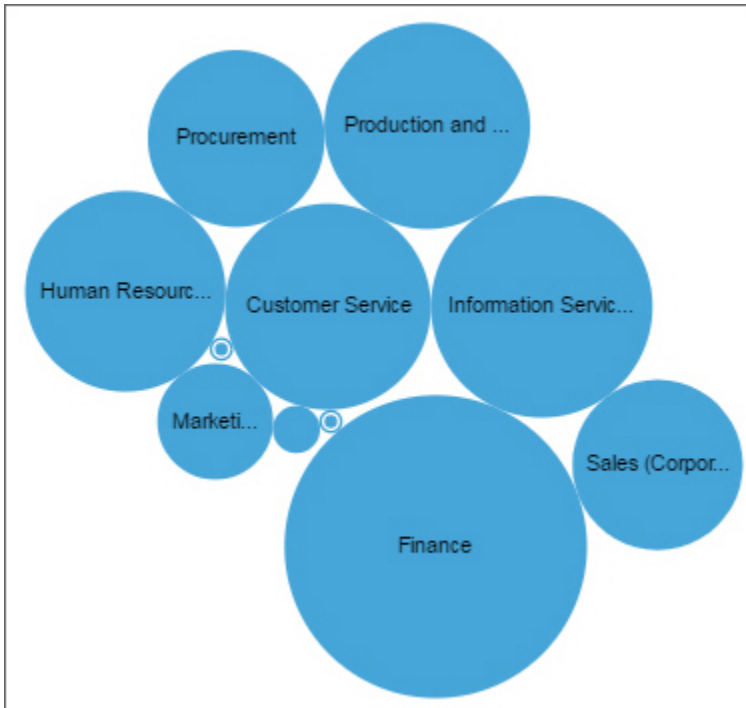
If any of the sample objects are missing, contact your administrator.

Packed bubble

Use a packed bubble visualization when you want to show relationships among columns that contain numeric values, such as revenue. It is similar to the bubble visualization but the bubbles are tightly packed instead of spread over a grid. A packed bubble visualization shows a large amount of data in a small space.

The bubbles are in different sizes and colors.

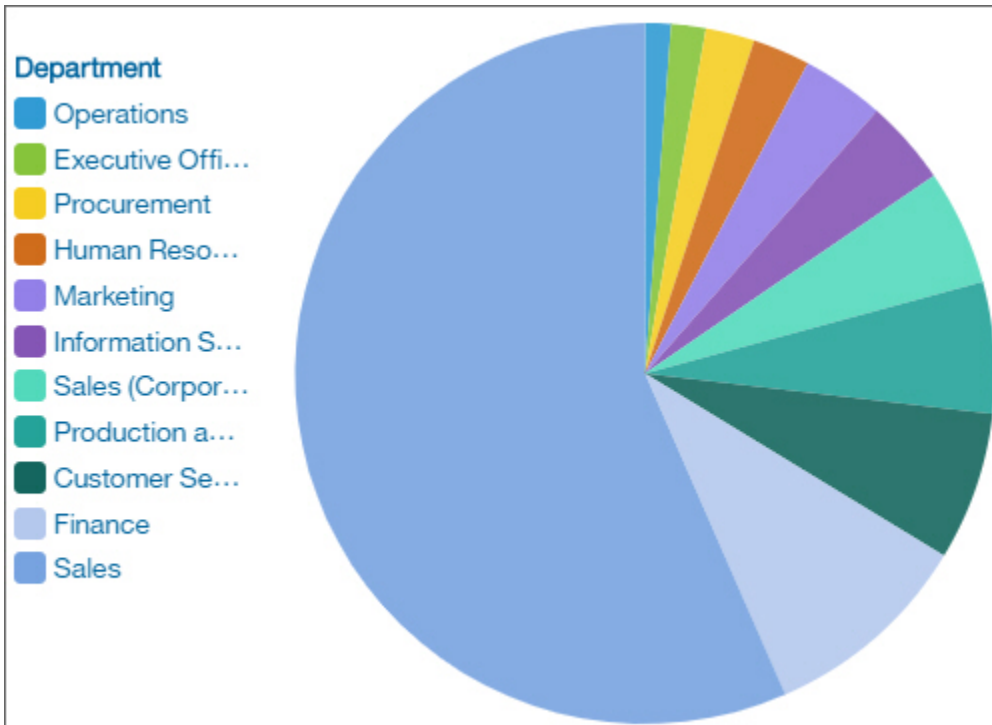
For example, this packed bubble visualization shows external hires by department. Each bubble is a different department. The size of each bubble is determined by the number of external hires for that department.



Pie

Use a pie visualization to highlight proportions. Each slice shows the relative relationship of each part to the whole.

For example, this pie visualization shows the number of course days for each department.



Point

Use a point visualization to show trends over time.

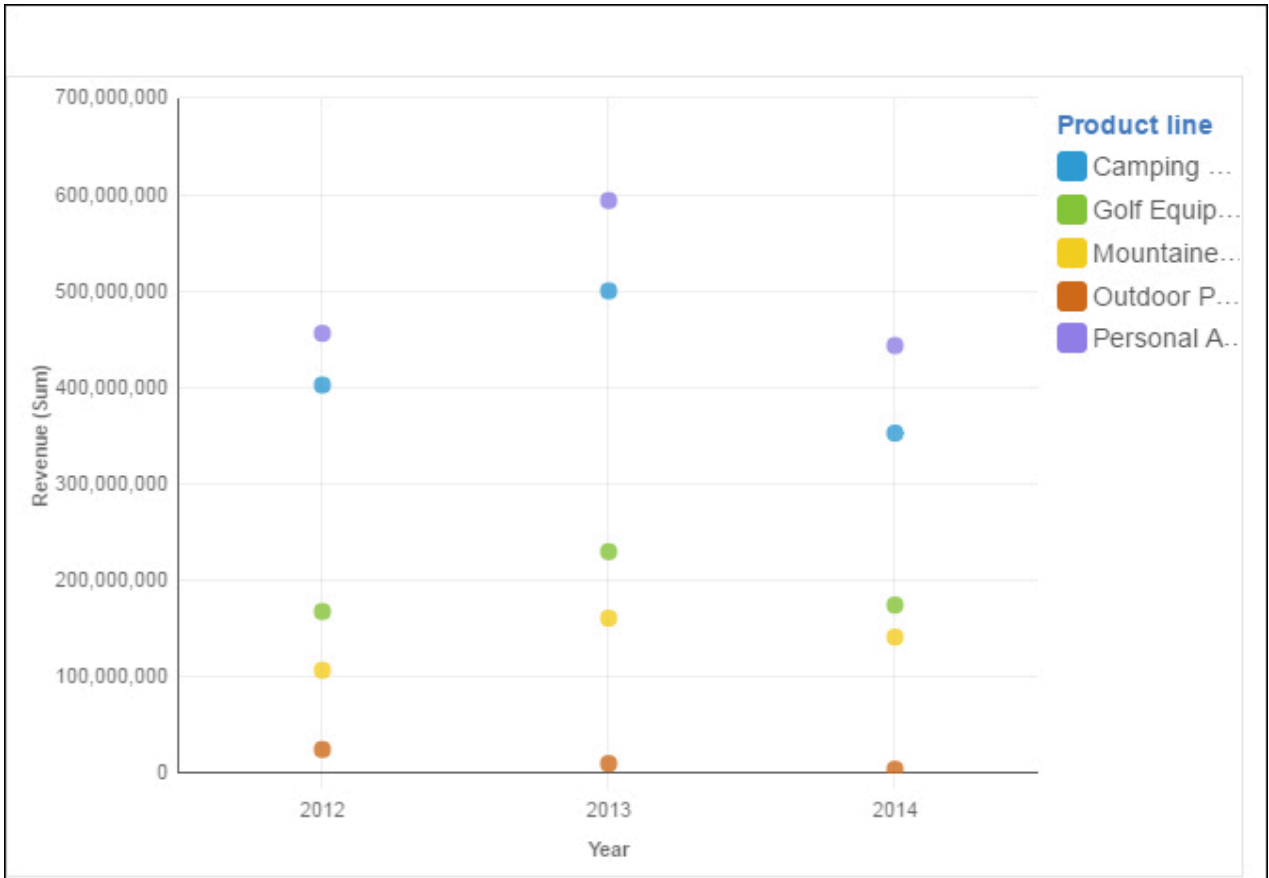
A point visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

A point visualization is like a line chart without the connecting lines.

For an effective line visualization, the x-axis should show time, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar visualization.

Data values are plotted vertically.

For example, this line visualization shows revenue over quarter by order method type. Web orders have grown dramatically over this period.



Radar

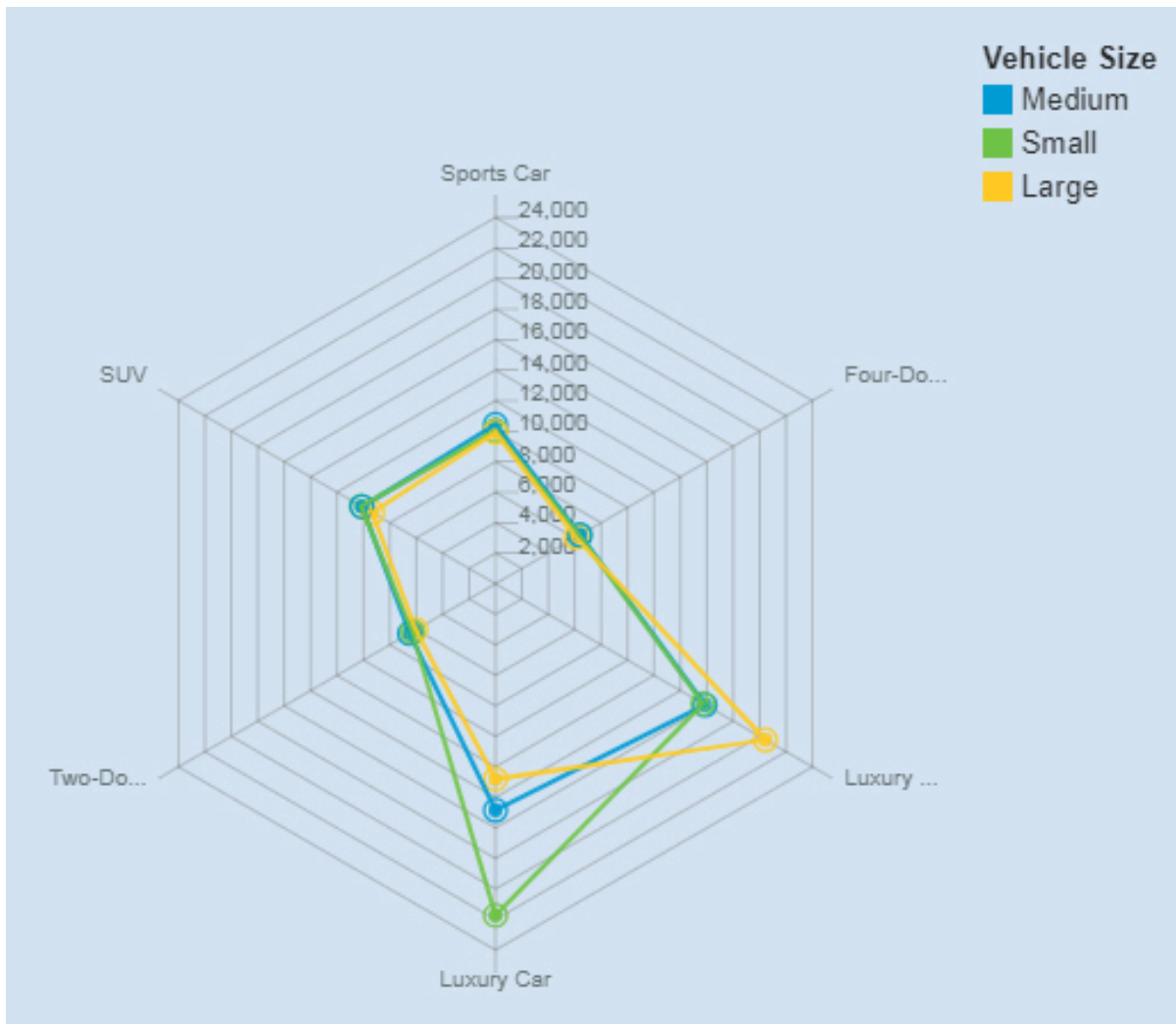
Use a radar visualization for comparing multiple quantitative variables. The radar visualization shows which variables have similar values or if there are any outliers amongst each variable.


Radar visualizations are also useful for seeing which variables are scoring high or low within a data set, making them ideal for displaying performance.

Examples of using a radar visualizations are:

- Comparing cars: speed, durability, comfort, power, space.
- Competitor profiles: number of employees, revenue, profit, current stock price, customer satisfaction.

The following example shows the revenues per retailer type for product lines in different states.



The radar visualization was created by dragging the following data items from the **Sources**  pane:

- Drag **Vehicle Class** onto the **x-axis** field.
- Drag **Vehicle Size** onto the **Color** field.
- Drag **Customer Lifetime Value** onto the **y-axis** field.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content** > **Samples** > **Dashboards** > **Standard dashboards** > **Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Radial

In a radial visualization, each bar appears in a circle with longer bars that represent larger values. Hover over a bar to see the details about it, such as the exact value represented by the bar. Each bar starts at 12 noon and goes in a clockwise direction for positive values and counterclockwise for negative values.

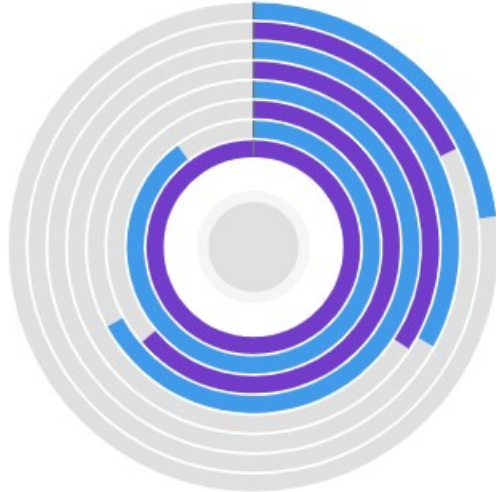
Radial visualizations, also known as dial charts or speedometer charts, show information as reading on a dial. The radial visualization is valid only with one category.


For example, this visualization shows renewals by offer type and gender.

Number of Policies by Renew Offer Type colored by Gender





Gender
● F ● M



Create the Radial visualization by dragging the following data items from the **Customer Analysis** section in the **Sources** pane :

- Drag **Renew Offer Type** onto the **Bars** field.
- Drag **Number of Policies** onto the **Length** field.
- Drag **Gender** onto the **Color** field.

The next step is to set the sort properties for **Renew Offer Type** and **Gender**.

1. Click the visualization, then in the **Data** pane, click the **<Renew Offer Type>** data item.
2. Click .
3. In the **Properties** pane, for **Sort order**, select **Ascending**.
4. In the **Data** pane, click the **<Gender>** data item.
5. In the **Properties** pane, for **Sort order**, select **Descending**.
6. Click  to close the **Properties** pane.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

River

A river visualization is an area visualization where sections are stacked on top of another instead of overlaying each other. Use an area visualization to emphasize the magnitude of change over time.

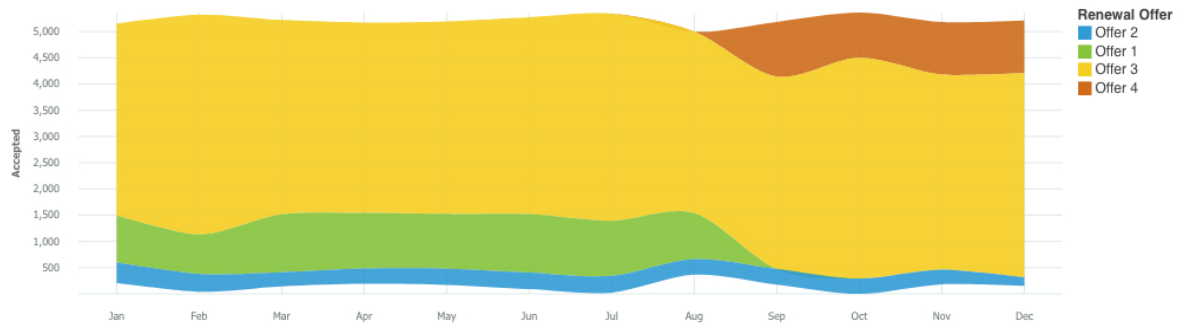
Use river visualizations to show changes of different categories over time, when the categories start and stop at different times. The height of each individual river shows how the river changed over time.

The length shows its duration. Colors can provide more information about the value of a category or to differentiate between categories.

Because a river visualization stacks the results for each column or item, the total of all results is easily seen.

For example, a river visualization is excellent for looking at revenue over time across several products.

This example shows renewals by offer type over a year.



Create the River visualization by dragging the following data items from **Renewals** in the **Sources** pane



- Drag **Month** onto the **x-axis** field.
- Drag **Renew Offer Type** onto the **Color** field.
- Drag **Accepted** onto the **y-axis** field.

To change the size of the visualization, click the visualization, then set the following option in the **Properties** pane:

- **Size - Width:** 1000 px, **Height:** 300 px

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

If any of the sample objects are missing, contact your administrator.

Scatter

Scatter visualizations use data points to plot two measures anywhere along a scale, not only at regular tick marks.

Scatter visualizations are useful for exploring correlations between different sets of data.

The following example shows the correlation between revenue and gross profit for each product type.



Stacked combination

Use a stacked combination visualization to compare the proportional contributions for each item to the total, such as sales for products and sales for products each month and use lines to highlight relationships between multiple data series.

For example, this stacked combination visualization shows the relationship between position count and planned position count by department.

Use the **Line position** field to apply a comparison line.



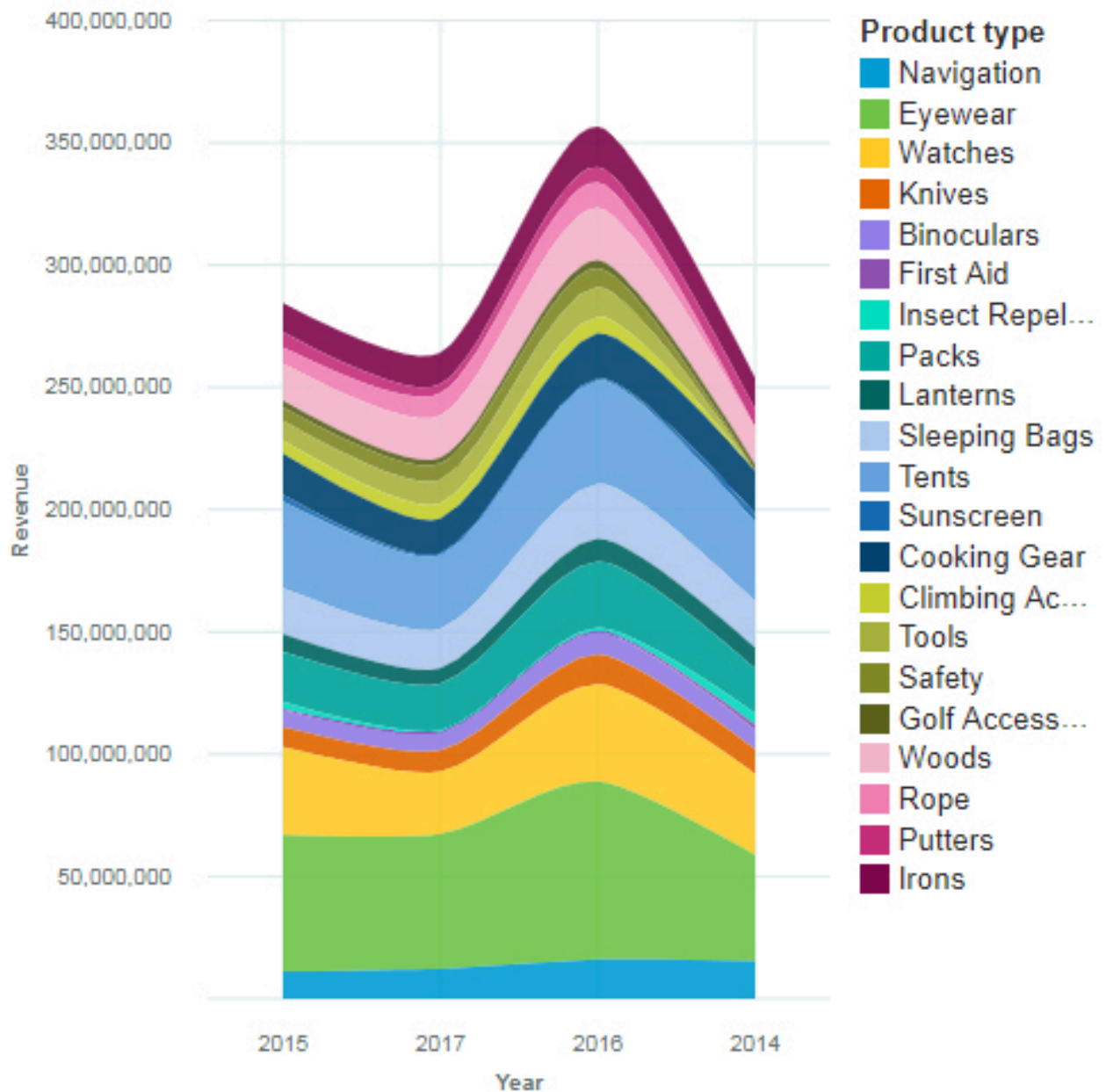
Smooth area

Smooth area visualizations are like line visualizations, but the areas below the lines are filled with colors or patterns. Use a smooth area visualization to show trends over time.

Smooth area visualizations are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total.

For an effective smooth area visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this smooth area visualization shows the trend in revenue costs by product type over the years.



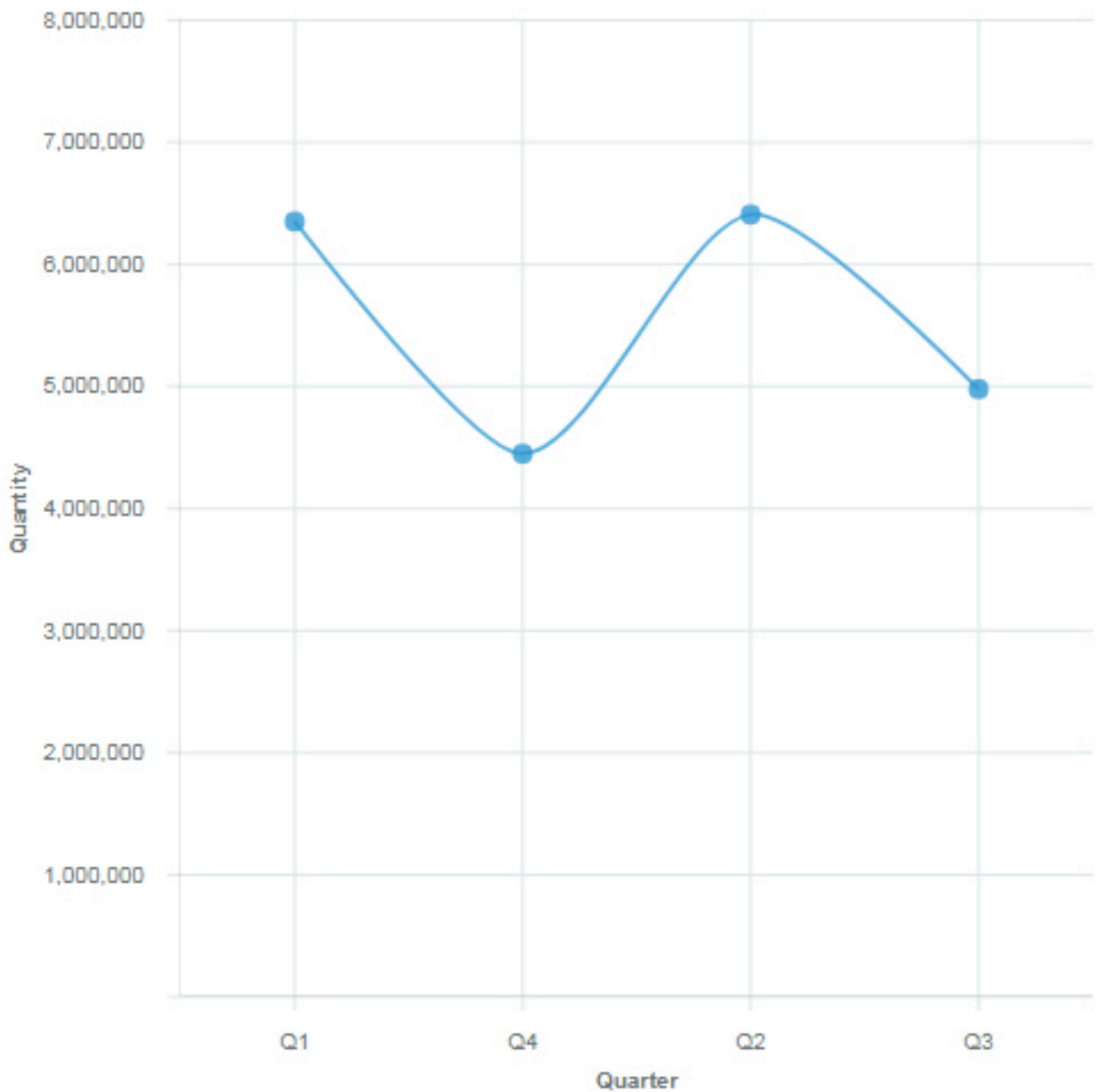
Smooth line

Use a smooth line visualization to show trends over time when your data is noisy.

A smooth line visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective smooth line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

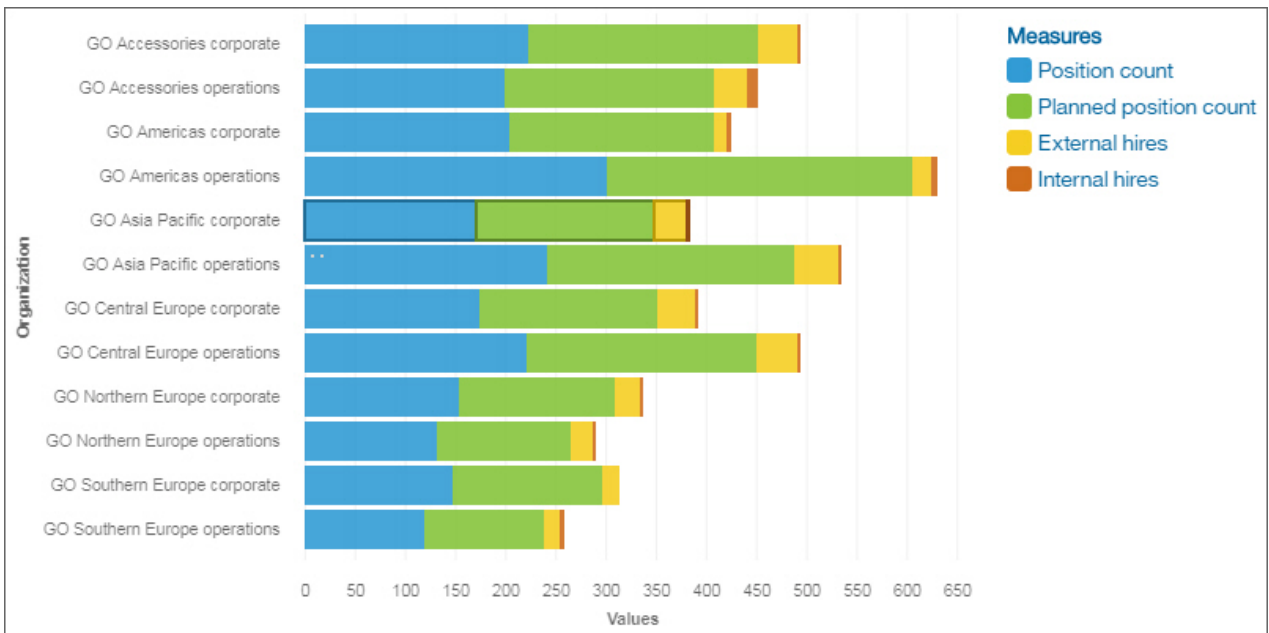
For example, this smooth line visualization shows the trend in quantity of sold products over year.



Stacked bar

Use a stacked bar visualization to compare the proportional contributions for each item to the total, such as sales for products and sales for products each month.

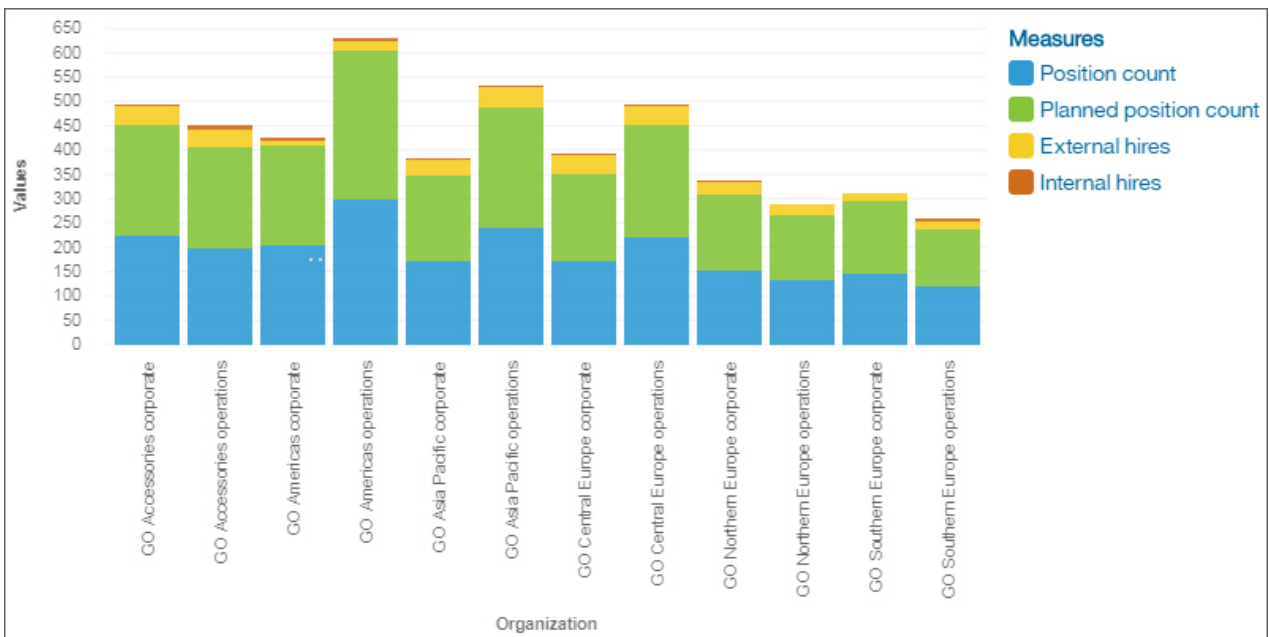
A stacked bar visualization can show change over a specific time period or compare the proportional contributions for each item to the total. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



Stacked column

Use a stacked column visualization to compare the proportional contributions for each item to the total, such as sales for products and sales for products each month.

A stacked column visualization can show change over a specific time period or can compare the proportional contributions for each item to the total. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



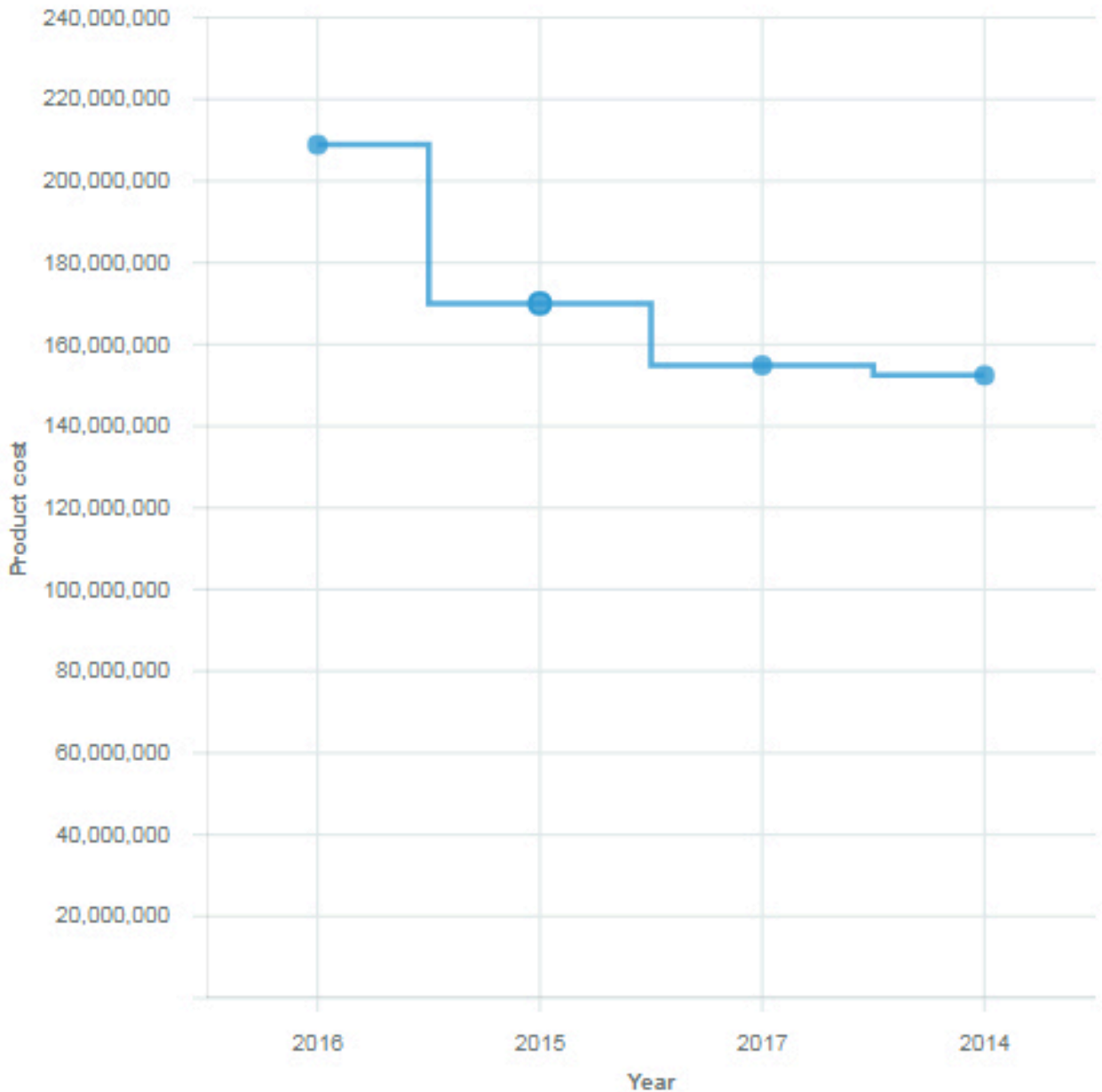
Step line

A step line visualization plots data at regular points that form a series of steps between data points.

You can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective step line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this step line visualization shows the trend in product costs over years.



Stepped area

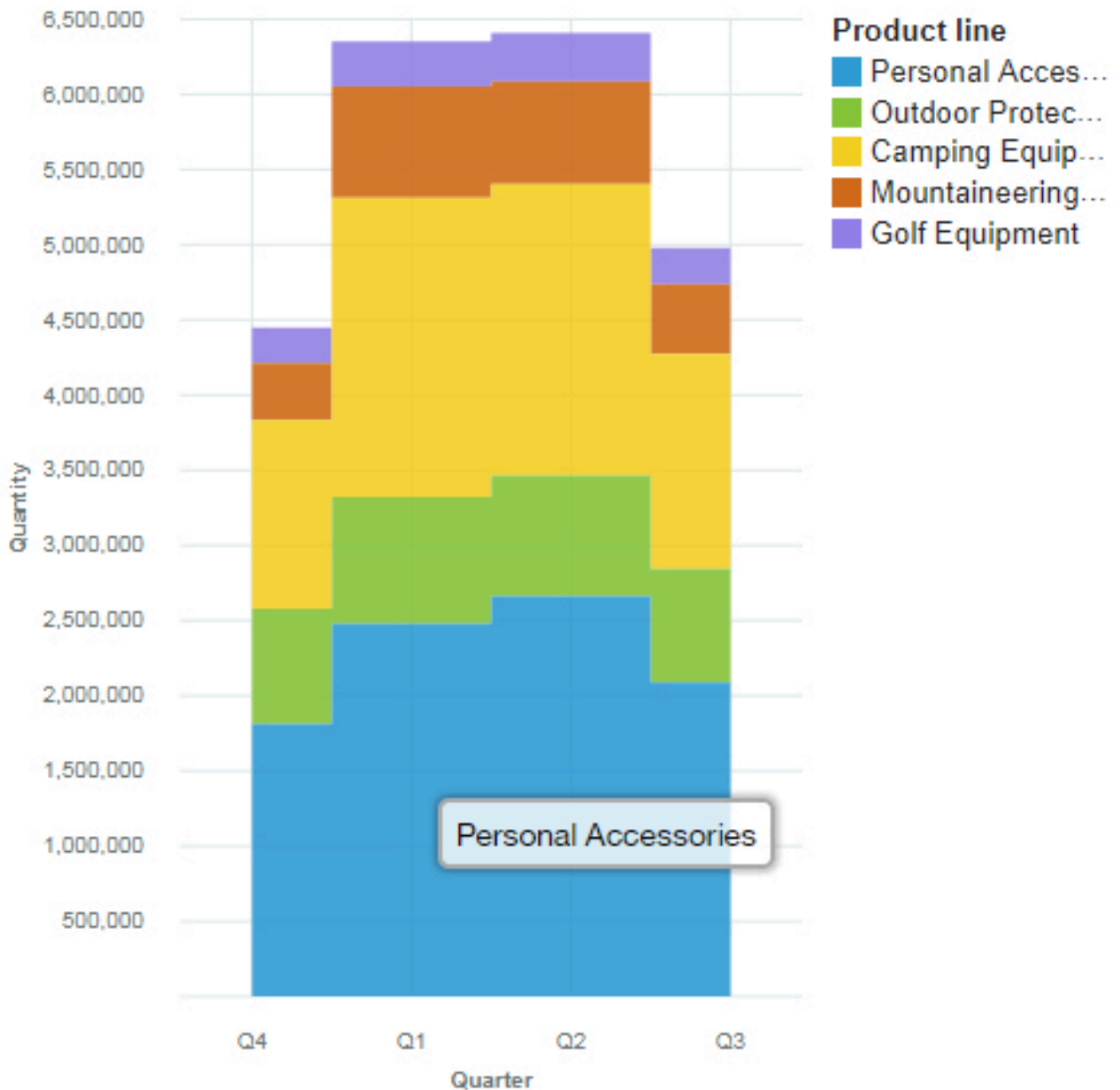
Stepped area visualizations are like line visualizations, but the areas below the lines are filled with colors or patterns.

Stepped area visualizations form a series of steps between the data points.

Stepped area visualizations are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total.

For an effective stepped area visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this stepped area visualization shows the trend in sold products by product type, over the quarters.



Target column

Use a target column visualization to compare values by one or more columns and against a target value, such as sales for products per country.

Target column visualizations use horizontal data markers that are arranged in groups to compare individual values. You can use target column visualizations to compare discrete data or to show trends over time.

Use the **Target** field to show measures that need to be compared against a target value.

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

If any of the sample objects are missing, contact your administrator.

Target bar

Use a target bar visualization to compare values by one or more columns and against a target value, such as sales for products per country.

Target bar visualizations use horizontal data markers that are arranged in groups to compare individual values. You can use target bar visualizations to compare discrete data or to show trends over time.

Use the **Target** field to show measures that need to be compared against a target value.

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

If any of the sample objects are missing, contact your administrator.

Treemap

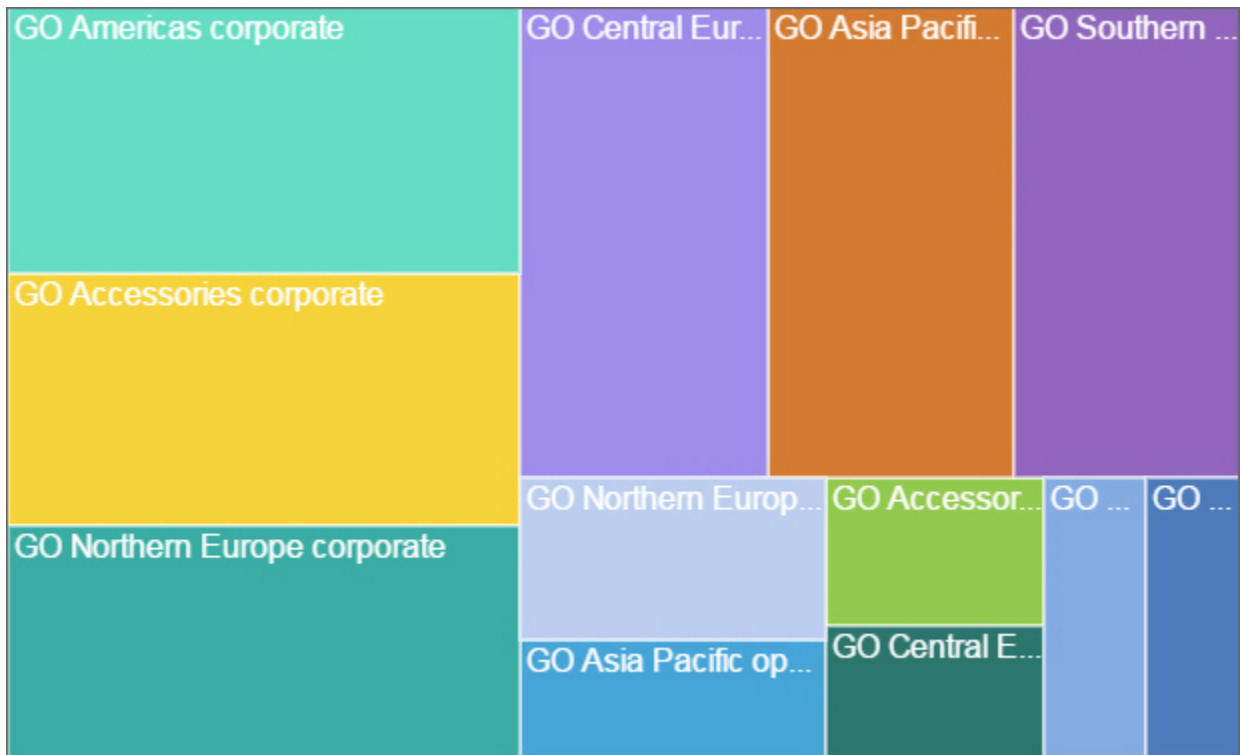
Use a treemap visualization to identify patterns and exceptions in a large, complex data asset.

Tree maps show relationships among large numbers of components by using size and color coding in a set of nested rectangles.

A treemap that is colored by category identifies the level 1 category by color. The sizes of the rectangles represent the values. In a treemap that is colored by value, the sizes of the rectangles represent one of the values and the color represents a second set of values. Do not use data that includes negative numbers. A treemap ignores negative numbers.

Many data assets have a hierarchical structure. For example, you have data about the profit margin of food items in a grocery store. Under the general category of fruit, there is a category for citrus fruit. Various citrus fruits are listed, such as grapefruit, orange, and lemon. A treemap displays how each citrus fruit is performing when compared to each other and to other types of food.

For example, this treemap visualization shows course cost by organization.



To deselect a box that you selected, Ctrl+click the selected box.

Treemap visualizations support the following display modes:

- **Squarified:** The default display mode.
- **Slice:** Displays measures that belong to the same node in a vertically sliced way.
- **Dice:** Displays measures that belong to the same node in a horizontally sliced way.
- **Slice - Dice:** Displays stacked hierarchical measures that belong to the same node in a vertically sliced way.

The following screen capture displays a treemap with the Organization and Department measures on the **Area hierarchy** field, and Expense total on the **Size** field.

Expense total for Organization and Department hierarchy



Waterfall

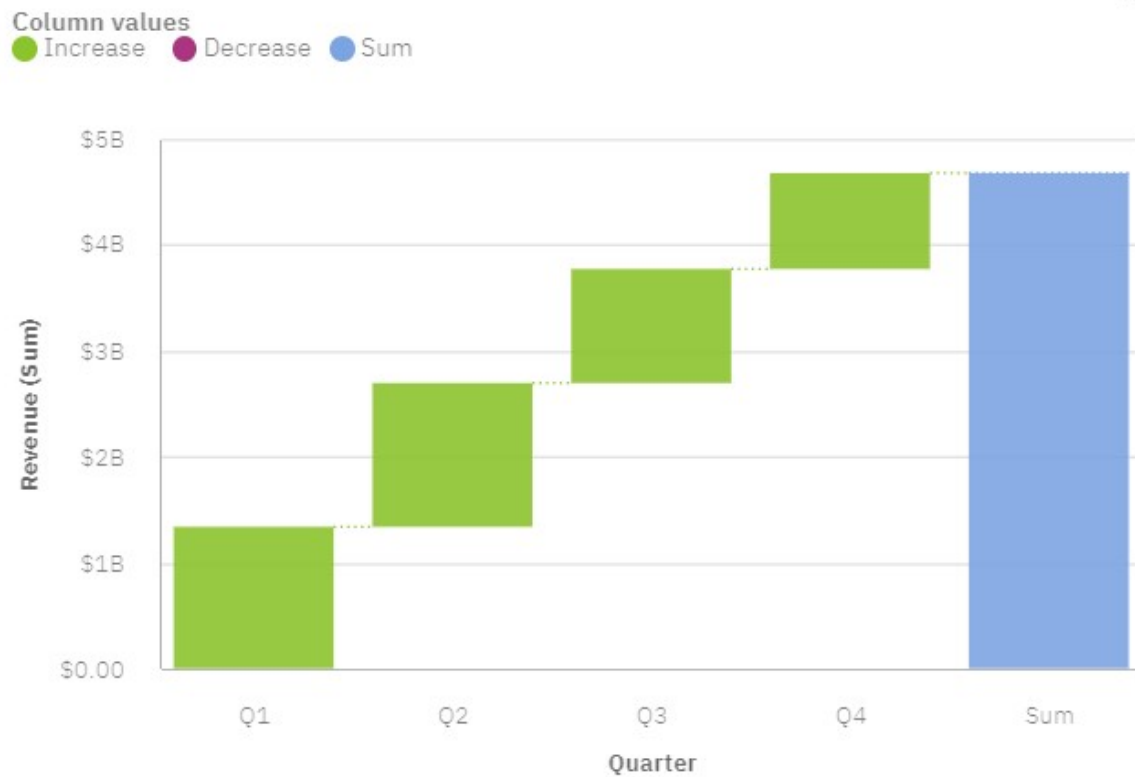
Use a waterfall visualization to understand the cumulative effect a series of positive and negative values have on an initial value. The bars in a waterfall visualization are not totals.

A waterfall visualization shows how an initial value is increased and decreased by a series of intermediate values, leading to a final cumulative value shown in the far right column. The intermediate values can either be time-based or category-based.

Some examples of waterfall visualizations are as follows:

- Viewing the net income after you add the increases and decreases of revenue and costs for an enterprise over a quarter.
- Cumulative sales for products across a year with an annual total.

This waterfall visualization shows the revenue delta by quarter.



Creating a waterfall visualization

1. Create a new report.
2. Open the sample data module: **Select a source** > **Team content** > **Samples** > **Data** > **Sporting Goods Company**.
3. Click **Visualizations** and click **Waterfall** to add the waterfall visualization to the report.
4. Click **Sources**



5. Drag the following data items from the Policy Holders section:

- Drag **Quarter** onto the **x-axis** field.
- Drag **Revenue** onto the **y-axis** field.

6. Set the properties for the appearance of the visualization. Click



In the **Visualization** tab, you can set column color options, axis, legend position, and chart properties.

For example, set these options:

- **Total column positive color:** #8DC945
- **Show legend:** Off

When you are done, click



to close the **Properties** pane.

Sub-categories

You can use sub-categories in waterfall visualizations. Use sub-categories to display how categories are build up.

1. While in page preview mode, drag **month** onto the **Sub-categories** field.

You can see how the revenue of each month contributes to the quarters.

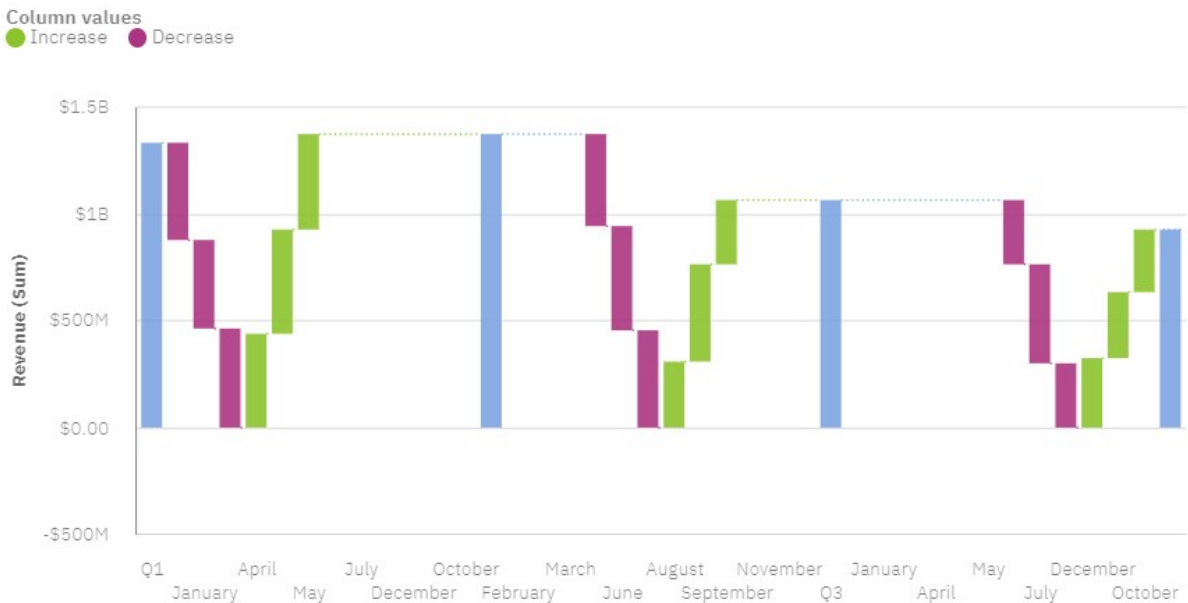


Showing the sub-categories as actual or as changed values

You can display the values of the sub-categories as actual or as changes.

1. While in page preview mode, click . In the **Visualization** tab, click **WATERFALL** > **Sub-category values**. Select from the menu either **Actual** or **Change**.

You can see how the changes in revenue of each month contribute to the quarters.

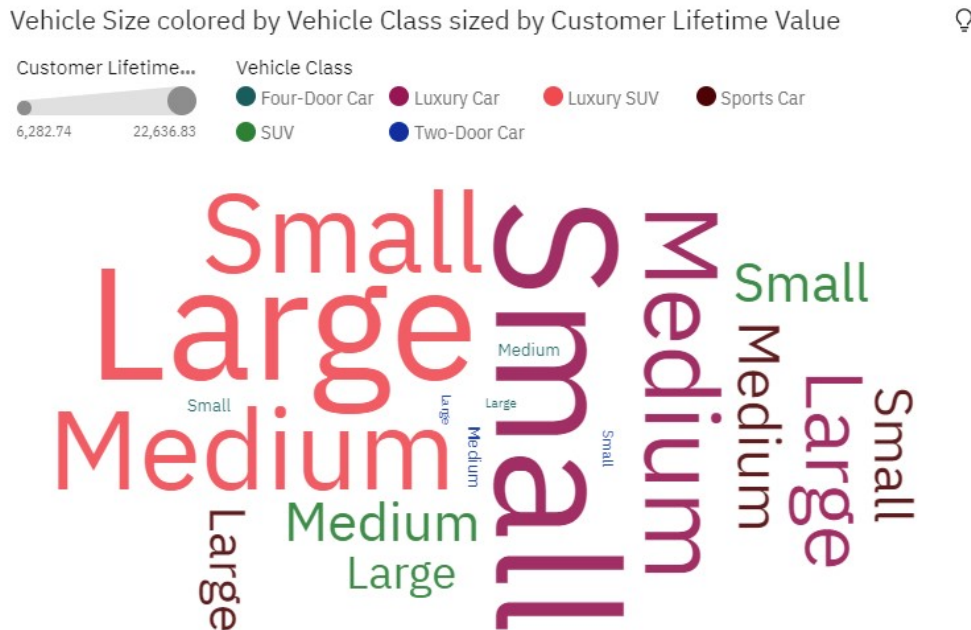


Word cloud

Use a word cloud visualization when you want to see a text-based visualization of a column. The text height represents the scale. The name itself is the different members of the column.

Tip: The data asset should contain at least 15 columns and at least 100 rows to create an effective word cloud.

For example, this word cloud visualization shows the customer life time value by vehicle size and class.



The word cloud was created by dragging the following data items from the Sources panel:

- Drag **Vehicle size** type onto the **Words** field.
- Drag **Average CLTV** onto the **Size** field.
- Drag **Vehicle class** onto the **Color** field

Samples

You can see an example of a word cloud visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Reports > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Visualization types version 11.0

IBM Cognos Analytics - Reporting provides many types of visualizations for presenting your data in a way that is meaningful for your users.

You can select from a variety of chart types (such as pie, bar, line, gauge, scatter, and so on) and you can select from a variety of chart configurations (such as stacked columns, 3-D pies). Combination charts allow you to use more than one chart type within your chart.

Some chart types are not supported for Microsoft Excel output or appear differently in Excel. For more information, see [Appendix B, “Limitations When Producing Reports in Microsoft Excel Format,”](#) on page 499.

Area

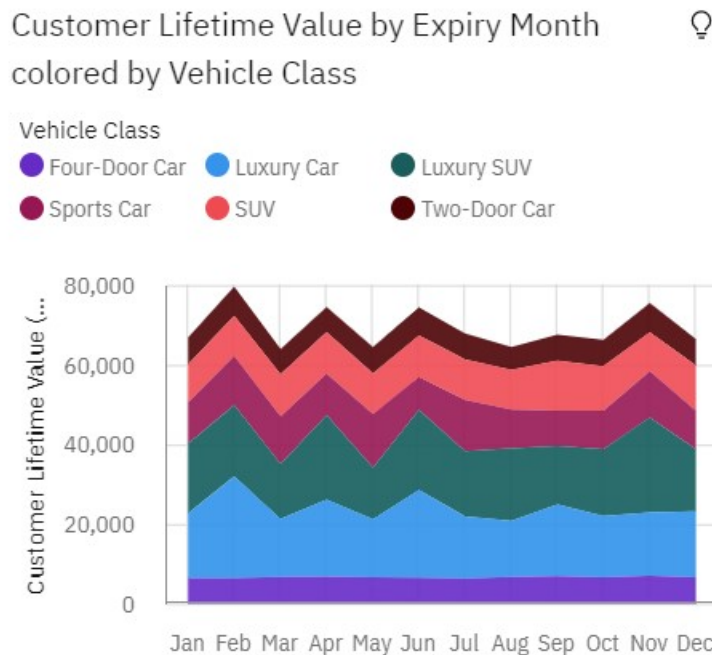
Use an area visualization to emphasize the magnitude of change over time.

Area charts are like line charts, but the areas below the lines are filled with colors or patterns. Stacked charts are useful for comparing proportional contributions in a category. They plot the relative value that each data series contributes to the total.

Because an area visualization stacks the results for each column or item, the total of all results is easily seen.

For example, an area visualization is excellent for looking at revenue over time across several products.

For example, this area visualization shows the customer lifetime value for each vehicle class per month. Because the area visualization stacks the results, you see the totals for each month.



The area visualization was created by dragging the following data items from the Sources panel:

- Drag **Expiry Month** type onto the **x-axis** field.
- Drag **Vehicle Class** onto the **Color** field.
- Drag **Customer Lifetime Value** onto the **y-axis** field

Samples

You can see an example of a word cloud visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Reports > Standard reportsCustomer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Box plot

You can use box plots for identifying outliers and for comparing distributions.

You can create a box plot to show the median, quartiles, and outlier and extreme values for a variable. The inter-quartile range is the difference between the 75th and 25th percentiles and corresponds to the length of the box. The middle line is the 50th percentile.

Above and under each box whiskers give additional information about the spread of the data.

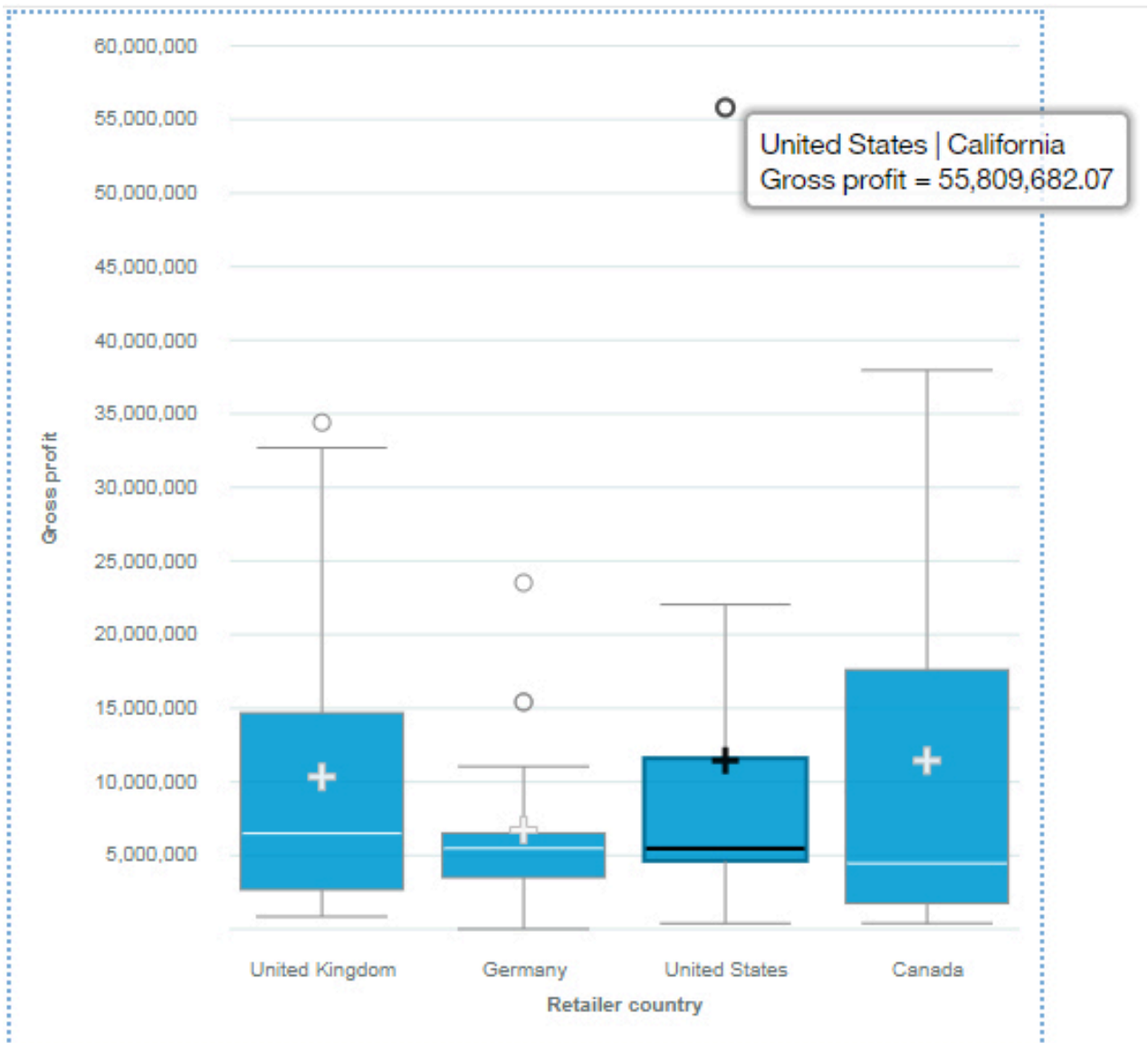
Far out values are represent by adding "o" signs beyond the whiskers.

The mean score in a box plot is presented by a "+" sign.

Use the key field in a box plot visualization to determine for which items you want to identify outliers and compare distributions. In our example, we use **Province or State** from the GOSales data source.

The next box plot shows the gross profit statistics for various markets.

Note: Drill-through is not available for a box plot visualization.



Bubble

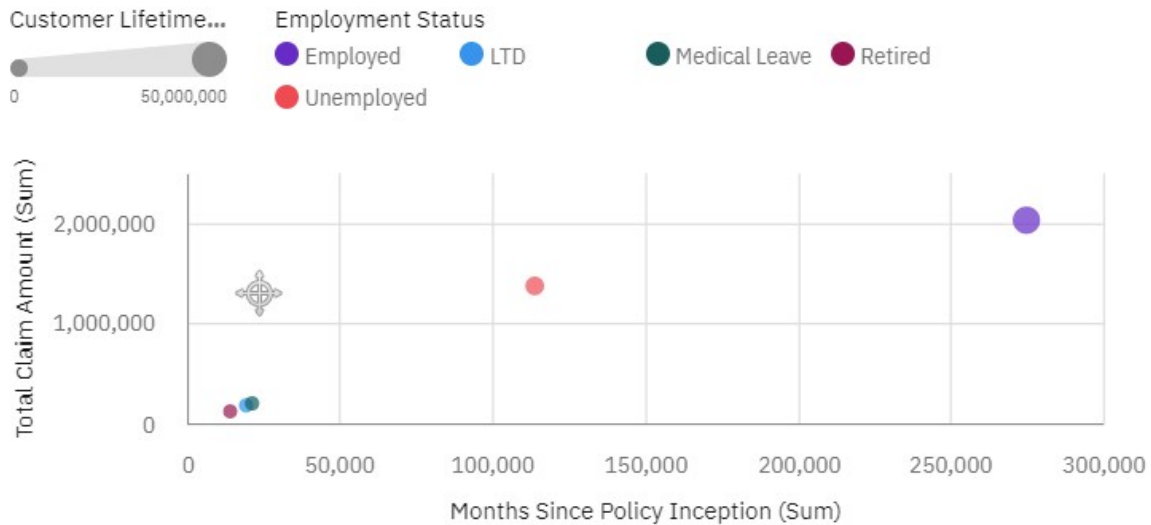
Use a bubble visualization to show relationships among columns that contain numeric values, such as revenue and profit.

A bubble visualization uses data points and bubbles to plot measures anywhere along a scale. One measure is plotted along each axis. The size of the bubble represents a third measure. Use bubble visualizations to represent financial data or any data where measure values are related.


The bubbles are in different sizes and colors. The x-axis represents one measure. The y-axis represents another measure, and the size of the bubbles represents the third measure. In the example shown below, color is represented by an identifier.

The example that is shown represents the months since the policy inception.

Months Since Policy Inception by Total Claim Amount colored by Employment Status and sized by Customer Lifetime Value





Create the Bubble visualization by dragging the following data items from **Customer Analysis** in the

Sources pane  :


- Drag **Months Since Policy Inception** onto the **x-axis** field.
- Drag **Total Claim Amount** onto the **y-axis** field.
- Drag **Customer Lifetime Value** onto the **Size** field.
- Drag **Employment Status** onto **Color**

You can customize the bubble chart. For example, to make the x-axis of the bubble chart appear as it does in the sample, do the following steps:

1. Click the visualization, then in the **Data** pane, click the **<Total Claim Amount>** data item.
2. Click .
3. Next to **Value data format**, click  and set the following options:
 - **Format type:** Currency
 - **Currency symbol:** K
 - **Currency symbol position:** End
 - **Number of decimal places:** 0
 - **Scale:** -3 (this presents values in thousands).
4. Click **OK**.

To change the size of the visualization, click the visualization, then set the following option in the properties pane:

- **Size - Width:** 700 px, **Height:** 300 px

Click  to close the **Properties** pane.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

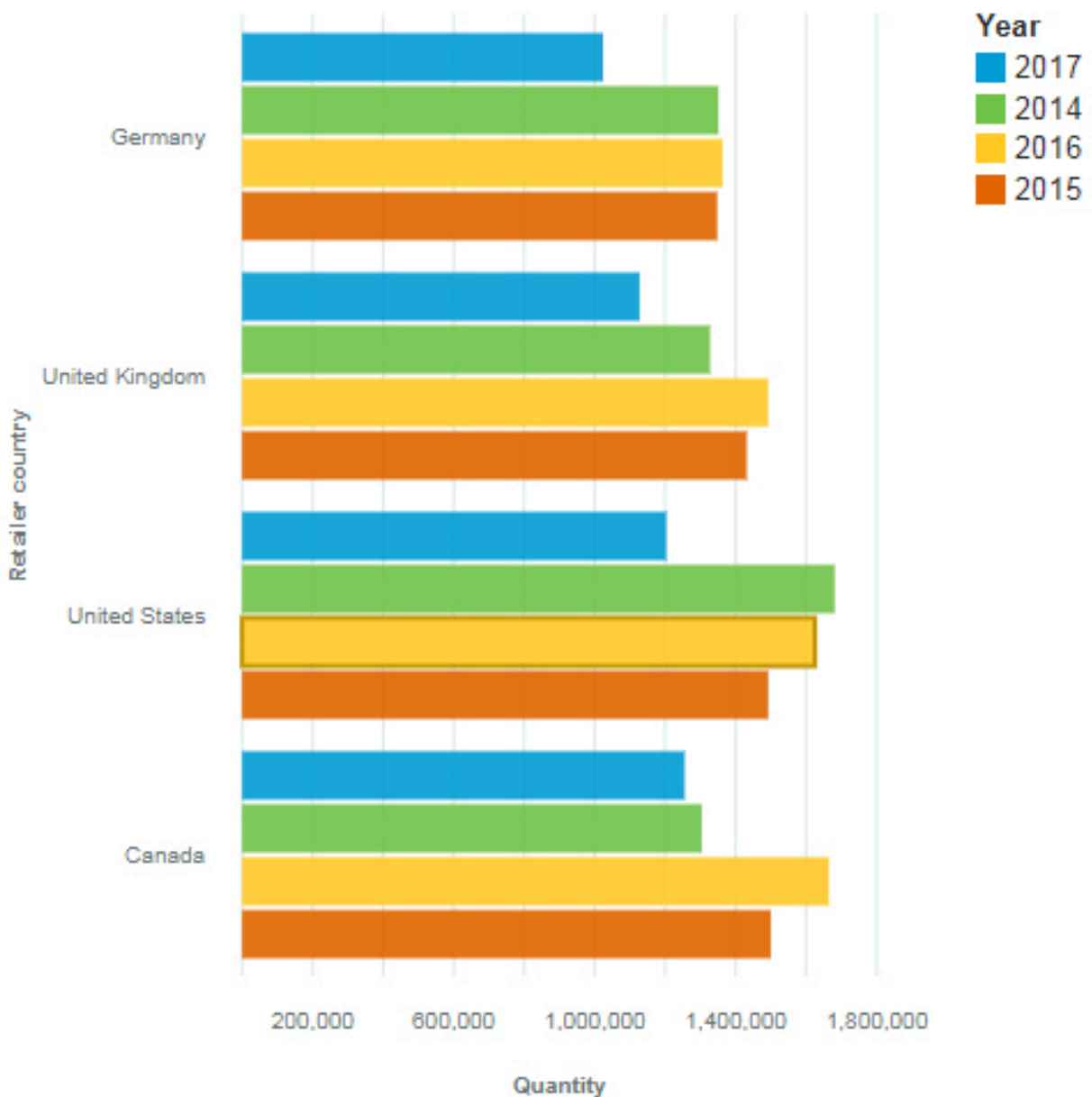
If any of the sample objects are missing, contact your administrator.

Clustered bar

Use a clustered bar visualization to compare values by one or more columns, such as sales for products per country.

Clustered bar visualizations use horizontal data markers that are arranged in groups to compare individual values. You can use clustered bar visualizations to compare discrete data or to show trends over time.

A clustered bar visualization can show changes over a specific time period or can compare and contrast two or more columns in a time period or over time. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

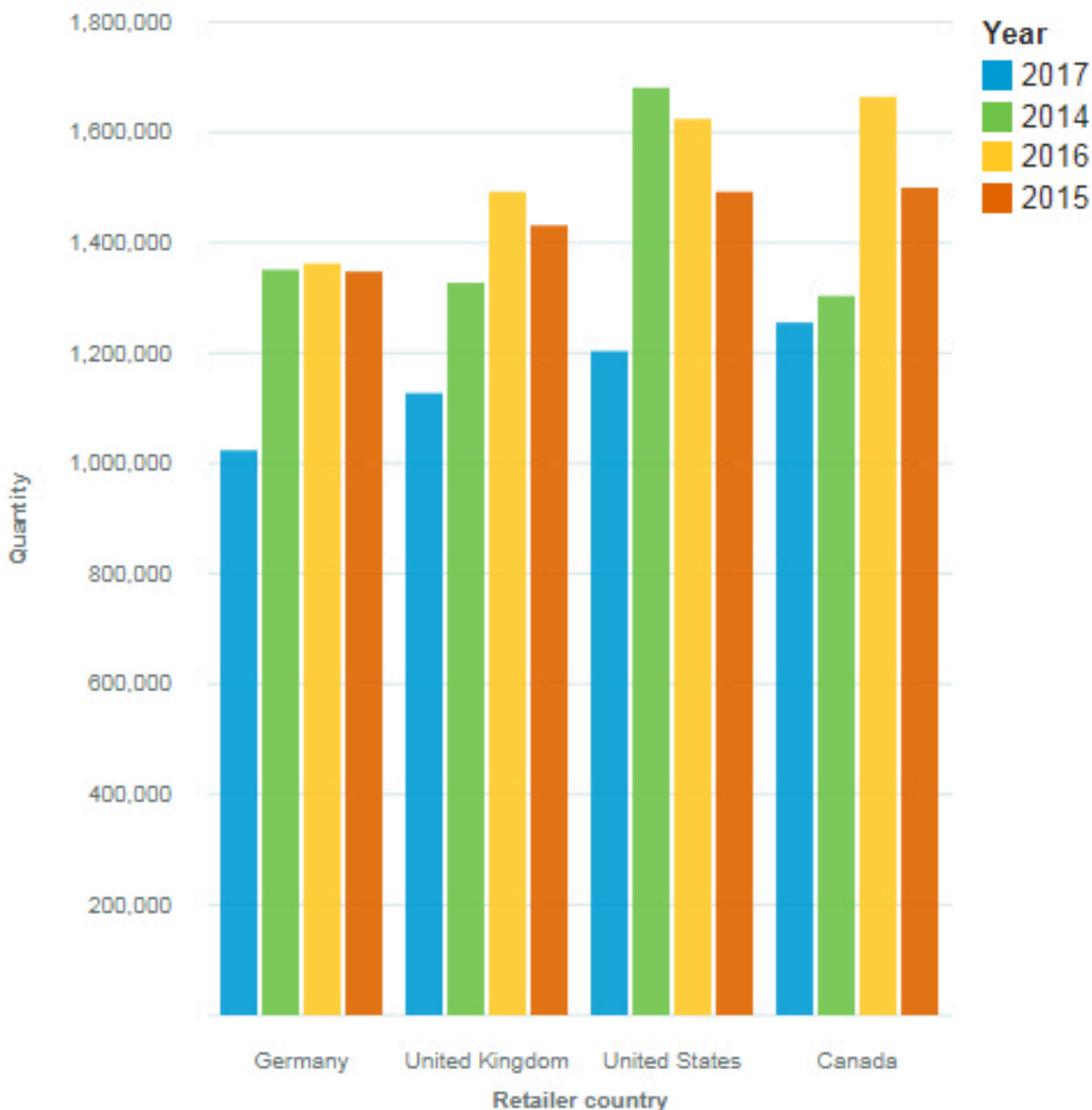


Clustered column

Use a clustered column visualization to compare values by one or more columns, such as sales for products per country.

Clustered column visualizations use vertical data markers that are arranged in groups to compare individual values. You can use clustered column visualizations to compare discrete data or to show trends over time.

A clustered column visualization shows change over a specific time period or can compare and contrast two or more columns in a time period or over time. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



Floating bar

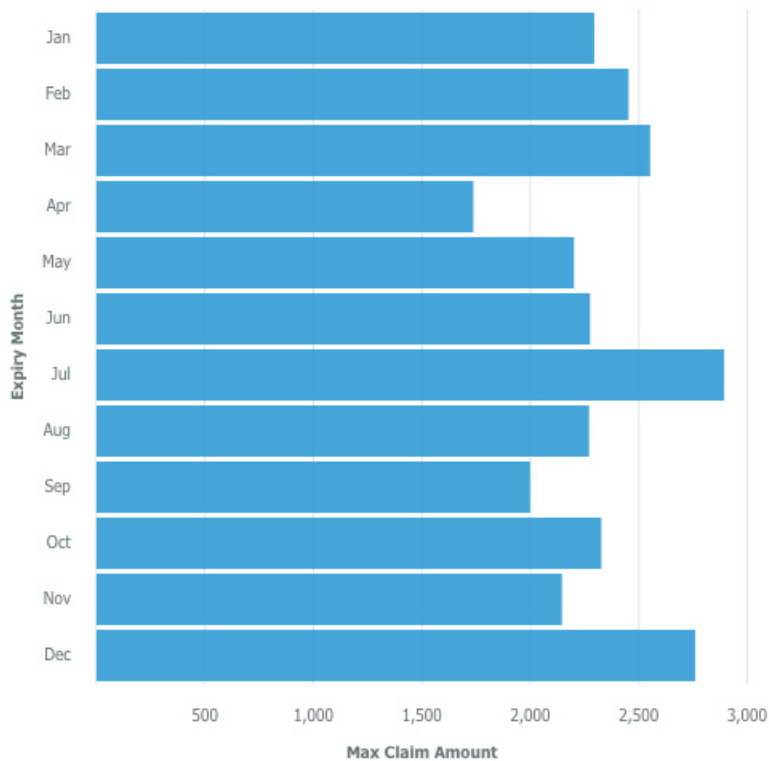
Use a floating bar visualization to display the minimum and maximum value of your data.

The series of the chart does not connect to an axis but next to the axis, which views as floating.

Floating bar visualizations use horizontal data markers to compare individual values. You can use floating bar visualizations to compare discrete data or to show trends over time.

A floating bar visualization can show changes over a specific time period. If the visualization has so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

For example, this floating bar visualization shows the claim amount range per month.



Create the floating bar visualization by dragging the following data items from the **Customer Analysis**

section in the **Sources**  pane:

- Drag **Expiry Month** onto the **Bars** field.
- Drag **Total Claim Amount** onto the **Length** field.
- Drag **Premiums over claim** onto the **y-start** field.

Use the **y-start** field to define where the measure must start.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Floating column

Use a floating column visualization to display the minimum and maximum value of your data.

The series of the chart does not connect to an axis but next to the axis, which views as floating.

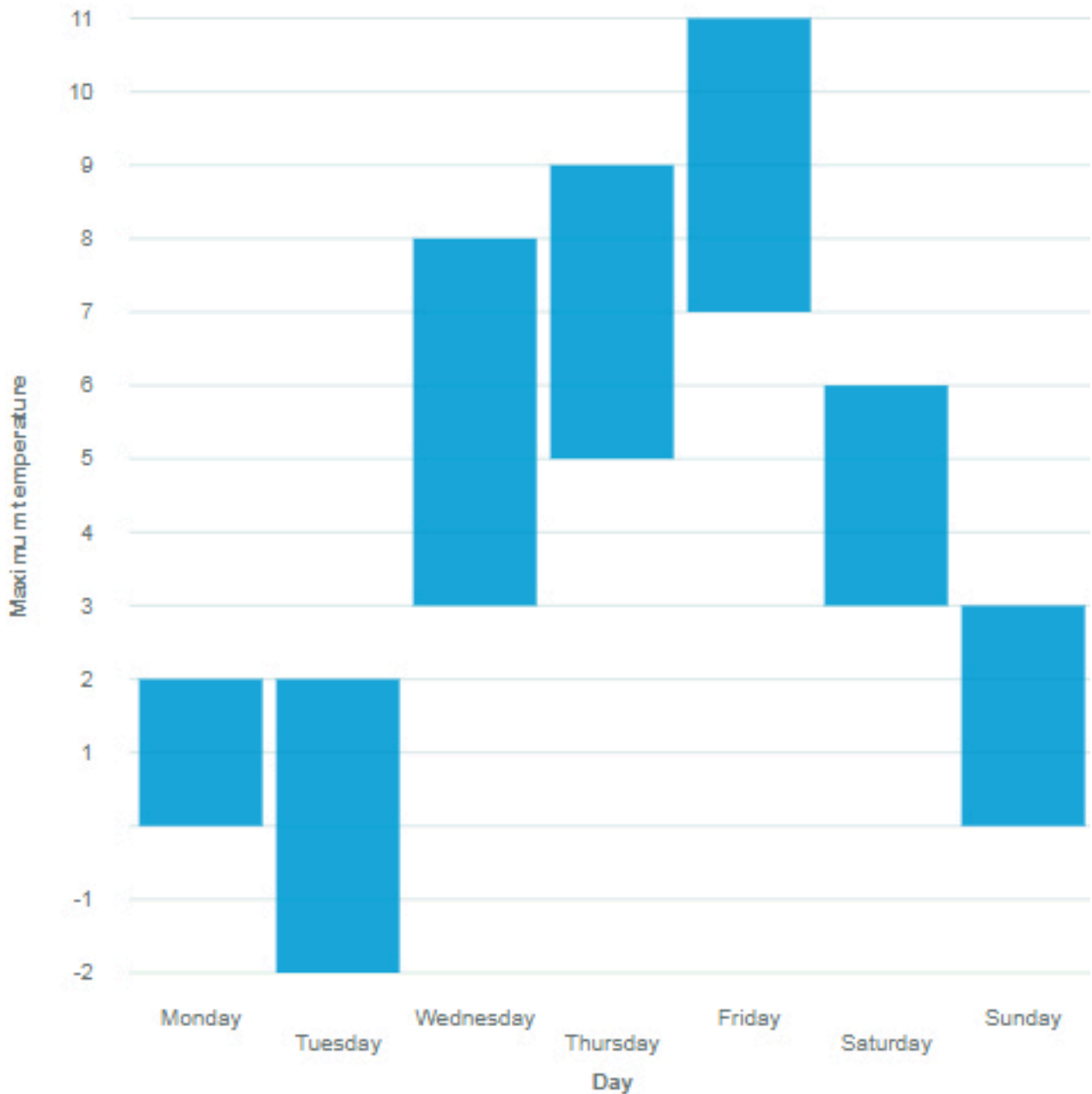
Floating column visualizations use horizontal data markers to compare individual values. You can use floating column visualizations to compare discrete data or to show trends over time.

A floating column visualization can show changes over a specific time period. If the visualization has so many columns that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.

Suppose that you have the following data from the next table.

| Day | Maximum temperature | Minimum temperature |
|------------|----------------------------|----------------------------|
| Monday | 2 | 0 |
| Tuesday | 2 | -2 |
| Wednesday | 8 | 3 |
| Thursday | 9 | 5 |
| Friday | 11 | 7 |
| Saturday | 6 | 3 |
| Sunday | 3 | 0 |

Use the **y-start** field to define where the measure must start.



Heat map

Use a heat map visualization to visualize the relationship between columns, represented in a matrix type view.

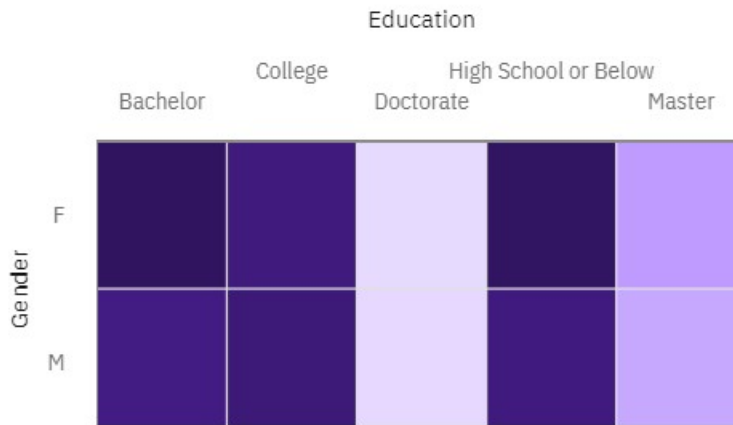
A heat map visualization uses color and intensity of the color to show the relationship between two columns.


For example, this heat map visualization shows the average customer lifetime value by gender and education.

Customer Lifetime Value by Gender and Education



Customer Lifetime...



Create the heatmap visualization by dragging the following data items from the **Sources** panel :

- Drag **Gender** onto the **Rows** field.
- Drag **Education** onto the **Columns** field.
- Drag **Customer Lifetime Value** onto the **Heat** field.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content** > **Samples** > **Dashboards** > **Standard dashboards** > **Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

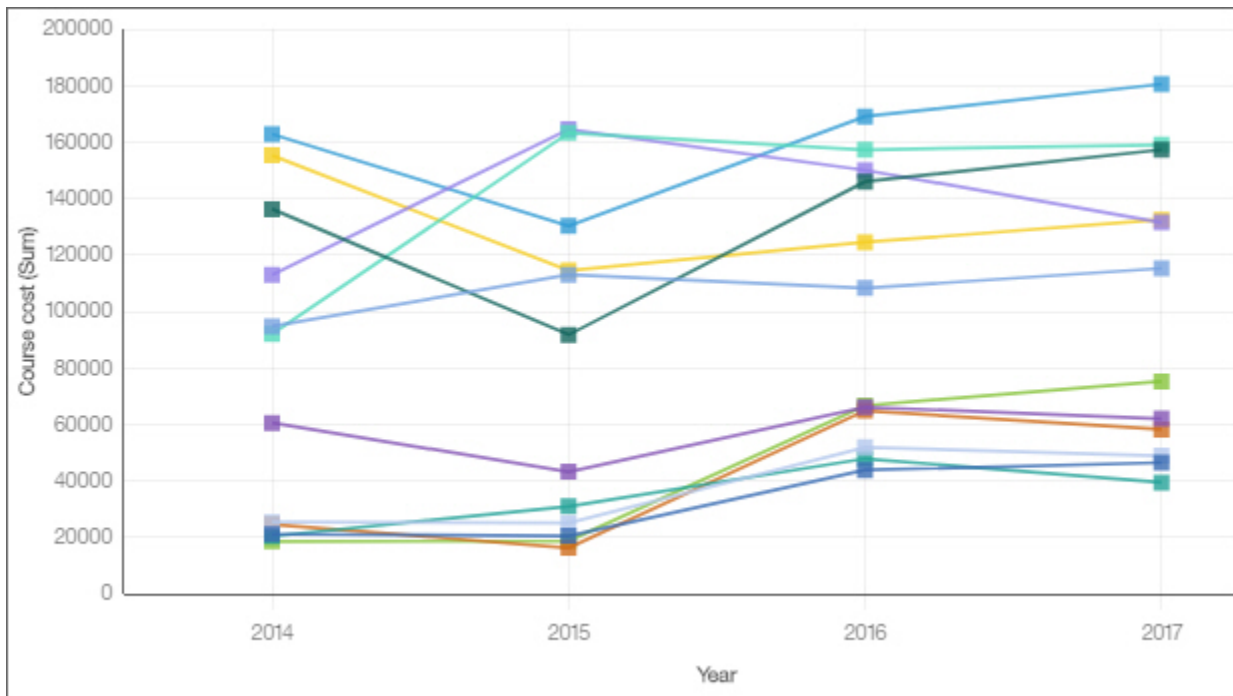
Line

Use a line visualization to show trends over time.

A line visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this line visualization shows the trend in course costs by department over year.



Map

Use a map when you want to see patterns in your data by geography.

Your data asset must contain geographical data, such as countries, states, provinces, or continents.

Note: Maps do not show animations if you set your ease of access system settings to not display animations.

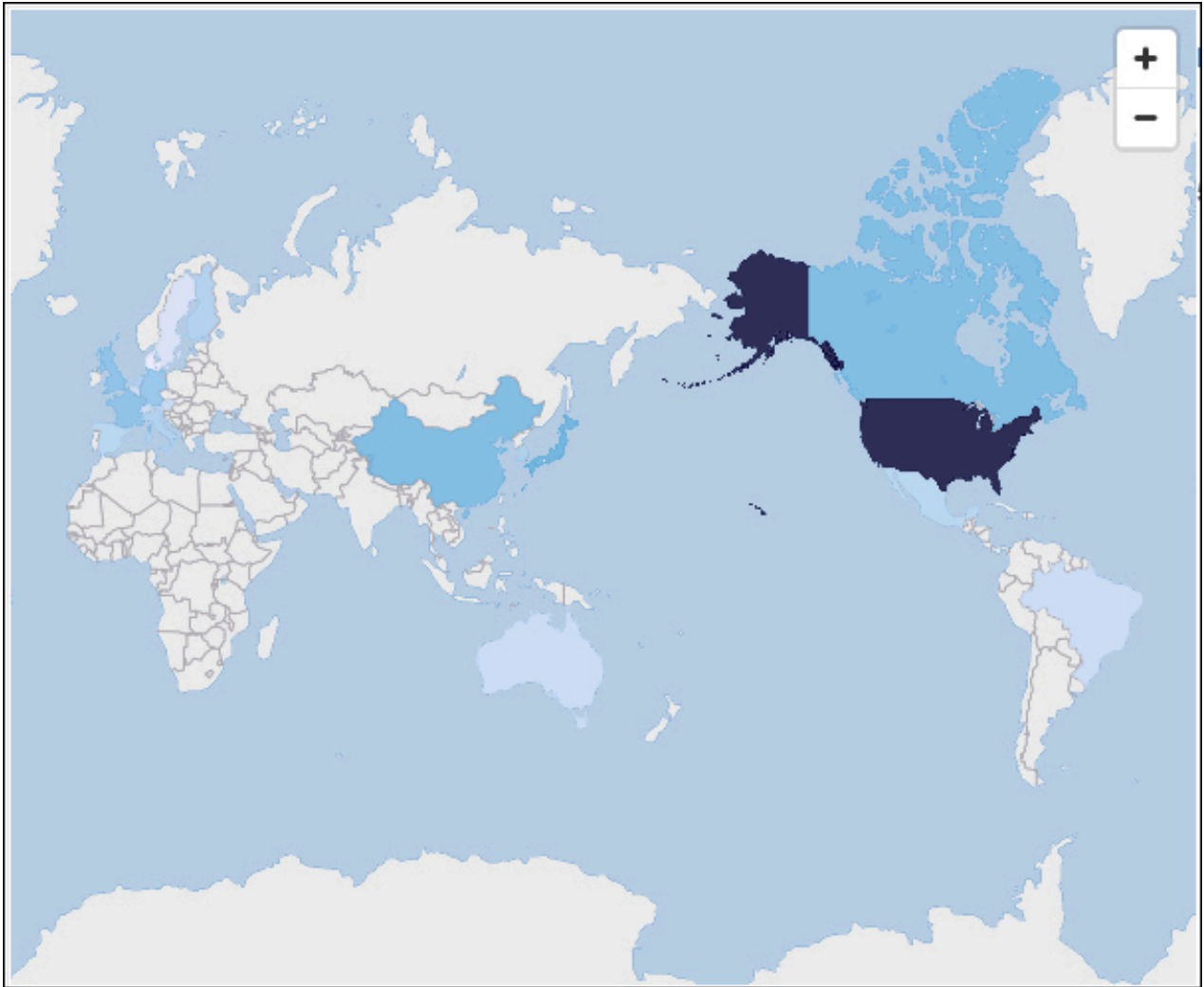
Maps in Cognos Analytics support the following continents:

- North America
- South America
- Africa
- Asia
- Europe
- Antarctica
- Oceania

To determine whether a column is mappable, Cognos Analytics analyzes a sample of 2000 values in the location column, looking for recognizable place names. If 80% or more are recognized as map values, Cognos Analytics produces a map.

For example, you have four countries in your location column: Brazil, China, India, and Russia. The typographical error for India means that only 75% of the values are recognizable place names and you will not see a map as a starting point. But if you have five countries and one has a typographical error in it, you see a map.

For example, this map visualization shows revenue by retailer country with the darker color indicating higher revenue.

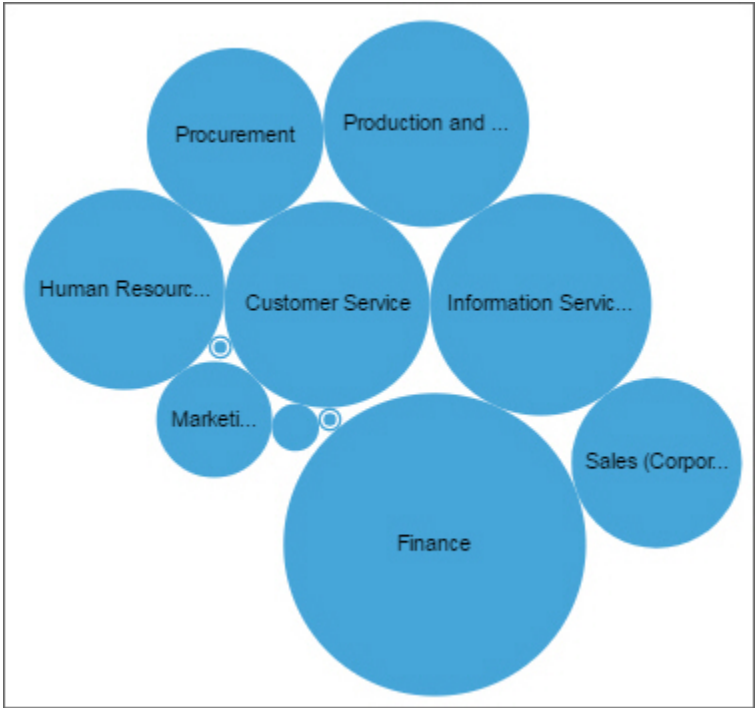


Packed bubble

Use a packed bubble visualization when you want to show relationships among columns that contain numeric values, such as revenue. It is similar to the bubble visualization but the bubbles are tightly packed instead of spread over a grid. A packed bubble visualization shows a large amount of data in a small space.

The bubbles are in different sizes and colors.

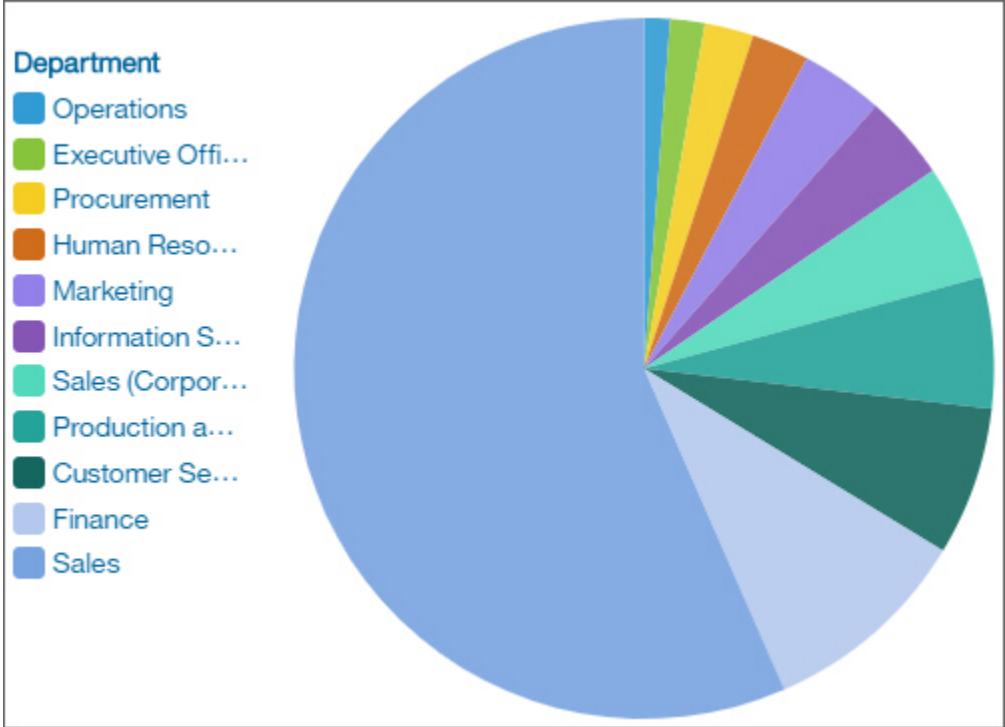
For example, this packed bubble visualization shows external hires by department. Each bubble is a different department. The size of each bubble is determined by the number of external hires for that department.



Pie

Use a pie visualization to highlight proportions. Each slice shows the relative relationship of each part to the whole.

For example, this pie visualization shows the number of course days for each department.



Point

Use a point visualization to show trends over time.

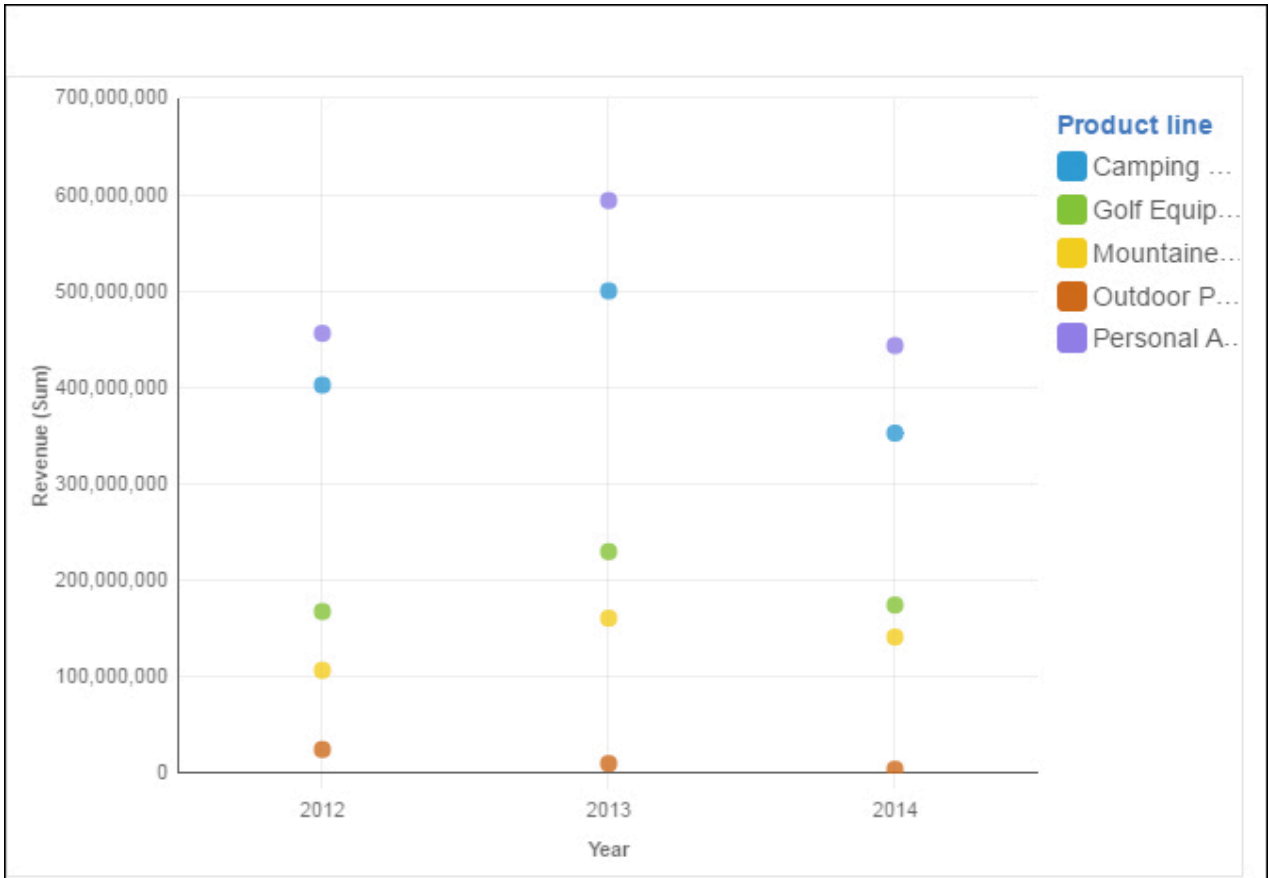
A point visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

A point visualization is like a line chart without the connecting lines.

For an effective line visualization, the x-axis should show time, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar visualization.

Data values are plotted vertically.

For example, this line visualization shows revenue over quarter by order method type. Web orders have grown dramatically over this period.



Radar

Use a radar visualization for comparing multiple quantitative variables. The radar visualization shows which variables have similar values or if there are any outliers amongst each variable.


Radar visualizations are also useful for seeing which variables are scoring high or low within a data set, making them ideal for displaying performance.

Examples of using a radar visualizations are:

- Comparing cars: speed, durability, comfort, power, space.
- Competitor profiles: number of employees, revenue, profit, current stock price, customer satisfaction.

The following example shows the revenues per retailer type for product lines in different states.



The radar visualization was created by dragging the following data items from the **Sources**  pane:

- Drag **Vehicle Class** onto the **x-axis** field.
- Drag **Vehicle Size** onto the **Color** field.
- Drag **Customer Lifetime Value** onto the **y-axis** field.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

Radial

In a radial visualization, each bar appears in a circle with longer bars that represent larger values. Hover over a bar to see the details about it, such as the exact value represented by the bar. Each bar starts at 12 noon and goes in a clockwise direction for positive values and counterclockwise for negative values.

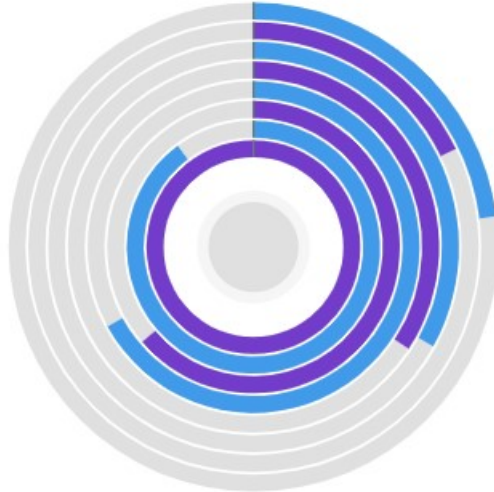
Radial visualizations, also known as dial charts or speedometer charts, show information as reading on a dial. The radial visualization is valid only with one category.


For example, this visualization shows renewals by offer type and gender.

Number of Policies by Renew Offer Type colored by Gender





Gender
● F ● M



Create the Radial visualization by dragging the following data items from the **Customer Analysis** section in the **Sources** pane :

- Drag **Renew Offer Type** onto the **Bars** field.
- Drag **Number of Policies** onto the **Length** field.
- Drag **Gender** onto the **Color** field.

The next step is to set the sort properties for **Renew Offer Type** and **Gender**.

1. Click the visualization, then in the **Data** pane, click the **<Renew Offer Type>** data item.
2. Click .
3. In the **Properties** pane, for **Sort order**, select **Ascending**.
4. In the **Data** pane, click the **<Gender>** data item.
5. In the **Properties** pane, for **Sort order**, select **Descending**.
6. Click  to close the **Properties** pane.

Samples

You can see examples of visualizations in the sample dashboard **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > Dashboards > Standard dashboards > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

River

A river visualization is an area visualization where sections are stacked on top of another instead of overlaying each other. Use an area visualization to emphasize the magnitude of change over time.

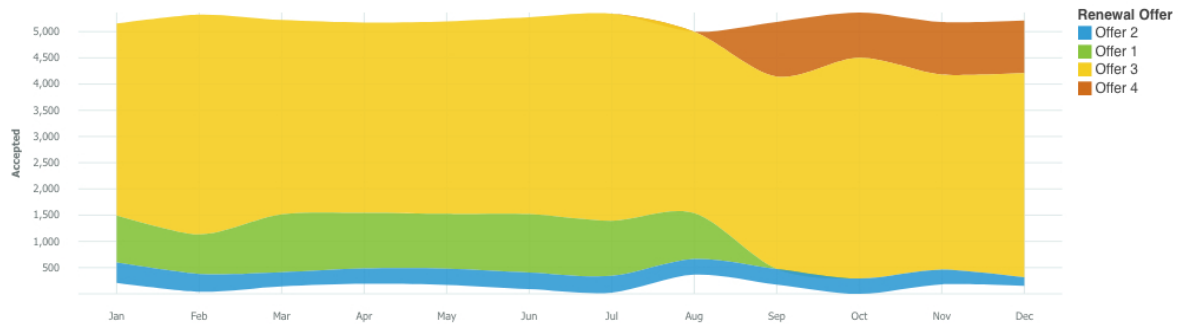
Use river visualizations to show changes of different categories over time, when the categories start and stop at different times. The height of each individual river shows how the river changed over time.

The length shows its duration. Colors can provide more information about the value of a category or to differentiate between categories.

Because a river visualization stacks the results for each column or item, the total of all results is easily seen.

For example, a river visualization is excellent for looking at revenue over time across several products.

This example shows renewals by offer type over a year.



Create the River visualization by dragging the following data items from **Renewals** in the **Sources** pane



- Drag **Month** onto the **x-axis** field.
- Drag **Renew Offer Type** onto the **Color** field.
- Drag **Accepted** onto the **y-axis** field.

To change the size of the visualization, click the visualization, then set the following option in the **Properties** pane:

- **Size - Width:** 1000 px, **Height:** 300 px

Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

If any of the sample objects are missing, contact your administrator.

Scatter

Scatter visualizations use data points to plot two measures anywhere along a scale, not only at regular tick marks.

Scatter visualizations are useful for exploring correlations between different sets of data.

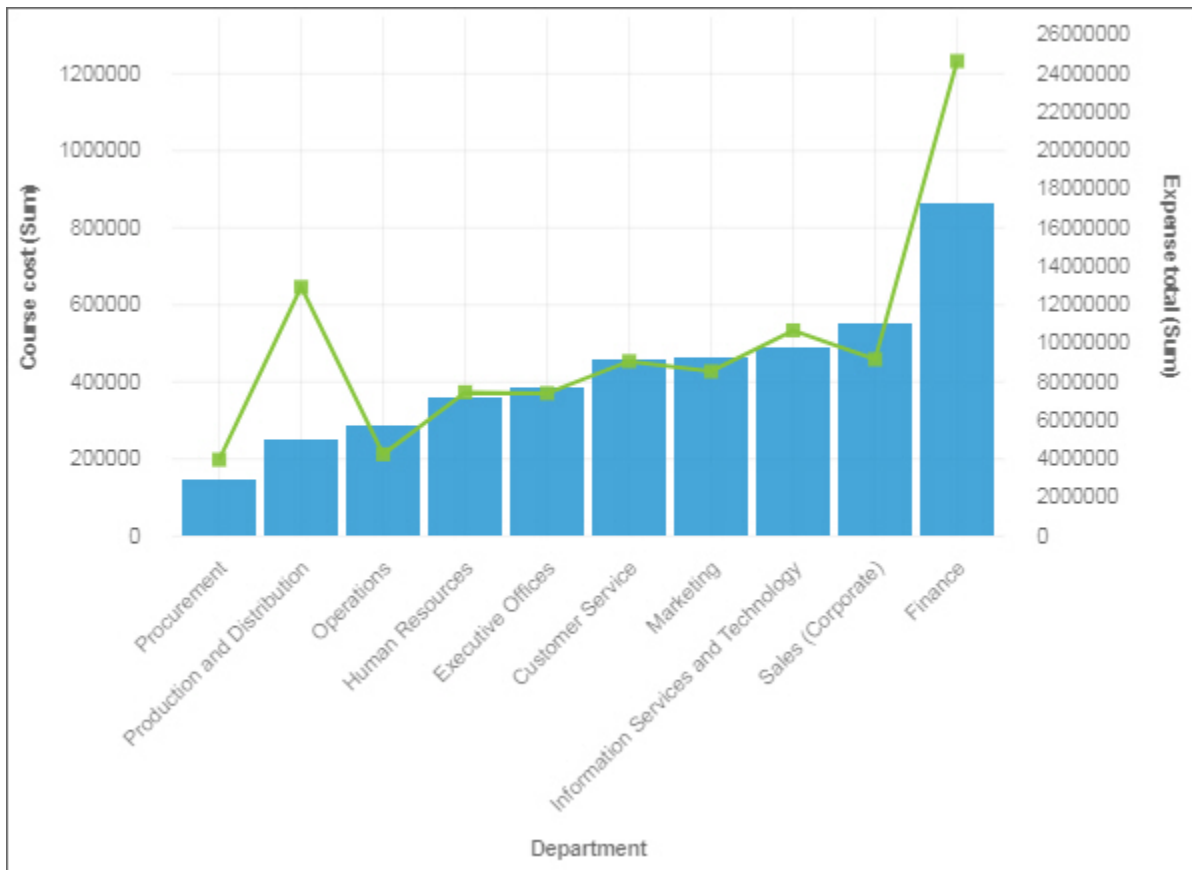
The following example shows the correlation between revenue and gross profit for each product type.



Line and column

Use a line and column visualization to highlight relationships between multiple data series by combining bars and lines with one visualization.

For example, this line and column visualization shows the relationship between course cost and expense totals by department.



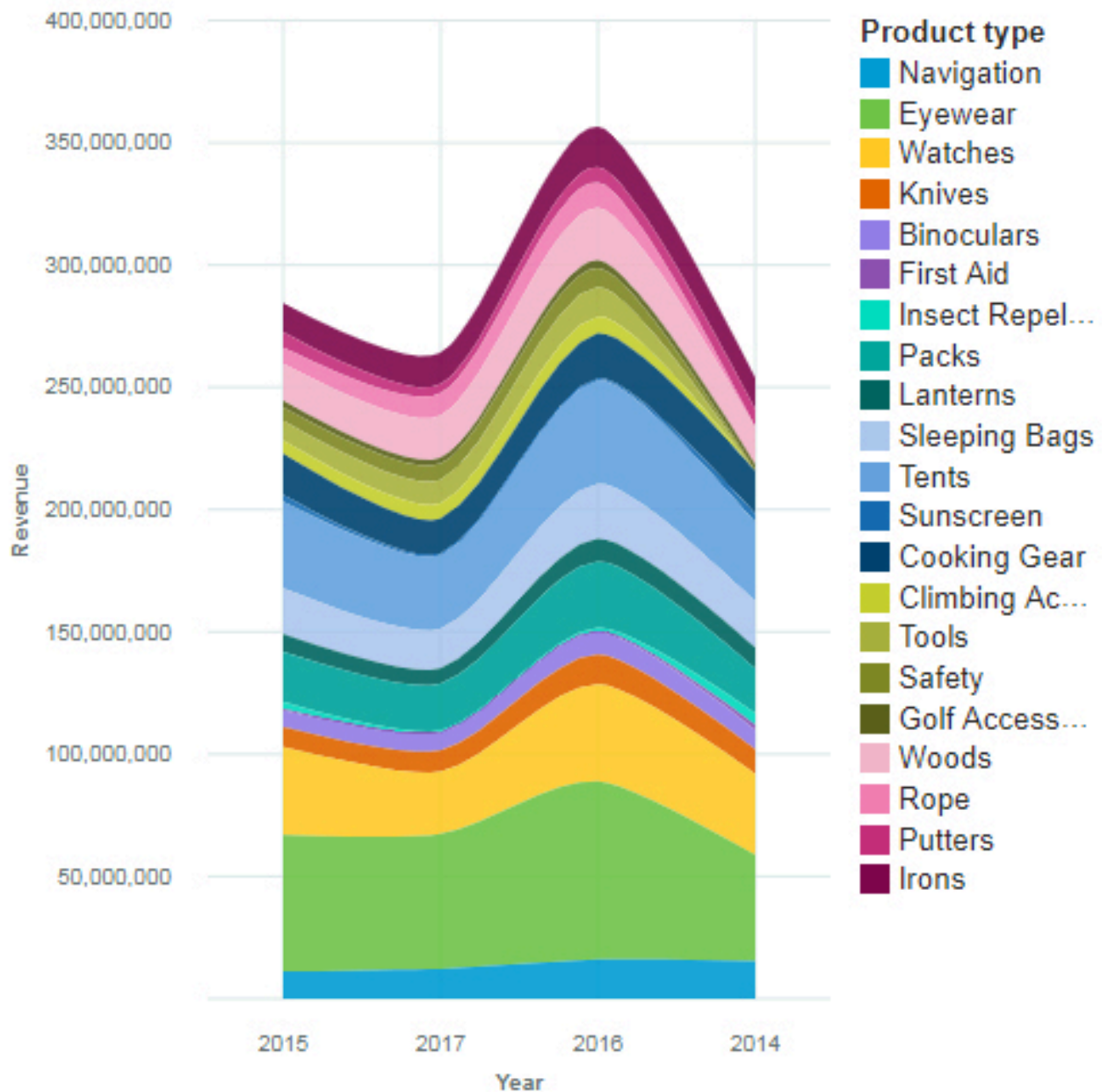
Smooth area

Smooth area visualizations are like line visualizations, but the areas below the lines are filled with colors or patterns. Use a smooth area visualization to show trends over time.

Smooth area visualizations are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total.

For an effective smooth area visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this smooth area visualization shows the trend in revenue costs by product type over the years.



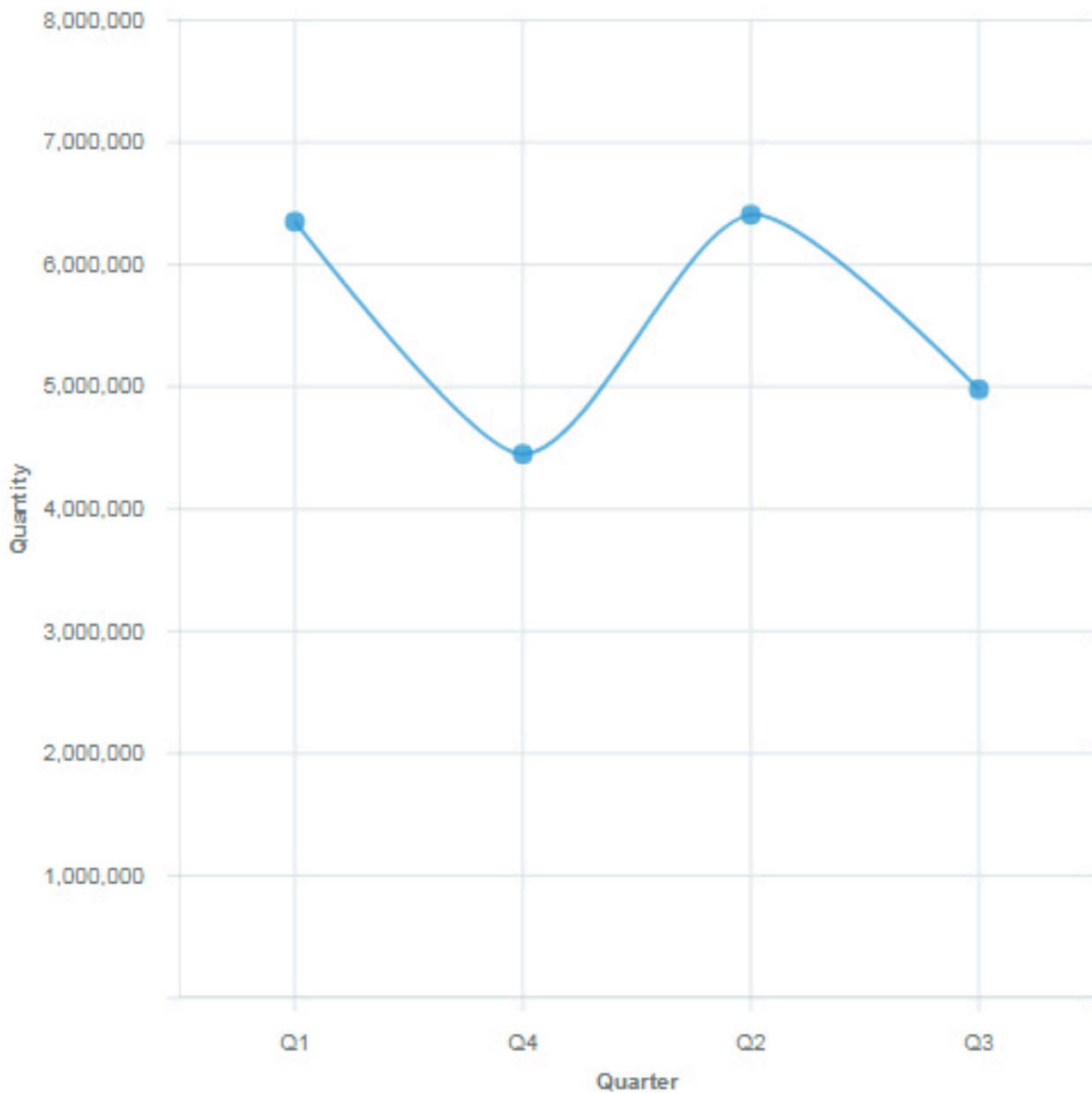
Smooth line

Use a smooth line visualization to show trends over time when your data is noisy.

A smooth line visualization can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective smooth line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

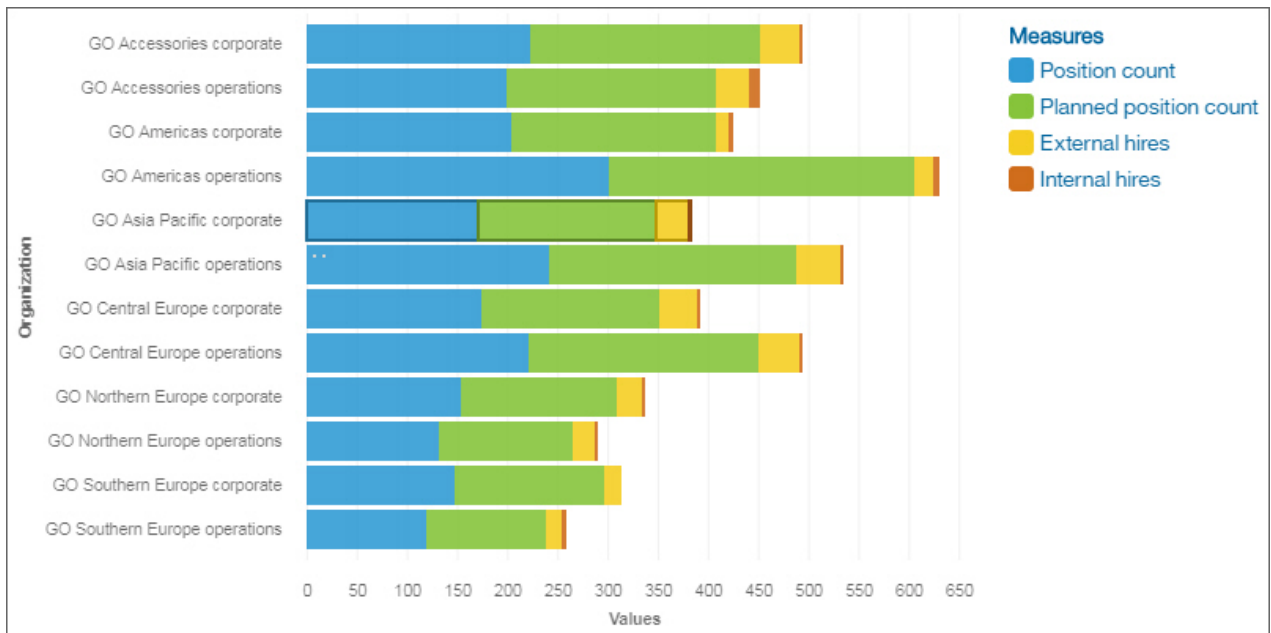
For example, this smooth line visualization shows the trend in quantity of sold products over year.



Stacked bar

Use a stacked bar visualization to compare the proportional contributions for each item to the total, such as sales for products and sales for products each month.

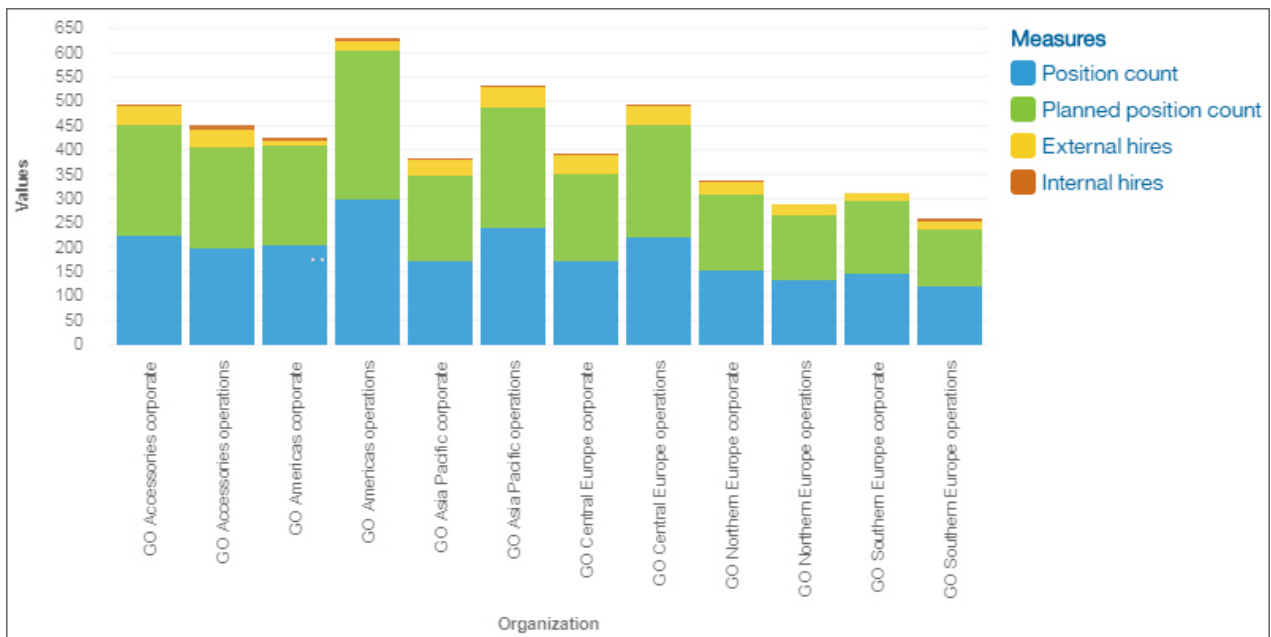
A stacked bar visualization can show change over a specific time period or compare the proportional contributions for each item to the total. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



Stacked column

Use a stacked column visualization to compare the proportional contributions for each item to the total, such as sales for products and sales for products each month.

A stacked column visualization can show change over a specific time period or can compare the proportional contributions for each item to the total. If there are so many bars that the labels are impossible to read, filter the data to focus on a subset of the data or use a tree map.



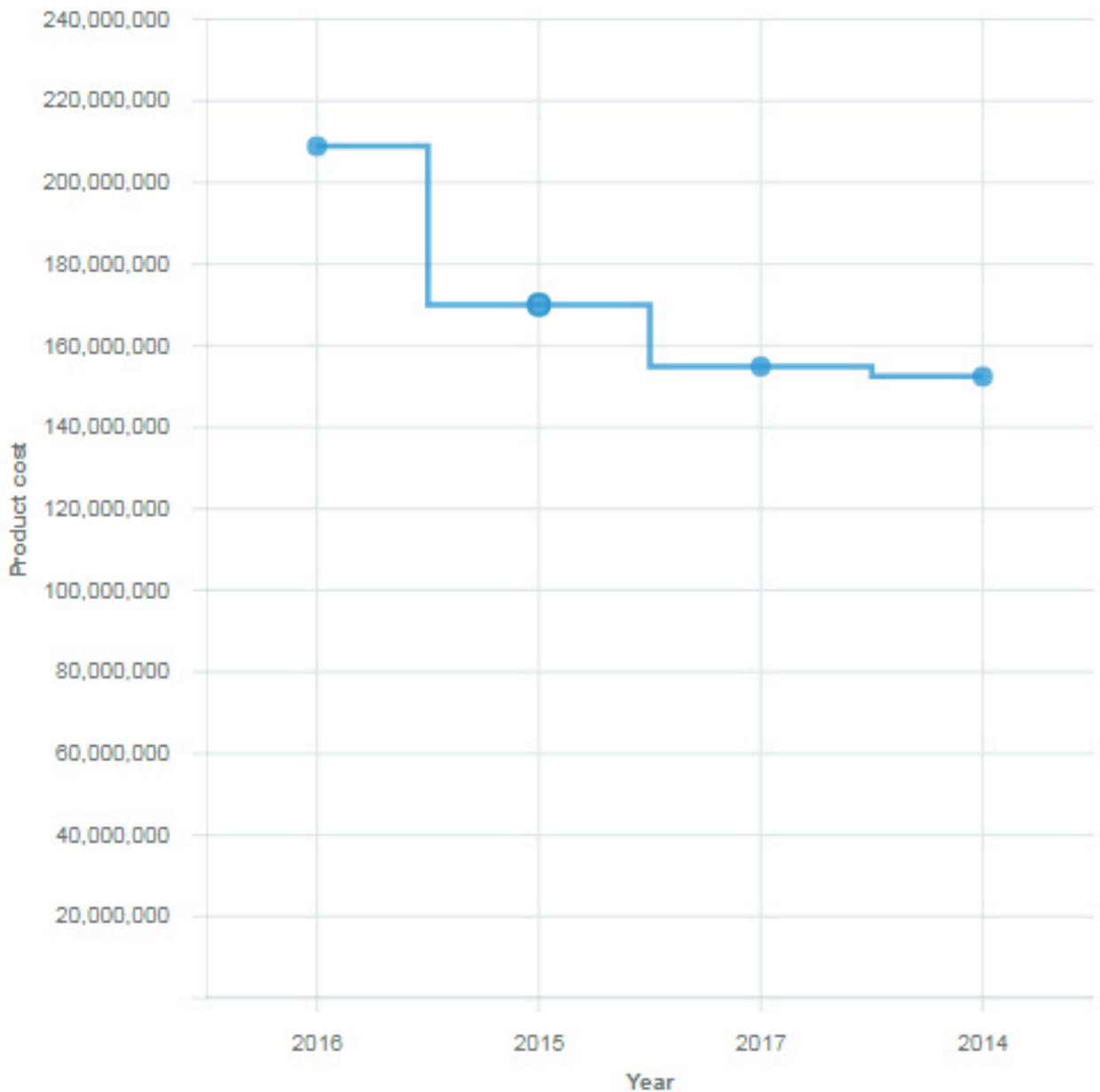
Step line

A step line visualization plots data at regular points that form a series of steps between data points.

You can compare trends and cycles, infer relationships between variables, or show how a single variable is performing over time.

For an effective step line visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this step line visualization shows the trend in product costs over years.



Stepped area

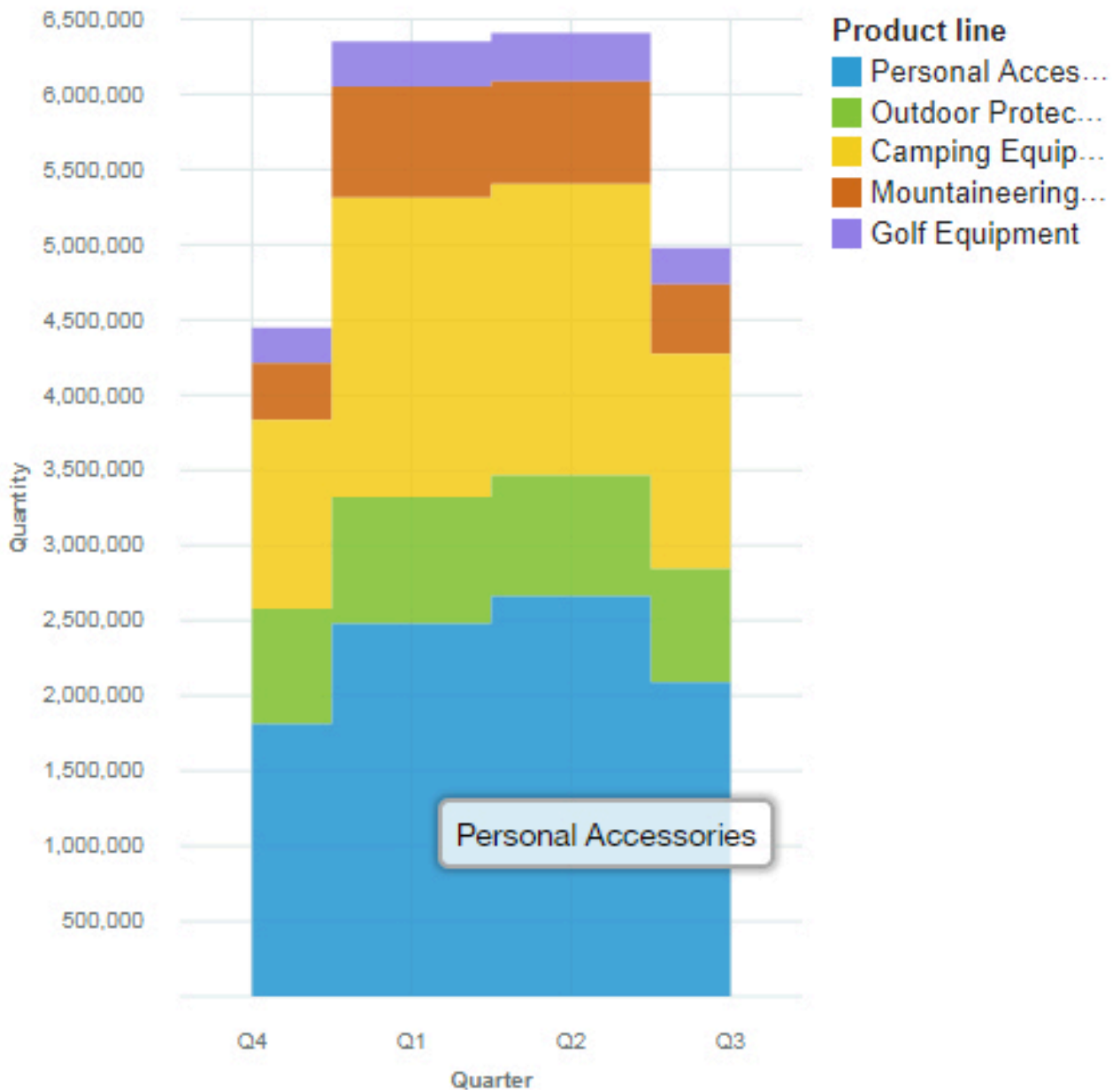
Stepped area visualizations are like line visualizations, but the areas below the lines are filled with colors or patterns.

Stepped area visualizations form a series of steps between the data points.

Stepped area visualizations are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total.

For an effective stepped area visualization, use a time column in the x-axis, such as years, quarters, months, or days. If the x-axis shows something else, such as Canada, Netherlands, UK, and US, use a bar or column visualization.

For example, this stepped area visualization shows the trend in sold products by product type, over the quarters.



Treemap

Use a treemap visualization to identify patterns and exceptions in a large, complex data asset.

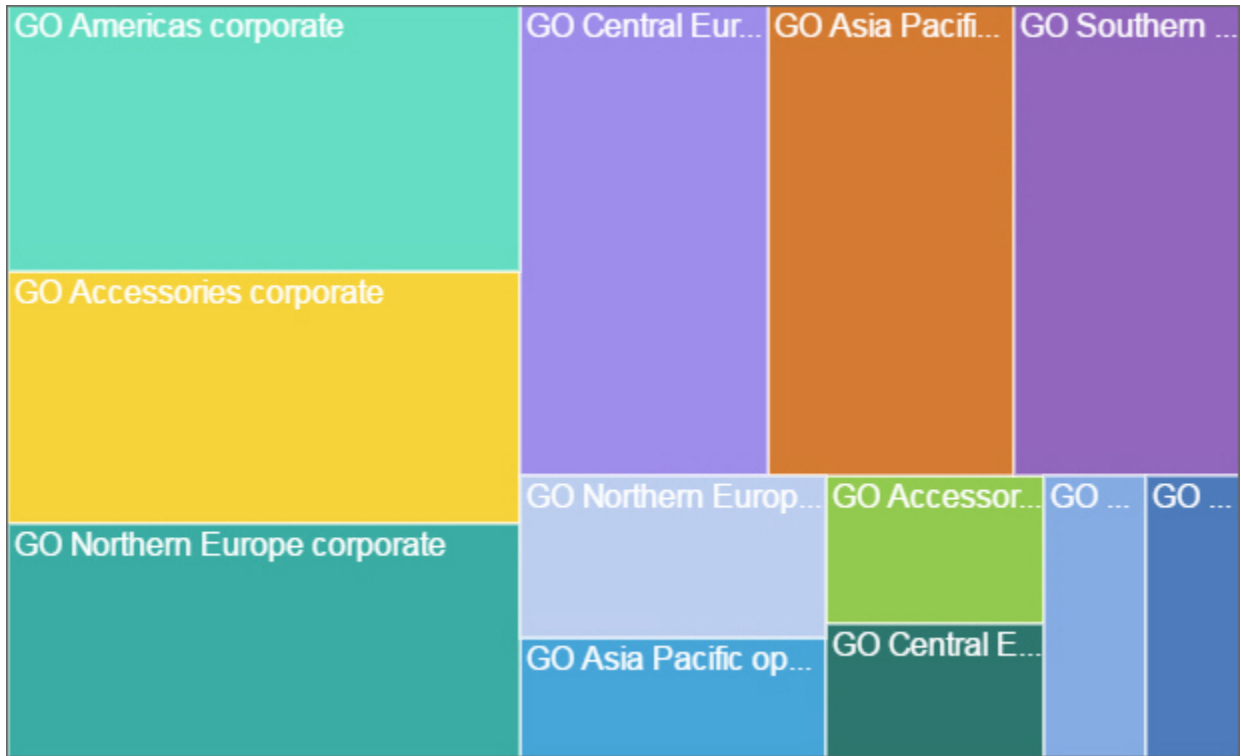
Tree maps show relationships among large numbers of components by using size and color coding in a set of nested rectangles.

A treemap that is colored by category identifies the level 1 category by color. The sizes of the rectangles represent the values. In a treemap that is colored by value, the sizes of the rectangles represent one of the values and the color represents a second set of values. Do not use data that includes negative numbers. A treemap ignores negative numbers.

Many data assets have a hierarchical structure. For example, you have data about the profit margin of food items in a grocery store. Under the general category of fruit, there is a category for citrus fruit. Various

citrus fruits are listed, such as grapefruit, orange, and lemon. A treemap displays how each citrus fruit is performing when compared to each other and to other types of food.

For example, this treemap visualization shows course cost by organization.



To deselect a box that you selected, Ctrl+click the selected box.

Treemap visualizations support the following display modes:

- **Squarified:** The default display mode.
- **Slice:** Displays measures that belong to the same node in a vertically sliced way.
- **Dice:** Displays measures that belong to the same node in a horizontally sliced way.
- **Slice - Dice:** Displays stacked hierarchical measures that belong to the same node in a vertically sliced way.

The following screen capture displays a treemap with the Organization and Department measures on the **Area hierarchy** field, and Expense total on the **Size** field.

Expense total for Organization and Department hierarchy



Waterfall

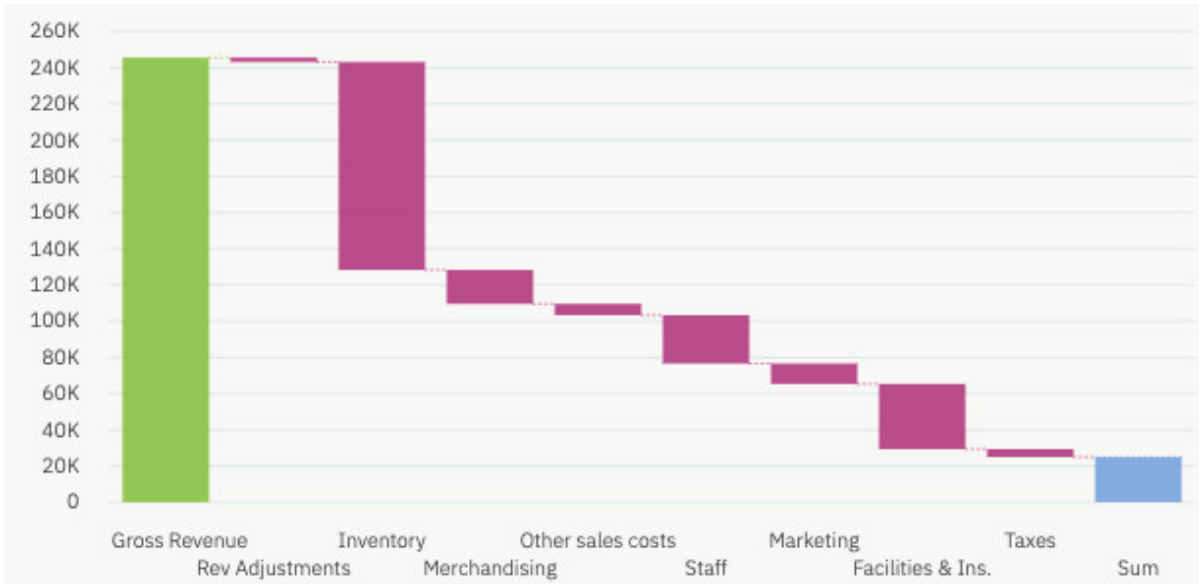
Use a waterfall visualization to understand the cumulative effect a series of positive and negative values have on an initial value. The bars in a waterfall visualization are not totals.

A waterfall visualization shows how an initial value is increased and decreased by a series of intermediate values, leading to a final cumulative value shown in the far right column. The intermediate values can either be time-based or category-based.

Some examples of waterfall visualizations are as follows:


- Viewing the net income after you add the increases and decreases of revenue and costs for an enterprise over a quarter.
- Cumulative sales for products across a year with an annual total.

This waterfall visualization shows the policy holder delta by month.





Creating a waterfall visualization

To build a waterfall visualization, create a new report and open the sample data *Customer analysis* module. Add a waterfall visualization to your report (for more information, see [“Creating visualizations”](#)

on page 79). From the **Source** tab  drag and drop the following data items from the Policy Holders section:

- Drag **Month** onto the **x-axis** .
- Drag **Delta** onto the **y-axis** .

The next step is to set the properties to customize the way the **<Delta>** data item values appear.

1. Click the visualization, then in the **Data** pane, click the **<Delta>** data item.
2. Click .
3. Next to **Data format**, click  and set the following options:


- **Format type:** Currency
- **Currency symbol:** K
- **Currency symbol position:** End
- **Number of decimal places:** 1
- **Scale:** -3 (this presents values in thousands).

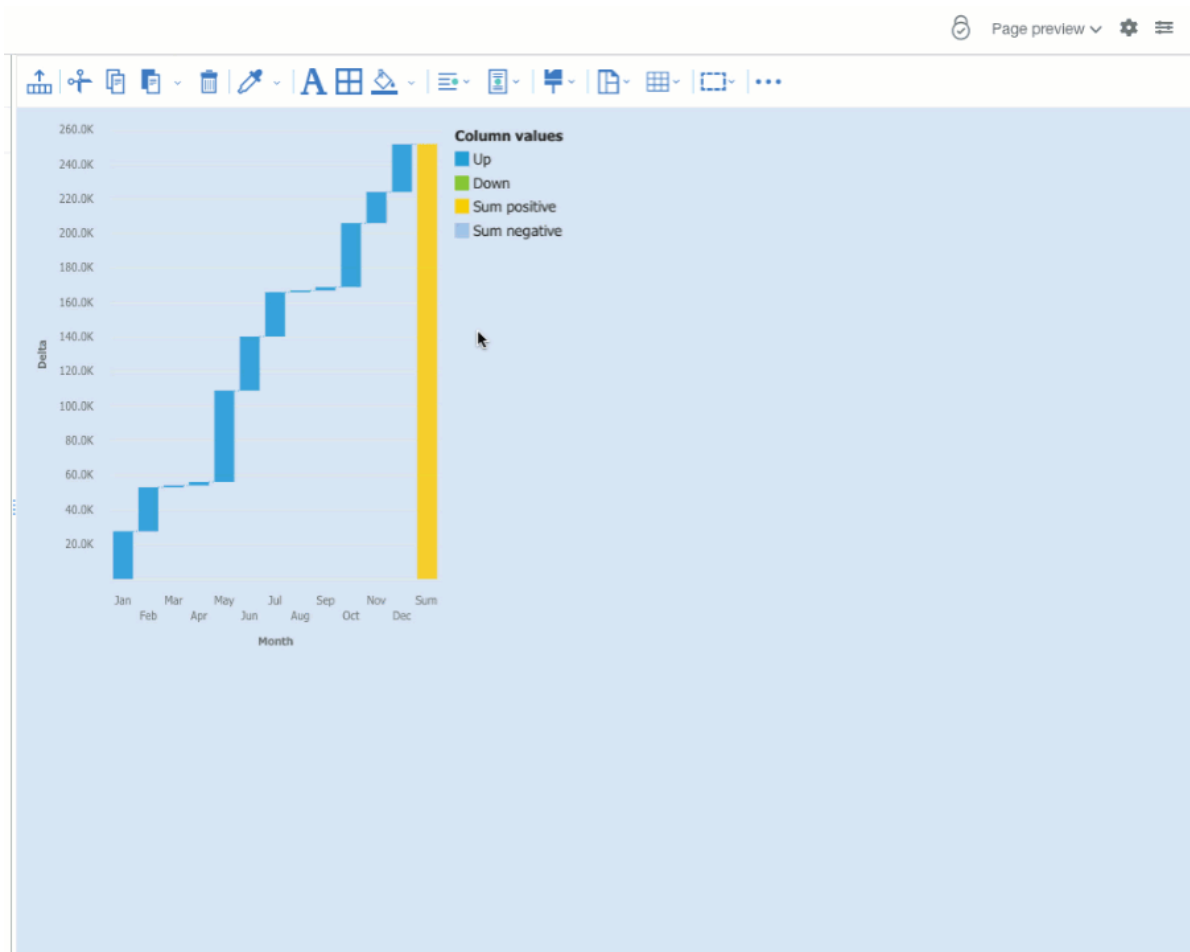
4. Click **OK**.

Finally, customize the appearance of the visualization.

1. Click the visualization, then set the following options in the Properties pane:

- **Size - Width:** 700 px, **Height:** 300 px
- **Total column axis label:** Total.
- Set the column colors. This example uses green.
- **Show legend:** No

2. Click  to close the **Properties** pane.



Samples

You can see examples of a waterfall visualization on the **Overview** tab the sample report **Customer lifetime value analysis**. You can find the samples here: **Team content > Samples > Reports > Customer lifetime value analysis**.

If any of the sample objects are missing, contact your administrator.

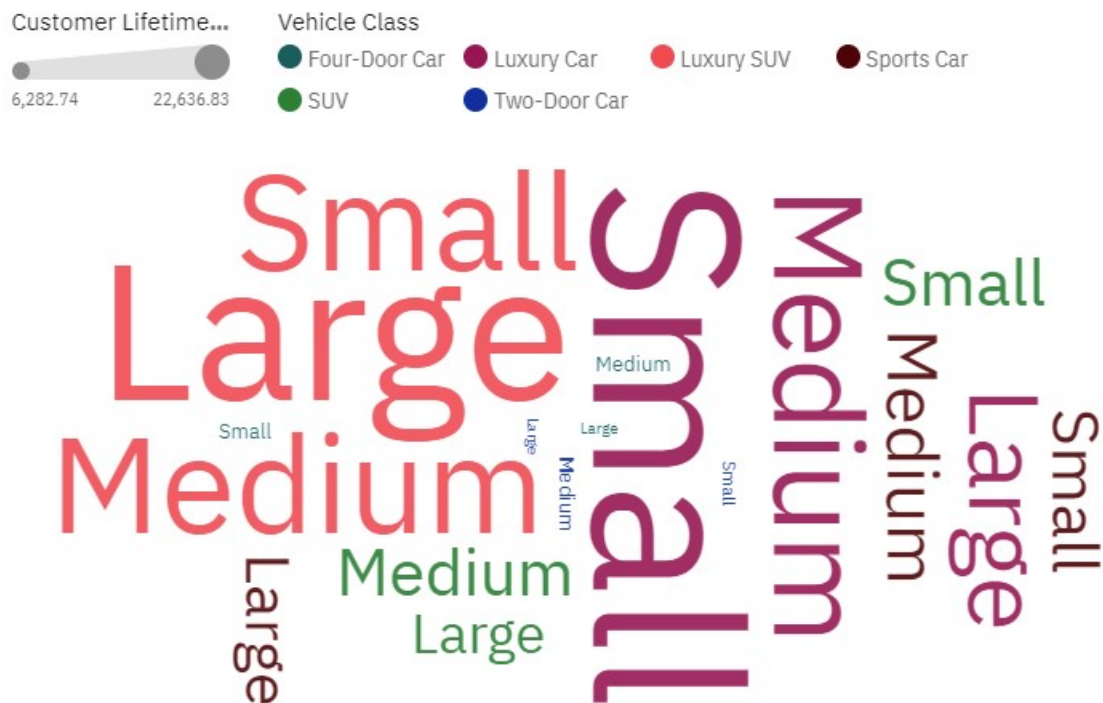
Word cloud

Use a word cloud visualization when you want to see a text-based visualization of a column. The text height represents the scale. The name itself is the different members of the column.

Tip: The data asset should contain at least 15 columns and at least 100 rows to create an effective word cloud.

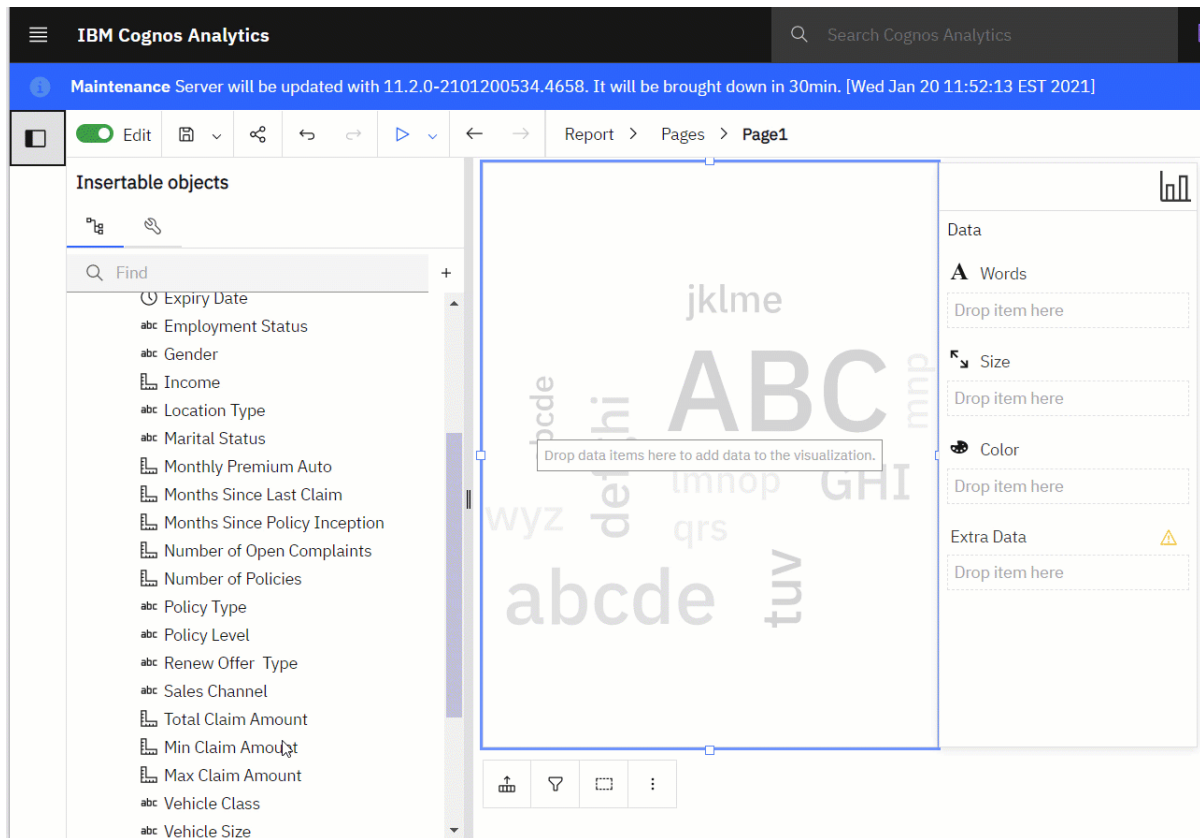
For example, this word cloud visualization shows the customer life time value by vehicle size and class.

Vehicle Size colored by Vehicle Class sized by Customer Lifetime Value 



The word cloud was created by dragging the following data items from the **Sources** pane :

- Drag **Vehicle size** type onto the **Words** data slot.
- Drag **Customer lifetime value** onto the **Size** data slot.
- Drag **Vehicle class** onto the **Color** data slot



Samples

You can see an example of a bullet visualization in the sample report **Customer lifetime value analysis**. You can find the sample here: **Team content > Samples > By industry > Insurance > Data > Customer analysis**.

If any of the sample objects are missing, contact your administrator.


Change visualization from one type to another

You can change a visualization from one type (for example, a bar chart) to another type (for example, a line chart).

When you change an existing visualization to a new visualization type, IBM Cognos Analytics - Reporting keeps the properties from the existing visualization if those properties exist in the new chart type. For example, if you change a pie visualization to a bar visualization, Reporting maps your visualization palette to the new visualization, but does not map the exploding slices, because the exploding slices property does not exist in a bar visualization.

Note: Reporting converts legacy charts to the 11.x visualization types automatically if you change the visualization type unless you select the **Use legacy chart authoring** option. You can convert legacy charts to 11.x visualizations, but you cannot convert 11.x visualizations back to legacy charts.

Procedure

1. Click a visualization and, from the report object toolbar, click the **Change Visualization** icon .
2. From the list, select a new chart type.

If some chart properties cannot be converted, the **Chart Property Changes** dialog box appears notifying you of the properties that cannot be converted.

Changing properties for visualizations version 11.x


Set the properties for each version 11.x visualizations, including font, line width, and size.

About this task

There are properties that are available for all visualizations. For more information, see [“Properties for all version 11.1 visualizations in Reporting”](#) on page 166.

Many visualizations have their own specific properties that control specific behavior of the visualization. For more information, see [“Properties for individual 11.1 visualizations in Reporting”](#) on page 151.

Procedure

Click the **Show properties** icon , and set the aimed properties.

Properties for individual 11.1 visualizations in Reporting

Set the properties for each version 11.1 visualizations, including font, line width, and size. Many visualizations have their own specific properties that control specific behavior of the visualization.

Area (River, Area, Smooth area, Stepped area)

| Property | Explanation |
|--|---|
| Transpose | When enabled, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |
| Area opacity | The opacity of the colored area. The value must be between 0 (fully transparent) and 1 (fully opaque). |
| Area border width | The width of the area border. Use one of the following units: <ul style="list-style-type: none">• px• %• in• cm• mm• pt• pc• em• ex |
| Area border color | The color of the area border. |
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Interpolation (only for River and Smooth area) | Controls how lines between data points are drawn. Choose from the following options: <ul style="list-style-type: none">• Step• Step before• Step after |

| Property | Explanation |
|--------------------------------|---|
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Box plot

| Property | Explanation |
|------------------------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Extreme outlier fill color | The fill color that is applied to the box plot extreme outliers. |
| Extreme outlier stroke color | The color of the stroke for extreme outliers. |
| Extreme outlier border width | The width of the box plot extreme outliers. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Mean color | The color that is applied to the box plot mean. |
| Mean stroke width | The width of each box plot mean. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Outlier fill color | The fill color that is applied to the box plot outliers. |

| Property | Explanation |
|---------------------------------------|--|
| Outlier stroke color | The color that is applied to the box plot outliers. |
| Outlier stroke width | The width of the box plot outliers. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Median stroke color | The color that is applied to the box plot median. |
| Median stroke width | The width of the box plot median strokes. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Apply size box plot by original data | When enabled, the size few the box plots is controlled by ordinal data. |
| Size of box plot with continuous data | The width of box plots when continuous data is used. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Fill color | The fill color that is applied to the box plots. |
| Stroke color | The color that is applied to the box plot strokes. |

| Property | Explanation |
|--------------------------------|---|
| Stroke width | The width of the box plot strokes. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Whisker stroke color | The color that is applied to the box plot whiskers. |
| Whisker stroke width | The width of the box plot whiskers. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |

Bubble (bubble, scatter, packed bubble)

| Property | Explanation |
|--------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Marker shape | The shape that is used for line markers. Choose from the following: <ul style="list-style-type: none"> • Circle • Cross • Diamond • Donut • Donuts with center • Square |

| Property | Explanation |
|--------------------------------|--|
| | <ul style="list-style-type: none"> • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) |
| Border width | <p>The width of the borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Border color | The color of the borders |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |

Bullet

| Property | Explanation |
|---------------------|--|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Minimum range color | The color that is applied to the minimum range region. |
| Medium range color | The color that is applied to the medium range region. |
| Maximum range color | The color that is applied to the maximum range region. |
| Bullet border width | <p>The width of the borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm |

| Property | Explanation |
|--------------------------------|---|
| | <ul style="list-style-type: none"> • mm • pt • pc • em • ex |
| Bullet border color | The color of the borders |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Column (Clustered bar, Clustered column, Clustered combination, Stacked combination, Floating bar, Floating column, Stacked bar, Stacked column)

| Property | Explanation |
|----------------------------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Disable padding | Switches padding off. |
| Display as stacked percent chart | Displays as stacked percent chart. |
| Column border width | <p>The width of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Column border color | <p>The color of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm |

| Property | Explanation |
|--------------------------------|---|
| | <ul style="list-style-type: none"> • mm • pt • pc • em • ex |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Heatmap

| Property | Explanation |
|--------------|--|
| Border width | <p>The width of the borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Border color | The color of the borders. |

Line (Line, Smooth line, Step line)

| Property | Explanation |
|--------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Show markers | Shows or hides the markers. |
| Marker shape | <p>The shape that is used for line markers. Choose from the following options:</p> <ul style="list-style-type: none"> • Circle • Cross • Diamond |

| Property | Explanation |
|--|--|
| | <ul style="list-style-type: none"> • Donut • Donuts with center • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) |
| Interpolation (only for Smooth line and Step line) | <p>Controls how lines between data points are drawn. Choose from the following options:</p> <ul style="list-style-type: none"> • Step • Step before • Step after |
| Value axis logarithmic scaling | <p>Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important.</p> |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Map

| Property | Explanation |
|----------|---|
| Style | <p>Configures the display style of the map. Choose from the following options:</p> <ul style="list-style-type: none"> • Streets • Basic • Bright • Light • Dark • Outdoors • Satellite • Satellite streets • Lapis • Alabaster • Obsidian • Turquoise • Jade |

| Property | Explanation |
|-----------------------|---|
| | <ul style="list-style-type: none"> • Chalcedony • Default |
| Automatic zoom | Automatically zooms to fit all data points on screen when the visualization is drawn. |
| Maximum zoom | The maximum zoom level. Value between 0 and 22. |
| Missing value color | The color that is applied to missing values |
| Enable layer control | Displays a control that allows toggling the visibility of data layers. |
| Show map labels | Controls if labels, like country and city names are shown on the map. |
| Enable search control | Enables search for recognized features or locations on maps. |

Marimekko

| Property | Explanation |
|--------------------------------|--|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Display as stacked percentages | Displays as a stacked percent chart. |
| Border width | <p>The width of the borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Border color | The color of the borders |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Network

| Property | Explanation |
|--------------------|--|
| Nodes minimum size | Node size for the elements with the fewest attached links. |
| Nodes maximum size | Node size for the elements with the most attached links. |
| Network link color | The color of the network link. |

Pie

| Property | Explanation |
|------------------|--|
| Donuts radius | The radius of the donut. 0 means the donut size is 0 (empty chart). 0.5 shows a half pie chart (donut). 1 shows a full pie chart. |
| Pie border color | The border color of the pie. |
| Pie border width | The border width of the pie. Use one of the following units: <ul style="list-style-type: none">• px• %• in• cm• mm• pt• pc• em• ex |
| Label location | Call out: The label location is on the outside of the slices with a call out. Center: The label location is in the center of the slice. Center horizontally: The label location is horizontally in the center of the slice. Outside: The label location is on the outside of the slice. |
| Sort order | The sort order. Choose between: <ul style="list-style-type: none">• Sort ascending• Sort descending• Don's sort |

Point

| Property | Explanation |
|--------------------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Marker shape | The shape that is used for point markers. Choose from the following: <ul style="list-style-type: none">• Circle• Cross• Diamond• Donut• Donuts with center• Square• Star• Triangle (up)• Triangle (down)• Triangle (left)• Triangle (right)• Rectangle (horizontal)• Rectangle (vertical) |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Radar

| Property | Explanation |
|--------------------------------|---|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Fill polygons | Fills the radar, making it an area representation instead of a line representation. |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Schematic

| Property | Explanation |
|----------------------|---|
| Missing value color | The color that is applied to missing values. If you use a dataset and the region slot is populated, all associated elements in the SVG have a fill with a color as defined in the property Missing value color . |
| Highlight regions | Displays all regions that IBM Cognos Analytics with Watson can map. For example, the SVG element has an attribute <code>data-cv-key</code> with a value that contains a key. When turned on, all mappable elements receive a fill with a color as defined in the property Missing value color . All non-mappable items have an opacity applied. |
| Zoom to view | Specifies whether a view selection is zoomed when selected. |
| SVG reference | Specifies the SVG to use in the visualization. |
| View transparency | Defines the transparency of unselected views. |
| Enable view control | Toggles the View selection UI. |
| Enable layer control | Toggles the Layer selection UI. |

Dial (Radial)

| Property | Explanation |
|-----------------------------|--|
| Back ring color | The default color of the back ring. |
| Rounded dial ends. | When enabled, the dial ends are rounded. |
| Start angle of dial | The angle the dials start at, in degrees. For example, 0 is the top, and 180 is the bottom. |
| Padding between dials | The padding between the dials. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Padding color between dials | The default color of the padding between the dials. |
| Width of dial | The width of the dials. Use one of the following units: |

| Property | Explanation |
|--------------------------------------|--|
| | <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Center background radius | The radius of the background circle under the center. |
| Padding between center and dial ring | The radius of the padding circle around the center. |
| Center color | The color that is applied to the padding circle under the center. |
| Center radius | The radius of the center of the chart. |
| Dial border width | <p>The width of the borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Dial border color | The color of the borders |

Composite (Line and column)

| Property | Explanation |
|--------------------------|--|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Display as column chart | Switches the axis. |
| Smooth line | Enable to draw a smooth line |
| Line marker display mode | Shows line and points, line only, or points only in the chart. |
| Marker shape | <p>The shape that is used for point markers. Choose from the following options:</p> <ul style="list-style-type: none"> • Circle |

| Property | Explanation |
|--------------------------------|--|
| | <ul style="list-style-type: none"> • Cross • Diamond • Donut • Donuts with center • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) |
| Column border width | <p>The width of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Column border color | The color of the column borders. |
| Value axis logarithmic scaling | Logarithmic scales are useful when the data you are displaying is much less or much more than the rest of the data or when the percentage differences between values are important. |

Treemap

| Property | Explanation |
|--------------|--|
| Display mode | <p>Treemap visualizations support the following display modes:</p> <ul style="list-style-type: none"> • Squarified: The default display mode. • Slice: Displays measures that belong to the same node in a vertically sliced way. • Dice: Displays measures that belong to the same node in a horizontally sliced way. • Slice - Dice: Displays stacked hierarchical measures that belong to the same node in a vertically sliced way. |

| Property | Explanation |
|----------|---|
| | The following screen capture displays a treemap with the Organization and Department measures on the Area hierarchy field, and Expense total on the Size field. |

Waterfall

| Property | Explanation |
|-------------------------------------|--|
| Baselines | Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. |
| Show total column | Shows a total column in the chart. |
| Total column axis label | The axis label of the total column. |
| Total column positive color | The color to use for the total column, if its value is positive. |
| Total column positive legend label | The legend label for a positive total column. |
| Total column negative color | The color to use for the total column, if its value is negative. |
| Total column negative legend label | The legend label for a negative total column. |
| Column border width | The width of the column borders. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Column border color | The color of the column borders. |
| First column positive color | The color to use for the first column, if its value is positive. |
| First column negative color | The color to use for the first column, if its value is negative. |
| The columns positive color | The color to use for the total column, if its value is positive. |
| The columns negative color | The color to use for the total column, if its value is negative. |
| Legend label for first positive bar | Specifies the label on the Legend for the first bar if positive. |

| Property | Explanation |
|-------------------------------------|--|
| Legend label for first negative bar | Specifies the label on the Legend for the first bar if negative. |
| Positive legend label | The legend label for positive values. |
| Negative legend label | The legend label for negative values. |
| Connecting lines width | The width of the connecting lines. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Value axis maximum value | The maximum value of the value axis. |
| Value axis minimum value | The minimum value of the value axis. |
| Value axis tick interval | Interval between ticks on value axis. |

Word cloud

| Property | Explanation |
|-------------------|---|
| Word orientation | The orientation of the words. |
| Value label font | The font that is applied to the value labels |
| Minimum font size | The minimum font size to use for each word. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Maximum font size | The maximum font size to use for each word. |
| Font padding | The padding that is applied between each word. |

Properties for all version 11.1 visualizations in Reporting

Set the properties for each version 11.1 visualizations, including font, line width, and size.

Conditional

| Property | Explanation |
|-----------------|---|
| Render variable | <p>Add conditional rendering to specify which objects are rendered when a report is run. This is useful when your report contains sensitive data.</p> <p>For more information, see “Add conditional rendering” on page 417.</p> |

Data

| Property | Explanation |
|-------------|--|
| Data format | <p>Format data in a report to improve readability. For example, you can show all date values in the order year, month, and day.</p> <p>For more information, see Chapter 18, “Format data,” on page 427.</p> |

General

| Property | Explanation |
|-----------|--|
| Type | Shows the visualization type. This property also shows the visualization ID, which represents the visualization bundle name. |
| Autochart | With this option you can determine whether Cognos Analytics provides a suggested visualization that is based on your data. |

Miscellaneous

| Property | Explanation |
|----------------|--|
| Name | Specifies a unique name that allows layout objects to be reused, usually to take advantage of the applied styling. |
| Alternate text | You can add alternate text charts to make your reports accessible. When a screen reader encounters one of these objects, it reads the alternate text that you added to the object. For more information, see <i>Add Alternate Text to Images and Charts</i> in <i>IBM Cognos Analytics with Watson Accessibility Guide</i> . |

Visualization

| Property | Explanation |
|----------|---|
| Size | You can set the size of your visualization. Use one of the following units: |

| Property | Explanation |
|----------|---|
| | <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |

Color palette

| Property | Explanation |
|---|---|
| Color palette. Series, categories, heat, area hierarchy | You can set the color palette for you visualization. You can choose from existing palettes, or create your own palette. |

Annotations

| Property | Explanation |
|----------------------|---|
| Show value labels | Shows or hides the value labels. |
| Value label location | Specify the location of the value labels. Choose from the following: <ul style="list-style-type: none"> • Outside end • Center • Inside end • Inside base |
| Display % | Displays values as a percentage. |
| Value label format | The format to use for the value labels. |
| Value label font | The font that is applied to the value labels. |
| Show bar labels | Shows or hides the bar labels |
| Bar label color | The color of the bar labels. |
| Bar label font | The font that is applied to the bar labels. |
| Value label color | The color that is applied to the value labels. |
| Contrast label color | Adjust the label color to contrast with the background. |
| Show item labels | Shows or hides the item labels. |
| Item label color | Sets the color of the item labels. |
| Item label font | Sets the font that is applied to the item labels. |

| Property | Explanation |
|--------------------------|--|
| Item label format | The format to use for the item labels. Choose between item, value, or both. |
| Label shadow | Shows or hides shadows for the labels. |
| Line marker display mode | Shows line and points, line only, or points only in the visualization. |
| Marker shape | The shape that is used for line markers. Choose from the following: <ul style="list-style-type: none"> • Circle • Cross • Diamond • Donut • Donuts with center • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) |
| Show leaf labels | Toggles the leaf level labels visibility. |

Item axis

| Property | Explanation |
|-----------------------------|--|
| Show item axis title | Shows the item axis title. |
| Item axis title | The title of the item axis. |
| Item axis title font | The font that is applied to the item axis title. |
| Item axis title color | The color of the of the item axis title. |
| Show item axis labels | Shows the item axis labels. |
| Item axis label font | The font that is applied to the item axis labels. |
| Item axis label color | The color of the item axis label. |
| Item axis label orientation | Configures the layout mode for the item axis labels. |
| Show item axis ticks | Shows the item axis ticks. |
| Item axis tick color | The color of the item axis ticks. |
| Show item axis grid lines | Shows item axis grid lines. |
| Item axis grid line color | The color of the item axis grid lines. |
| Show item axis line | Shows the item axis line. |
| Item axis line color | The color of the item axis line. |

Value axis

| Property | Explanation |
|----------------------------|--|
| Show zero origin | Ensures 0 is displayed on the value axis. |
| Show value axis title | Shows the value axis title. |
| Value axis title | The title of the value axis. |
| Value axis title font | The font that is applied to the value axis title. |
| Value axis title color | The color of the value axis title |
| Show value axis labels | Shows the value axis labels. |
| Value axis label font | The font that is applied to the value axis labels. |
| Value axis label color | The color of the value axis label. |
| Show value axis ticks | Shows value axis ticks. |
| Value axis tick color | The color of the value axis ticks. |
| Show value axis grid lines | Show the value axis grid lines. |
| Value axis grid line color | The color of the value axis grid lines. |
| Show value axis line | Shows the value axis line. |
| Value axis line color | The color of the value axis line. |

Legend

| Property | Explanation |
|-------------------------|--|
| Show legend | Shows or hides the legend. |
| Legend background color | The background color of the legend. |
| Legend size | The maximum size of the legend, as a CSS size of percentage. |
| Legend position | The position of the legend in the visualization. |
| Legend font | The font to use for the legend. |
| Legend font color. | The font color of the legend. |
| Legend title visible | Shows or hides the legend title. |
| Legend title font | The font to use for the legend title. |
| Legend title font color | The font color of the legend title. |

Common

| Property | Explanation |
|---------------------------|--|
| Background color | The background color of the visualization. |
| Elements background color | The background color behind the elements of the visualization. |

| Property | Explanation |
|------------|---|
| Responsive | Hides certain aspects of the visualization if the size is limited, to maximize the space that is available to display data. |

Properties for individual 11.0 visualizations in Reporting

Set the properties for each version 11.0 visualizations, including font, line width, and size. Many visualizations have their own specific properties that control specific behavior of the visualization.

Area (River, Area, Smooth area, Stepped area)

| Property | Explanation |
|---------------------|---|
| Switch X and Y axis | When enabled, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |
| Opacity | The opacity of the colored area. The value must be between 0 (fully transparent) and 1 (fully opaque). |
| Border width | The width of the area border. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Border color | The color of the area border. |

Box plot

| Property | Explanation |
|------------------------------|--|
| Extreme outlier fill color | The fill color that is applied to the box plot extreme outliers. |
| Extreme outlier stroke color | This width of the box plot extreme outliers. |
| Extreme outlier width | The width of the box plot extreme outliers. |
| Mean color | The color that is applied to the box plot mean. |
| Mean stroke width | The width of each box plot mean. |
| Outlier fill color | The fill color that is applied to the box plot outliers. |
| Outlier color | The color that is applied to the box plot outliers. |
| Outlier width | The width of the box plot outliers. |
| Median color | The color that is applied to the box plot median. |
| Median width | The width of the box plot median strokes. |

| Property | Explanation |
|--------------------------------------|---|
| Apply size box plot by original data | When enabled, the size few the box plots is controlled by ordinal data. |
| Size | The width, in pixels, of box plots when continuous data is used. |
| Fill color | The fill color that is applied to the box plots. |
| Stroke color | The color that is applied to the box plot strokes. |
| Stroke width | The width of the box plot strokes. |
| Whisker stroke color | The color that is applied to the box plot whiskers. |
| Whisker stroke width | The width of the box plot whiskers. |
| Configuration | The configuration that is used to plot the data. |

Bubble (bubble, scatter, packed bubble, point)

| Property | Explanation |
|---------------------------------|--|
| Bubble shape | The shape that is used for line markers. Choose from the following: <ul style="list-style-type: none"> • Circle • Cross • Diamond • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) • Star • Donut • Donut-plus |
| Bubble border width | The width of the borders |
| Bubble border color | The color of the borders |
| Smallest data value bubble size | The size (glyph area in square pixels) of the bubble that is used for the smallest data value. The size can be larger that the Biggest data value bubble size property. In this case, the scale is reversed. |
| Biggest data value bubble size | The size (glyph area in square pixels) of the bubble that is used for the biggest data value. The size can be smaller that the Smallest data value bubble size property. In this case, the scale is reversed. |
| Switch X and Y axes | When set to Yes, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |

| Property | Explanation |
|--|---|
| Bubble label | Shows or hides bubble labels. |
| Item label font | Font styles for the item labels. |
| Show pack bubbles with negative values | Shows or hides pack bubbles with negative values. |

Bullet

| Property | Explanation |
|---------------------|--|
| Minimum range color | The color that is applied to the minimum range region. |
| Medium range color | The color that is applied to the medium range region. |
| Maximum range color | The color that is applied to the maximum range region. |

Column (Clustered bar, Clustered column, Floating bar, Floating column, Stacked bar, Stacked column)

| Property | Explanation |
|----------------------------------|---|
| Disable padding | Switches off padding. |
| Display as stacked percent chart | Displays as stacked percent chart. |
| Column border width | <p>The width of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Column border color | <p>The color of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |

| Property | Explanation |
|---------------------|---|
| Switch X and Y axes | When set to Yes, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |

Heatmap

| Property | Explanation |
|-------------------|---|
| Cell border width | The width of the borders. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Cell border color | The color of the borders. |

Line (Line, Smooth line, Step line)

| Property | Explanation |
|--------------------------|--|
| Chart display mode | Shows line and points, line only, or points only. |
| Line-width-points symbol | The shape that is used for line markers. Choose from the following: <ul style="list-style-type: none"> • Circle • Cross • Diamond • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) • Star • Donut • Donut-plus |
| Line-width-points size | The size, in square pixels, of the line-with-points symbol. |

| Property | Explanation |
|--------------------------|---|
| Show missing data as gap | Shows missing data as gap instead of interpolating a line across the missing data. |
| Sort points by x | Sorts the line points by x. |
| Switch X and Y axes | When set to Yes, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |

Map

| Property | Explanation |
|------------------------|--|
| Style | Configures the display style of the map. Choose from the following: <ul style="list-style-type: none"> • Streets • Basic • Bright • Light • Dark • Satellite |
| Hide location warnings | Hides the warning message when not all location data is uniquely identified. |

Pie

| Property | Explanation |
|----------------------|--|
| Radius of donuts | The radius of the donuts. 0 means that the donuts size is 0 (empty visualization). 1 shows a full pie chart. |
| Pie border color | The border color of the pie. |
| Pie border width | The border width of the pie. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Label display option | Specifies where to draw slice labels. Use one of the following options: <ul style="list-style-type: none"> • Callout • Center radial |

| Property | Explanation |
|----------|--|
| | <ul style="list-style-type: none"> Center horizontal None |
| Sort | <p>The sort order. Choose between:</p> <ul style="list-style-type: none"> Ascending Descending Don's sort |

Radar

| Property | Explanation |
|--------------------------|---|
| Chart display mode | Shows line and points, line only, or points only. |
| Show chart as area chart | Fills the radar, making it an area representation instead of a line representation. |
| Line-with-points size | The size, in square pixels, of the line-with-points symbol. |
| Line-with-points symbol | The shape that is used for the line-with-points symbol. |

Dial (Radial, radial bar)

| Property | Explanation |
|--------------------------|---|
| Back ring color | The default color of the back ring. |
| Border color | The color of the dial borders. |
| Border width | <p>The width of the dial borders. Use one of the following units:</p> <ul style="list-style-type: none"> px % in cm mm pt pc em ex |
| Center background radius | <p>The radius of the background circle under the center. Use one of the following units:</p> <ul style="list-style-type: none"> px % in cm mm |

| Property | Explanation |
|-----------------------|--|
| | <ul style="list-style-type: none"> • pt • pc • em • ex |
| Center color | The color that is applied to the center of the chart. |
| Center radius | <p>The radius of the center of the chart. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Center padding radius | <p>The radius of padding circle around the center. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Rounded dial ends. | When enabled, the dial ends are rounded. |
| Padding | <p>The padding between the dials. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Padding color | The default color of the padding between the dials. |

| Property | Explanation |
|----------------------------|---|
| Width | The width of the dials. |
| Maximum value | The maximum value that the dial goes to. |
| Minimum font size | The minimum font size of values and labels. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Enable proportional widths | Scales widths to proportionally fit the chart. |
| Rounded dial ends | When set to yes, then the dial ends are rounded. |
| Show as percentage | Shows the values as a percentage. |
| Start angle | The angle the dials start at. For example, 0 is the top, while 180 is the bottom. |
| Value label size | The size of the value labels. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Value label color | The color that is applied to the value labels. |
| Value label font-family | The font of the value labels. |

Composite (Line and column)

| Property | Explanation |
|------------------------------|---|
| Switch X and Y axes | Switches the axis. |
| Column border color | The color of borders in the column visualization. |
| Align dependent axes on grid | Aligns the grid lines of dependent axes. |
| Column border width | The width of the borders in the column visualization. |

| Property | Explanation |
|--------------------------|---|
| Line-with-points size | The size, in square pixels, of the line-with-points symbol. |
| Line chart display mode | In the line chart, shows line and points, line only, or points only. |
| Line-with points symbol | The shape that is used for the line-with-points symbol. Choose from the following: <ul style="list-style-type: none"> • Circle • Cross • Diamond • Square • Star • Triangle (up) • Triangle (down) • Triangle (left) • Triangle (right) • Rectangle (horizontal) • Rectangle (vertical) • Star • Donut • Donut-plus |
| Show missing data as gap | Shows missing data as gap instead of interpolating a line across the missing data. |
| Show line | Shows or hides the X-axis line. |
| Line color | The color of the X-axis line. |

Waterfall

| Property | Explanation |
|------------------------------------|--|
| Connecting lines pattern | The pattern that is used for the connecting lines. Choose from the following: <ul style="list-style-type: none"> • Dot • Dash • Long dash • Dot dash |
| Connecting lines width (thickness) | The width of the connection lines. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm |

| Property | Explanation |
|-------------------------------------|---|
| | <ul style="list-style-type: none"> • pt • pc • em • ex |
| First bar positive color | The color of the first positive bar. |
| Legend label for first positive bar | The legend label for the first positive bar. |
| First bar negative color | The color of the first negative bar. |
| Legend label for first negative bar | The legend label for the first negative bar. |
| Bar border width | <p>The width of the column borders. Use one of the following units:</p> <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Bar border color | The color of the column borders. |
| Value bar negative color | The color for the negative value bars. |
| Legend label for negative value bar | The legend label for the negative value bars. |
| Value bar positive color | The color for the positive value bars. |
| Legend label for positive value bar | The legend label for the positive value bars. |
| Zero line color | The color for the line at zero. |
| Switch X and Y axes | When set to Yes, the Y-axis shows the independent scale and the X-axis shows the dependent scale. |
| Total | Toggles the tool column |
| Total | The legend label for the total column. |

Word cloud

| Property | Explanation |
|-------------------|---|
| Word orientation | The orientation of the words. |
| Font | The font that is applied to the value labels. |
| Minimum font size | <p>The minimum font size to use for each word. Use one of the following units:</p> <ul style="list-style-type: none"> • px |

| Property | Explanation |
|-------------------|---|
| | <ul style="list-style-type: none"> • % • in • cm • mm • pt • pc • em • ex |
| Maximum font size | The maximum font size to use for each word. |
| Font padding | The padding that is applied between each word. |

Properties for all version 11.0 visualizations in Reporting

Set the properties for each version 11.0 visualizations, including font, line width, and size.

Conditional

| Property | Explanation |
|-----------------|---|
| Render variable | <p>Add conditional rendering to specify which objects are rendered when a report is run. This is useful when your report contains sensitive data.</p> <p>For more information, see “Add conditional rendering” on page 417.</p> |

Data

| Property | Explanation |
|-------------|--|
| Data format | <p>Format data in a report to improve readability. For example, you can show all date values in the order year, month, and day.</p> <p>For more information, see Chapter 18, “Format data,” on page 427.</p> |

General

| Property | Explanation |
|-----------|--|
| Type | Shows the visualization type. This property also shows the visualization ID, which represents the visualization bundle name. |
| Autochart | With this option you can determine whether Cognos Analytics provides a suggested visualization that is based on your data. |

Miscellaneous

| Property | Explanation |
|----------------|--|
| Name | Specifies a unique name that allows layout objects to be reused, usually to take advantage of the applied styling. |
| Alternate text | You can add alternate text charts to make your reports accessible. When a screen reader encounters one of these objects, it reads the alternate text that you added to the object. For more information, For more information, see <i>Add Alternate Text to Images and Charts</i> in <i>IBM Cognos Analytics with Watson Accessibility Guide</i> . |

Common

| Property | Explanation |
|-----------------------------|--|
| Background color | Sets the background color of the visualization. |
| Elements background color | Sets the background color of the elements in the visualization. |
| Color palette | The color palette that controls the colors or patterns that are applied to the data elements in the chart. |
| Optimize visualization size | Hides certain aspects of the visualization if the size is limited, to maximize the space that is available to display data. |
| Padding | The padding around the chart and legend. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Configuration | The configuration that is used to plot the data. Use one of the following options: <ul style="list-style-type: none"> • Simple • Stacked • Stacked 100% • Stream |
| Width, Height | You can set the size of your visualization, in pixels. |

X axis

| Property | Explanation |
|------------------------|---|
| Show grid lines | Shows or hides the X-axis grid lines. |
| Grid line color | The color of the X-axis grid line. |
| Grid line dash pattern | The pattern that is applied to the X-axis grid lines. Use one of the following options: <ul style="list-style-type: none">• Dot• Dash• Long dash• Dot dash |
| Show labels | Shows or hides the X-axis labels. |
| Label font | The font properties of the X-axis labels (CSS styles) |
| Show line | Shows or hides the X-axis line. |
| Line color | The color of the X-axis line. |
| Show ticks | Shows or hides the X-axis tick marks. |
| Tick color | The color of the X-axis ticks. |
| Show title | Shows or hides the X-axis title. |
| Title font | The X-axis title font properties (CSS styles). |
| Title | The title of the X-axis. |

Y axis

| Property | Explanation |
|------------------------|---|
| Show grid lines | Shows or hides the Y-axis grid lines. |
| Grid line color | The color of the Y-axis grid line. |
| Grid line dash pattern | The pattern that is applied to the Y-axis grid lines. Use one of the following options: <ul style="list-style-type: none">• Dot• Dash• Long dash• Dot dash |
| Show labels | Shows or hides the Y-axis labels. |
| Label font | The font properties of the Y-axis labels (CSS styles) |
| Show line | Shows or hides the Y-axis line. |
| Line color | The color of the Y-axis line. |
| Show ticks | Shows or hides the Y-axis tick marks. |
| Tick color | The color of the Y-axis ticks. |
| Show title | Shows or hides the Y-axis title. |

| Property | Explanation |
|------------|--|
| Title font | The Y-axis title font properties (CSS styles). |
| Title | The title of the Y-axis. |

Legend

| Property | Explanation |
|--------------------------------|---|
| Show legend | Shows or hides the legend. |
| Legend position | The position of the legend in the visualization. |
| Space between legend and chart | Space between the chart and the legend, as as CSS size or percentage. Use one of the following units: <ul style="list-style-type: none"> • px • % • in • cm • mm • pt • pc • em • ex |
| Align legend to chart | Whether to align the legend to the interior of the chart. |
| Title | The title of the legend. |
| Title font | The font to use for the legend title. |
| Entry font | The font properties of the legend entry. |

Chapter 7. Charts

You can use IBM Cognos Analytics - Reporting to create many chart types, such as column, bar, area, and line charts.

Chart Types

IBM Cognos Analytics - Reporting provides many types of charts for presenting your data in a way that is meaningful for your users.

You can select from a variety of chart types (such as pie, bar, line, gauge, scatter, and so on) and you can select from a variety of chart configurations (such as stacked columns, 3-D pies). Combination charts allow you to use more than one chart type within your chart.

Some chart types are not supported for Microsoft Excel output or appear differently in Excel. For more information, see [Appendix B, “Limitations When Producing Reports in Microsoft Excel Format,”](#) on page 499.

Choosing a Chart Type and Configuration

To choose a chart type, consider what you want the chart to illustrate. Different chart types and configurations emphasize different things.

| Purpose | Chart type or configuration |
|--|--|
| Show contributions of parts to a whole | Bar Charts Pie Charts Stacked Charts, when you want to display measures of the whole, as well as the parts 100 Percent Stacked Charts |
| Show trends in time or contrast values across different categories | Line Charts Area Charts Bar Charts Column Charts Always place time in the horizontal axis. |
| Compare groups of related information against actual values | Bar Charts Radar Charts |
| Compare different kinds of quantitative information | Combination Charts |
| Rank values in descending or ascending order | Bar Charts Column Charts |
| Show correlation between two sets of measures | Point Charts |
| Show key performance indicators in an executive dashboard report | Gauge Charts Bullet Charts |

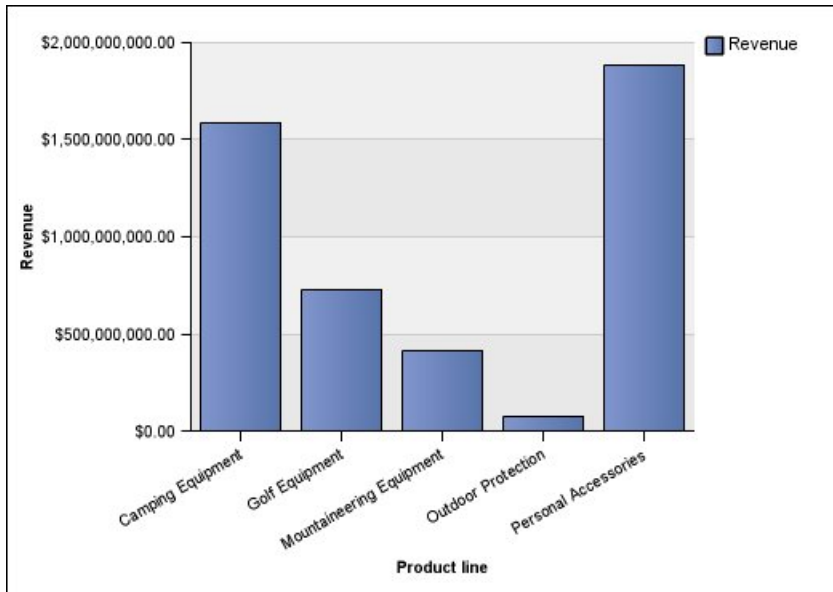
Column Charts

Column charts are useful for comparing discrete data or showing trends over time.

Column charts use vertical data markers to compare individual values.

Note: The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes a column chart.

The following example shows the revenue for each product line.



Column charts can plot data using [standard](#), [stacked](#), [100 percent stacked](#), and [three-dimensional](#) configurations.

Line Charts

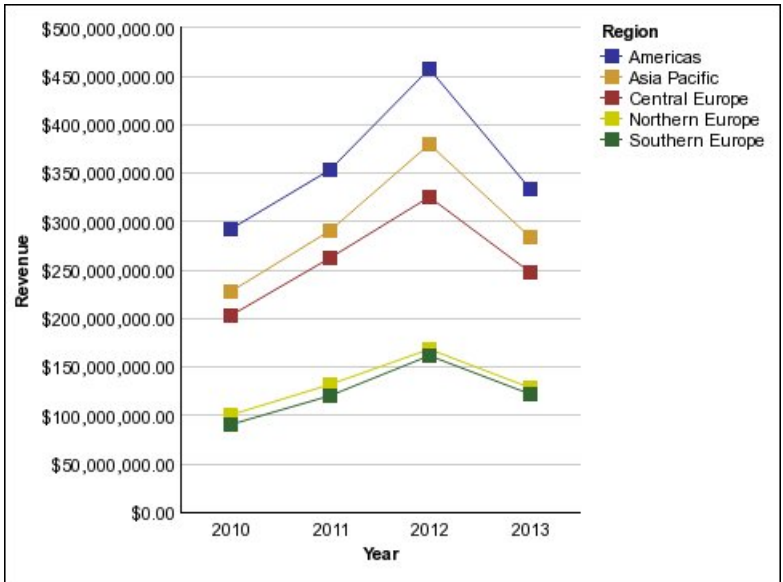
Line charts are useful for showing trends over time and comparing many data series.

Line charts plot data at regular points that are connected by lines.

Line charts can plot data by using [standard](#), [stacked](#), [100 percent stacked](#), and [three-dimensional](#) configurations. It is best not to use stacked line charts because they are difficult to distinguish from unstacked line charts with multiple data series.

Note: Line charts support a maximum of 32767 data points.

The following example shows a revenue trend that peaked in 2012 in every territory.



Note: The Top Retailers by Country or Region sample report in the Sales and Marketing (cube) package includes a line chart.

Pie Charts

Pie charts are useful for highlighting proportions.

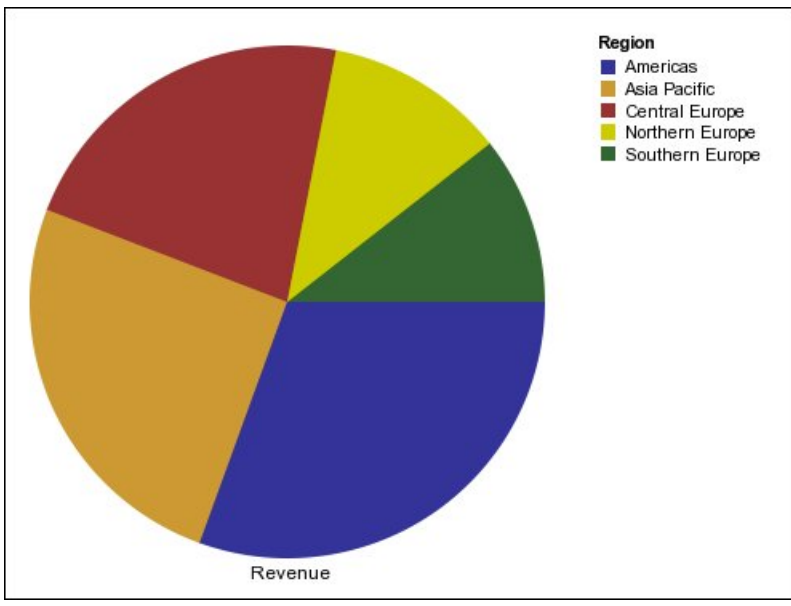
They use segments of a circle to show the relationship of parts to the whole. To highlight actual values, use another chart type, such as a stacked chart.

Pie charts plot a single data series. If you need to plot multiple data series, use a 100 percent stacked chart.

Reports in PDF or HTML format show a maximum of 16 pies or gauges per chart.

Note: The Returns by Failed Orders in 2012 sample report in the GO Data Warehouse (analysis) package includes a pie chart.

The following example shows that the largest proportion of revenue comes from the Americas, followed by the Asia Pacific region.



Pie charts can plot data using standard, 100 percent, and three-dimensional configurations.

Bar Charts

Bar charts are useful for showing trends over time and plotting many data series.

Bar charts use horizontal data markers to compare individual values.

Note: The Manager Profile sample report in the GO Data Warehouse (analysis) package includes a bar chart.

The following example shows revenue for every country or region.

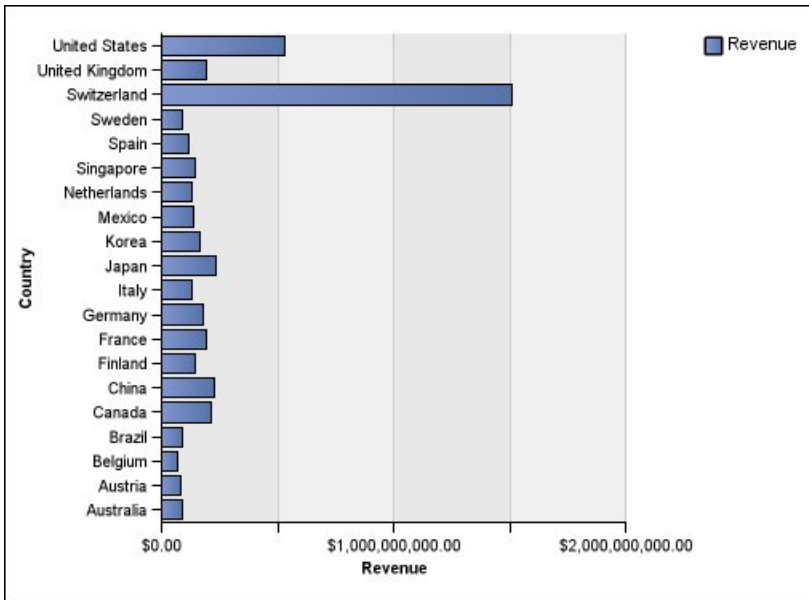


Figure 2. Bar chart

Bar charts can plot data using standard, stacked, and 100 percent stacked configurations.

Area Charts

Area charts are useful for emphasizing the magnitude of change over time. Stacked area charts are also used to show the relationship of parts to the whole.

Area charts are like line charts, but the areas below the lines are filled with colors or patterns.

Do not use standard area charts to show multiple data series because it is possible for areas with lower values to be covered by others. For multiple data series, use a stacked area chart.

The following example is a stacked area chart that shows the quantity of products that were sold over a four-year period in multiple territories.

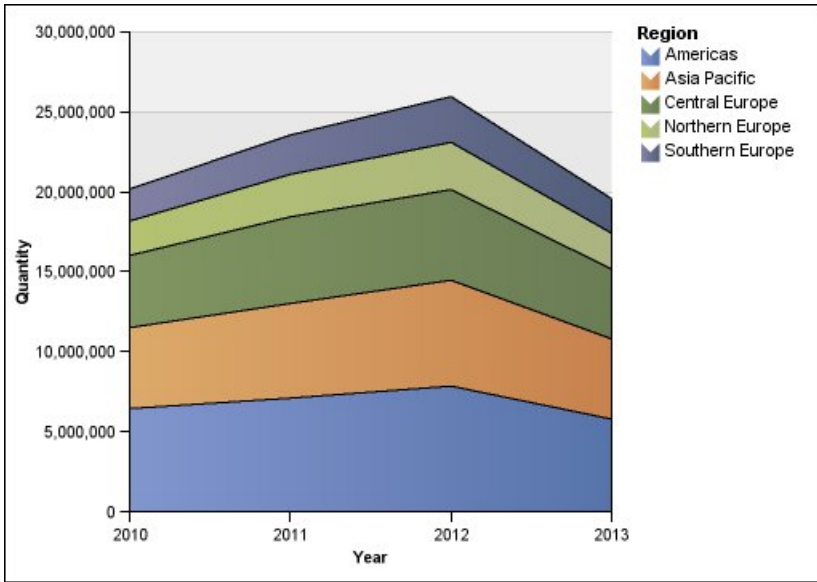


Figure 3. An example area chart

Area charts can plot data using standard, stacked, 100 percent stacked, and three-dimensional configurations.

Point Charts

Point charts are useful for showing quantitative data in an uncluttered fashion.

Point charts use multiple points to plot data along an ordinal axis. A point chart the same as a line chart without the lines. Only the data points are shown.

The following example shows the revenue for each product line.

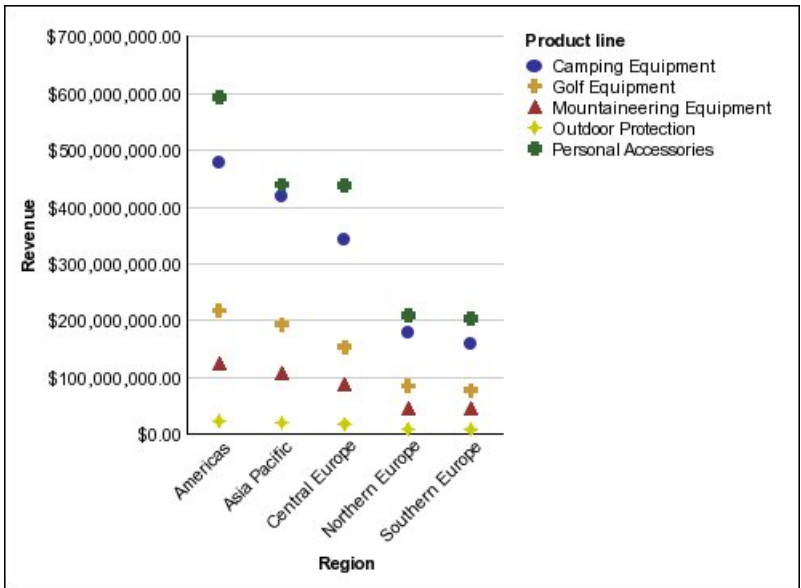


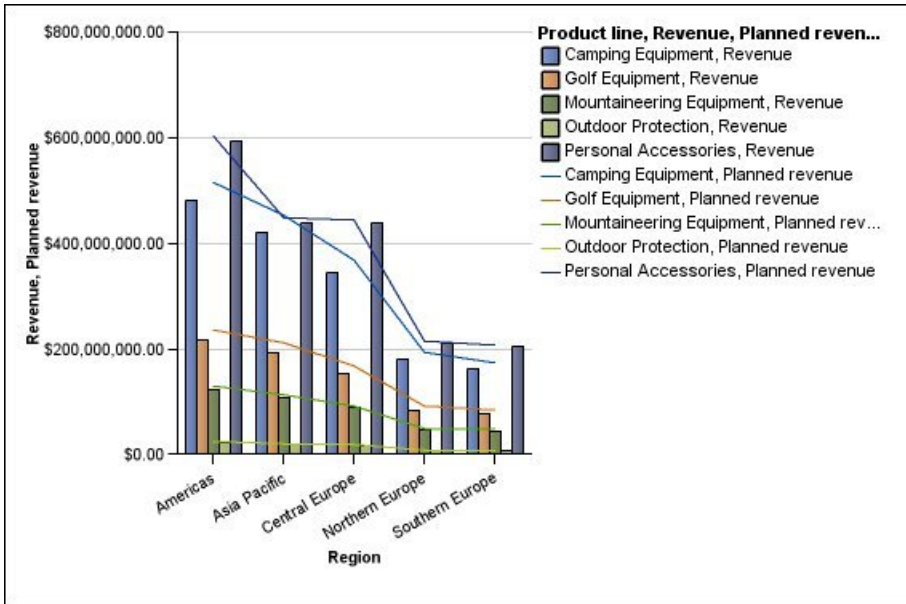
Figure 4. An example point chart

Combination Charts

Combination charts plot multiple data series by using combinations of columns, areas, and lines within one chart. They are useful for highlighting relationships between the various data series.

Note: The Quantity Sold vs. Shipped and Inventory sample report in the GO Data Warehouse (analysis) package includes a combination chart.

The following example shows a combination chart that includes planned revenue as a line chart and actual revenue as a column chart.



Combination charts can plot data using standard, stacked, 100 percent stacked, and three-dimensional configurations.

Scatter Charts

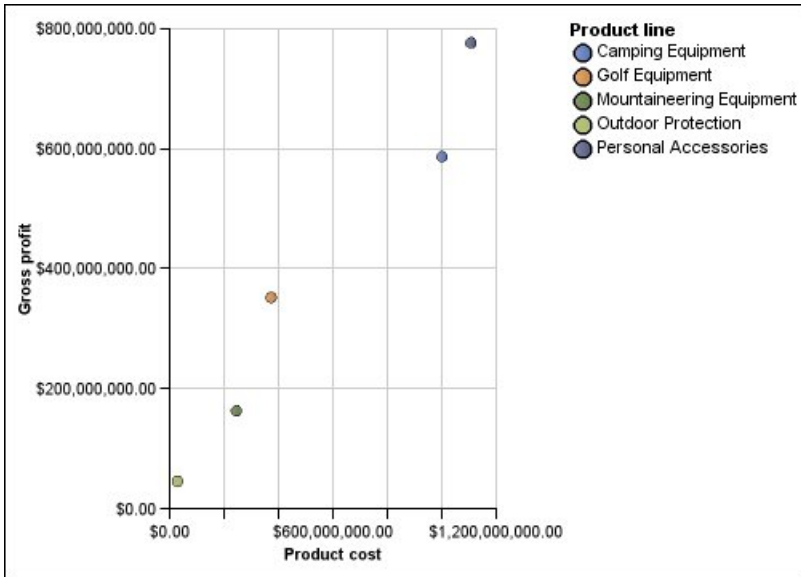
Scatter charts use data points to plot two measures anywhere along a scale, not only at regular tick marks.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure”](#) on page 76.

Scatter charts are useful for exploring correlations between different sets of data.

Note: The Employee Satisfaction 2012 sample report in the GO Data Warehouse (analysis) package includes a scatter chart.

The following example shows the correlation between production cost and gross profit for each product line.



Bubble Charts

Bubble charts, like scatter charts, use data points and bubbles to plot measures anywhere along a scale. The size of the bubble represents a third measure.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure”](#) on page 76.

Bubble charts are useful for representing financial data. These charts are not supported for Microsoft Excel output.

The following example plots quantity and revenue by product line. The size of the bubble represents the amount of gross profit.

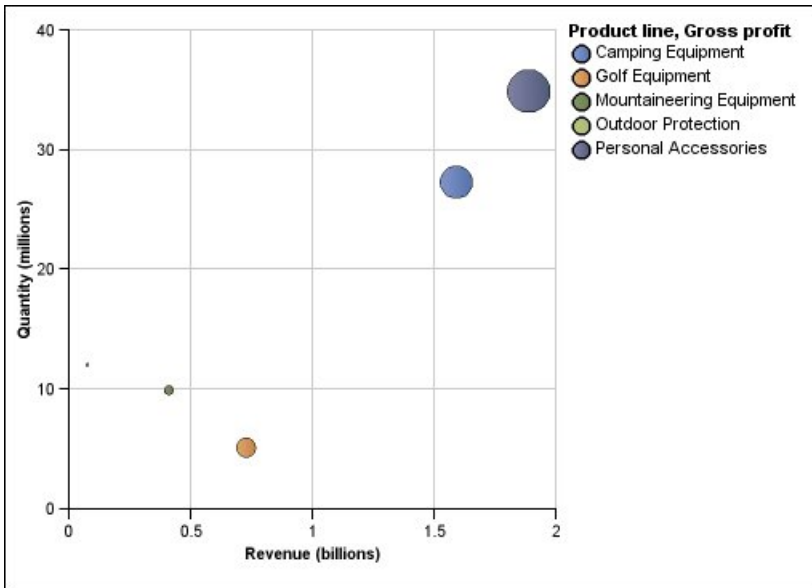


Figure 5. Bubble chart

Quadrant Charts

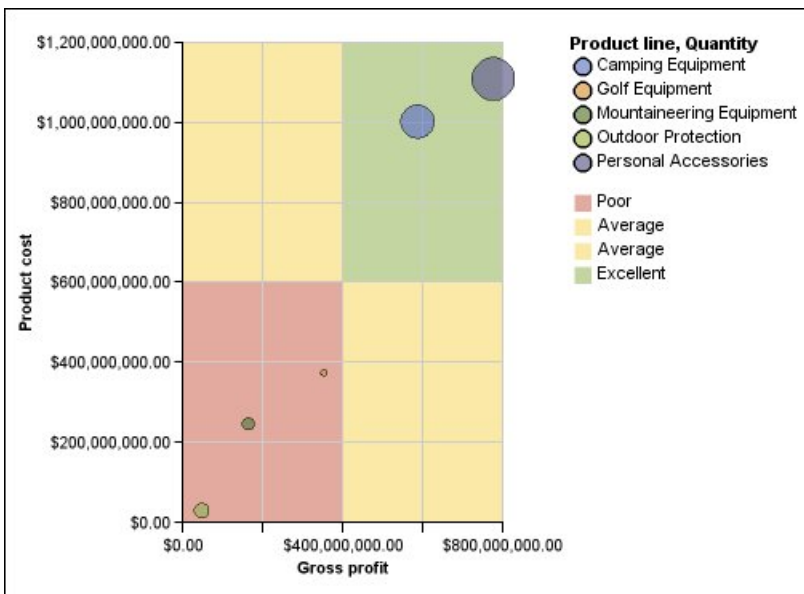
Quadrant charts are bubble charts with a background that is divided into four equal sections. Quadrant charts are useful for plotting data that contains three measures using an X-axis, a Y-axis, and a bubble size that represents the value of the third measure.

You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure” on page 76](#).

Legacy quadrant charts use baselines to create the quadrants. Current default charts use colored regions.

Use a quadrant chart to present data that can be categorized into quadrants, such as a SWOT (strengths, weaknesses, opportunities, and threats) analysis.

The following example shows the relationship between production cost and gross profit. The size of the bubble represents the quantity of units sold.



Bullet Charts

Bullet charts are a variation of bar charts. They compare a featured measure (the bullet) to a targeted measure (the target). They also relate the compared measures against colored regions in the background that provide additional qualitative measurements, such as good, satisfactory, and poor.

Bullet charts are often used instead of gauge charts in executive dashboards. Bullet charts can be horizontal or vertical.

Note: This chart type applies only to the current default charts, and does not apply to the legacy charts.

The following figure is an example of a bullet chart.

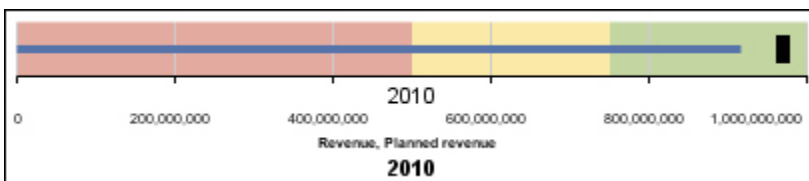


Figure 6. An example bullet chart

A bullet chart contains the following components:

- A bullet measure.

The bullet measure, Revenue, appears as the blue bar in the example.

- A target measure.

The target measure, Planned revenue, appears as the black indicator in the example.

- From zero to five colored regions along the numeric scale to provide information about the featured measures' qualitative state.

The example contains three colored regions, 0-50%, 50-75%, and 75-100%.

- A label that identifies the measures.
- A numeric scale.

Gauge Charts

Gauge charts, also known as dial charts or speedometer charts, use needles to show information as a reading on a dial.

On a gauge chart, the value for each needle is read against the colored data range or chart axis. This chart type is often used in executive dashboard reports to show key business indicators.

Gauge charts are useful for comparing values between a small number of variables either by using multiple needles on the same gauge or by using multiple gauges.

Reports in PDF or HTML format are limited to show a maximum of 16 pies or gauges per chart. These charts are not supported for Microsoft Excel output.

A gauge chart consists of a gauge axis (which contains the data range, color ranges, and intervals markers), needles, and a center pivot point. The following example shows a basic gauge chart with default attributes. It is a degree dial chart with two axes.

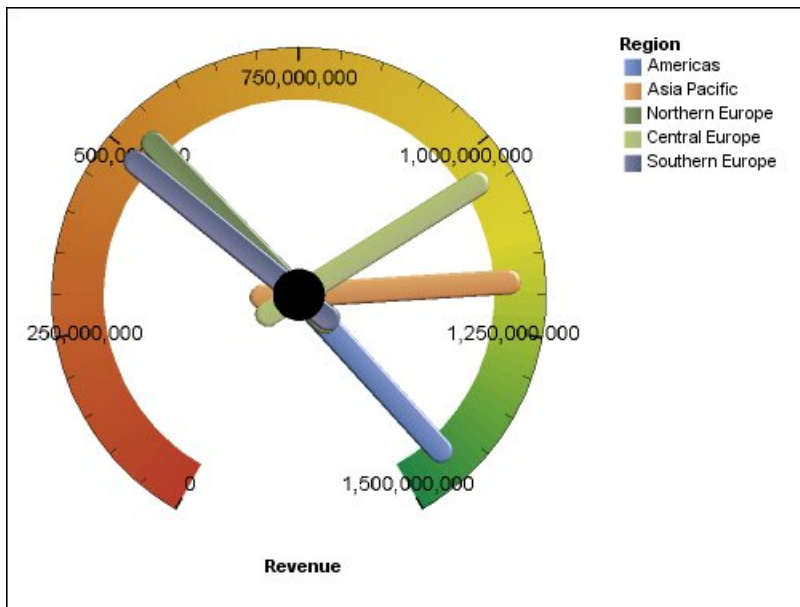


Figure 7. An example gauge chart

Pareto Charts

Pareto charts help you to improve processes by identifying the primary causes of an event. They rank categories from the most frequent to the least frequent. These charts are frequently used for quality control data, so that you can identify and reduce the primary cause of problems.

Pareto charts include a cumulation line, which shows the percentage of the accumulated total of all the columns or bars.

You can create before and after comparisons of Pareto charts to show the impact of corrective actions. These charts are not supported for Microsoft Excel output.

The following example shows that the most frequent reason for product returns is unsatisfactory product.

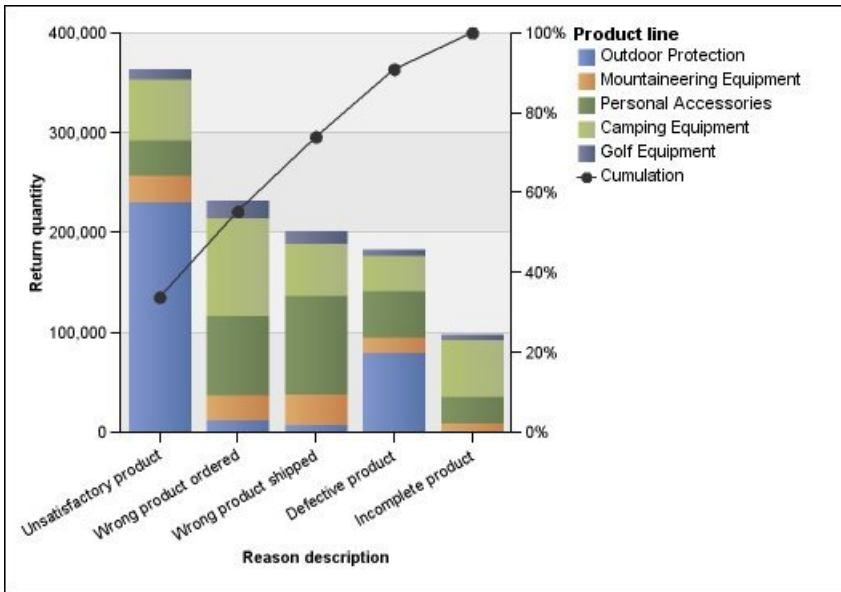


Figure 8. An example pareto chart

You can also create Pareto charts using horizontal bars.

Progressive Column Charts

Progressive column charts, also known as waterfall charts, are like stacked charts with each segment of a single stack displaced vertically from the next segment.

Progressive column charts are useful for emphasizing the contribution of the individual segments to the whole.

These charts are not supported for Microsoft Excel output.

The following example analyzes the contribution of each product line to revenue.

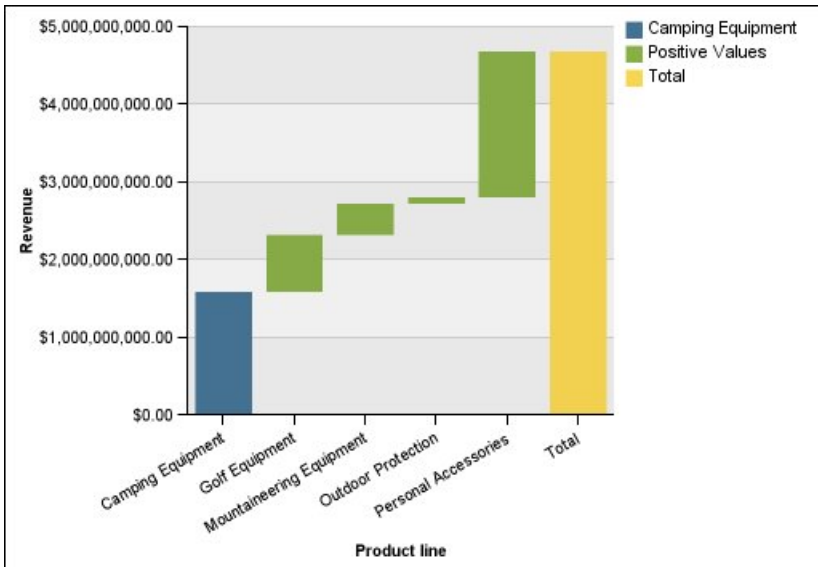


Figure 9. An example progressive column chart

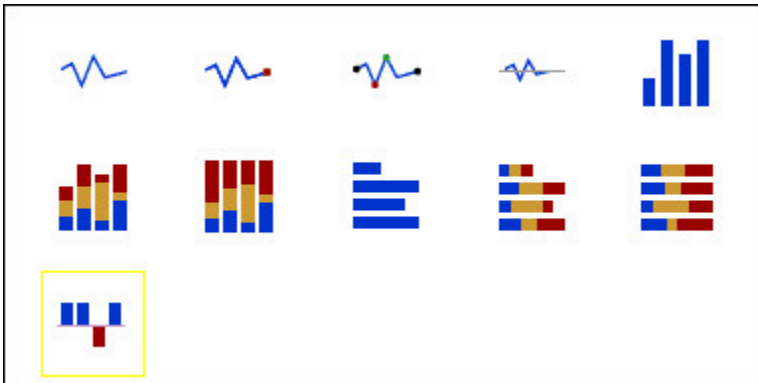
Progressive column charts can plot data using standard and three-dimensional configurations. You can also create progressive charts using horizontal bars.

Microcharts

Microcharts are smaller versions of column charts, bar charts, and line charts that you can use in crosstabs and dashboards. Microcharts include column microcharts and bar microcharts, which are available in stacked and 100 percent stacked configurations, and win-loss charts and modified line charts that contain the following:

- A closing value marker.
- Opening, closing, high, and low value markers.
- A reference line.

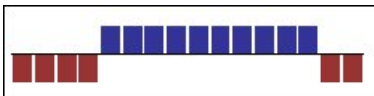
Note: If you specify custom labels for a microchart, the custom labels appear in the tooltips, not on the chart itself. For more information about custom labels, see [“Specify Custom Label Text”](#) on page 210.



Win-loss charts are microcharts in which the value of each column is either 1 or -1, often denoting a win or loss.

Win-loss charts use two measures (the default and the win-loss measure) and no series. The win-loss measure is the measure or calculation that you define. You can also specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure”](#) on page 76.

The following example shows the quarters that have a margin of less than 10,000 in red.



Marimekko Charts

Marimekko charts are 100 percent stacked charts in which the width of a column is proportional to the total of the column's values. Individual segment height is a percentage of the respective column total value.

The following example shows the contribution of revenues for product lines in different regions.

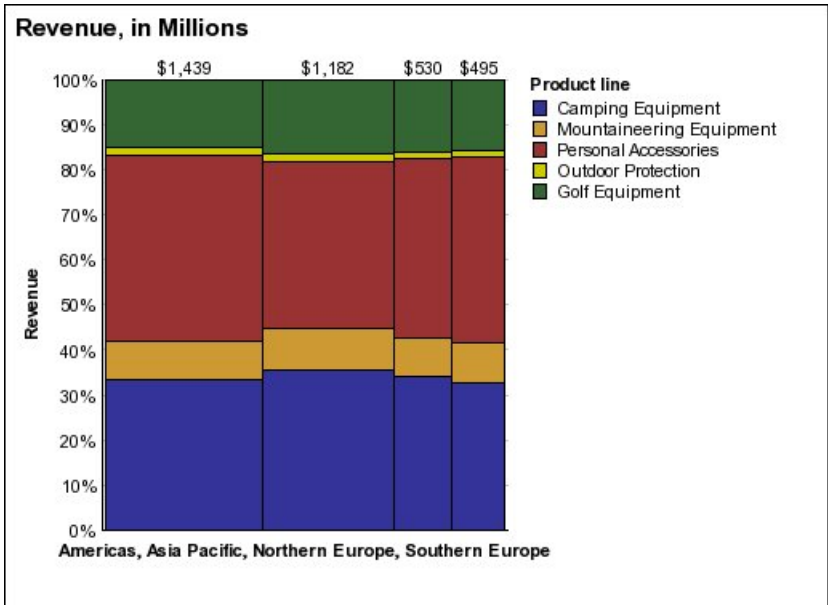


Figure 10. An example Marimekko chart

Radar Charts

Radar charts integrate multiple axes into a single radial figure. For each figure, data is plotted along a separate axis that starts at the center of the chart.

The following example shows the revenue from multiple retailer types in multiple territories.

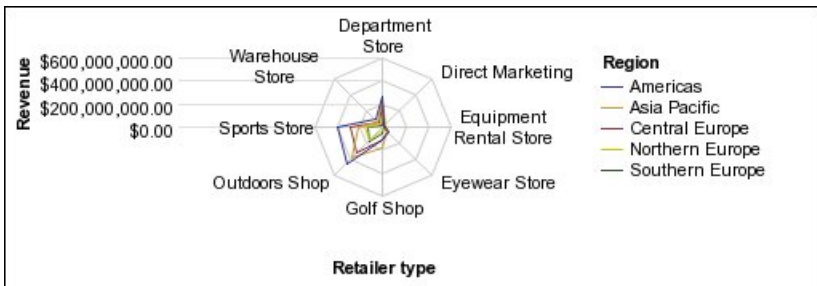


Figure 11. An example radar chart

Radar charts can plot data using standard and stacked configurations.

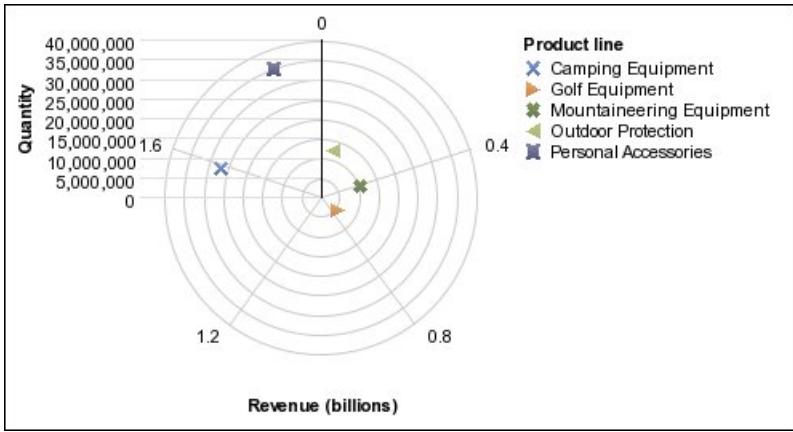
Polar Charts

Polar charts are useful for showing scientific data.

They are circular charts that use values and angles to show information as polar coordinates.

You can specify a default measure. For example, you might need to specify a default measure to give context to a calculated measure in the chart. For more information about the default measure, see [“Specify the Default Measure”](#) on page 76.

The following example shows the revenue and quantity for each product line. The distance along the radial axis represents quantity, and the angle around the polar axis represents revenue.



Range Indicator Charts

Range indicator, or metrics range, charts are useful for showing a target range and a tolerance range.

A range indicator chart adds a target and range marker to a column, line, or area chart.

The following example shows actual revenue versus planned revenue. The markers indicate the planned revenue, and the range and tolerance lines are defined by the chart author.

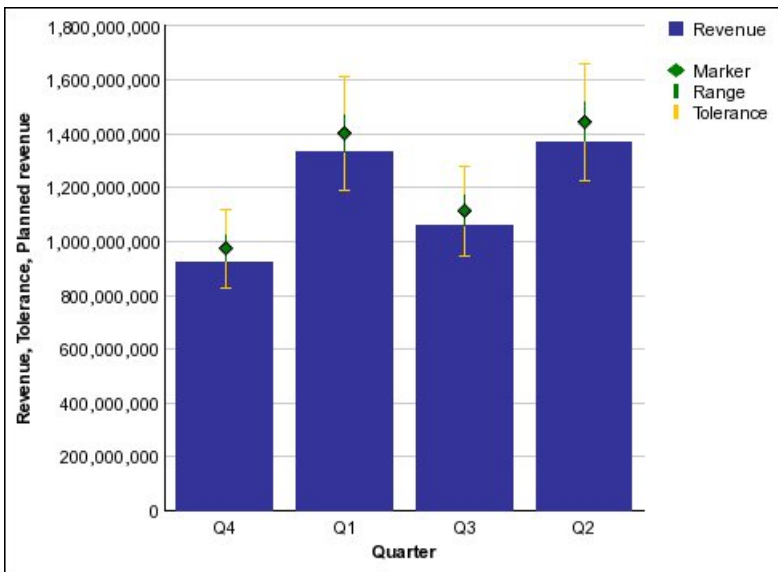


Chart Configurations

Chart configurations specify the grouping type of the columns, bars, lines, and areas in a chart. Some examples are standard, stacked, and 100 percent stacked charts.

Standard Charts

Standard or absolute charts are useful for comparing specific values and for representing discrete data, such as data for different regions or individual employees. For example, a standard column chart that plots regional sales emphasizes the actual value that each region achieves in sales.

Standard charts plot the actual value of each data series from a common axis.

When you create charts using multiple data series, you can distinguish each series by the color or pattern of its data marker. Related data series are shown together in clusters for easy comparison.

In standard area and radar charts that have multiple data series, the colored areas that represent lower values might be covered by the larger colored areas that represent higher values. Use the stacked configuration for area and radar charts with multiple data series.

The following example shows the revenue values for each product line within each territory.

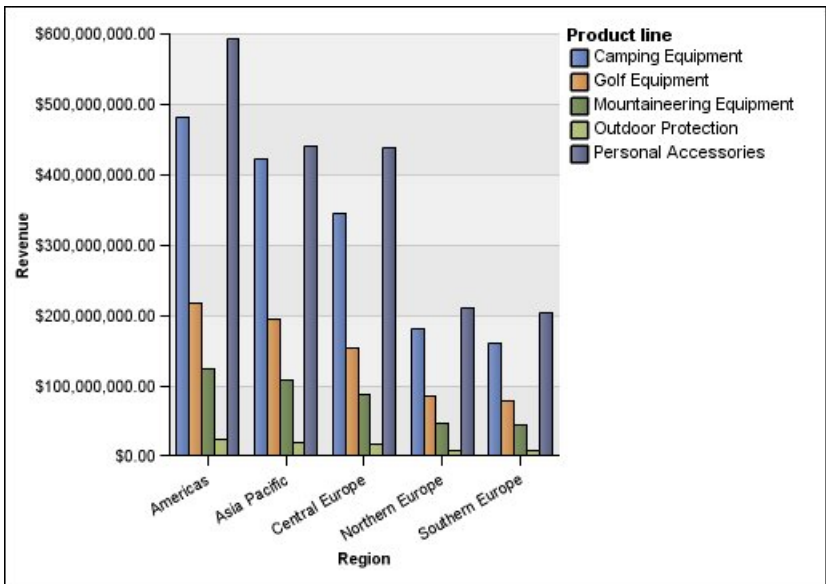


Figure 12. An example standard chart that compares specific values

Stacked Charts

Stacked charts are useful for comparing proportional contributions within a category. They plot the relative value that each data series contributes to the total. For example, a stacked column chart that plots product line sales will emphasize the proportion that each product line contributes to the total in each territory.

You can distinguish each data series by the color or pattern of its section in the stack. The top of each stack represents the accumulated totals for each category.

Do not use the stacked configuration in line charts that have multiple data series because it is difficult to distinguish between unstacked and stacked configurations, and your chart consumers might misunderstand your data.

The following example shows that camping equipment contributed a large proportion of the actual revenue in most sales territories.

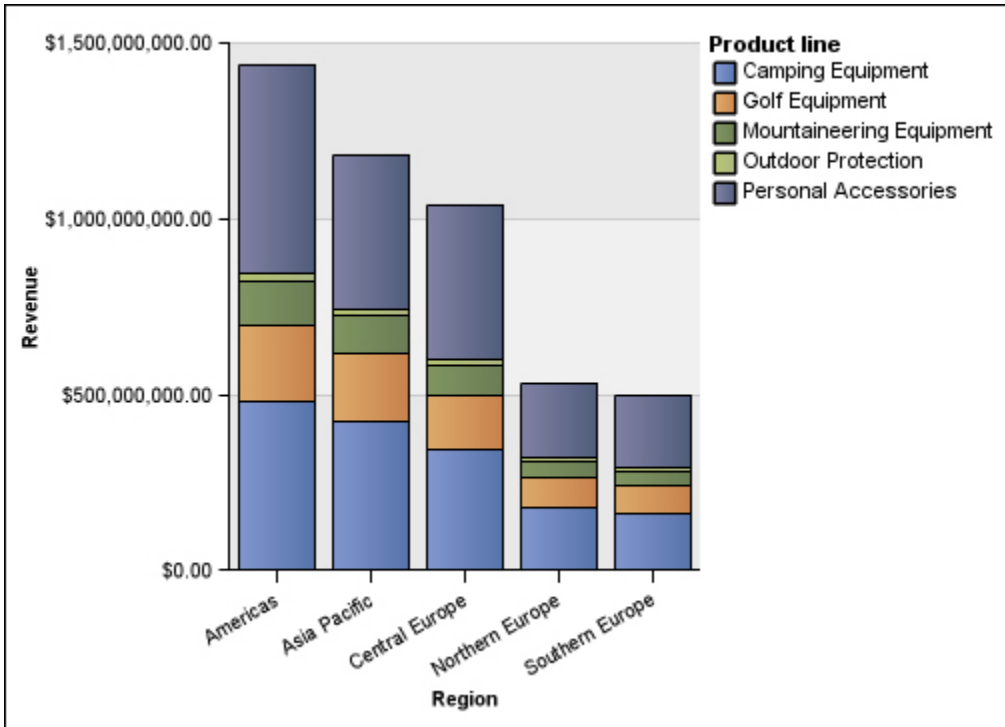


Figure 13. An example stacked chart

100 Percent Stacked Charts

100 percent stacked charts are useful for comparing proportional contributions across all categories. They plot the relative contribution of each data series to the total as a percentage. For example, a 100 percent stacked column chart that plots product line sales emphasizes the percentage within each region without referring to actual values.

You can distinguish each data series by the color or pattern of its section in the stack. Each stack represents 100 percent.

100 percent stacked charts highlight proportions. When actual values are important, use another chart configuration.

The following example shows the percentage of sales for each product line in each region.

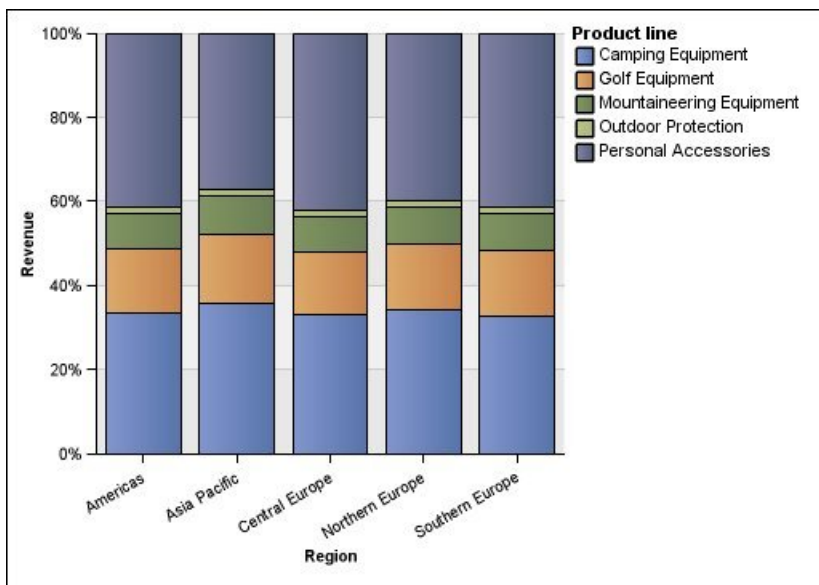


Figure 14. An example 100 percent stacked chart

Three-dimensional Charts

Three-dimensional charts provide a visually effective display that is suitable for presentations.

Three-dimensional column, bar, line, and area charts plot data by using three axes.

Three-dimensional pie charts have a three-dimensional visual effect.

Do not use three-dimensional charts when you need to show exact values, such as for control or monitoring purposes. The distortion in three-dimensional charts can make them difficult to read accurately. For example, the following chart shows actual revenue for each product line in each territory, but some data labels are omitted because there is not enough room to display them all.

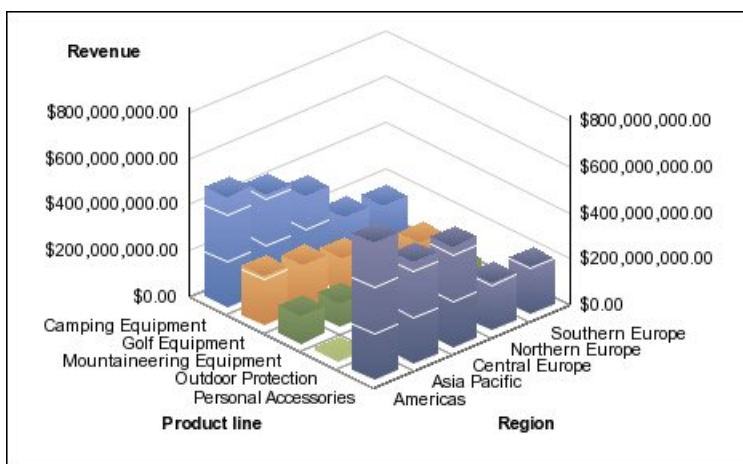


Figure 15. An example three-dimensional chart


Convert Charts From One Type to Another

You can convert a chart from one type (for example, a bar chart) to another type (for example, a line chart).

When you convert an existing chart to a new chart type, IBM Cognos Analytics - Reporting keeps the properties from the existing chart if those properties exist in the new chart type. For example, if you convert a pie chart to a bar chart, Reporting maps your chart palette to the new chart, but does not map the exploding slices, because the exploding slices property does not exist in a bar chart.

Note: Reporting converts legacy charts to the current default chart types automatically if you change the chart type unless you select the **Use legacy chart authoring** option. You can convert legacy charts to current default charts, but you cannot convert current default charts back to legacy charts.

Procedure

1. Click a chart and, from the report object toolbar, click the **Change chart type** icon .
2. From the list, select a new chart type.

If some chart properties cannot be converted, the **Chart Property Changes** dialog box appears notifying you of the properties that cannot be converted.

Customizing chart properties

After you create a chart, you can customize it by changing its properties.

You select the chart object in IBM Cognos Analytics - Reporting to view its properties. Some properties are dependent on the existence of other properties.

Note: Make sure your report is in **Page design** mode.



If you are familiar with using conditional variables, you can customize the chart to change its appearance or provide information in response to expressions or conditions.

As you edit the chart properties, Reporting provides you with a preview of your chart, using simulated data. This allows you to view your style changes without running the report. You can disable the chart preview in the options.

The following table shows some of the properties you can change in charts. These properties are available when you select the chart object unless specified otherwise in the **Action to perform in the Properties pane** column.

| Goal | Action to perform in the Properties pane |
|--|---|
| Hide or show the title, subtitle, or footer | Select the chart. Under Chart Titles , set the Title , Subtitle , or Footer property. |
| Hide or show the legend | Select the chart. Under Chart Annotations , set the Legend property. For more information, see “Customize the Legend in a chart” on page 214. |
| Hide or show baselines | Select the chart. Under Chart Annotations , set the Baselines property. For more information, see “Adding a baseline to a chart” on page 217. |
| Increase the contrast of the labels | Select the chart. In the Properties pane, under Label , select Contrast label color . |
| Add a shadow to the labels to increase the visibility. | Select the chart. In the Properties pane, under Label , select Label shadow . |
| Hide or show trendlines or regression lines | Select the chart. Under Chart Annotations , set the Trendlines or Regression Line property. For more information, see “Display Trendlines in charts” on page 220. |

| Goal | Action to perform in the Properties pane |
|--|--|
| Hide or show markers | <p>Select the chart. Under Chart Annotations, set the Markers property.</p> <p>For more information, see “Add a Marker to a chart” on page 219.</p> |
| Hide or show notes | <p>Select the chart. Under Chart Annotations, set the Notes property.</p> <p>For more information, see “Add a note to a chart” on page 215.</p> |
| Hide or show the axes | <p>Select the chart. Under Axes, set the Y1 Axis, Y2 Axis, or Category Axis property.</p> <p>For more information, see “Customize the Axes of a chart” on page 210.</p> |
| Hide or show the axis title or axis line | <p>Select the axis. Under General, set the Axis Line or Axis Title property.</p> <p>For more information, see “Customize the Axes of a chart” on page 210.</p> |
| Change an axis title | <p>Select the axis title. Under General, set the Default Title property to No, and then double-click the axis title and type a new title.</p> <p>Tip: You can use the Properties pane to change the axis title properties, such as font, positioning, color, and so on.</p> <p>For more information, see “Customize the Axes of a chart” on page 210.</p> |
| Change axis properties, such as range, scale interval, and so on | <p>Select the numeric axis. Under General, set the Minimum Value, Maximum Value, Scale Interval, or Scale property.</p> <p>For more information, see “Change the axis scale of a chart” on page 211.</p> |
| Hide or show the tooltips | <p>Select the chart. Under Chart Labels, set the Tooltips property.</p> <p>When you pause your pointer over a data marker in the report output, the corresponding absolute or cumulative value appears in a tooltip.</p> <p>Tooltips are not supported in PDF output.</p> |
| Change the data format | <p>Select the numeric axis. Under Data, set the Data Format property.</p> |


| Goal | Action to perform in the Properties pane |
|--|--|
| Change the white space around the chart | <p>Select the chart. Under Box, set the Padding or Margin property.</p> <p>For more information, see “Apply Padding to an Object” on page 390 and “Set Margins for an Object” on page 391.</p> |
| Change the color or pattern in the palette for columns, lines, and areas | <p>Select the chart object. Under Color & Background, set the Palette or Conditional Palette property.</p> <p>For more information, see “Customizing the Color Palette of a Chart” on page 204 and “Create a Simple Conditional Palette for a Chart” on page 206.</p> |
| Change the chart orientation | <p>Select the chart. In the Properties pane, under Chart Orientation, select Vertical or Horizontal.</p> |
| Change the default color or font for all chart objects | <p>Select the chart. Under Color & Background, set the Background Color, Foreground Color, or Fill Effects property.</p> <p>Under Font & Text, set the Font or Relative Alignment property.</p> <p>Tip: The 2011 Quarterly Sales Forecast sample report in the GO Sales (analysis) package includes text alignment.</p> |
| Override the default font or color for axes and chart values | <p>Click the Show properties icon , click the Locked icon  to unlock the chart object, select the chart body by clicking between the axes, and set the Font, Background Color, Foreground Color, or Fill Effects property.</p> |
| Change the three-dimensional appearance of a chart | <p>Select the chart. Under General, set the Depth or Visual Angle property.</p> <p>For example, for a pie chart, a Depth value of 0 (zero) leaves the pie flat, or two-dimensional. A value of 100 raises the pie almost to a sphere.</p> <p>Tip: You can select a value from the Depth list or type a value that is not listed.</p> |
| Insert a background image or watermark in the chart body. | <p>Click the lock button in the toolbar to unlock the chart object, select the chart body by clicking between the axes.</p> <p>Under Color & Background, set the Background Image property.</p> |
| Go to another report | <p>Select the chart. Under Data, set the Drill-Through Definitions property.</p> <p>For more information, see Chapter 20, “Drill through access,” on page 453.</p> |

| Goal | Action to perform in the Properties pane |
|--|---|
| Specify which labels and values to use when generating the text shown on the chart | Select the chart. Under Chart Labels , set the Values property. Note: When you show all the labels and values on some chart types, such as scatter charts, bubble charts, and polar charts, the text shown might be too long. |

Resize a chart

You can change the size of a current default chart by dragging the resize handle in the lower right corner of the chart.

Procedure

1. Select the chart object.
2. Click the resize handle in the lower right corner of the chart .
Use Shift+drag to maintain the aspect ratio of the chart.
3. To see the actual size of the chart as it will appear in the report output, collapse the chart objects with the minus (-) button in the upper left corner of the chart.

Results

The new chart size appears in the **Size & Overflow** property. You can also edit the chart size with this property.

Customizing the Color Palette of a Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart. For example, if "Telephone" is the first in a data series of order methods, and you want it to appear in blue, use the palette to make the first item in the series blue.

You can customize the color palette for area, bar, bubble, gauge, Pareto, pie, and scatter charts.

You can also apply background effects to chart objects or change the colors of specific chart elements.

Note: Your administrator can create custom palettes. For more information, see [Create Custom Palettes](#) in IBM Cognos 10 Report Studio. Although this document refers to Cognos BI 10.2.2, the information also applies to Cognos Analytics 11. The only difference is that, in Cognos 11, the location *install location\webcontent\pat* has changed to *install location\webcontent\bi\pat*.

Customize the Color Palette of a Chart


You can use the chart palette to control the colors or patterns that are used in the columns, lines, data markers, or areas in a chart.

Progressive charts and legacy charts have different steps.

If specified, the default color is used for outputs that do not support the palette definition. For example, if the palette is defined to use a radial rectangle gradient and you run the report as PDF output, the default color is used because radial rectangle gradients are not supported in PDF output.

Procedure

1. Select the chart object. For combination charts, select the bar, line, or area objects.

2. To choose a preset color palette, click **Chart palette presets**  on the style toolbar, and then click a palette.
3. To change the existing color palette:
 - In the **Properties** pane, under **Color & Background**, double-click the **Plot area fill** property.
 - In the **Fill Effects** dialog, select a fill type. The options in the **Fill type** list depend on the chart type you are using.


Linear Gradient displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.

Radial Line Gradient displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.

Radial Rectangle Gradient displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.

Pattern displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.

Color displays a solid color. You can specify the transparency.

Image displays an image. You can specify the image to use.
 - To change the color of this palette definition, click the color in the **Colors** list, click **Color**, specify the color properties, and click **OK**.
4. Under **Style**, depending on the chart type you are customizing and the fill type you chose in step 2, you can change the marker shape, line style, default color, and line weight.
5. To add a palette entry, click the **New** icon  and specify the new palette settings.
6. To change the order in which the colors, gradients, or patterns appear in the chart, use the arrow buttons under the **Palette** box to change their position.
7. To copy and paste a palette, open the palette dialog box and press Ctrl+C to copy the palette to the clipboard. Close the palette dialog box. Select another chart, open the palette dialog box, and press Ctrl+V to paste the palette from the clipboard.
8. To customize the data markers, on the **Properties** tab, depending on the chart type you are customizing and the fill type you chose in step 2, you can specify whether data markers are shown and change their color and size.

Customize the Color Palette of a Progressive Chart

You can use the chart palette to control the colors or patterns used in the columns, lines, data markers or areas in a chart.

Legacy charts and other types of current default charts have different steps.

If specified, the default color is used for outputs that do not support the palette definition. For example, if the palette is defined to use a radial rectangle gradient and you run the report as PDF output, the default color is used because radial rectangle gradients are not supported in PDF output.

Procedure

1. Select the progressive chart object.
2. In the **Properties** pane, double-click the **Progressive Palette** property.

You can specify the following:

- **Positive value fill** defines the appearance of the positive bars or columns on the chart.
- **Negative value fill** defines the appearance of the negative bars or columns on the chart.

- **First value fill** defines the appearance of the first bar or column on the chart.
 - **Total value fill** defines the appearance of the total bar or column on the chart, if a total bar or column is present.
3. To change the appearance of a fill:
- Click the colored box beside the fill name.
 - Click a fill type from the **Fill type** list.
- Linear Gradient** displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.
- Radial Line Gradient** displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.
- Radial Rectangle Gradient** displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.
- Pattern** displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.
- Color** displays a solid color. You can specify the transparency.
- Image** displays an image. You can specify the image to use.
- To change the color of this fill, click the color in the **Colors** list, click **Color**, specify the color properties, and click **OK**.
4. To change the text of the label that appears next to a bar, double-click the text box beside the fill name and specify the text.

Creating a Conditional Color Palette in a Chart


You can create a conditional palette to color data items in your chart in different ways depending on a condition. For example, in a column chart that shows revenue per month, you want to make the columns for the months that have a revenue greater than \$1000000 green.


You can also use conditional styles to highlight exceptional data and use conditions to control the layout of your report.

Create a Simple Conditional Palette for a Chart



You can create a simple conditional palette based on a string data item or a numeric data item. For example, if you want to create a condition to display only Revenues over one million dollars, you can create a numeric condition; whereas, if you want to create a condition to display only product codes with the letter A in them, you can create a string condition.

Procedure

1. Select the chart series to which you want to apply the conditional palette.
2. In the **Properties** pane, under **Conditional**, double-click the **Conditional styles** property.
3. Click the **New** icon  and click **New Conditional Style**.
4. If you want to create a conditional palette based on a string, do the following:
 - a) Select the string data item to determine the condition.
 - b) In the **Type of conditional style** list, click **String**, and click **OK**.
 - c) Click the new button and select how to define the condition:
 - To select more than one individual value, click **Select Multiple Values** and click the values.
 - To type specific values, click **Enter Values** and type the values.

- To specify your own criteria, such as values that begin with the letter A, click **Enter String Criteria** and specify the condition.
- d) Under **Palette Entry**, beside the new condition, click the edit button .
 - e) Define the palette entry fill type, colors, and angle, and click **OK**.
5. If you want to create a conditional palette based on a numeric range, date/time range, interval range, date range, or time range, do the following:
- a) Select a numeric data item to determine the condition.
 - b) In the **Type of conditional style** list, click the type of condition you want to create, and click **OK**.
 - c) Click the new button and type a value to define a threshold.
The value appears in the **Range** column, and two ranges are created.
 - d) For each range, under **Style**, click the edit button to define the palette entry fill type, colors, and angle, and then click **OK**.
 - e) Repeat the previous substeps to add other conditions.

Tip: Under **Style**, pause the pointer over each range  to see the condition produced for that range.




- f) If you want to use the default palette for the lowest range instead of specifying a conditional palette select the **Use default palette for lowest range** check box.
 - g) To move a value above or below a threshold, click the arrow button  next to the value.
For example, you insert a threshold value of five million. By default, the ranges are less than or equal to five million and greater than five million. Moving the five million value above the threshold changes the ranges to less than five million and greater than or equal to five million.
6. To customize the label for a conditional palette, do the following:
- a) Click **Label** beside the palette entry.
 - b) In the **Conditional Palette Entry Label** dialog box, click **Specified text** and click the ellipsis button.
 - c) Type the default label text in the **Label** text box.
 - d) To add customized labels for other languages, click the **Add** icon , select the other languages, and click the language to define the customized label for that language.
7. Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

Create an Advanced Conditional Palette for charts

Advanced conditions allow you to use a calculations or expression to evaluate the condition. If multiple advanced conditions are met, only the first conditional style is applied.

Procedure

1. Select the chart series to which you want to apply the conditional palette.
2. In the **Properties** pane, under **Conditional**, double-click the **Conditional styles** property.
3. Click the **Add** icon  and click **Advanced Conditional Style**.
4. Click the new advanced condition icon  and specify the expression that defines the condition.
The new advanced condition appears in the **Conditional Style - Advanced** dialog box.
5. Under **Palette Entry**, beside the new advanced condition, click the edit button .
6. Define the palette entry fill type, colors, and angle, and click **OK**.

- Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

Change a Chart Background in a chart

You can use a gradient, pattern, color, or image to customize the chart background.

Procedure

- Click the chart object.
- Click the **Show properties** icon , click the **Locked** icon , select the chart body by clicking between the axes, and, in the **Properties** pane, under **Color & Background**, double-click the **Plot Area Fill** property.
- Click a fill type from the **Fill type** list.

- Linear Gradient** displays a gradient that changes color horizontally. You can specify the position of each color in the gradient and add or remove colors from the gradient.
- Radial Line Gradient** displays a gradient that changes color outwards from a central point, or focus. You can specify the position of each color in the gradient and the size and position of the focus. You can also add or remove colors from the gradient.
- Radial Rectangle Gradient** displays a gradient that changes color outwards from a rectangle. You can specify the position of each color in the gradient and the size of the rectangle. You can also add or remove colors from the gradient.
- Pattern** displays a colored pattern that you choose from a preset list. You can specify the foreground and background colors.
- Color** displays a solid color. You can specify the transparency.
- Image** displays an image. You can specify the image to use.

Add colored regions in a chart

You can define colored regions in the body of a chart. For example, you can divide the background of a scatter chart into quadrants and color each quadrant.

You can add colored regions to bubble, bullet, combination, Pareto, progressive column, and scatter charts.

In bullet charts, colored regions are automatically added.


You can use the following criteria to position the colored regions.

| Option | Position |
|----------------------------|--|
| Percent on Axis (%) | Uses a percentage of the full range of the axis. For example, if the axis range is -500 to 1100, a Percent on Axis value of 25% puts the baseline at -100 (25% of the range, 1600). |
| Numeric Value | Uses a static numeric value. |
| Mean | Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis. |
| Percentile (%) | Uses a specified percentile. |

| Option | Position |
|----------------------------|--|
| Statistical Maximum | <p>Uses the following expression:</p> $25\text{th percentile value} - 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [2.5 -1.5(5) = -5].</p> |
| Statistical Minimum | <p>Uses the following expression:</p> $75\text{th percentile value} + 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [7.5 +1.5(5) = 15].</p> |
| Query Calculation | <p>Uses a query calculation from the same query or from a different query. For more information, see “Using relational calculations” on page 306.</p> |
| Layout Calculation | <p>Uses a layout calculation. For more information, see “Using relational calculations” on page 306.</p> |
| Category Index | <p>Specifies a position based on the index value of the data item in the categories axis. The value must be between 0 and 100.</p> <p>For example, a Category index value of 1 indicates that the position is located at the first data item. This is the default.</p> |

You can also combine colored regions with grid-lines.

Procedure

1. Click the chart object.
2. In the **Properties** pane, under **Color & Background**, double-click the **Colored Regions** property.
3. Click the **New** icon .
4. Under **Region label**, type a name for the region.
5. Under **Label location**, specify whether the label should appear in the legend or in the chart.
6. If your chart includes multiple charts, such as in a combination chart, under **Based on**, select the chart to which the colored regions apply.
7. Under **Region fill**, click the color box to specify the color and fill effects.
8. Specify the start and end of the category and numeric positions.
9. If you want to add more colored regions, repeat steps 3 to 5.
10. If you add more than one colored region, specify their order using the up and down arrows.

The regions are drawn in the same order that they appear in this list. The first region is drawn first, on the bottom, and the last region is drawn on top of the other regions.

Tip: To delete a colored region, click the colored region icon and text and click the delete button .

Results

The new region appears in the **Colored regions** box.

Specify Custom Label Text

By default, chart labels use the name of the underlying data item label. You can change the label text to make it more meaningful. For example, you can rename a chart item labeled **ISO_3_Letter_Code** to **Country or Region**.

If you specify custom labels for a microchart or win-loss charts, the custom labels appear in the tooltips, not on the chart itself.

Procedure

1. Click the chart node member or measure.
2. In the **Properties** pane, under the **Chart Labels**, set the **Custom Label** property to **Show**.
A new chart text item appears above the default measure or below the chart node member.
3. Do one of the following:
 - To change the text of the label, double-click the chart text item and type the text.
 - To change the source of the label text, select the new chart text item. In the **Text Source** section of the **Properties** pane, set the **Source Type** property.

If nothing is specified in the new chart text item, the label appears blank.

Tip: To remove a custom label, set the **Custom Label** property to **Hide**.

Customizing the Axes of a Chart

Chart axes are lines that border the chart area and provide a reference for measurements. They act as a vehicle for tick marks and scales and form a frame around the chart. The Y-axis is usually the vertical axis and contains data. The X-axis is usually the horizontal axis and contains categories.

To make your chart data easier to understand, you can do the following to customize each axis:

- show or hide the axis labels (data values)
- show or hide the axis line
- change the color, style, and weight of the axis line
- show or hide major and minor tick marks and specify where to display them

In HTML/PDF, if you have a report with a line chart, you can use the **Include Zero For Auto Scale** property to adjust the scale of the Y-axis of the chart. If the difference between your measure's maximum/minimum values is much less than the difference between your measure's minimum value and zero, using this property will make the chart Y-axis begin at something closer to your measure's minimum value, making the line utilize all of the chart's vertical space. In some cases this is significant in improving the readability of the chart.

Customize the Axes of a chart

You can customize the axis labels, axis lines, and minor and major tick marks.

You can change the scale for the major and minor tick mark using the **Axis Range** property.

Procedure

1. Select the Y-axis or the X-axis of the chart.
2. To show or hide the axis labels, in the **Properties** pane, set the **Show labels** property.

3. If your chart includes nested categories, to change how the category axis labels are displayed, set the **Nested Label Display** property.
4. To show or hide axis lines, in the **Properties** pane, select or clear the **Show lines** check box.
5. To change the color, style, and weight of the axis line, in the **Properties** pane, set the **Line color** property.
6. To show or hide minor and major tick marks and specify their location, in the **Properties** pane, set the **Show ticks** property.

Change the axis scale of a chart

By default, IBM Cognos Analytics - Reporting automatically determines the minimum and maximum scale values for the numeric axes in a chart. For example, a Y-axis showing revenue values might have an axis range of zero dollars to one million dollars. You can customize the axis scale, or range, to make your chart easier to understand.

You can specify the following for each numeric axis:

- the maximum and minimum values of the range
- whether to include zero in an automatic axis range
- whether to use a logarithmic scale, if the values in the chart cover a very large range
- how often major and minor gridlines appear

Logarithmic scales can be useful when some of the data you are displaying is much less or much more than the rest of the data or when the percentage or ratio differences between values are important.

A logarithmic scale in Reporting shows the base value of 10 raised to the power of a value. For example, 10 has a logarithm of 1 because 10 raised to the power of 1 is 10, 100 has a logarithm of 2 because 10 raised to the power of 2 is 100, and so on.

For example, the following chart is using a normal scale:

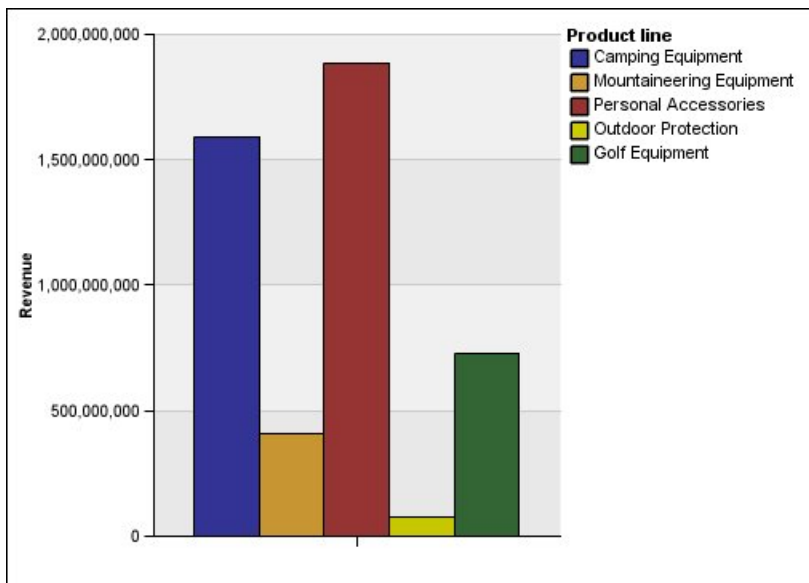


Figure 16. Chart with a normal axis range

In this chart, the Y-axis shows values up to 2,000,000,000 with evenly spaced intervals of 400,000,000. However, the Outdoor Protection column is so much less than the other columns that it is difficult to compare them.

The following is the same chart using a logarithmic scale:

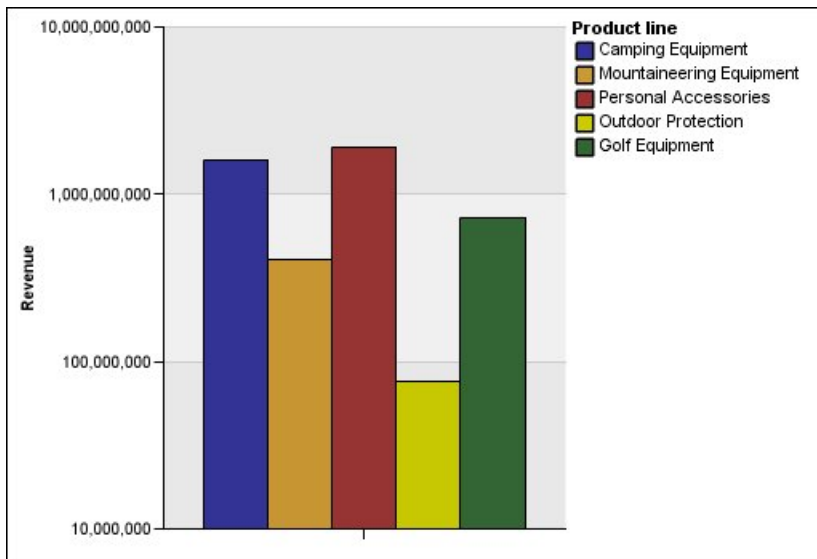


Figure 17. Chart with a logarithmic axis range

In this chart, the Y-axis still shows the same revenue values, but the intervals reflect a logarithmic scale, which increases exponentially. You can now compare all the product lines because none of the product lines have much higher or much lower values than the others.

Logarithmic scales can also be useful when the percentage or ratio differences between values are important. For example, if the logarithmic scale chart above represents data from 2011, and you add data from 2012 as a second set of colored bars, you could see the differences between the 2011 revenue and 2012 revenue. In a logarithmic scale, differences between values on the Y-axis represent the same percentage for each bar. So if the 2011 and 2012 data differs by the same distance for each product line, you could deduce that your revenue went up by the same percentage for each product line. This would not be clear on a normal scale.

Procedure

1. Select the Y-axis or the X-axis of the chart.
2. In the **Properties** pane, under **General**, double-click the **Axis Range** property.
3. To set a maximum value for this axis, under **Maximum**, click **Manual**, and then type a maximum value in the **Manual** box.

Note: You can use either a positive or negative value as the maximum value.
4. To set a minimum value for this axis, under **Minimum**, click **Manual**, and then type a minimum value in the **Manual** box.

Note: You can use either a positive or negative value as the minimum value.
5. To include zero on this axis, select the **Include zero** check box.
6. To use a logarithmic scale for this axis, select the **Logarithmic scale** check box.

Note: If you choose to use a logarithmic scale, ensure that your chart consumers know that the scale is logarithmic by including that information in the axis title or in a note on the chart.
7. To set the position of major gridlines and tick marks, under **Major interval**, click **Manual**, and then type the distance between major gridlines and tick marks in the **Manual** box.

The distance between major gridlines and tick marks is measured in the units of that axis. For example, if the axis is revenue in dollars, type the dollar value in the **Manual** box.
8. To add minor gridlines, type the number of minor gridlines that you want to see between each major gridline in the **Number of minor intervals** box.

Showing Gridlines in a Chart

To make the data in a chart that includes axes easier to read, you can show horizontal and vertical gridlines. You can show gridlines for the major or minor intervals on the axes.

You cannot show gridlines for chart types that do not display axes, such as pie and donut charts.

Show Gridlines in a chart

You can also show alternating bands of color in the chart background that correspond to your axis grid lines.

You can change the scale for the major and minor gridlines using the **Axis Range** property.

Procedure

1. Select the Y-axis or the X-axis of the chart.
2. To show alternating bands of color as your chart background, do the following:
 - a) In the **Properties** pane, double-click the **Gridlines** property.
 - b) Select the **Show alternating color bands** check box.
 - c) Set the color and transparency of the first and second colors.
3. To show major gridlines as your chart background, do the following:
 - a) In the **Properties** pane, double-click the **Gridlines** property.
 - b) Select the **Show major gridlines** check box.
 - c) Set the color, style, and weight of the major gridlines.
 - d) If you are working with a gauge chart, specify the length of the gridline.
4. To show minor gridlines as your chart background, do the following:
 - a) In the **Properties** pane, double-click the **Minor gridlines** property.
 - b) Select the **Show minor gridlines** check box.
 - c) Set the color, style, and weight of the minor gridlines.
 - d) If you are working with a gauge chart, specify the length of the gridline.
 - e) To specify by how many minor intervals to divide the major intervals, in the **Properties** pane, type a number in the **Number of Minor Intervals** property.
5. To specify the color, style, and weight of major gridlines do the following:
 - a) Select the **Show major gridlines** check box.
 - b) Click **Line color** and choose a color for the major gridlines.
 - c) To specify the thickness of the gridlines, click **Point size** and select a line weight from the list.
 - d) Click a line style in the **Line style** list.
6. To specify the color, style, and weight of minor gridlines:
 - a) In the **Properties** pane, under **General**, double-click the **Minor Gridlines** property.
 - b) Select the **Show minor gridlines** check box.
 - c) Click **Line color** and choose a color for the minor gridlines.
 - d) To specify the thickness of the gridlines, click **Point size** and select a line weight from the list.
 - e) Click a line style in the **Line style** list.
 - f) To change the transparency of the gridlines, type a percentage in the **Transparency** box.

Customize the Legend in a chart

You can hide or show the legend and change its position relative to the chart area, chart body, or a data item. For example, in a bar chart showing revenue for each product line by country or region, you could use the expression [Country or Region] = 'Canada' to position the legend relative to the Canada bar.

Note: When you choose a preset legend position, that position appears inside any padding that you have added to the chart object. Customized legend positions do not include any chart padding.

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Legend** property.
3. To show the legend on the chart, select the **Show Legend** check box.
4. To choose a preset legend position, click **Preset** and click a position from the diagram.
5. To choose a customized legend position, do the following:
 - a) Click **Advanced** and click the ellipsis button.
 - b) To display the legend at a set distance from the sides of the chart area, from the **Anchor** list, click **Relative to Chart**.
 - c) To display the legend at a set distance from the sides of the chart body, from the **Anchor** list, click **Relative to Chart Body**.
 - d) To display the legend at a set distance from a data item, such as a specific pie slice in a pie chart, from the **Anchor** list, click **Report Expression**, click the ellipsis button beside **Expression**, and enter an expression in the **Report Expression** dialog box.
 - e) Set the horizontal and vertical distances from the anchor.

Customize the Items in the Legend of a chart

If your legend includes items that are too long, you can truncate long legend items at a specific number of characters.

For example, if you want an ellipsis to appear at the end of each truncated legend item, type ... in the **Truncation text** box.

You can also show the values of the data items in your legend.

Procedure

1. Select the legend.
2. To truncate the legend
 - a) In the **Properties** pane, under **General**, double-click the **Text Truncation** property.
 - b) To specify the number of characters at which the legend items are truncated, click **Manual** and type the number of characters in the **Maximum characters** box.
 - c) To shrink the font of the legend item text until all the text fits in the legend, select the **Shrink font as needed** check box.
 - d) To specify some text to appear at the end of truncated legend items, in the **Truncation text** box, type the text that you want to appear at the end of truncated items.
3. To show the values of legend items within the legend
 - a) In the **Properties** pane, under **General**, set the **Show Values** property.

First Value and **Last Value** refer to the first and last item in the child set under the legend data item. **Minimum Value** and **Maximum Value** refer to the lowest and highest value in the child set under the legend data item.

- b) If you want to change the separator between the legend item and value, type a new separator in the **Legend Separator** property.
- 4. To customize the title of the legend
 - a) Click the default legend title area in the work area.
 - b) In the **Properties** pane, under **General**, set the **Default Title** property to **No**.
 - c) Double-click the default legend title area in the work area and type the new title.

Adding a note to a chart

Add a note to a chart to provide additional detail. Notes appear as text in a chart.

By default, notes are aligned in the first part of the chart object. When you add a note to a chart, you can set the note's position relative to the sides of the chart area or chart body. You can also use a report expression to position the note next to a data item within the chart. For example, in a bar chart showing revenue for each product line by country or region, you could type [Country or Region]='Canada' to position the note relative to the Canada bar.

Notes overwrite whatever is under them so you must position them properly.


If you apply more than one note, ensure that each note has a different position in the report so that they do not overwrite each other. You can also specify the order that they should be drawn in when the report runs. If you have two notes with the same coordinates, the first one in the list is drawn first and the next one is drawn before the first.


Tip: The Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package includes a note.


Add a note to a chart

You can add and position multiple notes on your chart.


Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Notes** property.
3. Click the **New** icon .
4. Type the note text in the **Text** box and click **OK**.

Tips: To delete a note, click the note and click the delete button . To move a note up or down in the list, click the up or down arrows.

5. In the **Notes** dialog box, click **OK**.
6. To position the note, do the following:
 - a) Click the note icon  in the list of notes.
 - b) In the **Properties** pane, under **Positioning**, double-click the **Position** property.
 - c) To align the note horizontally, click the left, center, or right alignment button.
 - d) To align the note vertically, click the top, middle, or bottom alignment button.
 - e) To set the margins around the chart body, type margin values and choose margin units.
 - f) To display the note at a set distance from the sides of the chart area, from the **Anchor** list, click **Relative to Chart**.
 - g) To display the note at a set distance from the sides of the chart body, from the **Anchor** list, click **Relative to Chart Body**.

h) To display the note at a set distance from a data item, from the **Anchor** list, click **Report Expression**, click the ellipsis button beside **Expression**, and enter an expression in the **Report Expression** dialog box.

7. To edit the text, double-click the text next to the note object  in the chart.

Baselines

Baselines are horizontal or vertical lines that cut through the chart to indicate major divisions in the data. For example, you can add a baseline to show a sales quota or break-even point.

Each baseline represents a value on an axis.

Depending on the type of chart, you can use the following options to position the baseline.

| Option | Description |
|---------------------------|--|
| Numeric Value | Uses a static numeric value. |
| Query Calculation | Uses a query calculation from the chart query or from a different query. For more information, see “Using relational calculations” on page 306 . |
| Layout Calculation | Uses a layout calculation. For more information, see “Using relational calculations” on page 306 . |
| Category Index | Uses the index value of the data item in the categories axis. For example, a Category index value of 1 indicates that the baseline is located at the first data item. This is the default. |
| Member Value | When working with dimensional data sources, uses a position relative to a member. For example, a member calculation that uses an expression similar to [Query1].[Current year]=2011 places the baseline in the middle of the chart object that represents 2011. To place the baseline between 2011 and 2012 on the chart, a half member width after, set the Member Offset property to 50%. To place the baseline between 2010 and 2011, set the Member Offset property to -50%. You can also type in 100, -200, and so on to place the baseline on the chart. |

| Option | Description |
|----------------------------|---|
| Statistical Limit | <p>Statistical minimum uses the following expression:</p> $25\text{th percentile value} - 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [2.5 - 1.5(5) = -5].</p> <p>Statistical maximum uses the following expression:</p> $75\text{th percentile value} + 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [7.5 + 1.5(5) = 15].</p> <p>Statistical minimum and Statistical maximum use percentiles to determine values, so the baseline might not appear on the chart if its value is off the axis.</p> |
| Mean | Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis. |
| Percentile (%) | Uses a specified percentile. |
| Percent on Axis (%) | <p>Uses a percentage of the full range of the axis.</p> <p>For example, if the axis range is -500 to 1100, a Percent on Axis value of 25% puts the baseline at -100 (25% of the range, 1600).</p> |

If you apply more than one baseline, you can specify the order in which they should be drawn when the report runs. If you have two baselines with the same coordinates, the first one in the list is drawn first and the next one is drawn before the first one.

By default, the baseline and its label appear in the legend.


Baselines do not support color transparency.

Tip: The Positions to Fill sample report in the GO Data Warehouse (analysis) package includes a baseline.

Adding a baseline to a chart

In charts, you can define baselines by values on the numeric axis or the category axis.

Procedure

1. Click the chart object.
2. Depending on your chart and the type of baseline you want to add, in the **Properties** pane, under **Chart Annotations**, double-click the **Numeric Baselines** or **Category Baselines** property.
3. Click the **New** icon  and choose the type of baseline from the list.
4. Specify the necessary criteria for the baseline position



5. Under **Baseline Properties**, type a label for the baseline and specify the line style.

Tip: To remove the baseline from the legend, delete the label.




6. If you add more than one baseline, specify their order using the up and down arrows.

The new baselines appear in the **Markers, notes, baselines, and trendlines** box.

7. To change the label that appears next to the baseline, under the **Markers, notes, baselines, and**

trendlines box, double-click the placeholder text next to the baseline icon   and type your text.

8. To change the line style, select the chart and in the **Properties** pane, under **Chart Annotations**, double-click the **Baselines, Numeric Baselines**, or **Category Baselines** property.

9. To delete a baseline, select the baseline icon   and click the delete button .

Adding markers to charts

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

For example, you might want to add a marker to designate the time when a significant event happened, such as the date when a new product was launched.

You can add a marker to combination, progressive column, Pareto, scatter, and bubble charts.

When you define the position of the marker, you define the X- and Y-axes coordinates for the placement of the symbol. You can position the marker in the chart using the following options.

| Option | Position |
|----------------------------|--|
| Numeric Value | Uses a static numeric value. |
| Query Calculation | Uses a query calculation from the same query or from a different query. For more information, see “Using relational calculations” on page 306 . |
| Layout Calculation | Uses a layout calculation. For more information, see “Using relational calculations” on page 306 . |
| Statistical Minimum | <p>Uses the following expression:</p> $25th\ percentile\ value - 1.5 * (75th\ percentile\ value - 25th\ percentile\ value)$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical minimum is -5 [2.5 - 1.5(5) = -5].</p> <p>Statistical minimum uses percentiles to determine values, and might not always appear in the chart if the values are off the axis.</p> |

| Option | Position |
|----------------------------|--|
| Statistical Maximum | <p>Uses the following expression:</p> $75\text{th percentile value} + 1.5 * (75\text{th percentile value} - 25\text{th percentile value})$ <p>For example, if 2.5 is the 25th percentile and 7.5 is the 75th percentile, the statistical maximum is 15 [7.5 + 1.5(5) = 15]. Statistical maximum uses percentiles to determine values, so the marker might not always appear on the chart if its value is off the axis.</p> |
| Mean | Uses the statistical mean plus or minus a number of standard deviations based on all charted data values on the specified axis. |
| Percentile | Uses a specified percentile. |
| Percent on Axis | Uses a percentage of the maximum axis value. |


If you apply more than one marker, you can specify the order in which they should be drawn when the report runs. If you have two markers with the same coordinates, the first one in the list is drawn first and the next one is drawn after the first.

Add a Marker to a chart

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

Note: Current default scatter charts have a different set of steps.

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Markers** property.
3. Click the **New** icon , and then set the marker properties
4. In the **Based on** box, select the chart object that will determine the marker position.
5. In the **Numeric position** box, specify how you want to define the position on the numeric (Y) axis.
6. In the **Category position** box, specify how you want to define the position on the category (X) axis.
7. In the **Marker label** box, type the label that you want to give to the marker.
8. In the **Marker size** box, specify the size of the marker symbol.
9. To specify the color, fill, and shape of the marker symbol, click the **Color and style** box.
10. If you add more than one marker, specify their order by using the up and down arrows.

The new markers appear in the **Markers, notes, and baselines** box.


Tip: To delete a marker, click the marker icon and text and click the delete button .

11. Run the report.

Add a Marker to a Scatter Chart

Markers are symbols that you add to a chart to designate points of significance that can help you analyze or understand the data.

Procedure

1. Select the scatter chart object.
2. In the **Properties** pane, under **Chart Annotations**, double-click the **Markers** property.
3. Click the **New** icon , and then set the marker properties.
4. In the **X-axis position** box, specify how you want to define the position on the X-axis.
5. In the **Y-axis position** box, specify how you want to define the position on the Y-axis.
6. In the **Marker label** box, type the label that you want to give to the marker.
7. In the **Marker size** box, specify the size of the marker symbol
8. To specify the color, fill, and shape of the marker symbol, click the **Marker color and style** box.
9. If you add more than one marker, specify their order using the up and down arrows.

The new markers appear in the **Markers, notes, and baselines** box.

Tip: To delete a marker, click the marker icon and text and click the delete button .

Display Trendlines in charts

You can display or hide trendlines in the current default bar, line, area, bubble, or scatter charts.

Trendlines, also known as lines of best fit or regression lines, graphically illustrate trends in data series and are commonly used when charting predictions. A trendline is typically a line or curve that connects or passes through two or more points in the series, showing a trend.

You can specify the following types of trendlines:

- **Linear**

Use a linear trendline when your data increases or decreases along a straight line at a constant rate. For example, if your chart displays a steady increase in revenue by product line over time, you could use a linear trendline.

- **Exponential**

Use an exponential trendline when your data values increase or decrease exponentially, or at an increasingly higher or lower rate. For example, if your chart displays an exponential increase in revenue by product line over time, you could use an exponential trendline.

- **Polynomial**

Use a polynomial trendline when your data values both increase and decrease. For example, if your chart displays both increases and decreases in revenue by product line over time, you could use a polynomial trendline.

- **Logarithm or Natural Logarithm**

Use a logarithmic trendline when your data values increase or decrease rapidly and then level out. For example, if your chart displays a rapid decrease in revenue by product line over time and then a plateau, you could use a logarithmic trendline.

- **Power**

Use a power trendline when your data values increase or decrease in a curve at a steady rate. For example, if your chart displays a steady increase in revenue by product line over time and your data points will fit a curved line, you could use a power trendline.


- **Moving Average**

Use a moving average trendline when your data values fluctuate and you want to smooth out the exceptions to see trends. For example, if your chart displays wild fluctuations in revenue by product line over time, but you know that some data points are exceptions, you could use a moving average trendline.

If you are not sure which trendline type to use, try each type to see which one best fits most of your data points. For example, a linear trendline will not fit most points on a scatter chart with widely spread data points.

Trendlines do not support color transparency.

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Annotations**, double-click the **Trendlines** property.
3. Click the **New** icon  and click a trendline type.
4. Define the trendline by specifying the following options. The options that are available depend on the type of trendline you chose.
 - To set the order, or degree, of a polynomial trendline, in the **Order** box, type a value between 2 and 6.
 - To set the number of periods to go back in a moving average trendline, in the **Periods** box, type a value.
 - If you have more than one series on your chart, in the **Based on** list, click the data you want to use for the trendline.
 - Click either **One trendline for all series items** or **A trendline for each series item**.
 - To customize the style of the trendlines, click **Line Styles** and customize the line color, weight, and style.
 - To customize the trendline labels in the legend, click **Label** and choose **None**, **Automatic**, or **Custom**.
 - To display the trendline equation, click **Show equation**, and then click **Show in legend** or **Show on chart**, and then click **Position** to define the equation's position on the chart.
 - To display the R-squared value of the trendline, click **Show R-squared value**, and then click **Show in legend** or click **Show on chart** and then click **Position** to define the position of the value on the chart.

Showing data labels or values in charts

You can show the data labels or data values within the chart so that the data values are clearer.

For example, you can display the data values above each column in a column chart to show the exact height of each column.

Procedure

1. For a bar, column, line, or area chart, under **Series**, select the chart type icon.
2. For a bubble, scatter, Pareto, or progressive chart, click the chart.
3. In the **Properties** pane, under **Chart Labels**, double-click the **Show Values** property.
4. For bar, column, line, area, Pareto, or progressive charts, to specify the data label format, in the **Values** list, select what values to display.
 - **None** does not display data values.
 - **Values** displays the non-cumulative value of the data.
 - **Cumulative values** displays the cumulative value of the data.
5. For bubble or scatter charts, to specify the data label format, in the **Show** box, select whether to show values or values and labels for the category, series, and measure.
6. For bar, column, line, area, Pareto, or progressive charts, to show lines that point from data labels to data marker they apply to, select the **Show leader lines** check box.

7. For bubble or scatter charts, to show lines that point from data labels to data marker they apply to, select the **Leader lines** check box.
8. To specify where values and labels are to be rendered in the chart, click the **Value Location** list and choose the location that you want.
9. To specify how to display the labels if their positions on the chart overlap, in the **Collision Mode** list, click one of the following modes:
 - **None** specifies that labels appear in default positions and might overlap.
 - **Normal** (for pie and donut charts) specifies that labels are placed just above their corresponding data markers or chart objects. There is no collision detection, so labels can overlap.
 - **Coarse Stagger** specifies that labels are placed close to their data markers and staggered so that they do not overlap. This collision mode takes less time to render than **Fine Stagger** but might result in labels that are farther away from their corresponding data markers.
 - **Fine Stagger** specifies that labels are staggered so that they do not overlap. The labels are as close to the data markers as possible without overlapping. This collision mode takes more time to render than **Coarse Stagger** but might result in labels that are closer to their corresponding data markers.

Showing data values in pie and donut charts

You can show the data labels or data values within the chart so that the data values are more clear.

For example, in a pie chart, show the data values within each pie slice, so that you know the exact size of each pie slice.



Procedure


1. Select the chart object.
2. In the **Properties** pane, double-click the **Show values** property.
3. To display data labels for each slice of the pie, under **Show**, select the **Slice names** check box.
4. To show lines pointing from data labels to the slices they apply to, select the **Show leader lines** check box.
5. To specify the data label format, in the **Values** list, select what values to display.
 - **Hide** does not display data values.
 - **Absolute** displays the absolute value of the data.
 - **Percentage** displays the slice's percentage of the whole pie.
 - **Absolute and Percentage** displays the slice's percentage of the whole pie as an absolute value.
6. In the **Position** list, select the placement of data labels.

Define Query Context When Customizing Legend Entries, Legend Titles, or Axis Labels

You want to use a revenue expression as a chart legend title. If you get an error message saying that the query context of a layout object cannot be determined, you must define the property list for the item to which it refers. You must first add the desired data item to the query before you can define its property list.

Procedure

1. Open the chart to customize.
2. Click the **Queries** icon  and click the query.
3. Click the **Data** icon , and from the **Source** tab, drag the desired item to the **Data Items** window to add it to the query.
4. In the navigation menu, click **Report**, click **Prompt pages**, and then click the chart page.

5. Click the **Data** icon , and from the **Data items** tab, drag the desired item to the layout object.
6. In the **Properties** pane, under **Data**, double-click the **Properties** property.
7. Select the check box for the data item to define.

Summarize Small Slices, Bars, or Columns in charts

You can summarize the smaller slices or bars in charts to avoid having many tiny slices or bars. For example, if your pie chart shows revenue by product and 10 of your products have less than 1% of the pie, you can summarize these 10 slices into one larger slice and name that slice Other.

Similarly, you can summarize small items in a column, bar, area, and line chart.

You cannot summarize small slices or items in charts that have matrix edges or in charts that have multiple numeric axes.

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **General**, double-click the **Summarize Small Slices** or **Summarize Small Items** property.
3. To summarize small slices or items up to a maximum number, select the **Maximum number of slices** or **Maximum number of items** check box and type the maximum number.
4. To summarize all the slices or bars that are smaller than a specific value, select the **Summarize slices smaller than a value** or **Summarize items smaller than a value** check box, type a value that represents the upper size limit, and choose whether the value is a percentage or absolute.
5. Under **Small slice summarization type** or **Small item summarization type**, choose whether to summarize the slices or items as a **Total** or **Average**.

Note: Averages are calculated using only the summarized items in the report.

6. Under **Slice label** or **Item label**, type a label for the one large slice, bar, area, or line that summarizes the smaller ones.

Customizing lines and data points in a line chart

You can customize the lines in a line chart to show only lines, only data points, or both. Data points represent series values for each category on the Y-axis. You can show special data markers that represent statistically significant values, such as open, high, low, and close values.

You can also add markers at other positions on the chart. For more information, see [“Add a Marker to a chart”](#) on page 219.

You can also change the path of the line that connects the data points to one of the following:

- **Point to Point** shows data points connected by straight lines.
- **Step at Point** shows data points connected by steps that start and end at the data points.
- **Step Between Points** shows data points connected by steps that start and end between the data points.
- **Smooth** shows data points connected by smooth curves.

Customize Lines and Data Points in a line Chart

You can change the color and shape of the line or data markers in a line chart. You can also show or hide data labels, the line, and data markers.

You cannot show value markers when the **Data points** option is selected or when the configuration of the line chart is stacked or 100 percent stacked.

Procedure

1. Select the chart object.
2. In the chart area, under **Series**, click the line chart icon to view the line properties.
3. To select whether to show only the line, the line and data markers, or only the data markers, in the **Properties** pane, select an option from the **Line and Markers** list.
4. To show special data markers, double-click the **Value Markers** property. Select the check box for the special data markers that you want to add and for each marker, specify the color and shape.

The options you specify in **Value Markers** overwrite the options for **Line and Markers**.



5. To change the shape of the line that connects data markers, select an option from the **Line Shape** list.
6. To show data labels for the data points, double-click the **Data Labels** property.
7. To change the color of the lines, double-click the **Palette** property.

Customize a Combination Chart


Combination charts show data series using two or more types of charts - area, bar, and line. The different charts are overlaid on top of each other. You can customize the order in which the charts appear along with the type of charts and their configurations.

You can also customize which numeric axes to show and which chart to show on each axes.

Procedure

1. Select the combination chart object.
2. In the **Properties** pane, under **General**, double-click the **Combinations** property.
3. Under **Numeric axes**, select which axes to show.
4. Under **Combinations**, add  or remove  data series.
5. If you want to change the order in which the series appear, use the up and down arrows.

The series appear in the order they are listed. Each chart appears in the foreground of any previous charts.

6. If you want to change the configuration type of the series, such as changing clustered bars to stacked bars, under **Combinations**, select the series, click the edit button  and select the type.
7. If you use the same data series for multiple charts and want to synchronize the data marker colors, under **Color & Background**, set the **Series Color** property to **Match**.

Create a Matrix of Charts

You can view a complex chart that includes nested series or categories into a matrix, or crosstab, that shows multiple small charts arranged in rows and columns.

The charts in the rows represent the outer nested levels of the series and categories and, the charts in the columns represent the categories. Each data item in the outer nested levels of the series and categories becomes a separate chart. The numeric scale of all the charts is the same so that you can easily compare.

When working with pie, gauge, and bullet charts, if you include a data item in the categories, you automatically create a matrix of charts. One chart appears for each data item in the category. When working with progressive and bullet charts, if you include a data item in the series, you also automatically create a matrix of charts.

For example, the following column chart shows the revenue for each year (in the categories or X-axis) for all the regions and product lines (in the series or Y-axis). This chart is very complex and difficult to understand.

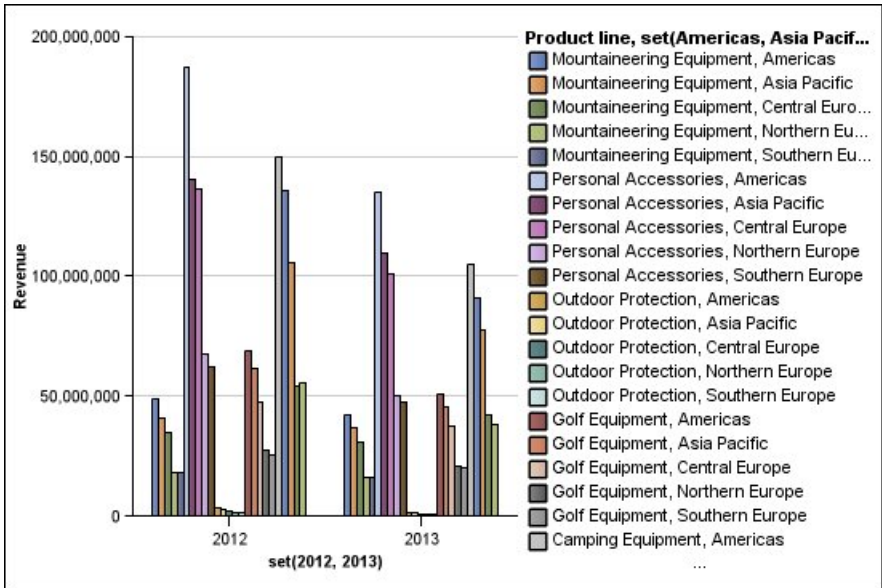


Figure 18. Complex column chart

The following chart contains the same series and categories. However, when converted to a matrix of charts, the information is much easier to analyze. The columns show charts for each year and the rows show charts for each the product lines. The bars represent the revenue for each region.

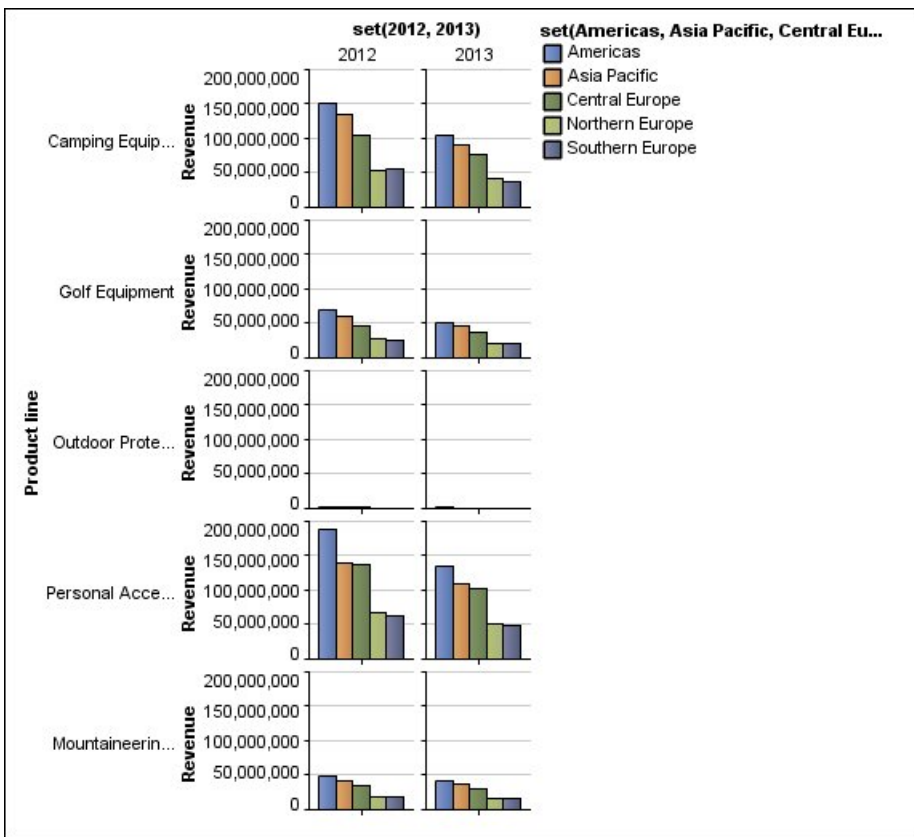


Figure 19. Matrix chart

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **General**, double-click the **Matrix rows and columns** property.

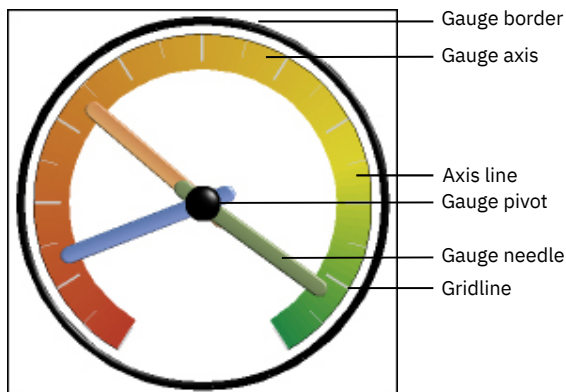
3. Select the **Show outer nested series as matrix rows** or **Show outer nested categories as matrix columns** check boxes (or both).
4. In the **Matrix levels** box, select the number of nested levels to include in the matrix columns or rows.
 The remaining nested levels are represented in the chart bodies in the matrix if the chart supports additional categories. The pie, gauge, and bullet charts do not support additional categories. The bullet and progressive column charts do not support additional series.
 For example, in the above chart, Regions are nested under Product Line. In the matrix chart, a **Matrix level** of 1 is specified. Therefore, Product Line appears as the matrix rows (series) and Regions appear within the chart bodies.
5. If you want labels for the matrix rows and columns to appear on each chart, select the **Show row labels** or **Show column labels** check box.
6. In the **Labels location** list, select where the nested labels should appear on each chart.
 The default position is on the left for rows and on the bottom for columns.
7. If the labels are too long, click **Truncation** and specify where to truncate text or select the **Size fonts automatically** check box to resize the text to fit.
8. To change the font, color, and data format of the labels, click **Style**.
9. To show the title in the row or column axis, select the **Show row title** or **Show column title** check box.
10. If you want to hide or show the axes, select the axis object, and in the **Properties** pane, under **Miscellaneous**, set the **Show in Matrix** property.
11. If your matrix chart includes only rows or columns, and you want them to wrap, select the **Wrap rows or columns if possible** check box.
12. If you want to show the axes and axis labels for each small chart in the matrix, select the **Repeat row and column axis labels** check box.

When this option is cleared, axes and axis labels appears only along the outer edge of the matrix.

Customize a Gauge Chart

When you create a gauge chart, you can choose from a variety of chart templates, which offer different shape, axis, and border options.

You can customize the following aspects of your gauge chart. As you modify properties, the chart preview shows you what your chart will look like.




Unless indicated in the user interface, all sizes are a percentage of the maximum allowed.

If your gauge chart includes a border, long axis labels, such as 250,000,000, may overlap the gauge border and be difficult to read. To avoid this problem, customize the data format of your gauge chart measure and reduce the scale so that less zeros are displayed. Or change the gauge border color or size or remove the border.

Procedure

1. Click the gauge chart object.
2. If you want to change the shape of the gauge, modify the start and end angles of the gauge axes and border, as follows:
 - a) In the **Properties** pane, under **General**, double-click the **Gauge Axes** property and specify the start and end angles and the direction of the axes.
 - b) Double-click the **Gauge Border** property and specify the style and the start and end angles of the border.

For example, a border start angle of 0 degrees and end angle of 180 degrees produces a semi-circular gauge.
3. If you want to add an additional axes to a gauge chart, do the following:
 - a) In the **Properties** pane, under **General**, double-click the **Gauge Axes** property.
 - b) Click the new icon  and specify the start and end angles and the direction of the new axis.
4. If you want to change the size, shape, and color of the center pivot point, double-click the **Gauge Pivot** property and specify the style.
5. If you want to change the indicators in the gauge axis, click the **Gauge Axis** object in the chart and do the following:
 - a) To change the needle, under **Axes**, double-click the **Gauge Needle** property and specify the style.
 - b) To change, add, or remove color bands that indicate the data range positions, under **Color & Background**, double-click the **Gauge Axis Colors** property and specify the color palette.
 - c) If you want to change the size or thickness of the gauge axis and color bands, under **Axes**, specify a percentage size for the **Gauge Axis Inner Radius** and **Gauge Axis Outer Radius** properties.
 - d) If you want to change the grid lines, under **General**, double-click the **Gridlines** or **Minor Gridlines** properties and specify the style.
 - e) If you want to change the appearance of the gauge axis line, under **General**, double-click **Axis Line**.

Defining color by value in scatter or bubble charts

In a scatter or bubble chart you can specify that data points or bubbles appear in different colors that are based on an additional measure or fact. The color of the points or bubbles helps you to see relationships in large amounts of data.

For example, the following bubble chart shows the relationship between the unit cost and unit sale price. The size of the bubbles shows the gross profit and the color of the bubbles shows whether the quantity sold is above (yellow) or below (green) 1,000,000 units.

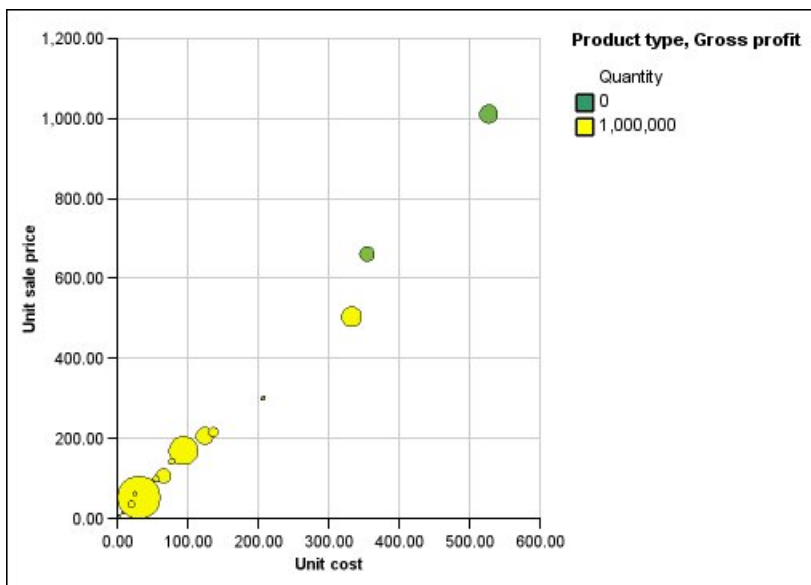


Figure 20. Example of a bubble chart that shows values in different colors

In a bubble chart, you can combine the color by value and bubble size to create a more meaningful chart.

Procedure

1. Drag a measure to the **Color** drop zone under **Measures** and then select the measure.
2. In the **Properties** pane, under **Color & Background**, double-click the **Color by Value** property.
3. To define the colors by percentages instead of actual values, select the **Percentage** check box.

For example, if you select the **Percentage** check box and your values range from 25 (red) to 50 (green), the bottom 25 percent of values are red and the top 50 percent of values are green. The values between 25 percent and 50 percent are an interpolated color, such as yellow.

4. If you want to use a preset color palette, click **Palette**, and select the palette that you want to use.
5. If you want to customize a palette color or boundary value, select the palette entry in the **Palette** box and specify the color, transparency, and type a new boundary value.
6. To add a palette entry, select the palette entry below which you want to add the new entry, click the new palette entry icon **+**, and click **Color**.
7. If your chart has lines or markers, under **Style**, set the marker shape, line style, and line weight.
8. To choose a color and transparency for missing or null values, under **Missing Values**, click **Color** and type a value in the **Transparency** box.

Specify the Bubble Size in a Bubble Chart

In a bubble chart, you use a measure or fact to determine the size of the bubbles.

You can use the **Bubble Measure** in the **Measures** drop zone of the chart to specify bubble size. You can then specify the size range of the bubbles in the chart. You can also specify what value the smallest bubbles represent. For example, your bubble measure is revenue, and you set the minimum and maximum bubble size to 5 pt and 20 pt, respectively. You set the smallest bubble to represent the value zero. All the bubbles on your chart will be between 5 and 20 pts and any bubbles between 0 and 5 pts on this scale will appear at 5 pt.

You can combine bubble size with colors by value to create a chart that shows multiple dimensions.

Procedure

1. Select the chart object.

2. In **Properties** pane, under **General**, double-click the **Bubble Size** property.
3. Under **Smallest bubble**, select what value the smallest bubbles represent:
 - To show data items with a value of zero at the minimum bubble size, click **Zero**.
Tip: This setting is consistent with Microsoft Excel 2003.
 - To show data items with a value of zero at the minimum bubble size and show negative bubbles as hollow, select the **Zero. Negatives shown as hollow** check box.
Tip: This setting is consistent with Microsoft Excel 2007.
 - To set the minimum bubble size to the minimum data value, click **Minimum data value**, and type a size for the minimum and maximum bubble size.
Note: The minimum data value can be positive or negative.

Set the Position of the First Slice in a Pie Chart

You can specify the angle in a pie chart where the first pie slice starts. You can also change the direction of the slices so they appear clockwise or counter-clockwise.

The default starting position of the first slice is **90**, which displays the first slice beginning at the 12 o'clock position. By default, the slices appear clockwise around the pie, so a starting position of **90** displays the first slice at the 12 o'clock position, a starting position of **180** displays the first slice at the 9 o'clock position, and so on.

Procedure

1. Select the pie chart object.
2. In the **Properties** pane, under **General**, beside the **First Slice Angle** property, enter the angle at which you want the first slice to appear.
3. To change the directions in which slices appear, change the **Slice Direction** property.

Creating a Donut visualization from a Pie

You can add a hole to the middle of your pie chart to create a donut chart.

Procedure

1. Select the **Pie** visualization.
2. In the **Properties** pane, under **PIE**, set the **Donut hole radius** property to a decimal number between 0 and 1. This number represents the percentage of the pie that you want the hole to take up.

For example, if you enter a value of **.35**, then the radius of the donut hole will be 35% of the radius of the pie.

Pull Out Pie Slices in a Pie Chart

You can highlight pie slices by pulling them out from the rest of the pie. For example, the following chart shows revenue by product line with slices of less than 1,000,000,000 in revenue pulled out by 25%.

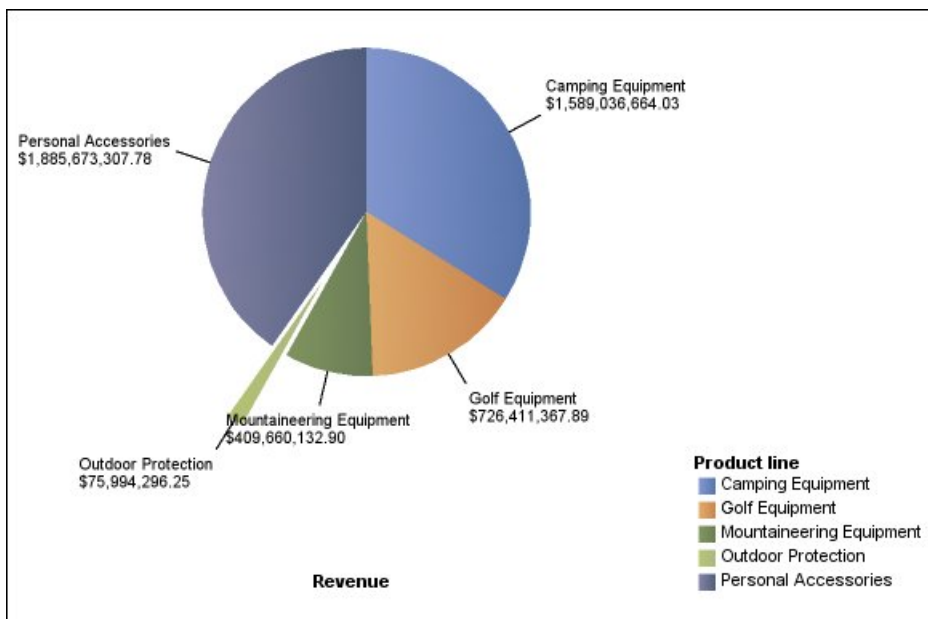


Figure 21. Exploding slices in a pie chart

Procedure

1. Select the pie chart object.
2. In the **Properties** pane, under **General**, double-click the **Exploded Slices** property.
3. In the **Exploded Slice** dialog box, click the new button **+**.
4. In the **Exploded amount** box, type the percentage by which the slice should appear away from the rest of the pie.

0% displays the pie slice in the pie; **100%** displays the pie slice as far out from the rest of the pie as possible.

5. Define which slice to pull out:

- To select a slice to pull out using its slice index, under **Exploded slice**, click **Slice number** and type the slice number.

The slice number refers to the order of the slice in the legend. In the previous example, Camping Equipment has a slice number of 1 and Personal Accessories has a slice number of 5.

- To select a slice to pull out using a calculation, under **Exploded slice**, click **Expression** and click the ellipsis beside the **Expression** box to define an expression.

In the previous example, the expression that defines which slices to pull out is as follows: **[Query1].[Revenue] < 100000000**.

The slice definitions appear in the **Exploded Slices** list.


6. To pull out other slices, repeat steps 3 to 5.

Define the Cumulation Line in a Pareto Chart

The cumulation line on a Pareto chart displays the percentage of the accumulated total of all the columns or bars. For example, if your chart displays revenue by product line by year, the cumulation line at the second year's column would be the total revenue of the first and second years.

You can customize the appearance of the cumulation line and its data points.

Procedure

1. Select the Pareto chart.
2. To hide or show the cumulation line, in the **Properties** pane, under **Chart Annotations**, set the **Cumulation Line** property.
3. To customize the cumulation line, click the cumulation line icon , and in the **Properties** pane, under **General**, set the following properties:
 - **Line Styles** defines the cumulation line color, style, and weight.
 - **Cumulation Label** defines the label in the legend for the cumulation line. You can use the default label from the data source or type a custom label. The color and marker shape of the cumulation line still appears in the legend when this property is set to **None**.
 - **Data Points** defines whether to show or hide data points along the cumulation line, whether to show or hide data point borders, the color of data point borders, and the data point size and shape.
 - **Data Labels** specifies whether to show or hide the labels for the data points along the cumulation line.

Customize a Bullet Chart

After you create a bullet chart, you can customize the shape, color, and size of the bullet and target indicators.

By default, the bullet chart includes three gray colored regions in the background. You can edit the colored regions (**Properties** pane, **Colored Regions**).

Procedure

1. Select the bullet chart object.
2. To change the shape, color, and size of the bullet or target, do the following:
 - a) In the **Properties** pane, under **General**, double-click the **Bullet Indicators** property.
 - b) Under **Bullet**, specify how to show the bullet.

The **Bar width** setting specifies the width of the bullet bar as a percentage of the space available. For example, if you specify 50 percent, the bar uses half of the space available. If you specify 100 percent, the bar uses all the available space.
 - c) Under **Target**, specify how to show the target.
3. To change the chart orientation, in the **Properties** pane, under **General**, set the **Chart Orientation** property.

Changing the number of hotspots in a chart

To improve performance, you can limit the number of hotspots that are generated for Reporting charts.

About this task

A hotspot in a chart appears when you pause a pointer over it. For example, a hotspot on a drill-down symbol or a tooltip gives details about the column, line, or pie slice. The browser response time increases with the number of hotspots. When charts with many members are generated, the hotspots can become an additional burden for the system resources, which can freeze the browser.

When you limit the number of hotspots, priority is given to items such as axis labels and legend labels before individual graphical elements such as bars, pie slices, and so on. Depending on the number of items in a chart and the setting for maximum number of hotspots, some axis items may have hotspots while other axis items and all graphical elements do not, or all axis items and some graphical elements may have hotspots while other graphical elements do not.

The maximum hotspot setting in Reporting overrides the default set by the administrator. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Procedure

1. Select the chart object.
2. In the **Properties** pane, under **Miscellaneous**, specify a number for the **Maximum Hotspots** property.

Create a drill-up and drill-down chart

If you use a dimensionally-modeled data source, you can create a chart that allows you to drill down to lower-level data or drill up to higher-level data.

Drilling up and down allows you to view more general or more detailed information on your data within a predefined dimensional hierarchy.



This is an example of a dimensional hierarchy:

Years - Year - Quarter - Month

Before you begin

Before you begin, ensure that you are using a dimensionally-modeled data source.

Procedure

1. Open a chart that uses a dimensionally-modeled data source.
2. Click the **Show properties** icon , click the select ancestor icon , click Report, and then, in the **DATA** section, double-click **Advanced drill behavior**.
3. On the **Basic** tab, in the **Report output drill capabilities** section, select the **Allow drill-up and drill-down** check box.

By default, the system determines which items can be drilled on based on the dimensional structure.

On the **Basic** tab, you can make drilling unavailable for any data item by selecting the item in either the **Disable drill-up for** box or the **Disable drill-down for** box.

On the **Advanced** tab, you can change the drill-up or drill-down behavior for any parameter by selecting the parameter and then choosing one of the desired behaviors.

Results

The chart generates links for any item that can be drilled down on.

You can drill down or drill up by right-clicking and choosing the action from the context menu. The menu items are unavailable if an item cannot be drilled up or down on.

Chapter 8. Legacy visualizations

You can use legacy visualizations in IBM Cognos reports to visualize data.

Visualizations are available from the IBM Cognos Analytics blog [Custom visualizations used in the samples](https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2016/10/06/ibm-cognos-analytics-custom-visualizations-used-in-the-samples) (https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2016/10/06/ibm-cognos-analytics-custom-visualizations-used-in-the-samples). For more information about administration and visualizations, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

Tip: IBM Cognos Analytics with Watson samples include visualizations.

Because visualizations are extensible, they can be customized by an author with the necessary skills. You can create client-side visualizations that report consumers can run when they are not connected to the web. You can also use visualizations on mobile devices.

Some of the visualizations that you can add to your reports are treemaps, heatmaps, packed bubble visualizations, and network diagrams.

You can set properties that are available for each visualization type. These properties are determined by the visualization definition. Typically, you can set such properties as width, height, animation effect, and fixed-axis scaling.

Extensible visualizations support all Active Report interactivity. For example, you can use Active Report controls to dynamically filter visualizations to view only the data that you want to analyze.

Adding a visualization to a report

You can add a visualization to a report to efficiently represent your data.

About this task

You add data to a visualization by inserting data items in drop zones.




When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



Attention: The supported properties for a visualization are determined by the visualization definition.

Procedure

1. Create a new report or open an existing report.
2. Click the **Toolbox** icon , and drag a **Visualization** icon  to the work area.
3. In the **Visualization gallery** window, select **Legacy visualizations** from the menu.
4. Select a visualization and click **OK**.
5. From the **Source** tab , drag items to the appropriate location in the data container.
6. Run the visualization.

Example - Adding a treemap visualization

You can use a treemap visualization in reports to identify patterns and exceptions.

Treemaps show relationships among large numbers of components by using size and color coding in a set of nested rectangles.

A treemap that is colored by category identifies the level 1 category by color. The sizes of the rectangles represent the values. In a treemap that is colored by value, the sizes of the rectangles represent one of the values and the color represents a second set of values.



Attention: The supported properties for a visualization are determined by the visualization definition.

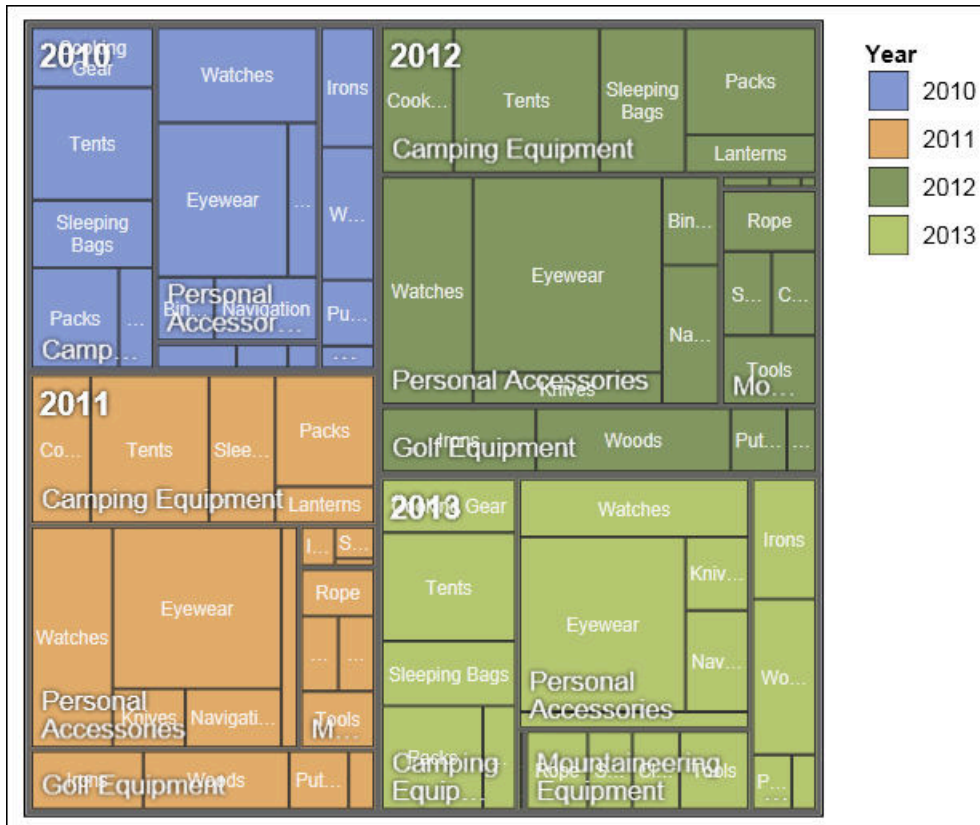


Figure 22. A treemap visualization

Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

About this task

You add data to a visualization by inserting data items in drop zones.




When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



Attention: The supported properties for a visualization are determined by the visualization definition.

Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select a Treemap icon:
 - If you are plotting a single measure, select a treemap colored by category.
 - If you are plotting two measures, select a treemap colored by value.
3. Click **OK**.
4. From the **Source** tab , drag items to the appropriate location in the data container:
 - a) Under **Values**, drag items to define the size and color of the rectangles to **Size** and **Color**.
 - b) Under **Categories**, drag items to the different levels. Each level represents the category within which the subsequent levels are nested.
For example, the levels might be Year, Product Line, and Product Type.

Example - Adding a heatmap visualization

Heatmaps use colors to represent the individual values that are contained in a matrix.

Similar to treemaps, you can use heatmaps to identify patterns and exceptions. Unlike treemaps, the sizes of the rectangles are not proportionate to values.

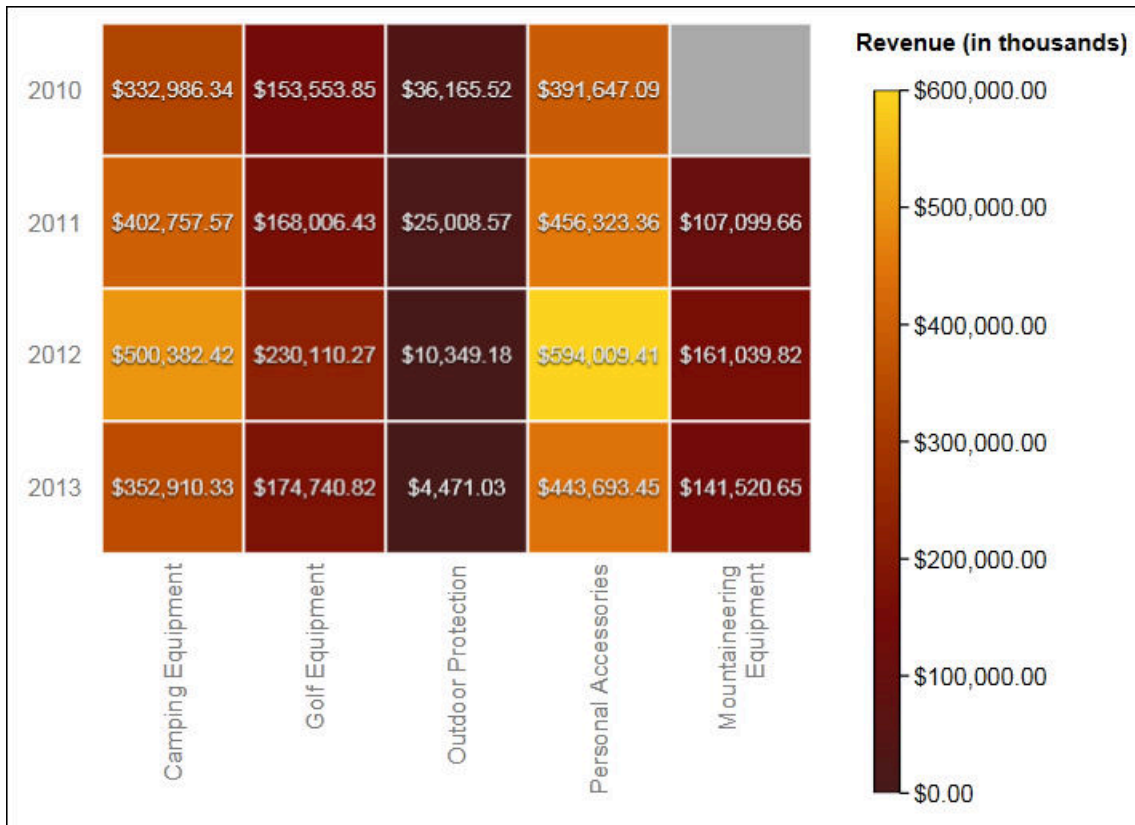


Figure 23. A heatmap visualization

Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

About this task

You add data to a visualization by inserting data items in drop zones.




When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



Attention: The supported properties for a visualization are determined by the visualization definition.

Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select the **Heatmap** icon and click **OK**.
3. From the **Source** tab , drag items to the appropriate location in the data container:
 - a) Under **Values**, drag a measure or a single value to define the color shading of the rectangles.
 - b) Under **Categories**, drag items to the Y Category and X Category.

Tip: Ensure that the items in the Y Category and X Category come from different dimensions.

Example - Adding a packed bubble visualization

A packed bubble visualization is similar to a bubble chart in which the bubbles are tightly packed rather than spread over a grid. You can use a packed bubble visualization to display a large amount of data in a small space.

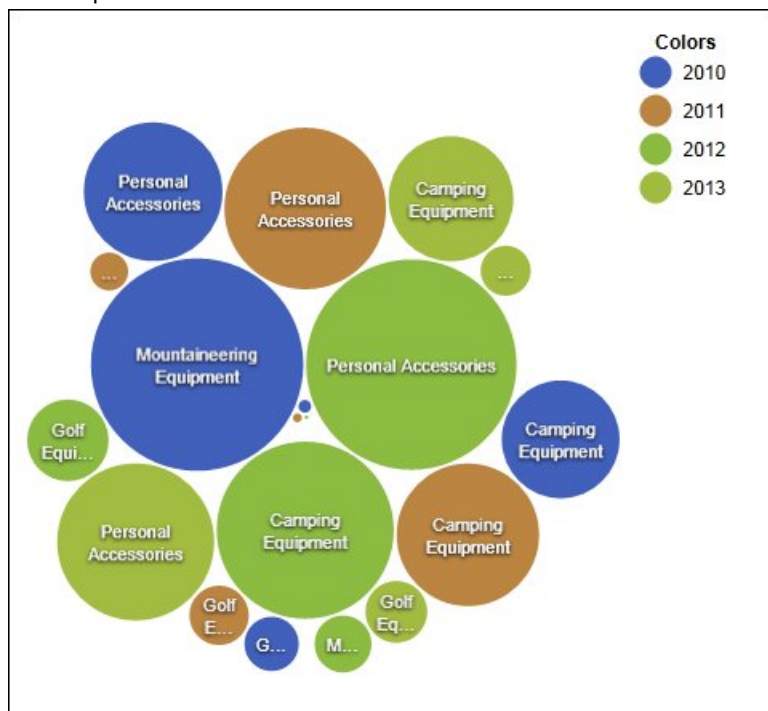


Figure 24. A packed bubble visualization

Before you begin

Your administrator must make the visualizations available in the **Visualization Gallery**.

About this task

You add data to a visualization by inserting data items in drop zones.




When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When you work with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.



Attention: The supported properties for a visualization are determined by the visualization definition.

Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.
2. From the **Visualization Gallery**, select the **Packed Bubble** icon and click **OK**.
3. From the **Source** tab , drag items to the appropriate location in the data container:
 - a) Drag a measure or a single value to the data container, under **Values**.
 - b) Under **Categories**, drag an item to plot as the bubbles.
 - c) Under **Series**, drag an item to apply as a category. Each item in the category gets a different color from the color palette.

Example - Adding a network diagram

You can create a network diagram in reports. The nodes data container defines the items that you want to link together. The links data container defines relationship between the items that you want to link together.

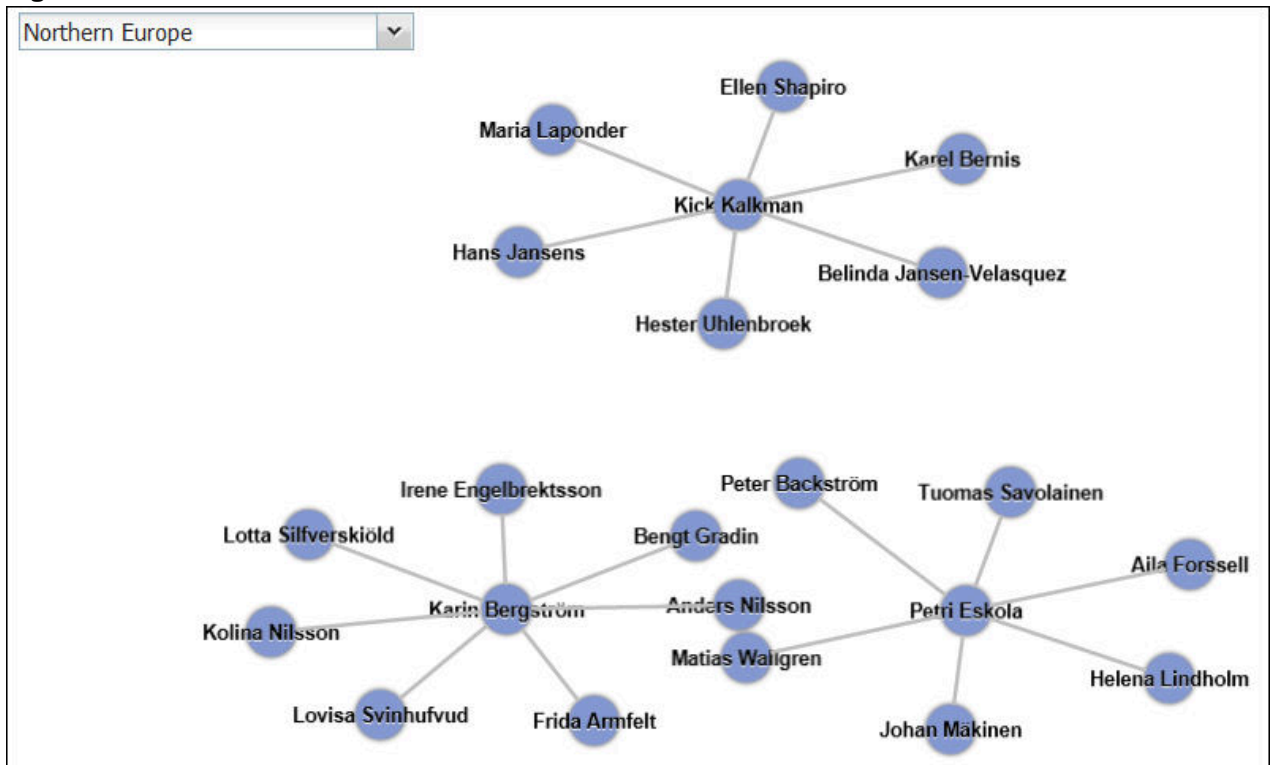


Figure 25. A network diagram in an active report showing employees by region

Before you begin

Network node drop zones only take numeric data items. Not all data sources have the appropriate data to create a network diagram.

Your administrator must make the visualizations available in the **Visualization Gallery**.

About this task

You add data to a visualization by inserting data items in drop zones.

When you add a visualization to an IBM Cognos Active Report, you can choose to render visualizations on the IBM Cognos server or on the client. When you choose to render visualizations on the client, additional drop zones appear for extra categories or values when all the required drop zones contain data items. You can use extra categories and extra values to filter data or set variables. Extra items are not visible in the visualization.

When working with dimensional data sources, if the visualization does not contain a measure against which to plot data, you must provide one. For example, if you add a single member to the values drop zone, such as '2012', the default measure drop zone appears in which you must insert a measure.




Attention: The supported properties for a visualization are determined by the visualization definition.

Procedure

1. Click the **Toolbox** icon , drag a **Visualization** icon  to the work area.

2. From the **Visualization Gallery**, select the Network diagram icon and click **OK**.

3. From the **Source** tab , drag items to the appropriate location in the data container:

a) In the **Nodes1** data container, drag items to **Node (Numeric)** and **Name**.

The nodes data container defines the items that you want to link together, such as Employees, defined by an employee code.

b) In the **Links1** data container, drag items to **From node (Numeric)** and **To node (Numeric)**.

The links data container defines relationship between the items that you want to link together, such as Employees and Managers.

Visualization properties

The properties that you can set for each visualization affect how you work with visualizations that are inserted in a report.

All extensible visualizations have properties in common and properties that are specific to each visualization. Properties that are specific to a visualization are defined by the visualization author in the visualization definition. By default, properties that are defined by the visualization author appear in a group that is named Custom in the **Properties** window, unless the author created property groups in the visualization definition.

To set properties for multiple visualizations, press Ctrl while you click the visualizations in the report. When multiple visualizations are selected, only the common properties appear in the **Properties** window.

Choosing where visualizations are rendered

When you add a visualization to an IBM Cognos Active Report, you can choose to render the visualization on the IBM Cognos server or on the client.

About this task

Visualizations that are added to regular reports are always rendered on the Cognos server. Visualizations that are rendered on the Cognos server are rendered as static images. Client-side visualizations are rendered as JavaScript code. Report size and performance are affected by whether visualizations are rendered on the server or on the client. For example, static images might increase the report size when there are many of them, but performance might be better.

Some visualization properties are available for only one of the render methods, and other properties are modified when you change the render method. For example, the **Container Filter** property, extra values drop zones, and extra categories drop zones are not supported when you choose to render visualizations on the Cognos server.

If you want to enable client-side filtering in the visualization, you must choose to render the visualization on the client.

Note: In the visualization definition, visualization authors can specify to render a visualization only as JavaScript or only as a static image. When a visualization supports only one output type, the visualization property **Render Method** is not available. In addition, visualizations that can be rendered only in JavaScript do not appear in the Visualization Gallery when you author regular reports.

Procedure

1. In the active report, select the visualization.
2. In the **Properties** window, click the **Render Method** property and choose the render method that you want.

Resizing a visualization

You can change the size of a visualization.

Procedure

1. Click and drag the lower right corner of the visualization.
2. To maintain the aspect ratio, press the Shift key while you resize the visualization.

You can view the changing height and width of the resized visualization in the **Properties** pane, under **Positioning**.

Changing the nesting order

When you create a visualization in an IBM Cognos Active Report, you can change the nesting order so that extra items are ordered properly in the query. If the items are not ordered properly in the query, the report might not run.

About this task

Extra items are data items that are used for filtering or setting variables. These items are not visible in the visualization. By default, extra categories are nested below other categories, so as not to affect sorting. However, if the extra categories are from the same dimension as a category, they must be in the correct hierarchical order: Years, Quarters, and Months. You can change the nesting order.

For example, you have Quarters and Months as categories. You then add Years as an extra category. You add an Active Report control and connect to Years as a filter. You might have to change the nesting order of the data items for the report to run.

Note: Extra items are available only when you choose to render the visualization on the client. You cannot add extra items to a visualization when you choose to render the visualization on the IBM Cognos server.

Procedure

1. Select the data container that contains the data set in which you want to change the nesting order.
2. From the **Properties** pane, under **General**, click **Change Nesting Order**.
3. In the **Change Nesting Order** window, select the extra category and use the arrow icon to reorder it.

Tip: You can click **Show Data Container** to view the new nesting order when the report is run.

Specifying the range values that are displayed

You can specify the range of values that you want to display in a visualization.

About this task

You can specify the range of values and categorical data that is displayed in visualizations. Some of the options that are available depend on whether you choose to render the visualization on the IBM Cognos server or on the client. When the visualization is rendered on the Cognos server, more choices are available when the visualization is in a master-detail relationship.

To control the range of values that is displayed, the following choices are available to calculate the minimum and maximum values of the range.

- All data

With this choice, minimum and maximum values are calculated to span the values of the inserted measure.

When the visualization is added to an active report, the values are calculated to span the values of all controls that are connected to the visualization.

Note: In visualizations that are added to active reports, the aggregation method that is specified in the **Rollup Method** property also affects the range of values.

- All detail data

This choice is available only when the visualization is in a master-detail relationship and is rendered on the Cognos server. With this choice, the range of data that is displayed is the same in each detail visualization.

- Filtered data

This choice is available only when the visualization is rendered on the client. With this choice, minimum and maximum values are calculated from values that users select in Active Report controls that are connected to the visualization.

- Specified values

With this choice, you specify the minimum and maximum values that you want to display in the visualization.

Note: The minimum and maximum values that are displayed in the visualization might differ from the values that you specify. For example, if you specify a range of 0 to 195, IBM Cognos Analytics with Watson might display a range of 0 to 200.

To specify the categorical data that is displayed, the following choices are available.

- All data

This choice is available only when the visualization is rendered on the client. With this choice, all categorical data that spans the values of all Active Report controls that are connected to the visualization is displayed.

- Filtered data

This choice is available only when the visualization is rendered on the client. With this choice, only the filtered data is shown in the legend and on axes.

The choice that you make for displaying categorical data can affect elements in the visualization, such as the legend and axes. For example, when all data is selected, all legend items are always shown in the visualization, and the color of each legend item stays the same in the visualization. When a category is inserted on an axis, space is reserved on the axis for all data. When filtered data is selected, the color of each legend item can change when users select different values in a control that is linked to the visualization. When a category is inserted on an axis, the axis shows only the values that are selected in the control.

Procedure

1. To specify the categorical data that is displayed, follow these steps.
 - a) In the visualization data container, select the category that you want.
 - b) In the **Properties** pane, click the **Category Range** property and select the choice that you want.
2. To specify the range of values that is displayed, follow these steps.
 - a) In the visualization data container, click the data item in the **Values** section that represents the values in the visualization.
For example, in a packed bubble visualization, click the data item that is inserted in the **Size** box.
 - b) In the **Properties** pane, double-click the **Value Range** property.
 - c) In the **Range type** box, click one of the available choices.
 - d) If you clicked **All data**, **Filtered data**, or **All detail data**, and you want the range of values to include zero, select the **Range includes zero** check box.
 - e) If you clicked **Specified**, type the minimum and maximum values of the range in the **Minimum** and **Maximum** boxes.

Summarizing data in a visualization

When a visualization is added to an IBM Cognos Active Report, you can specify how the data is summarized when users select multiple values in a control that filters the data in the visualization.

About this task

You can specify how data is summarized in a visualization only when you choose to render the visualization on the client. The **Rollup Method** property is not available when you choose to render a visualization on the IBM Cognos server.

In addition to summarizing data, the aggregation method that you choose affects the range of values that is displayed. For example, if the visualization is filtered by a single select control, Maximum is usually the appropriate aggregation method. With this choice, the range of values is based on the maximum of all values across the filtered items.

Set the aggregation method to the aggregation type of the data item. For example, if the data item is Margin, set the aggregation method to Average. When you are using an OLAP data source, IBM Cognos Analytics with Watson cannot retrieve the aggregation type of a measure. As a result, IBM Cognos Analytics with Watson sets the aggregation method to Total by default.

Procedure

1. In the visualization data container, in the **Values** section, click the box that represents the data values in the visualization.
For example, in a heatmap, click the **Color** box.
2. In the **Properties** pane, click the **Rollup Method** property and select the aggregation method that you want to use to summarize data in the visualization.

Populating a visualization with data from the visualization definition

In IBM Cognos Analytics - Reporting, you can populate a visualization with data that is specified in the visualization definition instead of adding data items from a package.

About this task

You can use data that is specified in the visualization definition to test a visualization before you add your own data. Using data from the visualization definition is also a way to bring external data into a visualization.

Procedure

1. Select the visualization.
2. In the **Properties** pane, double-click the **Use Embedded Data** property.
3. Select the check box of the data container for which you want to use data that is defined in the visualization specification.

Tip: Some visualizations have more than one data container.

Results

The data container is removed from the visualization. The data container is not required when the visualization is using data from the visualization definition.

Updating visualizations

Update visualizations when a change was made to the visualization definition.

About this task

You can update the visualizations in a report by opening the report in a new IBM Cognos Analytics - Reporting window.

If any part of a visualization is invalidated by changes that were made to the visualization definition, the invalidated part is removed. For example, if a field is renamed, the data items in the field are removed. You must add the data items to the renamed field for the visualization to run.

For visualizations that are rendered on the client, if you do not update visualizations when the visualization definition is changed, the old visualization definition is used when you run the report. Visualizations that are rendered on the IBM Cognos server always use the latest visualization definition. As a result, server-side visualizations might not run if they are not updated.

Procedure

Open the report that contains the visualizations that you want to update in a new Cognos Analytics - Reporting window.

Converting visualizations from one type to another

You can convert a visualization from one type to another type.

About this task

The following list describes the conversion process.

- Data items are mapped to fields with the same name.
- If no field with the same name exists, the first field of the same type is used. Value fields are mapped to value fields. Category fields are mapped to category fields. Category fields that are ID fields are only mapped to other category fields that are also ID fields.
- In active reports, for visualizations that are rendered on the client, extra values and category items are used to fill any empty fields in the converted visualization.

If you convert to a visualization that has fewer fields than the original visualization, the extra data items are kept as extra values or category items.

- Common properties that are not specific to visualizations, such as **Data format**, are preserved.
- No warnings appear for properties that are dropped during the conversion.

When you convert a visualization to a new visualization type, you can preserve properties that have the same ID and the same type. Or you can choose to use only the default properties of the new visualization.

If you convert a visualization to a visualization type that has more fields than the original visualization, you must populate the empty fields in the converted visualization. For example, if you convert a column chart to a combination chart that has columns and lines, there are empty fields for the line data container.

You cannot convert a visualization to a current default chart and vice versa.

Procedure

1. Select the visualization that you want to convert, and in the report object toolbar, click the **More** icon : and then click **Convert Visualization**.
2. Select a new visualization type.
3. To preserve properties that have the same ID and the same type, under **Visualization properties**, click the **Preserve existing visualization properties** radio button.

4. To use only the default properties of the visualization type that you are converting to, under **Visualization properties**, click the **Use new visualization default properties** radio button.
5. Click **OK**.

Sorting a category field by a measure in visualizations

You can sort a category field by a measure in visualizations that are inserted in IBM Cognos Active Report.

About this task

In visualizations, you can sort a data item by the overall totals or by the totals in the context of an extra category. While Cognos Active Report supports client-side filtering for visualizations, sorting always occurs on the Cognos server. As a result, you must construct the visualization so that the underlying crosstab reflects your filtering options and provides the correct sorting. As you construct the visualization, you can view the underlying crosstab by right-clicking the visualization data container and clicking **Show Container Data**.

This task describes how to maintain the sorting of a category by a measure when the visualization is filtered by a single selection control. For example, an active report contains a data drop-down list control with Quarter as the data item, and a clustered bar visualization that shows quantity that is sold by retailer type. In the visualization, Retailer type appears as the series, Quantity appears as the measure, and no data item is specified for the categories. You want to sort the visualization by quantity that is sold, and filter by quarter. To have the sorting applied for each quarter, place Quarter on the same edge as Retailer type in the underlying crosstab, which is accomplished by inserting the Quarter data item as an extra category for the series. In addition, Quarter must be nested outside of Retailer type in the underlying crosstab. Otherwise, Retailer type is sorted according to the quantity that is sold for all quarters.

This technique does not work when a visualization is filtered by multiple controls, or by a control that accepts multiple selections, such as a check box group control.

Procedure

1. In the visualization, select the category field that you want to sort.
In the preceding example, select Retailer type.
2. In the **Properties** pane, set the **Category Range** property to **Filtered Data**.
3. Double-click the **Sorting** property.
4. In the **Data Items** box, drag the measure that you want to sort the category by to the **Sort List** box.
In the preceding example, drag Quantity.
5. To specify the sort order, click the **Sort Order** icon.
6. Click **OK**.
A warning message appears that informs you that sorting is applied when the report is run, and does not reflect client-side filtering.
7. Click **OK**.
8. Select the clustered bar data container.
9. In the **Properties** pane, double-click the **Nesting Order** property, and change the nesting order of the extra category as needed.
In the preceding example, for the series, move Quarter above Retailer type.
10. Optional: To view the data in the underlying crosstab, click **Show Container Data**.
The data in the crosstab is sorted by the sort order that you specified in step 5.
11. Click **OK**.

Chapter 9. Maps

Maps help you to do geographic analysis of data by using location data such as regions, cities, and latitude and longitude.

IBM Cognos Analytics with Watson supports over 200,000 administrative boundaries in more than 245 countries.

Data is mapped by matching the location name on the map with a location in your data.

Note: Other names for a map are *polygon*, *filled region*, and *choropleth*.

Example: Adding regions and points to a map

This example explains how to show regions and points data on a map.

Before you begin



You must have access to the IBM Cognos Analytics with Watson base samples. If your administrator installed these samples, they are in **Team content > Samples > Data**.

About this task

This procedure shows you how to create a map that shows revenue by country and quantity as points. To see how to add latitude and longitude data to a map, see [“Example: Adding latitude and longitude data to a map”](#) on page 246.

Procedure


Create the map and add a regions layer that shows revenue by country.

1. Click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. On the canvas, click the **Pinned** icon , and then click **Visualization**.
4. In the **Visualization gallery**, click **Map**, and then click **OK**.
5. In the navigation pane, click **Select sources** or the **Add a source** icon , select **Team content > Samples > Data > Sample data module** and click **Open**.
6. Make sure that **Regions** displays in the data slot pane. If it doesn't, click the down arrow and select it.
7. Expand **Sample File Go Sales Xls** and drag **Retailer country** to the **Locations** data slot.
8. Drag **Revenue** to the **Location color** data slot.
9. In the **Properties** pane, under **REGIONS**, set **Transparency** to 10.
10. Optionally, under **COLOR PALETTE**, set a color palette for the **Regions** property.
11. Select **Page preview** to run the report.

Note: You can also click **Run options > Run HTML** to run the report.

The map is populated.


Tip: Zoom in and zoom out of the map to see more or less detail. Click and drag to move around the map.

Notice that the **Visible layers**  icon displays on the map. When you click it, **Regions** is selected, which means that region data is displayed on the map. You can hide the region data by clearing the **Regions** check box.

12. Select **Page design** to return to page design mode. If you ran the report from **Run options**, close the tab, which returns you to page design mode.

Now add quantity as a points layer on the map.

13. In the data slot pane, click the down arrow and select **Points**.
14. Drag **Retailer country** to the **Locations** data slot.
15. Drag **Quantity** to the **Point size** data slot.
16. Make sure that the visualization is selected on the canvas, and in the **Properties** pane, under **POINTS**, in the **Type** field, select **Heat**.
17. You can set a color palette and transparency for the points layer, like you did for the regions layer.
18. Select **Page preview** to run the report.

The map refreshes with the new points data. Now, when you click the **Visible layers**  icon, the **Points** check box displays, along with the **Regions** check box. You can clear one or both to show or hide the data. Also, the points data appear as heat points on the map.

19. Save the report when you're done.



Example: Adding latitude and longitude data to a map

This example uses the California website visits sample data to show data by latitude and longitude on a map.

Before you begin

You must have access to the IBM Cognos Analytics with Watson base samples. If your administrator installed these samples, they are in **Team content > Samples > Data**.

Procedure

1. Click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. On the canvas, click the **Pinned** icon , and then click **Visualization**.
4. In the **Visualization gallery**, click **Map**, and then click **OK**.
5. At the top of the data slot pane, click the down arrow and select **Latitude/Longitude**.
6. In the navigation pane, click **Select sources** or the **Add a source** icon , select **Team content > Samples > Data > California website visits** and click **Open**.
7. Expand **California Zip Website Visits Xlsx** and drag **Latitude** and **Longitude** to their data slots.
8. Drag **City** to the **Label** data slot. The latitude, longitude, name of the city appears when you hover over the data points.
9. Drag **Website Visits** to the **Point size** data slot and drag **Visitor Ranking** to the **Point color** data slot.
10. Select **Page preview** to run the report.

Note: You can also click **Run options > Run HTML** to run the report.

The report runs and zooms in on California. Notice that the visualization is hard to read because the points are very close together.

11. Select **Page design** to return to page design mode. If you ran the report from **Run options**, close the tab, which returns you to page design mode.
12. Make sure that the visualization is selected on the canvas, and in the **Properties** pane, under **LATITUDE/LONGITUDE**, in the **Type** field, select **Cluster**.
13. Under **LATITUDE/LONGITUDE**, set **Transparency** to 20.
14. Optionally, under **COLOR PALETTE**, set a color palette for the **Latitude/Longitude** property.

15. Run the report.

Now the website visits are clustered by latitude and longitude.

16. Save the report when you're done.

Setting up Mapbox to work with Cognos Analytics

IBM Cognos Analytics with Watson supports the use of custom polygons that come from Mapbox.

Create a free Mapbox account. When you have created your Mapbox account, upload your geoJSON custom polygon file to Mapbox as a tileset. If your geoJSON is less than 5 MB, then you can edit the geoJSON directly as a data set in Mapbox. After you edit the geoJSON files, export them into a tileset. Make sure that each polygon has at least one uniquely identifying property as a string value. For more information about tilesets, see the Mapbox documentation about a [tileset](#).

Custom polygons in formats such as .shp and KML can be converted to geoJSON, by using, for example QGIS.

Retrieving data from Mapbox

When you have your tileset created in Mapbox, make note of the following information from the tileset page:

- Tileset Id (appears in the **Share & use** panel)
- Layer name (appears in the **Vector layers** panel)
- Property name (appears in the **name** field for the layer)

You specify these values when you want to use Mapbox data in your map.

Enter the Tileset ID into the field marked Tileset Id.

Best practices

- For increased performance and to make sure that polygons appear at zoom level 0 (world view), compress geoJSON files to less than 10 MB. A tool that can compress geoJSON files is <http://mapshaper.org/>.

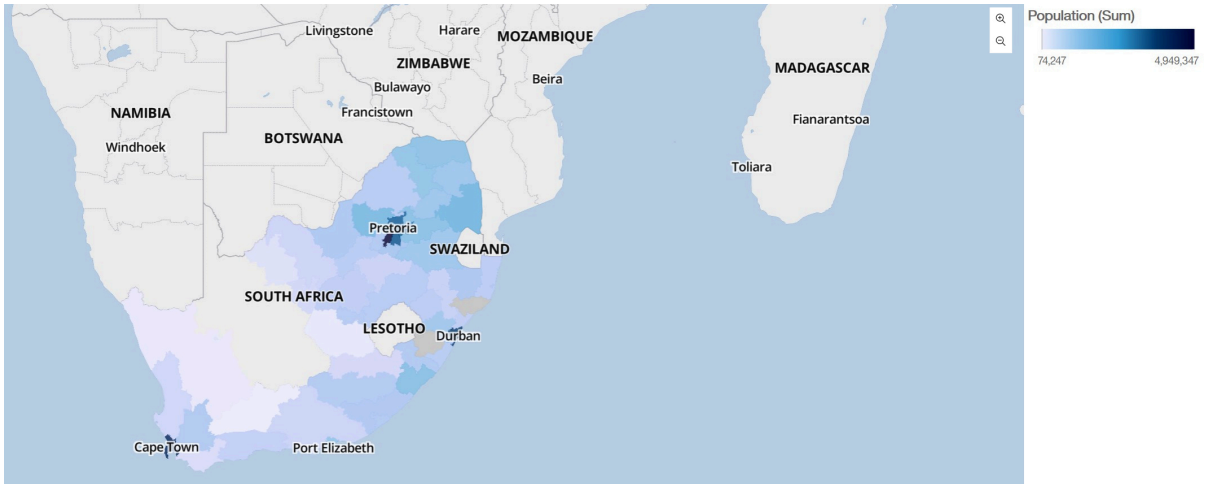
If your geoJSON files are larger than 10 MB, then Mapbox sets the default zoom to not start at worldview 0. If you want to manually change the zoom extents, there are few ways to do so:

- Tippecanoe APIs, which are available on Linux and Apple MacOs.
- Download Mapbox studio classic on your Microsoft Windows computer and change the minimum and maximum zoom levels.

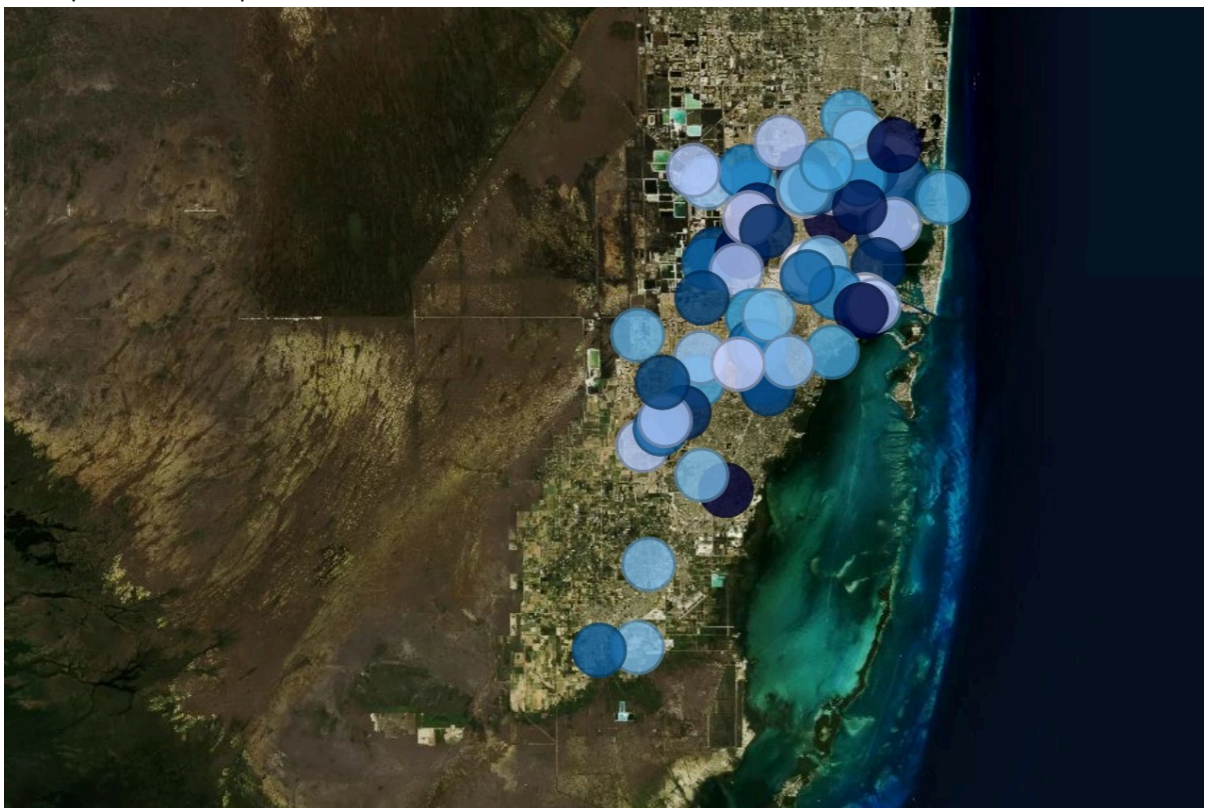
For more information, see <https://www.mapbox.com/help/adjust-tileset-zoom-extent/>.

- To ensure that auto-zoom works in IBM Cognos Analytics - Reporting set the unique polygon identifier as a string value.
- If you work with custom polygons in small areas, for example at postcode level, turning off auto zoom after the initial data loads. This results in a better experience when you filter because the map does not reset zoom and zoom in multiple times.
- Keep the Mapbox keys confidential.

Example of custom regions



Example of custom points



Adding custom points or regions to a map



You can enhance IBM Cognos Analytics with Watson maps by adding custom point or region information from Mapbox to them. You do this by adding a layer on the map to display the additional information.

Before you begin

You must have created a tileset in Mapbox that contains the custom region or point data that you want to add to the map. The tileset that Mapbox generates has the following properties. You must have these values ready to configure in your map:

- Map ID
- Layer name
- Property name

Procedure

1. Click **New**, and then click **Report**.
2. In the **Templates and themes** window, click **Blank**, and then click **OK**.
3. On the canvas, click the **Pinned** icon , and then click **Visualization**.
4. In the **Visualization gallery**, click **Map**, and then click **OK**.
5. In the left pane, click the **Add report data** icon , select report data that contains region or point data.
6. On the data slot pane, click the down arrow and select:
 - **Regions**, if you want to use region data from Mapbox.
 - **Points**, if you want to use point data from Mapbox.
7. In the left pane, expand your data items and drag point or region data to the **Locations** data slot.
8. Drag a measure to the **Location color** or **Point color** data slot.
9. Specify the properties for the custom region or point data. You must obtain the values of the properties for Map ID, Layer name, and Property name from the Mapbox. Make sure the visualization is selected on the canvas, and in the **Properties** pane, under **REGIONS** or **POINTS**, specify the following properties:

Note: Use the same sentence case as used in the Mapbox properties.

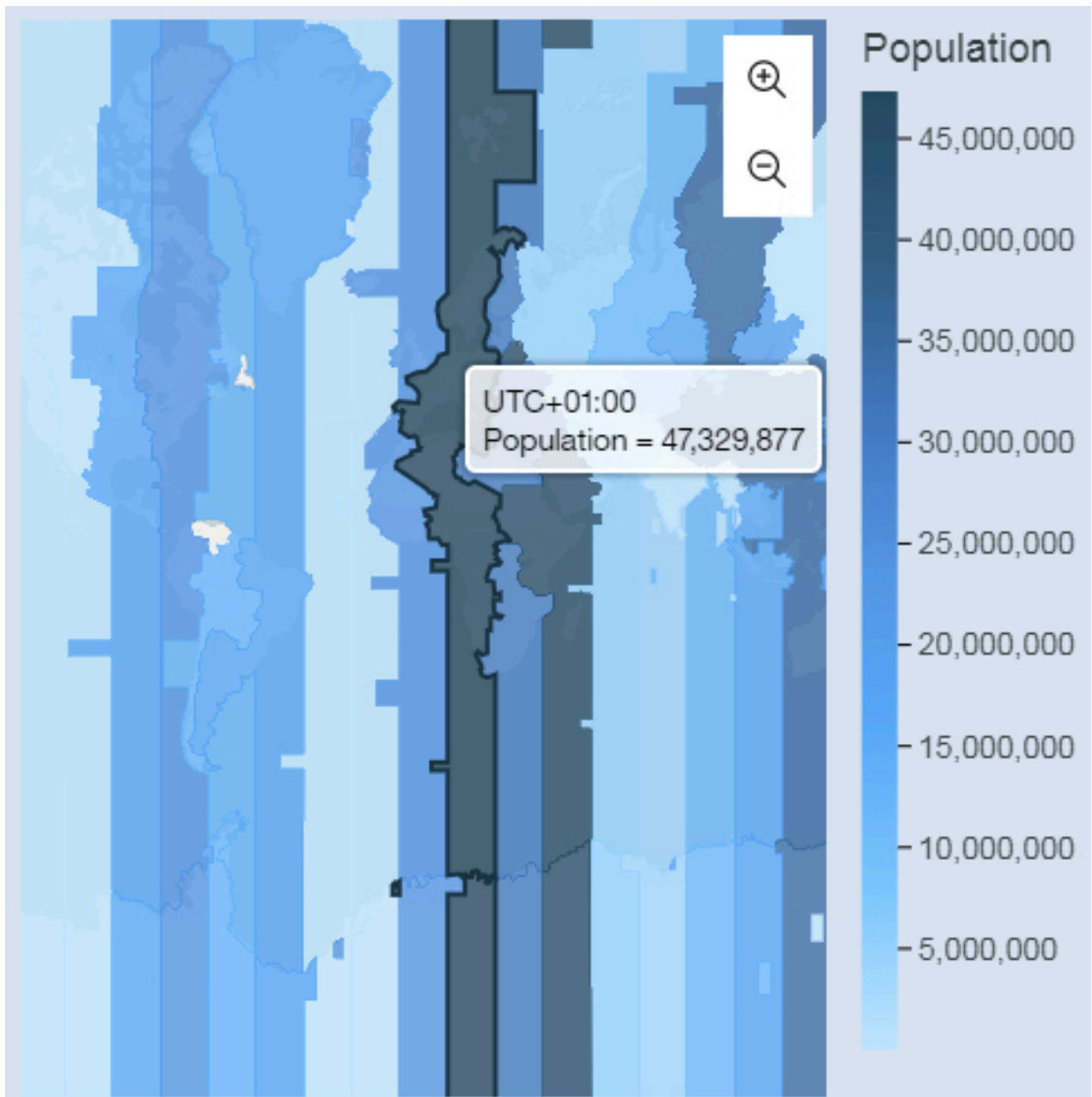
| Option | Description |
|----------------------|--|
| Transparency | Transparency of the region fill. 0 is fully opaque and 100 is completely transparent. |
| Map ID | The Mapbox unique map ID |
| Layer name | The layer name that is used in the Mapbox map |
| Property name | The custom property name that you want to use from the Mapbox map |
| 11.1.0 Type | Defines how points are grouped. Choices are no grouping, heat, and clustered. Applies only to points (and latitude/longitude). |

10. Select **Page preview** to run the report.

Note: You can also click **Run options > Run HTML** to run the report.
11. Select **Page design** to return to page design mode. If you ran the report from **Run options**, close the tab, which returns you to page design mode.

Example

An example of a map visualization with a region layer that shows the population for each time-zone. The layout of the time-zones is defined in a Mapbox map.



Geospatial data

To use a map, your data set must contain geographical data, such as countries, states, or provinces.

To determine whether a column can be used in a map, Cognos Analytics analyzes a sample of 2000 values in the location column, looking for recognizable place names. If 80% or more are recognized as map values, Cognos Analytics produces a map.

For example, you have four countries in your location column and one country is misspelled: Brazil, China, India, and Russia. The typo for India means that only 75% of the values are recognizable place names and you cannot see a map as a starting point. However, if you have five countries and one has a typo in it, you see a map.

Ambiguous data

Ambiguous data in your data set can lead to misleading, inaccurate, or incomplete maps in your dashboard or report. If you don't see a map as a recommended starting point for your data, look at your location column to see whether it contains ambiguous data.

Here are some tips for preventing, locating, and correcting ambiguous data:

- **Important:** Qualify a region with its next level parent. For example, qualify city with state or province. Qualify state or province with country.
- If the column heading for the location column is misleading, such as a location column called Employee Name, it cannot be used for mapping your data.
- Look at the values in your data. Misspellings cause problems.
- Check for and resolve ambiguous locations in your data file and then replace the data in the data set. For example, Georgia is the name of a country and the name of a state in the United States.
 - If Georgia appears in a column that contains American states, a map of the United States is displayed.
 - If Georgia appears in a column that contains countries, a world map or a map of Asia is displayed, depending on the other values in the column.
 - If Georgia is in a column that contains both states and countries, no map is displayed. To avoid this problem, split the column into two, one for countries and one for states. Make sure that the state appears as US Georgia.
- Unmatched values occur when the location on your data cannot be matched by name to a supported admin boundary or postal code. For admin boundaries, if the location is under a different name, you must correct your data.
 - Cognos Analytics does not support U.S. of America, but it does support USA. Create a calculation to change the unsupported value to a supported one.
 - Lakes or other bodies of water are not supported locations.
- For postal codes, you must understand the postal code system for the country that is mapped. You must include both the country and the postal code data items. If Cognos Analytics cannot map the data, there are several possible causes.
 - You are trying to map a full or extended postal code. In Canada, the first 3 characters of the postal code are supported (forward sortation area).
 - For the United States of America, the 5-digit postal code is supported, not the extended postal code.
 - Many countries use a 5-digit postal code so your data must include the country.
 - Countries are constantly updating their postal codes. Cognos Analytics updates the list of supported postal codes once a year.

A map is not displayed in the following cases:

- The data contains both countries and provinces, countries and states, or regions and parts of a region. For example, US, Texas, Florida; UK, Scotland, England; Europe, France, Germany; Florida, Miami-Dade, Broward, Sarasota.
- The data contains abbreviations that can be both countries or states. For example, AL, AR, CA, DE can be Alabama, Arkansas, California, Delaware, Albania, Argentina, Canada, or Germany.

Large custom tiles with multiple labels

When you use large tiles in your map chart, it is expected that multiple labels are displayed in the tiles.

In your map visualization in IBM Cognos Analytics with Watson, you can use [tilesets](#) that were created in Mapbox. To use a tileset, you must provide values to the following properties of the tileset in **Properties > Regions layer** of your map:

- Tileset ID
- Layer name
- Property name

When you use large tiles, and you activate the option **Show value labels**, the labels are being displayed multiple times in the tiles. Such action is expected.

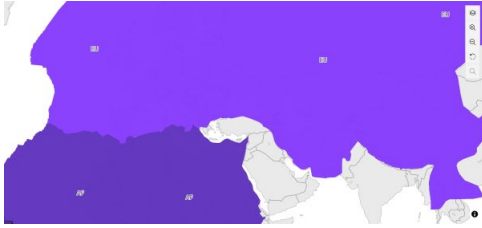



Figure 26. A label is displayed multiple times in a tile.

Searching and zooming in a map

When you use a map in a report, you can search and automatically zoom into items that are matched on your maps. For example, small regions that are spread over a large area.

Procedure

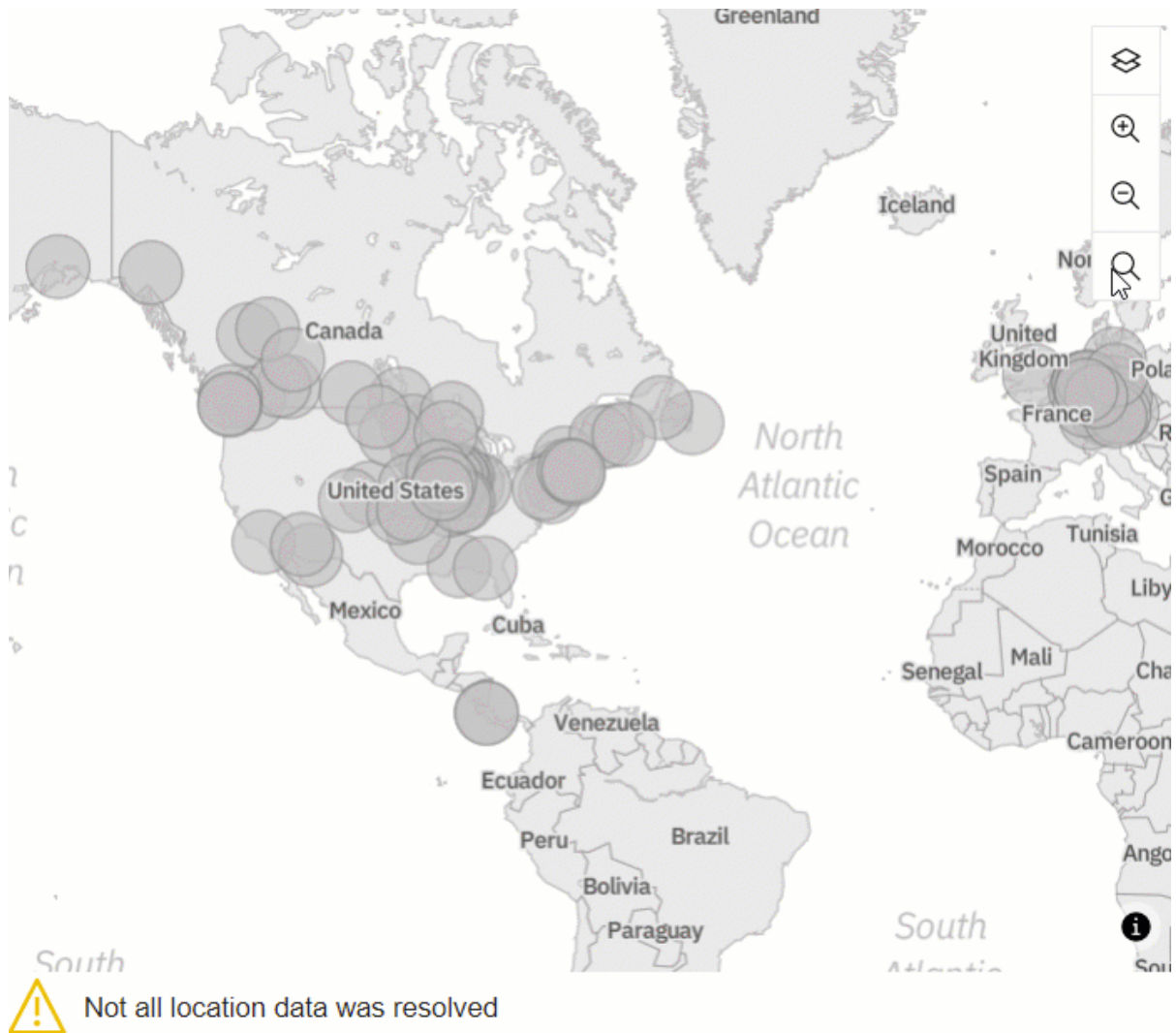
1. Click **New** and then click **Report**.
2. Leave the default values in the **Select a template** window and click **OK**.
3. In the **Visualization gallery** window, select **Map**.
4. In the left pane, click **Sources**, and then click **Select sources**. Select a data source that contains location data.
5. In the visualization, expand and select **Locations**.
6. In the left pane, expand your data items and drag location data to the **Locations** data slot.
7. In the visualization, click the search icon  and enter a location to search for.

Note: The zoom level is not saved when the report is saved.

8. To enable or disable the search function, click the **Properties**  icon, and open the **Map** section > **Enable search control**.

Example


The following example shows a search for the city of Calgary.



Showing labels in the local language in a map in a report

When you use a map in a report, you can show the labels in the local language.

Procedure

1. Click **New** and then click **Report**.
2. Leave the default values in the **Select a template** window and click **OK**.
3. In the **Visualization gallery** window, select **Map**.
4. In the left pane, click **Sources**, and then click **Select sources**. Select a data source that contains location data.
5. In the visualization, expand and select **Locations**.
6. In the left pane, expand your data items and drag location data to the **Locations** data slot.
7. To enable or disable the **Show label in local language** function, click the **Show properties** icon , and open the **Map** section > **Show label in local language**.

Example

The following example shows a map visualization with the standard labels.



The following example shows a map visualization with the local labels.






Hexbin map layer in a map

When you use a map in a report, you can interact with different map layers to customize how a map is displayed. You can visualize data by location that uses a hexbin map layer on a map. The hexbin map layer is available as a property on both points and latitude and longitude layers.

Hexbins calculate the quantity of points in the given radius. If you increase the value of the **Hex radius** property, you will display fewer hexbins. If you decrease the value of the **Hex radius** property, you will display more hexbins. You can also increase the **Maximum Hex extrusion height** property to make the high and low hexbins more distinct.

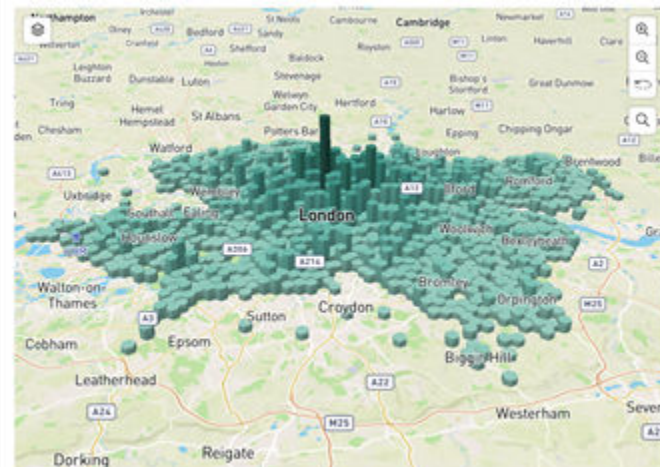
Note: If all of your hexbins are the same color and size, there are not enough data points. For example, this could occur within a map of states in the United States of America. To solve this issue, select a lower level of granularity on your map, such as the postal code.

Procedure

1. Click the **Open menu** icon , and then click **+ New**.
2. Click **Report**.
3. Leave the default values in the **Select a template** window and click **OK**.
4. In the left pane, click the **Visualizations** icon , and then click the **Map** icon.
5. In the left pane, click **Sources**, and then click **Add a Source**. Select a data source that contains longitude and latitude data.
6. In the visualization, expand and select **Longitude/Longitude**.
7. In the left pane, expand your data items and drag latitude and longitude data to the **Latitude** and **Longitude** data slots.
8. Drag a measure to the **Size** data slot.
9. Click the **Properties** icon , and open the **Latitude/Longitude layer** section.
10. From the **Type** menu, select **Hexbin**.
11. Adjust the **Minimum Hex extrusion height** and **Maximum Hex extrusion height**.
12. Optionally you can change the heat palette with the **Change heat palette** option and change the transparency with the **Transparency** slider.

Example

The following example shows latitude / longitude data that is combined with hexbin as type. The size of the points resembles the elevation of the locations.



Chapter 10. Active Reports

You can use IBM Cognos Analytics - Reporting to create active reports - highly interactive and easy-to-use type of reports. Active reports are built for business users, allowing them to explore their data and derive additional insight.

Active reports make business intelligence easier for the casual user. Report authors build reports targeted at their users' needs, keeping the user experience simple and engaging. Active reports can be consumed offline, making them an ideal solution for remote users, such as the sales force.

Active reports are an extension of the traditional IBM Cognos report. You can leverage existing reports and convert them to active reports by adding interactive behavior, providing end users with an easy-to-consume interface.

Like existing IBM Cognos reports, you can execute active reports from the Cognos Analytics portal as well as schedule and burst them to users.

You build active reports with the same objects that you use to build other report types. However, there are objects that are specific to active reports. These objects fall into two categories:

- Active report controls
- Active report variables

For tips about building active reports, see the [IBM Developer Analytics](https://developer.ibm.com/technologies/analytics/) page (<https://developer.ibm.com/technologies/analytics/>).

Note: Cognos Active Report does not support JavaScript.

Active Report Controls

You use active report controls to create the layout of an active report as well as filter, sort, and navigate through data in the report.

Layout

The following controls are used to build the layout of an active report:

- Tab controls, which are used for grouping similar report items.
- Decks of cards, which are used for layering report items.
- Hiding or showing list columns, which allows users to control the data they see by using check boxes.
- Row numbers, which show the number of rows of data in a control.

Filtering and Sorting

To help report authors deliver the content in the most consumable way possible, IBM Cognos Analytics - Reporting provides several filtering controls:

- List and drop-down list controls
- Interactions with charts

For example, clicking a category in a chart filters the data in a list.

- Radial buttons
- Check boxes
- Toggle buttons
- Push button controls

Navigation

To help users navigate through data in a report, report authors can add the following controls:

- Iterators
- Sliders

Data Containers

Data containers, such as lists, crosstabs, charts, visualizations, and repeater tables, are also considered controls in an active report, as you can add interactive behavior to them.

Active Report Variables


Active report variables work in conjunction with active report controls to add interactivity to a report.

Actions performed on a control, such as selecting an item in a control or selecting a control itself, can set the value of a variable. In turn, controls can respond to changes in the value of a variable, such as filtering data in a control.

Convert an Existing Report to an Active Report

You can leverage existing reports by converting them to active reports.

Procedure

1. Open the report that you want to convert.
2. Click the **Save** icon  and click **Convert to Active Report**.




Results

IBM Cognos Active Report commands, objects, and properties become available in IBM Cognos Analytics - Reporting. Objects in the report that are not supported in active reports, such as prompt controls in report pages, are removed.

Specify Active Report Properties

You can specify properties for active reports, such as the text that appears in the browser window title bar, the maximum number of rows that a report can contain, and an access code that users must enter to view a report.

Procedure

1. Open an active report and from the tool bar, click the **Properties** icon , and then, from the top navigation bar, expand **Report**, and select **Report**.
2. Double-click the **Active reports** property.
3. To specify the title that will appear in the browser window title bar when the report is viewed, under **Window Title**, type the title that you want.
4. If you want to specify the window title in other languages, do the following:
 - Under **Window Title**, click the ellipsis button.
 - Click the add button .
 - Select the languages that you want.
 - In the **Language** column, click one of the languages that you selected.
 - Click the the edit button  and type the window title for that language.

5. In the **Window Startup Size** box, choose among the available options to specify the size of the browser window when an active report is viewed.
6. In the **Maximum query rows** box, specify the maximum number of rows of data that the report can contain.

If the number of rows of data returned when the report is run exceeds this value, an error message appears, and users will not be able to view the report.

7. If you do not want to compress the MHT file that is produced when the active report is run, clear the **Compress the active report output** check box.

Compressing the output reduces the size of MHT files so that active reports can support more data and load faster in browsers and mobile devices.

8. If you made changes to the **Window Startup Size**, **Maximum query rows**, or **Compress the active report output** properties and you want those changes to become the default values when you create new active reports, click **Change defaults**.
9. To specify an access code that users will have to enter to view the report, enter the code in the **Access code** box.

You can use any Unicode character in the access code, and there is no limit to the number of characters an access code can contain.

The access code will not be hidden or treated like a password when entered (* will not appear as the code is entered). Users will have three attempts to enter the correct code, after which the active report will shut down. To try again, users have to reopen report.

Note: The access code is a tool to help prevent the unauthorized consumption of an active report within an organization. It is not an enterprise grade security solution.

Adding Interactivity to a Report

You create an active report by adding interactive behavior to controls in the report. Adding interactive behavior links controls to each other, allowing an action performed on a control to change the state of another control.

Creating an Active Report Variable

Create active report variables to allow controls in a report to interact with each other. Active report variables pass information from one control to another control.

About this task

You can also create active report variables when you define connections between controls. However, you may want to modify these variables, such as changing the name or defining default values.

In addition, active report variables allow active reports inserted in a workspace in IBM Cognos Workspace to interact with each other. For example, selecting a product line in one active report causes another active report to show the data for the selected product line. In addition, variables allow check boxes and sliders in a workspace in Cognos Workspace to drive active reports in the workspace.

To work in Cognos Workspace, active report variables must meet the following criteria:

- The variables must be public.



When you make a public variable, the variable can be consumed in other IBM Cognos products.

- For active reports to listen to each other in a workspace, each report must have a public variable with the same name.
- For a Cognos Workspace slider to drive an active report, a range variable must be defined in the active report.

The data item of the slider and the range variable in the active report must have the same name.

Two variables are used to define the minimum and maximum values of the range variable. The two variables are used to define the minimum and maximum values of the slider.

Procedure

1. Click the **Insertable objects** icon  and then click the **Active Report variables** icon .
2. Create a variable by following these steps:
 - a) Click **Create a new variable**.
 - b) In the **Name** box, type the name of the variable.
 - c) Click the **Data Type** drop-down menu and click the type of variable that you want to create.
 - d) To make the variable public, select the **Public (External)** check box.
 - e) If you want to specify a default value for the variable, click **Set default values** and define or specify the values that you want.

If you have added a control to the active report, the **Variable Values Source** drop-down menu becomes active.


To define your own default values, in the **Variable Values Source** list, click **Enter Value(s)**, and then click the new icon .


To specify default values that come from a data item in a control, in the **Variable Values Source** list, click **Select Value(s)**. Specify the control and the data item from which you want to select default values, and then select the values that you want from the **Values** box.

Tip: Define multiple default values when you want more than one item selected in a control that allows multiple selections, such as a check box group.


Adding Controls to a Report

IBM Cognos Active Report offers several active report controls. For many controls, two different versions are available, a static version and a data-driven version.


Use the static version of a control when you want to manually define the values that the control can contain. Use the data-driven version of a control when you want the values that the control can contain to come from a data item. You can find active report controls by clicking the **Toolbox** icon .

When you add a control to an active report, you can convert the control to another type of control that is compatible. Select the control, click the **More** icon , and click **Convert Control**. For example, you can convert a data drop-down list control to a data iterator control.

Variable Text Items

Use variable text items  to insert active report variables in a report. Variable text items are useful to show the value of a variable when an item in another control is selected. For example, you can use a variable text item as a title for a list that is linked to a drop-down list control. When an item is selected from the drop-down list, the item appears as the title of the list.

Row numbers

The active report row number tool  adds row numbers that reflect the visible row number in the report. This is different from the report row number tool, which reflects the server calculated row number.

Static repeater tables

Use static repeater tables and data repeater tables to build a repeating structure of content. Repeater table controls allow you to create button bars or grids of custom content to control the content that

appears in other controls. In data repeater table controls, the content that appears in the repeater table is driven by a data item that you insert in the control.

The following image shows a static repeater table when it is inserted in an active report.

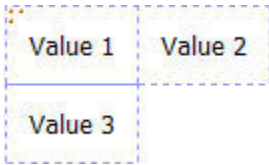


Figure 27. Static repeater table control

The data repeater table is the repeater table data container that is available for all report types. The static repeater table is available in the **Toolbox** tab only when you are authoring an active report.

Decks and Data Decks

Use decks and data decks to show different objects and different data respectively based on a selection in another control. For example, in a deck, clicking a radio button in a radio button group control shows a list object while clicking a different radio button shows a chart object.

The following image shows a deck control when it is inserted in an active report.



Figure 28. Deck control

Decks are composed of cards. In static decks, you define the number of cards in the deck and you insert the objects that you want in each card. This allows you to create cards that can contain different objects, such as pie chart in one card and a crosstab in another card. In data decks, the cards are defined by a data container or data items inserted in the deck, and a data item determines which card appears.

Tab Controls and Data Tab Controls

Use tab controls and data tab controls to define multiple pages for the same area of a report. In data tab controls, the tabs are driven by a data item that you insert in the control.

The following image shows a tab control when it is inserted in an active report.



Figure 29. Tab control

Button Bars and Data Button Bars

Use button bars and data button bars to add a group of push buttons. In data button bars, the buttons are driven by a data item that you insert in the control.

The following image shows a button bar control when it is inserted in an active report.

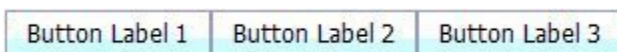


Figure 30. Button bar control

In reports, users can click only one button at a time.

Toggle Button Bars and Data Toggle Button Bars

Use toggle button bars and data toggle button bars to add a group of buttons that change appearance when pressed. In data toggle button bars, the buttons are driven by a data item that you insert in the control.

The following image shows a toggle button bar control when it is inserted in an active report.

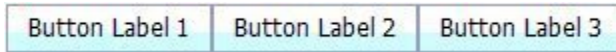


Figure 31. Toggle button bar control

In reports, users can click one or more buttons simultaneously.

Radio Button Groups and Data Radio Button Groups

Use radio button groups and data radio button groups to group a set of buttons that have a common purpose. In data radio button groups, the radio buttons are driven by a data item that you insert in the control.

The following image shows a radio button group control when it is inserted in an active report.



Figure 32. Radio button group control

In reports, users can click only one radio button at a time.

Check Box Groups and Data Check Box Groups

Use check box groups and data check box groups to group a set of check boxes. In data check box groups, the check boxes are driven by a data item that you insert in the control.

The following image shows a check box group control when it is inserted in an active report.

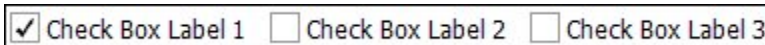


Figure 33. Check box group control

In reports, users can select one or more check boxes simultaneously.

Drop-Down Lists and Data Drop-Down Lists

Use drop-down lists and data drop-down lists to provide a list of items that users can choose from. In data drop-down lists, the lists are driven by a data item that you insert in the control.

The following image shows a drop-down list control when it is inserted in an active report.



Figure 34. Drop-down list control

In reports, users can select only one item at a time.

List Boxes and Data List Boxes

Use list boxes and data list boxes to provide a list of items that users can choose from. In data list boxes, the lists are driven by a data item that you insert in the control.

The following image shows a list box control when it is inserted in an active report.

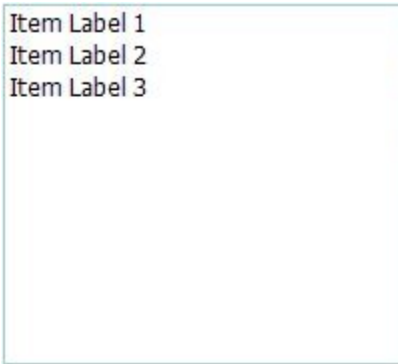


Figure 35. List box control

In reports, users can select one or more items in a list box.

Iterators and data iterators

Use these controls to allow users to navigate or filter values in a control by clicking buttons such as previous and next. In data iterators, the iterations are driven by a data item that you insert in the control.

The following image shows an iterator control when it is inserted in an active report.



Figure 36. Iterator control

Discrete values sliders, continuous values sliders, and data discrete values sliders

These controls allow users to navigate or filter data using a slider bar. Discrete and data discrete values sliders allow users to slide between individual values, such as months. In data discrete values sliders, the values are driven by a data item that you insert in the control. With continuous values sliders, users slide through numeric values between minimum and maximum values that you define, such as 0 and 100.

The following image shows a discrete value slider control when it is inserted in an active report.

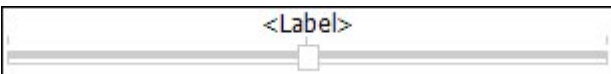


Figure 37. Discrete values slider control

Buttons

Use buttons to add individual push buttons to a report.

The following image shows a button control when it is inserted in an active report.



Figure 38. Button control

Report prompts and iFrames

With these tools, you can use an active report as a prompt to launch and filter target reports, or to launch external web pages. Similar to drill-through, links are created from the active report to other reports or external web pages. Target reports and external web pages can appear in an iFrame in the current window, or in a separate window or browser tab.

The **Report prompts** tool opens a window where you specify the target report that you want to open. IBM Cognos Analytics - Reporting creates the necessary controls and variables.

If you insert an **iFrame** tool, you must create the necessary controls and variables to launch a target report or external web page.

Data Containers

Lists, crosstabs, charts, maps, visualizations, and repeater tables are also controls in an active report, as you can add interactive behavior to them.

In addition, a list container called a data list is available when you are authoring an active report. Data lists offer better performance than regular lists, because they are run on the client workstation or device instead of on the Cognos server. Data lists are scrollable and have pinned headers. Other features include applying a sequence of colors to the list rows, and replacing column values with a microchart.



Add Data to a Control

For every control that you insert in a report, you must add the data that you want to appear in the control.

Add data to a data-driven control


For data-driven controls, you insert data items from the package.

Procedure

1. From either the **Data**  tab, or the **Source** tab , drag query subjects or query items to the control.
2. To add an image to the data in the control, drag the appropriate data item to the **Icon** box.
3. If the data that will appear in the control depends on other data that you do not want to show, drag the appropriate data item to the **Extra Items** box.

For example, you add Product type to a data list box control and you want to filter the product types that appear in the control based on a product line selected in another control. To filter the data, you must drag Product line to the **Extra Items** box.

Tip: IBM Cognos Analytics - Reporting can automatically copy data items from other controls when you create connections between controls.

4. If the control is a data deck and you want to create a default card that will appear when no other card matches the variable value passed to the deck, select the deck, click the **Show properties** icon , and navigate to the properties of the deck. Click **Yes** for the **Show Default Card** property, and then click the **Current Card** property and select **(Default)**. Insert the objects that you want to appear on the default card.

Add data to a static control

For static value driven controls, you manually define the data in a data table.



Procedure


1. In the report, click the definition icon  of the control.


Tip: The definition icon is available from the on-demand toolbar when the control is selected in the report.


2. To add a new object, such as a card in a deck or a button in a button bar, under **Data Table**, click the new button.
3. In **Data Table**, define the values that you want to appear in the control.

Values are organized by data item. In addition to the default data item (Label) and values provided, you can create your own data items and values. For example, to add an icon to each value, you must create a data item for the icons.

- To define a new data item, click the new button  and type the name of the data item that you want to create.
- Click inside each table row and type the name of the value.
- To add translations for the values, to support users in multiple languages, click the ellipsis button, choose the languages that you want to support by clicking the add button , and type the translated text for each language added.
- If you created new data items, in the **Definition** box, click the **Label** drop-down list and select the data item that you want to use in the control.
- To add an icon to each value, select the **Icon** check box, click the drop-down list, and select the data item that contains the icons that you want to use.


You cannot add an icon to values in static decks and discrete values sliders. To add an icon to values in a static repeater table, insert the **Image** object from the **Toolbox** pane . Then specify the data item for the icons by referencing the data item in the **Properties** pane.

4. Optional: If you want to copy all data values to another static control, click the copy control definition icon .

After you have copied the data values of the control, click the definition icon of another static control, and then click the paste control definition icon  to copy the data values.

Tip: You can also drag data items from one control and drop them in another control. This action moves the data item from one control to another control instead of copying the item. You can drag and drop data items only to static controls that can contain objects, such as a deck, tab control, and repeater table. In addition, the data table of the target control must contain a data item with the same name as the data item you are moving, such as Label.

5. If the control is a deck, click the arrows to navigate to each card of the deck and insert the objects that you want to appear on each card.

To create a default card that will appear when no other card matches the variable value passed to the deck, click the **Show properties** icon , and navigate to the properties of the deck. Click **Yes** for the **Default Card** property, and then click the **Current Card** property and select **(Default)**. Insert the objects that you want to appear on the default card.

Referencing data items defined in a static control

If you insert an object in a static control, such as an image in a static repeater table, you can use a data item in the control to populate the object.


Before you begin

You must create the data item in the data table of the control before you can reference the item.

About this task

You can reference data items only for text items, images, hyperlinks, and HTML items inserted in decks, tab controls, and repeater tables.

Procedure


1. In the static control, click the object for which you want to reference a data item.
2. Click the **Show properties** icon , and in the **Properties** pane, click the **Source type** property and choose **Control data item value**.
The **Control data item value** property appears.
3. Click the **Control data item value** property and select the data item that you want to reference.



Tip: If the object is a hyperlink, you can specify the data item to be used to populate the hyperlink text as well as the data item to be used to populate the URL of each link.

Define a Connection Between Controls

Define a connection between controls to link them together. When you link controls, an action performed on one control affects the behavior of the other control.

Procedure

1. Select the control that you added to the report, and from the on-demand toolbar, click the create a new connection icon .

The interactive behavior  and the new connection  icons appear in the on-demand toolbar only when an interactive object control is selected.



2. In the **Source Control** drop-down list, select the source control for which you want to define a connection.
3. Click the **Data Item** drop-down list under the source control and select the data item that will drive the behavior of the target control.
4. In the **Target Control** drop-down list, select the target control for which you want to define a connection.

If the target control is a visualization, select a visualization data container.

5. Click the **Data Item** drop-down list under the target control and select the data item that will determine what appears in the target control.

If the data item that you want to use is not in the query of the target control, and the source control is a data-driven control, select **Copy Data Item from Source** to copy the source data item specified in the previous step to the target control query. If the source control is a static control, select **Use Source Definition**.

If the target control is a data container, the copied data item appears shaded in the container to indicate that the column visibility property for the item is set to **Hidden**.

6. Click the **Behavior** drop-down list between the source and target controls and specify the type of relationship that you want to define between the two controls:
 - To select data in the target control based on what will be selected in the source control, click **Select**.
 - To filter data in the target control based on what will be selected in the source control, select **Filter**.
7. Below the **Behavior** area, click the active variable drop-down list and choose to create a new variable for the connection or use an existing variable.


Tip: If there are no variables defined in the report, you cannot click the active variable drop-down list.

- a) If you create a new variable, type a name for the variable and specify its data type. You can also specify its default values.
- b) If you choose to use an existing variable, choose the variable that you want. You can also specify its default values.

8. Click **Connect**.

Results

When a connection is defined, IBM Cognos Analytics - Reporting creates the appropriate conditions for the selection behavior and reaction behavior of the source and target controls.

Tip: The interactive behavior icon  of a control changes to indicate that a connection was defined.

Click the **Queries** icon , and then click the **Active Report controls** icon  to see the controls and

variables inserted in a report and their relationships to one another. You can click a control in this tab to quickly locate the control in the report as well as set default values for variables.

Specify the Selection Behavior of a Control


Specify the selection behavior of a control to determine what interactive behavior should occur when the control is clicked or when an object in the control, such as a button, check box, or data item, is selected.

Specifying the selection behavior of a control sets the value of active report variables defined in the report. The active report variable values are then used to specify the reaction behavior of controls. For example, you add two drop-down list controls to a report and you create a connection between them. The first drop-down list shows product lines and the second drop-down list shows product types. When a product line is selected in the first drop-down list box, you want to pass that information to the second drop-down list box so that it shows only the product types of the selected product line.

You can specify a selection behavior for any control, except for decks and data decks.

IBM Cognos Analytics - Reporting automatically sets active report variable values when you define a connection between controls. However, you may need to set the value of other variables to specify additional interactive behavior.

Procedure

1. Click the interactive behavior icon  for the source control.

Tip: The interactive behavior icon appears in the on-demand toolbar only when the interactive object control is selected.

The **Report behavior** box shows the relationship between the source and target controls when you defined a connection between the controls. You can specify default values for the variable associated with the control by clicking **Set default values**.

2. In the **Behavior on select** box, click inside the **Set variable values** box and then click the edit button  that appears.

3. For each active report variable that you want to set as part of the selection behavior of the control, click the **Value** drop-down list and select one of the following choices:

- If you want to clear the current value of the variable, click **Set to empty**.

Tip: Clearing the current value of a variable is useful when you have cascading controls. For example, if the parent control is reset to a default value, you want to reset the child control to a default value as well.

- If you want to specify your own value, click **Type in a value** and type the value that you want to use.
- If you want the variable values to be driven by a data item in the report, click the data item that you want to use.
- If you do not want the variable to be used for the control, click **Do not set**.

4. To create a new active report variable, click **Create a new variable**.

Specify the Reaction Behavior of a Control

Specify the reaction behavior of a control to determine how a control will react when another control, or an object in the control, is selected.

About this task

You can specify the following reaction behaviors:

- Select an item in a control.

You can specify this reaction behavior for any control, except for single button controls.

For example, you specify a default value for a variable, and the variable drives a drop-down list control. When the report is run, you want the default value to appear in the control.

You can also specify to select the first or last item in a control by default. For example, an active report contains two data radio button groups that are connected to each other. The first data button group is driven by Product line and the second data button group is driven by Product type. When a user clicks on a product line, the product types that belong to the selected product line appear in the second radio button group, and you want the first or last radio button in the product type radio button group to be selected.

- Filter data in a control.

For example, you want to filter the product types in a drop-down list control based on the product line selected in another drop-down list control.

You can specify this reaction behavior for drop-down lists, data drop-down lists, list boxes, data list boxes, radio button groups, data radio button groups, check box groups, data check box groups, lists, and crosstabs.

- Enable a control.


For example, you want to make a control interactive only when a selection is first made in another control.



You can specify this reaction behavior for any control, except for decks, data decks, tabs, data tabs, lists, crosstabs, charts, and maps.

In addition to these behaviors, you can specify the item to appear when nothing is selected in a list control, hide or show a column, and whether to allow data to be sorted in a list.

IBM Cognos Analytics - Reporting automatically sets the reaction behavior when you define a connection between controls. However, you may want to change the reaction behavior or specify additional interactive behavior.

Procedure

1. Click the interactive behavior icon  of the control.
2. If you want to specify the select an item in a control reaction behavior, and you want to specify to select the first item or the last item in the control by default, click the **Auto Select** menu and choose **First Item** or **Last Item**.
3. In the **Reaction behavior** box, click the reaction behavior box that you want, such as **Container**

 **selection**, and click the edit button  that appears.

If a condition is not yet defined, two dialog boxes appear. The second dialog box prompts you to define the condition expression that you want to use to specify the reaction behavior.

Note: If the reaction behavior that you are setting is **Container selection**, and you previously clicked an option other than **None** in the **Auto Select** menu, defining a condition sets the **Auto Select** menu to **None**. Similarly, if you define a condition in the **Container selection** box, and you then set the **Auto Select** menu to an option other than **None**, the condition is deleted.

4. In the first **Item** box, define the left side of the condition expression.
 - To use a data item, click the **Data Item** radio button and then click the item that you want to use.
The data items that are available in the drop-down list depend on the data items that you inserted into the control.
 - To use a static item, click the **Value** radio button, type the value that you want to use, and then specify the value's data type.
The value must be defined as a value of the selected active report variable in the next step.
 - If you want to set the value of an active report variable to null, click the **Empty Variable** radio button.

5. Click the **Operator** drop-down list and select the operator that you want to use.

6. In the second **Item** box, define the right side of the condition expression.

- To use a value in an active report variable, click the **Active Report Variable** radio button and then click the variable that you want to use.

The variables that are available in the drop-down list depend on the variables that you defined in the report.

- To use a static item, click the **Value** radio button, type the value that you want to use, and then specify the value's data type.
- To use null as the value, click the **Empty Data Item** radio button.

Use null as the value to specify the reaction behavior when no data exists for the value selected in the source control.

7. If you want to apply the condition when no item is selected in the source control, clear the **Drop this condition if the variable is empty** check box.


Clearing the check box can improve performance and prompt users to perform an action. For example, a report contains a list with many rows of data, and the list is filtered by another control. When the check box is cleared, no data will appear in the list until an item is selected in the other control.

Set the No Value List Item

Set the no value list item to show a specific item in a control when no value is selected.


For example, a report contains a drop-down list control that contains product lines. You create a no value list item named (All) to show all product lines when the report is initially viewed.


Procedure

1. Select the control.
2. Click the **Show properties** icon , and for the **No Value List Item** property, click **Show**.

A text item representing the no value list item appears in the control.

3. In the **Properties** pane for the no value list item, double-click the **Label** property.
4. In the **Default text** box, type the name of the no value list item.
5. To specify the text for other languages, do the following:

- Click the add button .
- Select the languages that you want.
- In the **Language** column, click one of the languages that you selected.

- Click the edit button  and type the name of the no value list item for that language.
- Repeat for all remaining languages.



6. In the **Properties** pane for the no value list item, click the **Position in List** property and specify where you want the no value list item to appear in the control.

Show or Hide a Column or Row

You can show or hide a column in a list or a column or row in a crosstab when the report is viewed.

Procedure

1. Click the title of the column or row that you want to show or hide.

2. If the data container is a crosstab, click the **Properties** icon , click the **Visible** property and click **Yes** or **No**.
3. If the data container is a list, click the **Properties** icon  and double-click the **Column Visibility** property.
4. To make the list column visible when the report is viewed, click the **Visible** radio button.
5. To hide the list column when the report is viewed, click the **Hidden** radio button.
6. To make the list column visible based on a condition, click the **Visible based on condition** radio




button, click the edit condition button , and specify the condition.

- If you want to specify a value to use for the condition, click the **Value** radio button, type the value, and in the **Data Type** drop-down list, select the value's data type.
- If you want to use null as the value for the condition, click the **Empty Variable** radio button instead.
- Click the **Operator** drop-down list and select the operator that you want to use for the condition.
- In the **Active Report Variable** drop-down list, select the active report variable that you want to use for the condition.
- If you want to apply the condition when no item is selected in a control that is connected to the list, clear the **Drop this condition if the variable is empty** check box.

Sort Data in a List

You can specify whether users can sort data in a list in the report output.

Procedure

1. Select the column that you want users to be able to sort.
2. Click the **Show properties** icon , and for the **Allow Sorting** property, click **Yes**.

Recommendation - use master detail relationships when authoring decks

When authoring deck controls in active reports, use master detail relationships to improve performance.

Decks offer greater flexibility in active reports by allowing you to show different objects in each card of a deck. In data decks, the number of cards that are created depends on data items inserted in the deck. As a result, a data deck can contain many cards, which may reduce performance when the report is run and viewed. For example, if a data deck contains Product line and Years, there can be up to 20 cards in the deck (five different product lines multiplied by four different years). In addition, filtering data in a data deck can affect performance when there are many rows of data in the deck.

To improve performance, use a master detail relationship to filter data in a data container inserted in a data deck control. A master detail relationship defined between a data deck and a data container inserted in the deck results in a specific number of cards generated for the deck, which serves as a way to filter the data in the data container. For example, a data deck contains a list object that has many rows of data, and you want to filter the list by product line. Creating a master detail relationship between the deck and the list using Product line produces five cards in the deck, one for each product line. When you filter by product line, the appropriate card appears in the data deck.

In addition, specify **Select** as the behavior instead of **Filter** when defining the connection between the data deck control and the control you want to use to filter the data in the deck.

Tip: If the data container in the data deck is a chart, you must use a master detail relationship if you want to filter data in the chart.

Creating a data list

Create a data list to provide better performance in active reports that contain a large data set that is presented in a list format.

About this task


Data lists provide better performance than regular lists because they are rendered on the client workstation or device and not on the IBM Cognos server. Data lists include the following features:

- The list headers are pinned.
- The list is scrollable.
- You can apply a sequence of colors to the rows.
- You can substitute numeric values in a column that are between -1 and 1 with a microchart.

You add or modify features by accessing the properties of the data list or a column in the list.

Procedure

1. Click the **Toolbox** icon , expand the **Data Container** group, and drag **Data list** to the report.

2. Click the **Data items** icon  and add the data items that you want to the list.

The data items appear in the data list flyout, in the appropriate section (**Categories**, **Values**).

3. To add extra data items to the list, add the data items that you want to the **Extra Categories** or **Extra Values** sections in the flyout.

Extra items are items that are used for filtering or setting variables. Extra items do not appear in the data list.

Tip: You can move items from the data list flyout to the list. In the flyout, you can move items from one section to another section. For example, you can move an item in the **Categories** section to the **Extra Categories** section.

4. To modify data list properties, select the entire data list and click the **Show properties** icon .

5. To change the order of extra data items in the data list query, click the **Nesting order** property.

You might have to change the nesting order so that extra items are ordered properly in the query. If the items are not ordered properly, the report might not run.

a) Change the order of items as needed.

b) If you want the order of items to correspond to the order of the list columns, select the **Keep list columns synchronized** check box.

6. To replace numeric values in a column with a microchart, select the column and click the **Microchart** property.

a) Click the **Type** menu and select the type of microchart that you want to add.

The **Colored** option produces a microchart that shows a different color for positive, negative, or zero values. The **Sized** option produces a microchart of different colors and sizes, based on the column values. The **HTML** option shows HTML that you author.

Note: The **HTML** option is available only if you have the **HTML Items in Report** subcapability enabled. In IBM Cognos Administration, this subcapability is found within the **Report Studio** capability.

b) If you selected the **Colored** or **Sized** option, select the check boxes of the values for which you want to show a microchart, and then specify the type of microchart that you want to show and the color.

c) If you selected the **Sized** option, select the **Animate** check box to produce an animation effect when users interact with the list.


7. To specify a different label for a column, select the column heading and set the **Override Label** property to **Yes**, and then specify the label that you want in the **Label** property that appears.

Formatting an active report in the preview view

IBM Cognos Active Report has a preview view that you can use to format an active report and immediately see the layout changes. You no longer have to run the report whenever you make a formatting change.

About this task

In the Active Report preview view, you can toggle between two different modes. To format elements in the report, you must enter the edit mode. When you are in the edit mode, a dotted blue square appears when you hover over a selectable element in the report. You click an element to select it, after which you can format the element by modifying properties in the **Properties** pane. When you enter the Preview mode, you can test active report behavior by clicking elements in the report.

You can also make non-formatting changes to the report. When a non-formatting change is made, a message appears that notifies you that you must refresh the report. The report is refreshed when you click **OK**. You can also refresh the report by clicking the **Refresh** icon .

You can view the report in different screen sizes and orientation. Changing the screen size provides a guideline as to how the report will look on screens of various sizes. When you change the screen size, the Active Report preview view shows the report at the size that you specified. On a mobile device, the IBM Cognos Analytics Mobile Reports application zooms out the report to fit the width of the mobile device screen, eliminating the need for horizontal scroll bars.

Procedure

1. To enter the active report preview mode, click **Page preview**.
2. To enter the edit mode, in the toolbar, click the **Edit** icon.
3. In the edit mode, format the elements in the report that you want.
4. To enter the preview mode, in the toolbar, click the **Preview** icon.
5. To view the report in different screen sizes, in the toolbar, click the **Fit to screen** menu and choose one of the preset sizes, or click **Add custom size** to specify your own screen size.
6. If you specified a screen size in the previous step, click the **Orientation** menu to change the report orientation.


Summarizing Data in the Active Report Output


You can add an output summary to a list or crosstab control that reflects the data that appears in the control when an active report is viewed.

About this task

You can add two types of summaries to an active report: regular summaries and output summaries. Regular summaries are available to all reports while output summaries are available only to active reports. When you add summaries to a report, you can aggregate large quantities of data and identify significances in the combined value. For example, if you want to calculate the voter turnout of a specific region; rather than count individual votes, you can aggregate the total votes received by each candidate.

Procedure

1. In a list or crosstab, click the column or row for which you want to add an output summary.
2. In the report object toolbar, click the summarize button  and then, under **Summarize in Output**, choose the summary that you want to add to the active report output.

Tip: After you add an output summary, you can specify a different aggregation method. Select the summary data item in the list or crosstab, click the **Show properties** icon , and for the **Output summary** property, choose the aggregation method that you want.

Creating application links to other reports or external web pages

Create application links to use an active report to open other reports or external web pages in an iFrame.

About this task

The following active report tools are used to create links.

- **Report links**
- **iFrame**


The **Report links** tool opens a window where you specify the target report that you want to open. The necessary controls and active report variables are then created by using parameters that are found in the target report. If you choose to open the target report in the current window, an iFrame is added to the report.

If you later want to change an application link or add a new link, select a control that was created, click the **Refresh application link** property, and choose one of the available options. When you edit an application link, you can modify Cognos Viewer settings or application parameters.

With the **iFrame** tool, you specify the target report or external web page that you want users to open. You must manually create the controls and variables that are needed to open the target report or web page.

When users run an active report that contains a report prompt or iFrame tool, they are prompted to select values in the controls that appear. The target report is then run, and the data in the target report is filtered by the selected values.

Procedure

1. Click the **Toolbox** icon  and drag the **Report links** or the **iFrame** tool to the report.
2. Specify the target report that you want to link to the active report.
Note: You cannot choose an active report as the target report.
3. If you inserted a report link, specify whether to open the target report in an iFrame in the current window, in a new window, or replace the current window.
4. Click **OK**.

Run or save an active report

You can run an active report in HTML format or save it as a MIME HTML (MHT) file so that you can send the report to your consumers.



MHT files are viewable in [Active Report Viewer](#) and Internet Explorer.




About this task

To assist you in resolving problems related to authoring an active report, a run option is available that shows the state of the active report variables in the report as you click various controls. This option is enabled by default.

Active reports require the same web browser settings as regular reports.

Procedure

1. To disable the run option that can show the state of active report variables when the report is viewed, click the **Run options** icon , click **Show run options**, and clear the **Enable right-click debug menu** check box.
2. To run a report, click the **Run options** icon .

3. To save a report, next to the **Run options** icon , click the **Download Active Report** icon , and when prompted, choose to save the report as an MHT file.
4. To open the saved active report outside of Cognos Analytics - Reporting, click the **Download Active Report** icon , and when prompted, choose to open the report in **Active Report Viewer** or browse for Internet Explorer.

Results

When running a report with the **Enable right-click debug menu** check box selected, right-clicking in the report output window allows you to choose to view the active report variables in the report, reset variables, or print the report.

Tip: The right-click debug menu is not available if you run the report from the IBM Cognos Analytics with Watson portal.

Active Report Viewer

Use Active Report Viewer to view and interact with IBM Cognos Analytics with Watson active reports. The reports must be saved in the MIME HTML (.mht) file format.

This tool is supported on Windows platforms. You don't need access to the Cognos Analytics server to use this tool.

Installing Active Report Viewer

Install Active Report Viewer from **IBM Accelerator Catalog**. This application can be installed on Windows platforms only.

About this task

There are two installation options. One option makes Active Report Viewer available only to your account. The second option makes it available to other users when they log on to the computer by using their accounts. If you choose the second option, use the administration credentials to perform the installation.

Procedure

1. Open the [IBM Accelerator Catalog](#).
You can also access the catalog from the IBM Cognos Analytics with Watson welcome page, the **Getting started** tab. Click **Accelerator Catalog**, and then click the **Browse catalog** link.
2. In the **IBM Data and AI Accelerators** page, expand **Accelerator type**, and select the **Tools** checkbox.
3. Find the **Active Report Viewer** catalog, and click it.
4. Read the description of the catalog, and locate the **Download** link.
5. Download the installation .zip file.
6. Click the .zip in the download location, and run the executable .exe file.
7. Proceed with the installation steps as documented in the installation wizard.

Results

Active Report Viewer is added to the list of programs in the **Start** menu and you can access it from there.

Using Active Report Viewer

Use Active Report Viewer to view and interact with IBM Cognos Analytics with Watson active reports.

The reports must be saved in the .mht file format.

Open Active Report Viewer

Open Active Report Viewer from the **Start** menu on your computer. You can also open this application from the file system. To do that, right-click any **.mht** file, select **Open with**, and choose **Active Report Viewer**.

View and interact with active reports

When you open a **.mht** file in Active Report Viewer, the file is not imported, but only referenced.

Use any of the following methods to open an active report:

- From the **File** menu, click **Open**. Browse for a **.mht** file in your file system.
- Drag a **.mht** file from a folder in your file system, and drop it onto the Active Report Viewer window, either on top of another report or the **Recent** view.
- Right-click an **.mht** file in your file system. Click **Open with**, and select **Active Report Viewer**.
- In the **Recent** view, find and click the **.mht** file if it was viewed recently.

The following example shows an active report in Active Report Viewer.

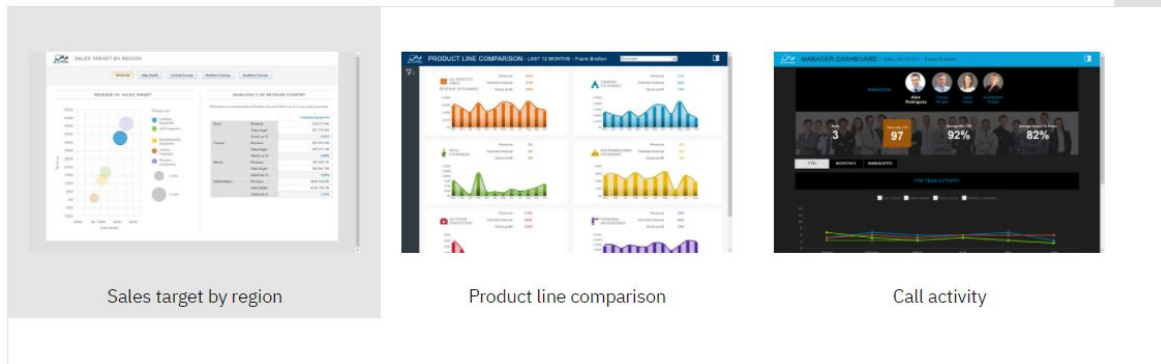


You can open multiple reports, or the same report, at the same time in different Active Report Viewer windows. To do that, from the **File** menu, click **New Window**. The new window opens the **Recent** view from where you can open the report. You can also drag a **.mht** file onto this view.

The Recent view

This view shows the recently viewed active reports (**.mht** files).

Recent



The files in this view can be displayed in the **Grid view** (default) or **List view**.

You can specify the maximum number of reports to retain in this view. To do that, click **File > Preferences**, and change the number for the **Maximum recent entries** preference.

To remove all files from the **Recent** view, click **File > Clear Recent**. To return to this view while a report is open, click **File > View All Recent**, or press the **Ctrl W** keys on your keyboard.

Customize Active Report Viewer

Use the **Preferences** to customize Active Report Viewer. To access the preferences, go to **File > Preferences**.

For example, use the **Maximum recent entries** preference to specify the maximum number of active reports to keep in the **Recent** view. Or use the **Show viewer menu bar** preference to hide or show the menu bar in the application window when a report is viewed. To toggle between the two menu bar states press the **Alt** key on your keyboard.

Chapter 11. Relational Reporting Style

The relational reporting style is recommended for relational data sources. Relational data is best represented by lists. This data is organized in IBM Cognos Analytics - Reporting by query items.

In relational reporting, you summarize data by using headers and footers in lists, summary functions, and within detail aggregation. You focus data in relational reporting with summary or detail filters.

IBM Cognos Query Studio also works with relational data.

Limitations when using data modules

IBM Cognos Analytics with Watson data modules can include data from relational data sources, other data modules, uploaded files, and data sets.

The following limitations apply when you used data modules in relational reporting:

- Data modules and Framework Manager packages cannot be combined in the same report.
- In IBM Cognos Analytics with Watson 11.1.7 and earlier versions, only one data module can be used as a source for a report. Starting with Cognos Analytics 11.1.7 FP1, multiple data modules can be used as sources for one report.
- Data modules that are based on dimensional data sources, such as PowerCubes, dynamic cubes, TM1 data sources, and dimensionally-modeled relational (DMR) data sources, are not supported.
- The **Tree prompt** is not available in reports.
- Navigation paths in data modules are not available when creating a union, except, intersect, join, or custom SQL query in Reporting.

The navigation paths for these types of queries must be created directly in data modules. For more information, see *"Creating navigation paths" in the IBM Cognos Analytics with Watson Data Modules Guide*.

For more information about data modules, see the *IBM Cognos Analytics with Watson Data Modeling Guide*.

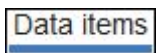
Add Relational Data to a Report

Select the data items to appear in the report.



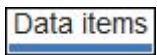
If you frequently use items from different query subjects or dimensions in the same reports, ask your modeler to organize these items into a folder or model query subject and then to republish the relevant package. For example, if you use the product code item in sales reports, the modeler can create a folder that contains the product code item and the sales items you need.

Procedure

1. From the **Source** tab , drag each query item to the report.

Note: A flashing black bar indicates where you can drop an item. Items inserted in the report appear on the **Data Items** tab .

Other ways to select data items are to double-click each item or to right-click each item and click **Insert**.

2. If you want to remove a data item from the report, select it, and in the report object toolbar, click the **More** icon  and then click the **Delete** option . To remove the data item from the report but keep it on the **Data Items** tab , click **Cut** instead.
3. For more information about a query item, right-click the item in the **Source** tab and click **Properties**. You can also obtain more information by clicking **Lineage**.

Group Relational Data

Group data items in a list report to remove duplicate values. For example, you have a report that shows all the products purchased and their product type. You group the Product type column so that each product type cell spans the products purchased cells.

You can specify whether grouping a column automatically makes it the first column in the list by selecting the **Automatic group and summary behavior for lists** check box in the IBM Cognos Analytics - Reporting options. With this option selected, if the list contains any fact or measure columns, footers that show the summary values for the columns are automatically created for each group. Grouping a second column makes it the second column. When you ungroup a column, that column becomes the first column after the grouped column.

After a column is grouped, you can move it elsewhere in the report.

You can also group data items in repeaters and in page sets.

In addition to grouping, you can specify the sort order of data items. In lists, you can sort data items within groups as well as ungrouped items. In crosstabs, you can sort row and column items. For more information, see [“Perform Advanced Layout Sorting” on page 297](#).


Tip: The Succession Report sample report in the GO Data Warehouse (analysis) package includes grouping.

Procedure

1. Click the column on which to group.

You can click either the column title or one of the column cells.

Tip: To perform multiple groupings at once, use Ctrl+click or Shift+click.

2. In the report object toolbar, click **Group/Ungroup** .

Results

A symbol appears indicating that the column is grouped. You can control when its values appear by [setting the group span](#), and the column appears in the list of headers and footers that you can add to the report.

Note: Grouping all columns in a list is equivalent to creating a single-edge crosstab.

Perform Advanced Grouping



You can perform more advanced groupings in a list to get the results you want.

For example, you can

- view the entire grouping structure and make changes to the grouping order
- group a data item that appears in a query but not in the layout
- specify a list of properties for a group

You can also perform advanced sorting.

Procedure


1. Click a column in the list.
2. Click the **Show properties** icon , click the **Select ancestor** icon  in the title bar of the **Properties** pane, and click **List**.

Tip: You can also click the container selector (three orange dots) of the list to select it.

3. In the **Properties** pane, double-click the **Grouping & Sorting** property.
4. To change the grouping order, in the **Groups** pane, click the grouped item in the **Groups** folder and drag it to the grouping hierarchy.
5. To create a new grouping, in the **Data items** pane, click the data item and drag it to the **Groups** folder in the **Groups** pane.
6. To specify a list of data items for a group, do the following:

- Click the group.

Tip: Click **Overall** to specify a list of data items for the overall group. The overall group is the grouping of all data into one group. You can specify a list of data items for the overall group to add overall totals to the list.

- Click the properties button .
- Select the appropriate check boxes.


Creating relational custom groups

Create custom groups to classify existing data items into groups that are meaningful to you.


You can use custom groups to convert numeric values into broader categories. For example, you can break down sales results into low, medium, and high categories. Or you can reduce the number of values into a smaller, more meaningful groups. For example, you can change a list of employees into separate teams or departments.

When you create custom groups in a list, a new column is added to the report, with the name *data item* (Custom). You can use this new column to group or sort the report. If you want to show only the new groups, you can delete the original column.

Procedure

1. Click the column that you want to group on and, in the report object toolbar, click the **Insert calculation** icon  and then click **Define Custom Groups**.

Tip: You can click either the column heading or one of the column cells.

2. Click the **New Group Entry** icon .
3. To group by values that you select, click **New Select Values Group**, type a **New group name**, select the required values from the **Values** box, and move the values to the **Selected values** box.
4. To group by a range of values, click **New Range Group**, type a **New group name**, and enter the **From** and **To** values.
5. If you do not want a group name to appear for remaining values, select **Do not show remaining values**. Clicking this option will produce empty cells for remaining values.
6. If you want the group name for remaining values to match each value, select **Use each remaining value as a group name**.
7. If you want to specify your own group name for all remaining values, select **Group remaining values into a single group** and type the name that you want.
8. If you are adding custom groups in a list, under **New data item name**, select either the default data item name or type a new data item name.

Set the Group Span for a Column


When columns are grouped, you can choose how often to show column names by changing the group spanning.

For example, when country or region and city are both grouped, you can choose to show the country or region name each time

- the country or region changes, by spanning Country or Region by Country or Region
- the city changes, by spanning Country or Region by City
- there is a new record, by specifying no spanning

Spanning one grouped column by another column is helpful if the second column contains many items.

Procedure

1. Click the column that will span the other column(s).
2. Click the **Show properties** icon , and In the **Properties** pane, set the **Group span** property to the column to span.


Divide data into sections

Create sections in a report to show a data item as the heading of a section. When you run the report, separate sections appear for each value.

Creating sections is similar to creating headers by grouping on a data item. The difference is that section headers appear outside the list, crosstab, chart, or repeater. In addition, you can group data items only in lists.


When working with dimensional data, you can also create page layers to show values on a separate page for each member.

Procedure

1. Click the column to make a section heading.
2. In the report object toolbar, click the Section/subsection icon .

If the column is in a list or repeater, sections are created without creating a master detail relationship. This can improve performance when running the report.

If the column is in a crosstab or chart, sections are created by using a master detail relationship.

Sections are created, and a section header appears. The data container that contains the column used to create sections is embedded in a list.
3. To add or remove section headers and footers, from the report object toolbar, click the **More** icon , click **Headers & footers** > **List headers & footers**, and then select or clear the appropriate check boxes.

The section header and footer check boxes appear under **Overall header**.

Remove Sections

You can remove sections and reinsert the data item that was used to create the sections in the data container.

Procedure

1. Make sure you select **Page structure**.
2. Expand the page containing the data container with the section.
3. Expand **Page body** until you see the data container in which you added the section.


The data container is nested in the **List column body** object of the **List** object that is created when you add a section.


4. Drag the data container to **Page body**.

The data container appears as a node of **Page body**.

5. Delete the **List** object.

6. Click the **Page views** icon and click **Page design**.

7. Open **Insertable objects** and click the **Data items** tab , and drag the data item that was used as a section header back into the data container.

8. If you created sections in a list, select the data item, and in the report object toolbar, click the **Group/Ungroup** icon  to ungroup the item.

Summarizing Data Relationally

Summarize data in your reports to obtain totals, averages, and so on.

In a report, you can add both detail and summary aggregation. Detail aggregation, which is supported only for relational data sources, specifies how a data item is totaled at the lowest level in a report. In lists, detail aggregation specifies how the values that appear in the rows are totaled. In crosstabs, detail aggregation specifies how the values in the cells are totaled. For example, detail aggregation for a measure like Revenue might be Total in both lists and crosstabs. In the following list report, this means that the values you see for the Revenue column represent the total revenue for each product type.

| Product line | Product type | Revenue |
|-------------------|------------------|----------------|
| Camping Equipment | Cooking Gear | 272,835,984.18 |
| | Lanterns | 126,925,660.64 |
| | Packs | 351,880,402.84 |
| | Sleeping Bags | 309,172,888.35 |
| | Tents | 528,221,728.02 |
| Golf Equipment | Golf Accessories | 51,514,343.88 |
| | Irons | 254,814,337.99 |
| | Putters | 106,184,271.37 |
| | Woods | 313,898,414.65 |

Figure 39. A list showing product line, product type, and revenue

Summaries, which are supported for all data sources, specify how data items are totaled in the headers and footers of a list and in the total rows and columns of a crosstab. For list reports, these summaries only summarize the data that is visible on that page of the report.

You can specify detail and summary aggregation in different ways by using any of the following:

- aggregation properties that are specified in the model
- the **Auto group & summarize** property
- the summarize icon in the report object toolbar
- aggregation properties for a data item
- summary functions in data item expressions
- the solve order of calculations

Tip: When you add a summary by clicking the summarize icon in the report object toolbar, a data item is created in the query for the summary. In lists, the data item that is created is called a list summary. In crosstabs and charts, the data item that is created is called an edge summary.

Limitation

If a summary is applied to a report that contains binary large object (BLOB) data, such as images or multimedia objects, you cannot also perform grouping or sorting.

The Type of Data

How data is aggregated also depends on the type of data that you are aggregating. Aggregation rules are applied differently to facts, identifiers, and attributes. For example, if you aggregate a data item that represents part numbers, the only aggregate rules that apply are count, count distinct, count non-zero, maximum, and minimum. For information about how to determine the type of data that a data item represents, see [“Add Relational Data to a Report” on page 277](#) and [“Add dimensional data to a report” on page 313](#).

Add a Simple Summary

You can add simple summaries to the groups in a report by using the summarize icon in the report object toolbar. This icon provides a subset of the summary functions available in IBM Cognos Analytics - Reporting. For list reports, a **Custom** option is also available so that you can add your own summary function in the expression of the data item.

The summarize icon sets the rollup aggregate property for the data item to the selected summary, and places the data item into an appropriate footer. A footer is created for each group as well as an overall footer, unless they already exist.


In lists, the summary appears as a footer. If the column to which you added a summary is grouped, group and overall summaries appear. In crosstabs and charts, the summary appears as a node.

To change a summary, select it, click the **Show properties** icon , and in the **Properties** pane, under **Data Item**, click the **Summary** property and choose a different function.

In crosstabs, you can add multiple summaries at the same level. For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. For Product line, you can add the **Total** summary as a header, which will total all revenue for each order year. You can then add the **Average** summary as a footer, which will give the average revenue of all product lines for each order year.

For information about adding a rolling or moving average, see [“Rolling and Moving Averages” on page 330](#).

Procedure

1. Click the column to which to add a summary.
2. In the report object toolbar, click the **Summarize** icon  and click a summary type.
3. To change the summary label, do the following:
 - Click the label.
 - Click the **Show properties** icon, and In the **Properties** pane, under **Text Source**, set the **Source type** property to the source type to define the label.

For example, set it as **Data item value** to produce a dynamic label for the summary based on data item values.

- Set the property under **Source type** to specify the label.



This property depends on the source type you chose. For example, if you chose **Data item value** as the source type, set the **Data item value** property to the data item to use to define the label.

Set the Auto Group & Summarize Property

Set the **Auto group & summarize** query property to specify whether IBM Cognos Analytics - Reporting should group non-fact data items (identifiers and attributes) and apply aggregate functions to aggregate fact data items in lists.

If you are using an OLAP data source, data is always summarized regardless of how this property is set.

Procedure

1. Click the **Queries** icon , and click a query.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Auto group & summarize** property:
 - To group non-aggregate fact data items and apply aggregate functions to aggregate fact data items in lists, set this property to **Yes**.
 - To render detail rows, set this property to **No**.

Specify Detail or Summary Aggregation in the Model

When working with relational or dimensionally-modeled relational (DMR) data sources, you can use the aggregation properties specified for the query item in the IBM Cognos Framework Manager model instead of specifying detail or summary aggregation in the report. The model specifies the default summary function for each query item.

Aggregation functions are mapped between data sources, Framework Manager, and IBM Cognos Analytics - Reporting. For more information about specifying aggregation properties in Cognos Framework Manager, see *Modifying how query items are aggregated* in the *Framework Manager User Guide*.


Specify aggregation properties for a data item

When working with relational data sources and list reports, for each data item in a report, you can specify detail and summary aggregation properties to manage summaries without having to create complex data item expressions.

About this task

For more information about the aggregation functions that you can specify, see [“Summary Functions” on page 285](#).

Procedure

1. Click the data item for which to set detail or summary aggregation.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Detail aggregation** or the **Summary aggregation** property to a function.

Use Summary Functions in Data Item Expressions

You can use summary functions in data item expressions. The summary functions in the expression editor that have the same name as the summary functions available through the **Detail aggregation** and **Summary aggregation** properties operate the same way. For example, in a relational report, setting the **Detail aggregation** property to **Total** is the same as changing the expression of the data item to `total ([Revenue])`.

In general, report maintenance is easier if the **Detail aggregation** and **Summary aggregation** properties are used rather than adding summary functions to data item expressions. Use summary functions in expressions if the required summary is not supported as an aggregate or rollup aggregate property or if the complexity of the expression cannot be managed using the data item properties. Add a summary function to a data item expression if one of the following conditions applies:

- The underlying data source is relational, and you want to use database vendor-specific summary functions.
- You want to use summary functions that require more than one parameter, such as percentile.
- You require summary expressions that are not available in the aggregation properties, such as a `for` clause. You should use `for` clauses only in relational style reports (list reports).

For example, your report uses Product line, Product type, and Quantity. You want to calculate the percentage of the parent quantity that is represented by each product type. This requires you to compare the total quantity for each product type to the total quantity for the parent product line. In other words, your expression requires summaries at different group levels. You use summary functions, such as aggregate, in the data item expression with a for clause to specify the group level as follows:

[Quantity] / aggregate ([Quantity] for [Product line])

| Product line | Product type | Quantity | % of Product Line |
|------------------------------------|------------------|-------------------|-------------------|
| Camping Equipment | Cooking Gear | 13,400,351 | 49% |
| | Lanterns | 4,826,755 | 18% |
| | Packs | 2,756,540 | 10% |
| | Sleeping Bags | 3,153,218 | 12% |
| | Tents | 3,164,285 | 12% |
| Camping Equipment - Summary | | 27,301,149 | 100% |
| Golf Equipment | Golf Accessories | 3,119,747 | 61% |
| | Irons | 391,445 | 8% |
| | Putters | 1,284,570 | 25% |
| | Woods | 317,939 | 6% |
| Golf Equipment - Summary | | 5,113,701 | 100% |

In some cases, you may need a summary that is different from the default. For example, if the default summary for Quantity is total, you can calculate the average as follows:

[Quantity] / average (aggregate ([Quantity]) for [Product line])

| Product line | Product type | Quantity | % of Product Line Average |
|------------------------------------|------------------|-------------------|---------------------------|
| Camping Equipment | Cooking Gear | 13,400,351 | 245% |
| | Lanterns | 4,826,755 | 88% |
| | Packs | 2,756,540 | 50% |
| | Sleeping Bags | 3,153,218 | 58% |
| | Tents | 3,164,285 | 58% |
| Camping Equipment - Summary | | 27,301,149 | 100% |
| Golf Equipment | Golf Accessories | 3,119,747 | 244% |
| | Irons | 391,445 | 31% |
| | Putters | 1,284,570 | 100% |
| | Woods | 317,939 | 25% |
| Golf Equipment - Summary | | 5,113,701 | 100% |

The inner summary gives you the expected Quantity values at the Product Type level, which are then averaged to the Product Line level. This two-stage aggregation is required for OLAP data sources and recommended for relational data sources also.

Why is this necessary? Here's what would happen if you simply averaged Quantity, as follows:


[Quantity] / average([Quantity] for [Product line])

| Product line | Product type | Quantity | % of Product Line Average |
|------------------------------------|------------------|-------------------|---------------------------|
| Camping Equipment | Cooking Gear | 13,400,351 | 2,538,352% |
| | Lanterns | 4,826,755 | 914,305% |
| | Packs | 2,756,540 | 522,156% |
| | Sleeping Bags | 3,153,218 | 597,296% |
| | Tents | 3,164,285 | 599,392% |
| Camping Equipment - Summary | | 27,301,149 | 5,171,500% |
| Golf Equipment | Golf Accessories | 3,119,747 | 1,205,327% |
| | Irons | 391,445 | 151,236% |
| | Putters | 1,284,570 | 496,299% |
| | Woods | 317,939 | 122,837% |
| Golf Equipment - Summary | | 5,113,701 | 1,975,700% |

The denominator is now computed as the average of the detail Quantity rows in the underlying fact table. Since these values are much smaller than the pre-summarized Quantity values you see in the report, the resulting percentage is far too big, and not what we wanted.


Tip: The Total Revenue by Country or Region sample report in the GO Data Warehouse (query) package includes a total summary function.

Procedure

1. Click a data item.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Expression** property and add summary functions to the expression for the data item.

Summary Functions

This section describes the summary functions that are available in IBM Cognos Analytics - Reporting.

Some functions, such as **Custom**, are available only when you click the **Summarize** icon  in the report object toolbar. Additional summary functions are available in the expression editor.

Default summary

Depending on the type of data item, applies the function **None**, **Summarize**, or **Calculated** based on the context in which the data item appears.

Calculated is applied if the data item expression

- contains a summary function
- is an **if then else** or **case** expression that contains a reference to at least a modeled measure in its condition
- contains a reference to a model calculation or to a measure that has the **Regular Aggregate** property set to a value other than **Unsupported**
- contains a reference to at least one data item that has the **Summary aggregation** property set to a value other than **None**

If the underlying data source is relational and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported**, **Summarize** is applied.

In all other contexts, **None** is applied.

For relational and dimensionally modeled relational (DMR) data sources, if this function is applied to a data item expression that has the average function, weighted averages are computed based on the lowest level detail values in the data source.

Note: This is the default function.

Average

Adds all existing values and then divides by the count of existing values.

Calculated

Specifies that all the terms within the expression for a data item are aggregated according to their own rollup rules, and then the results of those aggregations are computed within the overall expression.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Total**. You add a query calculation named Quantity Calculated. You define its expression as Quantity + 100 and you set its **Detail aggregation** property to **Calculated**. When you run the report, the values for Quantity Calculated are computed by first adding all values for Quantity and then adding 100 to each value.

Note: In crosstabs, this function overrides any solve orders that are specified.

Count

Counts all existing values.

If the underlying data source is dimensionally modeled relational (DMR), Count behaves as follows if it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

| Object | Behavior |
|------------|---|
| Level | Count distinct is used. A warning appears when you validate the report. |
| Member set | Count distinct is used. A warning appears when you validate the report. |
| Attribute | Supported. |
| Measure | Supported. |

If you add the count summary to a non-fact column in a list and then group the column, the column will not be grouped when you run the report. To resolve this issue, group the column first before adding the count summary.

Count Distinct

Returns the total number of unique non-null records.

If the underlying data source is dimensionally modeled relational (DMR), count distinct is supported for levels, member sets, attributes, and measures when it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

Custom

Summarizes data based on an expression that you define.

Maximum

Selects the largest existing value.

Median

Returns the median value of the selected data item.

Minimum

Selects the smallest existing value.

None

Does not aggregate values.

If the underlying data source is relational, the data item is grouped when the query property **Auto group & summarize** is set to **Yes**.

Not applicable

This function is available only for the **Detail aggregation** property. It specifies that the aggregate attribute is ignored. For example, the calculation will be applied after the data is aggregated.

This function differs from the **Calculated** function, which applies aggregation to the rows and then performs the calculation.

For example, for the `average ([Quantity]) + 5` expression, when the **Detail aggregation** property is set to **Not applicable**, five is added to the average of the single Quantity value. When the function is set to **Calculated**, five is added to the average of a set of numbers.

This setting should not be applied to a simple model reference.

This setting is relevant only for reports that are upgraded from IBM Cognos ReportNet 1.x.

Standard Deviation

Returns the standard deviation of the selected data item.

Note: From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

Summarize

Aggregates data based on model or data type information. This function can be thought of as a calculate and then aggregate rule. Data is aggregated using the following rules:

If the underlying data source type is relational and the data item or calculation is a reference to a single fact query item in the model that has the **Regular Aggregate** property set to **Sum**, **Maximum**, **Minimum**, **Average**, or **Count**, aggregate data using this function. Otherwise, data is aggregated according to the data type of the data item as follows:

- **Total** is applied for numeric and interval values.
- **Maximum** is applied for date, time, and date-time values.
- **Count** is applied for everything else.

The underlying data source type can be dimensional and the data item or calculation a reference to a single item in the model. In this case, if the **Regular Aggregate** property of the model item is not **unknown**, the summary function that corresponds to the **Regular Aggregate** property is applied. If the **Regular Aggregate** property is **unknown**, set the function to **Calculated**.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Average**. You add a query calculation named Quantity Summarize. You define its expression as `Quantity + 100` and you set its **Detail aggregation** property to **Summarize**. When you run the report, the values for Quantity Summarize are computed by first adding 100 to each value for Quantity and then calculating the total. The total is calculated because Quantity contains numeric values and the expression for Quantity Summarize

is not a simple data item reference. If Quantity Summarize is defined as Quantity, the function **Average** is applied to each value.

Total

Adds all existing values.

Variance

Returns the variance of the selected data item.

Note: From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

Mapping Aggregation Functions From Data Sources to Framework Manager and Reporting

The summary functions available in IBM Cognos Framework Manager and IBM Cognos Analytics - Reporting reflect summary functions supported by relational and dimensional data sources. The following table shows how summary functions in data sources are mapped to Framework Manager and Reporting.

| Data source | Framework Manager | Reporting |
|-----------------------------|---------------------------|---------------------------|
| None specified, or none | Unsupported | None |
| average (avg) | Average | Average |
| count | Count | Count |
| count distinct | Count Distinct | Count distinct |
| maximum (max) | Maximum | Maximum |
| minimum (min) | Minimum | Minimum |
| median | Median | Median |
| standard deviation (stddev) | Standard Deviation | Standard Deviation |
| sum | Sum | Total |
| variance (var) | Variance | Variance |
| count non zero | Count Non-Zero | Automatic |
| average non zero | unknown | Automatic |
| external | unknown | Automatic |
| any | unknown | Automatic |
| calculated | unknown | Automatic |
| unknown | unknown | Automatic |
| first_period | unknown | Automatic |

| Data source | Framework Manager | Reporting |
|-------------|-------------------|-----------|
| last_period | unknown | Automatic |

The following summary functions exist only in either Framework Manager or Reporting. There is no corresponding summary function in data sources.

| Framework Manager | Reporting |
|-----------------------------------|----------------|
| Automatic | Automatic |
| Calculated | Calculated |
| No corresponding summary function | Summarize |
| No corresponding summary function | Not Applicable |

Focusing Relational Data

You can limit the data in your report with filters or query parameters. The method you choose should depend on the capabilities of the data source, the performance requirements, the persistence of the dataset, and how complex you want the report to be.

In IBM Cognos Analytics - Reporting, summary and detail filters are best for list reports in the relational reporting style. Summary filters are applied to summaries and detail filters are applied to details. These filters remove rows and columns from your reports.

You can also use prompts, or prompt controls, to allow report users to provide input for the filter.


Creating a filter based on one data item

Use the **Create Custom Filter** option to create a simple filter based on one data item.


About this task

If you are viewing a report in the interactive viewer, some options, such as **Prompt for values when report is run in viewer**, are not available.

The filter criteria that you set depends on the type of item that you are filtering on. The types are string, numeric, and date.

Tip: You can also define filters in **Query explorer**. Click the **Queries** icon , and click a query. For more information, see [“Add a query to a relational report”](#) on page 299.

Procedure

1. On the canvas, select the item in the report that you want to filter on, and in the on-demand toolbar, click the **Filters** icon , and then click **Create Custom Filter**.

If more than one query is defined in the report, you must first select a data container object that is linked to a query.

The **Filter condition** window opens.

If the item you selected is a string, then do the following steps:

2. On the **Individual** tab, you can select values to keep from a list of available values or manually enter items:
 - a) Under **Available items**, select all values in the list, or select individual values.

The list of available items is created from the values in the data source.

The items you select appear under **Selected items**.

b) Under **Selected items**, click either **Keep these values** or **Exclude these values**.

c) To input your own values, click **Manually input items**.

This option is handy if you want to use values in a delimited text file. You can copy values from the file and paste them in to the window.

d) In the drop-down list, select the delimiter that separates the items.

You can choose comma, new line, space, or a plus sign as a delimiter.

e) Copy the values from the file and paste them in to the window and then click **Add**.

The items appear under **Selected items**.

f) Under **Advanced settings**, you can include missing values for the following conditions:

null

If you want to include an item that has no value, select this check box.

empty

If you want to include an item with a length of zero, select this check box. That is, "".

whitespace

If you want to include an item that contains only spaces, select this check box. For example, " ".

3. On the **Condition** tab, you can select a condition and then enter the value to match in the condition:

a) Select one of the conditions in the drop-down list.

You can choose contains, starts with, or matches SQL pattern.

b) Click **Input condition**, type the condition, and press Enter.

The condition appears in the list.

c) By default, **Case sensitive** filtering is applied to characters in the string. You can optionally change the setting to **Case insensitive**.

d) Under **Advanced settings**, you can include missing values for the following conditions:

null

If you want to include an item that has no value, select this check box.

empty

If you want to include an item with a length of zero, select this check box. That is, "".

whitespace

If you want to include an item that contains only spaces, select this check box. For example, " ".

If the item you selected is numeric, you can define a range of values or individual values:

4. On the **Range** tab, you can define a range of values:

a) Under **Add a condition**, select either **Keep these values** or **Exclude these values**.

b) Select a comparison statement from the drop-down list.

Depending on the comparison statement you select, you might have to select one value or **From** and **To** values.

5. On the **Individual** tab, you can manually input values:

a) Click **Manually input items**.

This option is handy if you want to use values in a delimited text file. You can copy values from the file and paste them in to the window.

The **Ignore empty items** option can be used to either include or remove the empty values that were copied from the file. By default, the empty values are removed.

b) In the drop-down list, select the delimiter that separates the items.

You can choose comma, new line, space, or a plus sign as a delimiter.

- c) Copy the values from the file and paste them in to the window and then click **Add**.
The items appear under **Selected items**.
- d) Under **Selected items**, click either **Keep these values** or **Exclude these values**.
6. Under **Advanced settings**, you can include missing null values by selecting the **null** check box.
A column that doesn't have a value is null.

If the item you selected is a date, then do the following steps:

7. On the **Range** tab, you can define a range of values:
 - a) Under **Add a condition**, select either **Keep these values** or **Exclude these values**.
 - b) Select a comparison statement from the drop-down list.
Depending on the comparison statement you select, you might have to select one value or from and to values.
8. On the **Individual** tab, you can select dates to keep or exclude from a list of available values or manually enter dates:
The list of available items is created from the values in the data source.
 - a) Under **Available items**, select all dates in the list, or select individual dates.
The items you select appear under **Selected items**.
 - b) Under **Selected items**, click either **Keep these values** or **Exclude these values**.
 - c) To input your own dates, click **Manually input items**.
This option is handy if you want to use values in a delimited text file. You can copy values from the file and paste them in to the window.
 - d) In the drop-down list, select the delimiter that separates the dates.
You can choose comma, new line, space, or a plus sign as a delimiter.
 - e) Copy the dates from the file and paste them in to the window and then click **Add**.
The dates appear under **Keep these values** or **Exclude these values**.
9. Under **Advanced settings**, you can include missing null values by selecting the **null** check box.
A column that doesn't have a value is null.

For all types of filters, there are some common settings you can define.

10. Click **Settings** and then do the following steps:
 - a) To prompt for filter values when the report is run, select **Prompt for values when report is run in viewer**, and type a name for the prompt.
Tip: If you leave the **Prompt for values** check box selected (the default) and run a report that contains the same parameter name that appears in your **My parameters** pane, you are not prompted to provide a value for the parameter. The system automatically uses the default values that are set for the users role. Even if the parameter on the report is optional, the default value for the global parameter is passed.
 - b) To allow the filter criteria to be changed in the viewer, select **Filter can be changed in the viewer**.
Note: Report consumers can change the filter only if the report is fully interactive.
Note: Low-level filters, such as ones defined in the expression editor, cannot be changed in the viewer.
 - c) Select one of the following items:
 - **Individual values in the data source**
 - **Aggregated values in the data source**
11. Click **OK** when you're finished defining the filter conditions.

Create a detail or summary filter

Add a filter expression to focus a report and minimize processing time by excluding unwanted data. For example, you can filter data to show only customers who placed purchase orders that were valued at over one thousand dollars during the past year. When you run the report, you see only the filtered data.

Detail filters are applied only to detail data items from the data source, and not to summary data items. Examples of detail data items include customer names, product numbers, and order numbers. Detail filters are Boolean expressions that apply one or more conditions and evaluate to either true or false. If the conditions are true for a row of data, the row is retrieved from the data source and appears in your report. If the conditions are false, the row is not retrieved and does not appear in your report. You can specify whether detail filters are applied before or after summaries using the **Application** property.

Tip: The 2011 Sales Summary sample report in the GO Sales (analysis) package includes a detail filter.

Summary filters are applied to summary data items in a report. They are also Boolean expressions, however they are used to exclude specific groups of data items based on the group summaries. They are based on summary calculations.

You can combine multiple conditions using AND, OR, and NOT operators. By default, multiple conditions are combined with an AND operator, which means that all conditions must be met for the filter to take effect.




For relational data sources, if a filter expression is used in multiple reports or by different report authors, ask your modeler to create the filter as a standalone object in the model and include it in the relevant package. For information about creating filters in the package, see the *IBM Cognos Framework Manager User Guide*.

If you are filtering a multiple-fact query, you should understand the differences between using a detail filter and summary filter.


If you filter values that are floating-point numbers, you may encounter imprecise filtering results due to rounding or data truncation. Floating-point numbers may appear differently in the report than how they are stored in the data source. To ensure accurate results, your filter criteria should account for any rounding issues.

If you are working with a Microsoft SQL Server 2005 Analysis Services (SSAS) data source, we recommend that you not use OR filters in summaries. Doing so causes error characters (--) to appear in summaries instead of values.


Procedure


1. To add a filter that was already created in the package, click the **Data** icon , and from the **Source** tab , drag the filter  to the report.









You must drag the filter to a data container object that is linked to a query, such as a list, crosstab, or chart.

2. To create your own filter, select the item in the report that you want to filter on, and in the on-demand toolbar that appears, click the **Filters** icon , and then click **Edit Filters**.

If more than one query is defined in the report, you must first select a data container object that is linked to a query.

Tip: You can also define filters in **Query explorer**. Click the **Queries** icon , and click a query.

3. In the **Filters** dialog box, decide what type of filter to create:
 - To add a filter that will apply to detail values, click the **Detail Filters** tab.
 - To add a filter that will apply to summary values, click the **Summary Filters** tab.
4. Click the add button .
5. In the **Create filter** dialog box, decide what conditions to include in the filter:

- To create a simple filter condition based on only one data item, click **Custom based on data item**, select a data item from the query, and click **OK**. Then, perform the steps in [“Creating a filter based on one data item”](#) on page 289.
 - To combine multiple filter conditions, click **Combined**, and click **OK**.
 - To create a filter condition that uses advanced calculations, click **Advanced**, and click **OK**.
6. If you create a **Combined** filter, do the following:
- a) In the **Create filter** dialog box, select the data item for the first filter condition and click **OK**.
 - b) In the **Filter condition** dialog box, specify the details for the first condition and click **OK**.
 - c) Click the new condition button  and, in the **Create filter** dialog box, select the data item for the second filter condition and click **OK**.
 - d) In the **Filter condition** dialog box, specify the details for the second condition and click **OK**.
 - e) In the **Combined filter** dialog box, use the AND, OR, and NOT operators to combine the filter conditions. Select the conditions that you want to combine, and click an operator. To change an operator, double-click the operator to toggle among available ones or select the operator and then select a different one from the list.
 - f) Click **OK**.
7. If you create an **Advanced** filter condition, in the **Filter expression** dialog box, define the filter expression:
- a) To add data items that are not shown in the report, on the **Source** tab , double-click data items.
 - b) To add data items that are in the report but not necessarily in the model (such as calculations), on the **Data items** tab , double-click data items.
 - c) To add data items from a specific query in the report, on the **Queries** tab , double-click data items.
 - d) To add functions, summaries, and operators, on the **Functions** tab , double-click elements. You can insert only functions that return a Boolean value (true or false). For example, you cannot insert the function topCount because it returns a set of data. Filter expressions must resolve to a Boolean in order to be valid.
 - e) To add a value that is derived from a parameter, on the **Parameters** tab , double-click the parameter. Parameters define prompts, drill-through reports, and master detail relationships.
 - f) To add a macro, on the **Macros** tab , double-click the parameter maps, session parameters, or macro functions you want to add to the macro expression.
- Tip:** Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.
- g) Click the **Validate** icon  and click **OK**.
 - h) Click **OK**.
- Tip:** You can also type the filter expression directly in the **Expression Definition** box. When typing date values, use the YYYY-MM-DD format.
- For more information about creating expressions, see [“Using relational calculations”](#) on page 306.
8. In the **Usage** box, specify whether the filter is required, optional, or not to be used.
9. If you create a detail filter, under **Application**, click one of the following options:
- To apply the filter to individual records in the data source, click **Before auto aggregation**.
- For example, for a specific product type within a product line, you want to filter out individual orders that generated less than one thousand dollars in revenue.

- To apply the filter to data after the query has grouped and summarized at the lowest level of detail, click **After auto aggregation**.

For example, you want to filter out the product types that generated less than ten thousand dollars in revenue within a product line.

For example, you have a list that contains the data items Product line, Product type, and Revenue. The revenue values you see are aggregated to the product type level. If you create a detail filter on Revenue and you choose to filter values before auto aggregation, you are filtering non-aggregated revenue values. If you choose to filter values after auto aggregation, you are filtering revenue values aggregated to the product type level.

10. If you want to allow report consumers to change the detail filter when the report is run, select the **Can be changed in the viewer** check box.

Note: Low-level filters, such as ones defined in the expression editor, cannot be changed in the viewer.

11. If you create a summary filter, under **Scope**, click the ellipsis button and select the grouping level at which to apply the filter.


For example, a revenue report is grouped on product line and product type. You can choose to filter total revenue for either the product line or product type level.

If the query in which you are creating the summary filter is linked to more than one data container, the data item that you select as the grouping level must be grouped in all data containers linked to the query. Otherwise, the report will not run successfully.

Tip: To filter at the overall level, do not click a level. For example, if a report has an overall footer that shows the total revenue for all products, by not choosing a level you will apply the filter to the footer. In addition, if you are using a dimensional data source, excluding a parent level excludes its children, and excluding all children excludes the parent.

12. To show filter text in a report, click a data container to which you added a filter, and in the on-demand

toolbar, click the **Filters** icon , and then click **Insert Filter Text**.



- a) Click the filter text block that appears.
- b) Click the **Show properties** icon .
- c) To specify how to display filter text for detail filters, click the **Display detail filter text** property and choose one of the available options.
- d) To specify how to display filter text for summary filters, click the **Display summary filter text** property and choose one of the available options.


13. Repeat step 12 to show filter text for other data containers that are linked to a different query.

Edit or remove a filter

After you created filters, you can edit or remove them.

Procedure

1. Click a data container object that contains a filter.
2. To remove all filters from the object, in the report object toolbar, click the **Filters** icon  and click **Remove All Filters**.
3. To edit a filter or remove a single filter, in the report object toolbar, click the **Filters** icon  and click **Edit Filters**.



Tip: You can also edit filters from the **Query explorer**. Click the **Queries** icon , and click the query that contains your filter.

Browse or Search the Values of a Data Item


When building expressions in the expression editor, you can browse the data of a data item.


This is useful when you do not know how a particular value is stored in the database. For example, you want to filter a report so that it shows data for only New South Wales. The actual value in the database for New South Wales is NSW, and this is what you must insert in the filter expression to obtain the correct results.

Procedure

1. In the source, data items, or query tab, select the data item you want to browse and in properties click **Expression**.
2. If you want to insert a single value, click **Select Value** .
3. If you want to insert multiple values, click **Select Multiple Values** .
4. In the **Values** box, click the value you want to insert in the expression.

Tip: Use the **Keywords** box to search for specific values. If you select **Use Tab as keyword delimiter**, you can add a tab in the **Keywords** box only by copying and pasting a tab (or the string you want to search on with a tab in it), from another application, such as Notepad. If the data source is case sensitive and you want to perform a case insensitive search, click the **Search** arrow and then click **Case Insensitive**.

5. If you clicked multiple values, click the right arrow button  to add them to the **Selected values** box.
6. Click **Insert**.

Tip: To control where values appear in the **Expression Definition** box, you can click the copy button  if you selected a single value or the copy all button if you selected multiple values instead. The values are copied to the clipboard, and you can then paste them where you want.

Searching for values might return unexpected results

In the expression editor, when searching for values for a data item, the results you obtain might contain unexpected results if the data item is not a string data type.

Because you can edit the expression for a data item, IBM Cognos Analytics with Watson cannot determine with certainty what the data type is.

Therefore, IBM Cognos Analytics with Watson guesses the data type of the data item by looking at its aggregate and rollup aggregate set.

Ignoring the Time Component in Date Columns

Database systems use Date, Time, and Timestamp to represent date and time values. While a timestamp type holds a date and time component, an application may allow the RDBMS to default the time component. When rows are inserted, updated, or queried, the application may specify only a date value and leave the RDBMS to extend the value to include a default time (usually 00:00:00.000).

The challenge with a timestamp is when the application has no immediate interest in the time component. For example, the business question How many orders were taken today? implies all orders taken irrespective of what time the order was booked. If the application defaulted the time component as it stored rows, the query that was used to answer the question returns the count of orders taken today. If the application stored the actual time component, the query likely returns no data, because the number of orders entered at midnight is probably zero.

Relying on the time defaults can be dangerous if the application changes and starts to capture actual times. To avoid this problem, you can

- truncate the time by creating a derived column

- [convert the timestamp to a date](#)
- [create a hi-low filter](#)

Truncating the Time by Creating a Derived Column

In the IBM Cognos Framework Manager model, create a derived column using a calculated expression that truncates the time from a timestamp, and returns a timestamp containing the original date and a default time. For example, if you use an Oracle data source, the following expression creates the derived column DATEONLY from COL1, where COL1 contains the values as stored by the application while DATEONLY contains the dates with the default time of 12:00:00 AM:

```
Select COL1, trunc(COL1) as DATEONLY from [SCOTT_TIGER].DATES
```

Tip: You can change the data format of the column to show only the date value by setting the **Date Style** property to **Short**.

You can then apply filters to the DATEONLY column that would return the correct results. If you create a parameter in IBM Cognos Analytics - Reporting that filters on this column, the default prompt will present a date and time control because the data type is still a timestamp.

Converting the Timestamp to a Date

In the IBM Cognos Framework Manager model, define a calculation that uses the cast function to convert the timestamp to a date. For example, the following expression converts the data type of the column COL1 to date:

```
cast ([SCOTT_TIGER]. [DATES]. [COL1], DATE)
```

If you create a parameter in IBM Cognos Analytics - Reporting that filters on this calculation, the default prompt presents a date control.

Ignoring the Time by Creating a Hi-Low Filter

You can create a hi-low filter to ignore the time. In the IBM Cognos Framework Manager model, create a filter in the form date-column between date-lowtime and date-hightime. For example, the following expression returns all values between 00:00:00:000 and 23:59:59:000 for a given day:

```
[SCOTT_TIGER].[DATES].[COL1] between?p1? and cast(substring(?p1?,1,10), '23:59.59.000', timestamp)
```

Sorting Relational Data


You can sort items to view them in your preferred order. By default, IBM Cognos Analytics - Reporting retrieves items in the order defined in the data source. OLAP data sources always have a defined order. Relational and dimensionally-modeled relational data sources may not always have a defined order. The data modeler defines the sorting options in the model.

For more information about data modeling, see the IBM Cognos Framework Manager *User Guide*. Sorting applied in Reporting applies only to the layout within the report.

You can sort items in a list in ascending or descending order based on a value or a label, such as revenue or employee name. You can also perform advanced sorting to sort columns within groups or to sort a row or column using another data item.

Tip: The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes sorting.

Procedure

1. Click the column or row on which to sort.
2. In the report object toolbar, click the **Sort** icon  and click **Ascending** or **Descending**.

An arrow appears beside the data item to indicate that a sort order was set.

When you specify a sort order for more than one column, the columns are sorted in the order in which they were inserted in the report. For example, you add columns A, B, and C to a report and specify a sort order for each. When you run the report, column A is sorted first, then column B, and then column C. You can change the order in which the columns are sorted in the **Edit Layout Sorting** options.

Tip: To remove a sort order, click **Don't Sort**.


Perform Advanced Layout Sorting

If you use relational data, in a list, you can sort columns within groups and change the sort order of columns. In a crosstab, you can sort a row or column by another item, such as Order year by Revenue.

Procedure


1. Click a column.

In a crosstab, click the sorted row or column on which to perform advanced sorting.

2. In the report object toolbar, click the **Sort** icon  and click **Edit Layout Sorting**.
3. To sort a list column within a group, do the following:

- In the **Groups** pane, under the **Groups** folder, expand the folder of the grouped column.
- In the **Data items** pane, drag the data items to sort to the **Sort list** folder.

Tip: You can also drag data items from the **Detail Sort List** folder.

- Click the **Sort order** icon  to specify ascending or descending order.
4. To change the sort order of columns, in the **Groups** pane, change the order of columns in the **Sort list** folder of a group or in the **Detail Sort List** folder.

Tip: Add items to the **Detail Sort List** folder to sort items that are not groups.

5. If you are sorting a crosstab, do the following:

- From the **Data items** pane, drag the item on which to sort to the **Sort List** pane.

For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. To sort Order year by Revenue, drag Revenue to the **Sort List** pane.

- Click the **Sort order** icon to specify ascending or descending order.

Working with relational queries

Queries specify what data appears in the report. In IBM Cognos Analytics - Reporting, you create and modify queries using **Query Explorer**.

Query Explorer provides an alternative way to modify existing reports or to author new reports. You can use **Query Explorer** to perform complex tasks and other tasks that are more difficult to do in the report layout. For example, use **Query Explorer** to

- improve performance by changing the order in which items are queried from the database, or by changing query properties to allow the report server to execute queries concurrently where possible

Note: Only queries that are referenced in the report layout can be executed concurrently. If a query is defined in Query Explorer by joining two or more existing queries, IBM Cognos Analytics with Watson cannot execute the source queries concurrently. By default, queries run sequentially. Your administrator must enable the concurrent query execution feature. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

- view or add filters and parameters and modify their properties
- view or add dimensions, levels, and facts

- incorporate SQL statements that come from other reports or reports that you write
- create complex queries using set operations and joins

Specify a List of Data Items for an Object

Specify the list of data items for an object when you must reference a data item that is in a query but is not in the layout.

For example, you want to add a layout calculation to a list that uses a data item that is in the query definition. If the data item does not appear in the list, you must reference it in order to make the layout calculation work. You must also specify the list of data items if you apply conditional formatting that uses a data item that is not in the query.

Procedure



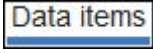
1. Click a layout object.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Properties** property and select data items.

Relate a Query to a Layout

Queries and layouts work together. After you decide the type of data that you need, you must create a layout in which to show the results. Each column of data must be both selected for the query and shown in a layout unless there are some columns that you do not want to show. The query and layout portions of a report must be linked to produce a valid report.

IBM Cognos Analytics - Reporting automatically links query and layout. For example, when you use Reporting and the list report layout, query and layout are automatically linked.

Procedure

1. Select a data container.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Query** property to a query.
3. Click the **Data** icon , click the **Data items** tab , and drag data items from the query to the data container.

Connecting Queries Between Different Data Sources

This section lists the data sources between which you can and cannot connect queries.

IBM Cognos Analytics with Watson supports the following:

- RDBMS to RDBMS joins
- set operations of any two queries
- master detail relationships between any two queries
- drill from any query to any other query

You cannot create the following types of joins:



- cube-to-cube (homogeneous)
- cube-to-cube (heterogeneous)
- cube-to-RDBMS
- cube-to-SAP BW
- SAP-BW-to-RDBMS

Add a query to a relational report

You can create multiple queries in **Query Explorer** to suit your particular needs. For example, you can create a separate query for each data container in a report to show different data.


Tip: The Briefing Book sample report in the GO Sales (analysis) package and the Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package include multiple queries.

Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon  and drag one of the following objects to the work area.

| Object | Description |
|------------------|--|
| Query | Adds a query. |
| Join | Adds a join relationship . |
| Union | Adds a union operator . |
| Intersect | Adds an intersect operator. |
| Except | Adds an except (minus) operator. |
| SQL | Adds SQL commands. |


Note: When adding queries to the report

- right-click the work area and click **Show Package Sources** to see the queries that use data items from a package
 - right-click the work area and click **Expand References** to see the relationships that exist between queries in the report, which is useful when you are creating complex queries
3. Click the **Show properties** icon , and In the **Properties** pane, set the object properties.
For example, if you added a [join](#), set the **Join relationships** property to define the join.

Note: The **Maximum execution time** property for a report query applies only to compatible query mode.

4. Double-click a query.
5. Click the **Data** icon , and from the **Source** tab , drag data items to the **Data Items** pane.

Tip: You can add data items to the query that you do not want to appear in the layout. For example, to filter on Product line code and show Product line in the layout, you must add both data items to the query.

6. To create a new data item, click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
7. To add a filter, click the **Toolbox** icon, drag **Filter** to the **Detail Filters** or **Summary Filters** pane and define the filter expression.

Tip: You can also create a filter by clicking the **Data** icon, dragging a data item from the **Source** tab to one of the filters panes, and completing the filter expression.

Create a Union Query

Create a union query to combine two or more queries into one result set.

You can combine queries that use different data sources. For example, you can combine a query that returns data from a dimensional data source with a query that returns data from a relational data source.

Before you begin

To combine two queries, the following conditions must be met:

- The two queries must have the same number of data items.
- The data items must have compatible types and appear in the same order.





For numeric data types, integer, float, double, and decimal are compatible.

For string data types, char, varChar, and longVarChar are compatible.

For binary data types, binary and varBinary are compatible.

Date data types must match exactly.

Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon , and do the following:
 - Drag **Query** to the work area.
 - Drag **Union**, **Intersect**, or **Except** to the right of the query.
Two drop zones appear to the right of the operator.
 - Drag a **Query** object to each drop zone.
Two queries are created in the work area, and a shortcut to each query appears in the drop zones.
3. Double-click each query that makes up the union query and [add data items](#) to the query.
4. Return to the Queries work area.
5. Click the set operator that you added in step 2.
6. Click the **Show properties** icon , and In the **Properties** pane, set the **Duplicates** property to remove or preserve duplicate rows.
7. Double-click the **Projection list** property.
The projection list shows the list of projected data items for the set operation.
8. To automatically produce the list of projected data items, click **Automatically generated**.
IBM Cognos Analytics - Reporting generates the projection list using only one of the two queries in the union.
9. To add, delete, move, or rename data items in the projection list, click **Manual** and make the changes.
10. Double-click the union query.
11. Click the **Data** icon , and drag data items to the **Data Items** pane.

Results



The union query is complete. You can now [link](#) the union query to a data container in the layout.


Create a Join Relationship

You can create a join relationship to join two queries.

In general, join relationships should be created in the IBM Cognos Framework Manager model. Create a join relationship in IBM Cognos Analytics - Reporting if what you are trying to do cannot be modeled in Framework Manager.

Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon , and do the following:
 - Drag **Query** to the work area.

- Drag **Join** to the right of the query.
Two drop zones appear to the right of the operator.
 - Drag a **Query** object to each drop zone.
Two queries are created in the work area, and a shortcut to each query appears in the drop zones.
3. Double-click each query that makes up the join query and add data items to the query.
 4. Return to the Queries work area.
 5. Click **Join**.
 6. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Join relationships** property.
 7. Click **New Link**.
 8. To create the link, click a data item in the left query, and then click a data item in the right query.
 9. For each query, click **Cardinality** and click a cardinality option.
 10. From the **Operator** drop-down list, click an operator. Click **OK**.
 11. To optimize the join relationship, specify the **Filter type** property.

(Default)

The join relationship is not optimized.

In

The generated filter is an IN predicate that is composed of constant values of the join keys from the "one-side" join operand.

Between

The generated filter is a BETWEEN predicate that is composed of the minimum and maximum of the join key values from the "one-side" operand.

Table

The generated filter is a table value constructor form of the IN predicate.

For more information, see "Optimizing joins by applying filters" in the *Framework Manager User Guide*.

12. To convert the join relationship to an expression, click **Convert to expression**.

Convert the join relationship to an expression to make changes to the join definition.

Note: After you convert the relationship to an expression, you cannot change it back to a relationship.

13. Double-click the join query.
14. Click the **Data** icon , and from the **Source** tab , drag data items to the **Data Items** pane.


Results


The join query is complete. You can now link the join query to a data container in the layout.

Reference a Package Item in a Child Query


When you create a child query in IBM Cognos Analytics - Reporting, you can only reference items from its parent or from other queries. For example, if you add a filter to a child query, the only items that you can insert into the expression are items that exist in other queries defined in the report. To add an item from the package, you must unlink the child query from its parent.

Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Unlink the child query from its parent by selecting the parent query shortcut to the right of the child query and pressing the Delete key.
3. Double-click the child query.

Items are now available on the **Source** tab .

4. Add items.

For example, to create a detail filter that references a package item, click the **Toolbox** icon  drag the filter object to the **Detail Filters** pane, and then add the items in the **Expression Definition** box.

5. Recreate the link between the child query and the parent query by dragging the parent query to the right of the child query.

6. If necessary, double-click the child query to complete it.

For example, if you created a filter, you may need to complete the filter expression.

Create a Master Detail Relationship

Create a master detail relationship to deliver information that would otherwise require two or more reports. For example, you can combine a list with a chart. The list can contain product lines and the chart can show details for each product line.

Master detail relationships must appear in nested frames to produce the correct results. You can create a master detail relationship in two ways:

- Use a parent frame for the master query and a nested frame for the detail query.
- Associate a report page with the master query and use a data container, such as a list or crosstab, for the detail query.


You cannot display parent data in the child frame or child data in the parent frame. Also, you cannot perform calculations across master detail queries.

You can use a master detail relationship to show data from separate data sources in a single report. However, the data sources must be contained in the same package.

With the dynamic query mode, master detail reports with a crosstab report object are optimized to use a single query whenever possible, rather than a separate query for each report object instance.

Procedure



1. To use a parent frame for the master query and a nested frame for the detail query:

- Click the **Toolbox** icon  and drag a **List**, **Repeater Table**, or **Repeater** to the report.
- Add a second data container to the object you inserted.

You can insert a list, crosstab, chart, repeater table, or repeater into a list. You can add a list to a repeater table or repeater.


- Add data items to both data containers.

2. To associate a report page with the master query and use a data container for the detail query:

- Click anywhere in the report page.
- Click the **Show properties** icon , and In the **Properties** pane, click the **Select ancestor** icon  and click **Page**.
- Set the **Query** property.
- Click the **Toolbox** icon and drag a data container to the report.

3. To link a data item in the master query to a parameter in the detail query instead of to another data item, create the parameter in the detail query.

Use parameters to filter values at a lower level in the detail query.

- Click the **Queries** icon , and double-click the detail query.
- Click the **Toolbox** icon and drag the **Filter** object to the **Detail Filters** box.
- In the **Expression Definition** box, create the parameter.

4. In the navigation menu, click **Report**, and then under **Pages** click the report page.
5. Click the data container containing the details.
6. In the on-demand toolbar, click the **Select ancestor** icon and click **Page**.
7. Click **New Link**.
8. In the **Master** box, click the data item that will provide the primary information.
9. To link the master query to a data item, in the **Detail** box, click the data item that will provide the detailed information.
10. To link the master query to a parameter, in the **Parameters** box, click the parameter that will provide the detailed information.

Tip: To delete a link, select the link and press the Delete key.

11. If your detail query object is a chart, you can disconnect a chart title from the master query.
 - Click the chart title, and in the report object toolbar, click the **More** icon and click **Master Detail Relationships**.
 - Clear the **Use the master detail relationships from the chart** check box.
12. If your master detail relationship includes a chart as the detail and you are using automatic axis ranges, you can set the same axis range for all the detail charts:
 - Select the axis.
 - In the **Properties** pane, under **General**, double-click the **Axis range** property.
 - Under **Maximum** and **Minimum**, click **Automatic**.

The master detail report option is only available with automatic axis ranges.

- Under **Master detail reports**, select the **Same range for all instances of chart** check box.

For more information about axis ranges, see [“Change the axis scale of a chart” on page 211](#).

Tip: To avoid seeing the same data item twice in the report, click the data item in the data container driven by the detail query, click the **More** icon and click **Cut**. This removes the item from the report display but keeps it in the query.

Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service

When running a master detail or burst report that includes a chart or crosstab, disk space exhaustion may cause the report or other requests to fail. A large set of burst keys or master rows may produce one or more charts per detail, resulting in many master detail executions. This may cause the temp folder to accumulate many gigabytes of temporary files containing data required for successful chart rendering.

To avoid this issue, we recommend that you test large master detail or burst reports that include charts or crosstabs to determine the potential peak disk requirements for the report.

Working with Queries in SQL

For each query in a report, you can work with the SQL that is executed when you run a report.

You can

- [view the SQL for an entire report or a query](#)
- [build a report using your own SQL](#)
- [convert a report to use SQL directly](#)
- [edit the SQL](#)

When working with a relational data source, the SQL that is produced by IBM Cognos Analytics - Reporting depends on the [report output selected](#).

Note: MDX is not available with relational or DMR data sources.

View the SQL for a report

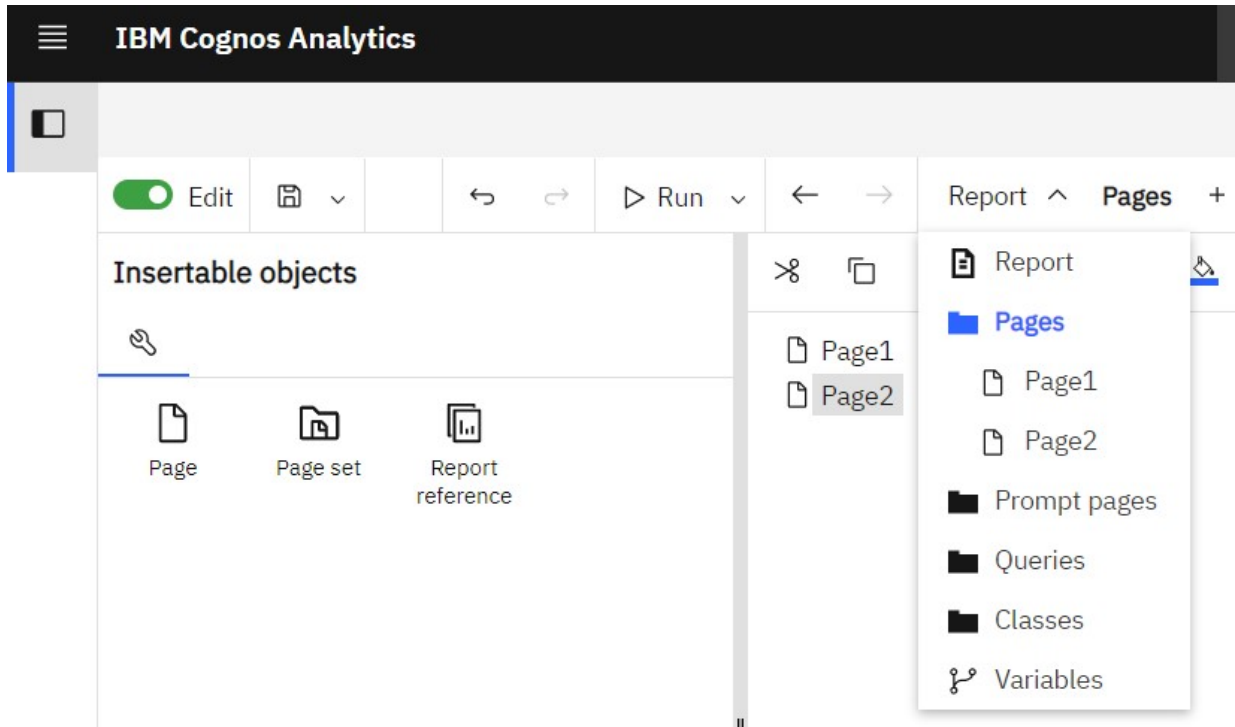
View the SQL to see what is passed to the database when you run a report.

Before you begin

You must be in edit mode in the report.

Procedure

1. From the navigation menu, click the **Queries** folder.



2. Click **More** , and then select **Show generated SQL/MDX**.

The **Generated SQL** window opens and displays the queries in the report.

3. In the **Query results** pane, click a query result.

The SQL for the query is displayed. If a query is used in more than one data container, a query result is generated for each data container.

4. In the drop-down list in the **Generated SQL/MDX** pane, you can choose **Native SQL**, which is the SQL that is passed to the database when you execute the query, or **IBM Cognos SQL**, which is a generic form of SQL that IBM Cognos Analytics - Reporting uses. Cognos SQL is converted to native SQL before the query is executed.

Build a Report Using Your Own SQL


You can build a report by adding SQL from an external source, such as another report.

If you edit the SQL of a query, you must change the **Processing** property for that query to **Limited Local**.

Procedure

1. Create a new report and choose the **Blank** template.
2. In the navigation menu, click **Report** and then click **Queries**.
3. Click the **Toolbox** icon and drag **Query** to the work area.
4. Click the **Toolbox** icon, and to build an SQL query, drag **SQL** to the right of the query.


Tip: You can drag **SQL** anywhere in the work area, and IBM Cognos Analytics - Reporting will automatically create a query.

5. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Data source** property and click a data source.
6. If required, set the **Catalog** property to the name of the catalog.
7. Double-click the **SQL** property and type the SQL.
8. Click **Validate** to check for errors.
9. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.
10. Double-click the query.

If the SQL is valid, the data items defined in the SQL appear in the **Data Items** pane.

11. In the navigation menu, click **Report**, click **Pages**, and then click a report page.
12. Click the **Toolbox** icon and drag an object to the work area.

For example, drag a list, crosstab, chart, or repeater.

13. Click the data container.
14. In the **Properties** pane, click the select ancestor button  and click the container you just created.

For example, if you created a list, click **List**.

Tip: You can also click the container selector (three orange dots) of the container to select it.

15. Set the **Query** property to the query for the report type.

16. Click the **Data items** icon 


17. Drag the items from the query to the data container.

Convert a Query to SQL

You can convert a query to SQL to edit it. You may want to do this to improve performance or to use SQL features that are not supported directly by IBM Cognos Analytics - Reporting.

Converting a query to SQL is an irreversible process.


Procedure

1. In the navigation menu, click **Report** and then click **Queries**.
2. On the canvas, click a query.
3. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Generated SQL** property.
4. Click **Convert**.
5. Click **Validate** to check for errors.
6. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.

Edit the SQL

You can edit the SQL for a query that has been created as an SQL query or that has been converted to SQL.

Procedure

1. Click the **Queries** icon , and double-click the SQL item under the query.
2. Make changes in the **SQL** window.
3. Click **Validate** to check for errors.

First-Rows Optimization

The SQL produced by IBM Cognos Analytics - Reporting depends on the report format you choose. For example, if you specify HTML format, first-rows optimization is requested. All-rows is requested if you specify PDF.

It is important for database administrators and programmers to remember that Reporting does not always use first-rows optimization. If you assume first-rows optimization is always requested, this can cause the RDBMS optimizer to process the query differently than you expect.

Optimizing query performance with query hints

If your reports are taking too long to run, you can specify query hints to optimize the report queries.

The hints control how the query is executed. If a query hint does not produce the results that you intended, check the governors that are specified in the IBM Cognos Framework Manager model.

Query hints can also be added to the report specification in the Cognos Analytics Software Development Kit (SDK). For more information, see "Use query hints" in the *IBM Cognos Analytics with Watson Software Development Kit*.

About this task

Cognos Framework Manager models might include governors that optimize query performance. A governor is a set of rules to limit user activities, such as the execution of reports, which can either take too long to run or consume too many resources. By default, at run time Cognos Analytics applies governors that are set in the model to all queries that query metadata from that model. For more information about governors, see the Framework Manager *User Guide*.

Similarly, you can add hints to optimize how Cognos Analytics runs a specific query in a report. Like governors, query hints can be applied to sorting, joins, row retrieval, and other aspects of the query. The governors can also affect how Cognos Analytics builds the SQL for the query. In general, hints do not return errors whereas governors return errors when limits set in them are exceeded.

Procedure

1. From the **Report** menu, click **Queries**, and select the query that you want to configure.
2. Open the **Properties** panel.
3. Under **QUERY HINTS**, click any of the available hints and specify its value.

Use the **Advanced hints** property to specify more hints by adding a name and value pair.

Tip: When you click a query hint in the **Properties** panel, you can view the hint description.

Using relational calculations

Insert a calculation to make your report more meaningful by deriving additional information from the data source. For example, you create an invoice report, and you want to see the total sale amount for each product ordered. Create a calculated column that multiplies the product price by the quantity ordered.

You build calculations in the expression editor using functions.

If a calculation is used in multiple reports, or by different report authors, ask your modeler to create the calculation as a standalone object in the model and include it in the relevant package.

You can add calculations to lists, crosstabs, and all other data containers. You can also add calculations directly to a page header, body, or footer. However, you must first associate a query to the page. For more information, see ["Add a page to a report" on page 465](#)

Units of Measure

When creating calculations in IBM Cognos Analytics - Reporting and IBM Cognos Query Studio, you may encounter problems with the units of measure. For example, the calculation Cost*Cost returns the unit of measure * instead of a currency unit of measure. To avoid this problem, change the format of the corresponding column to obtain the desired unit of measure.

Calculation Solve Order

When calculations in the rows and columns of a report intersect, calculations are performed in the following order: addition or subtraction, multiplication or division, aggregation (rollup), and then the remaining arithmetic functions.

The remaining functions are as follows:

- absolute, round, round down, average, minimum, maximum, medium, count
- percentage, % difference (growth) or % of total
- rank, quartile, quantile, or percentile

If both calculations have the same precedence, for example, if they are both business functions, then the row calculation takes precedence.

Limitations of Calculations

You should use only the expressions and functions available in Reporting, and follow their syntax.

Minimal checking exists for calculations. If your calculation uses an invalid expression, your report results may contain unexpected values.

In addition, you should define member summaries as follows:

summary_function (*currentMeasure* within *set set_reference*)

where *set_reference* is a level or set inserted from the **Source** tab [¶](#).

Unless otherwise required, *summary_function* should be the `aggregate` function. If you use an explicit summary function, you may encounter problems with measures and scenario or account dimension members (such as profit margin, distinct count, and so on) that have complex rollup rules, or members that do not roll up.

Know your data, and confirm with the owner of the cube where overriding the automatic aggregation is safe.

Because of these limitations, summaries of calculations may not provide reliable values. For convenience, you may have to build reports where row summaries and calculated member columns intersect. In such reports, these intersections may contain unexpected values. In contrast, row calculations intersecting with column aggregates using the `aggregate` function are safe because the calculation is performed on the reliably summarized values.

Create a simple calculation


You can select items in your report and create simple calculations.

In addition to simple arithmetic calculations, you can perform the following calculations:

| Calculation | Description |
|-------------|--|
| Rollup | Summarizes, or rolls up, all the values in a hierarchy. |
| % | Calculates the value of a selected item as a percentage of another item. |

| Calculation | Description |
|-------------|---|
| % Growth | Calculates the difference between two items as a percentage. |
| % Of Base | <p>This calculation is only available if you select two members from different hierarchies, each from a different edge.</p> <p>This calculation takes the first selected member from edge A and the second selected member from edge B. The calculation result of a percent of base should be such that all the values for member A will compare itself to the intersect value of member A and B.</p> |
| Custom | Allows you to specify your own value when performing a simple arithmetic calculation. Also allows you to change the order of operands or type a custom name for the new calculated row or column. |

Procedure

1. Select the items in your report to calculate.
2. From the report object toolbar, click the insert calculation button  and select the calculation to perform.

Tip: Calculations that are not applicable to the items you selected are grayed out.
3. To change the order of the operands, the name of the calculated item added to the report, or to create a custom calculation, click **Custom**.

Results

The calculation appears as a new row or column in your report.

Insert a Query Calculation

Insert a query calculation into your report to add a new row, column, or baseline in a visualization with values that are based on a calculation.

For example, you create a query calculation named Euros that converts dollars to euros by multiplying an existing dollar measure by a conversion rate. Euros can then be displayed to end users in a separate row or column.

Note: When creating an expression that will be used in a double-byte environment, such as Japanese, the only special characters that will work are ASCII-7 and ~ -- || - \$ ¢ £ ¬.

Not all data sources support functions the same way. The data modeler can set a quality of service indicator on functions to give a visual clue about the behavior of the functions. Report authors can use the quality of service indicators to determine which functions to use in a report. The quality of service indicators are:

- not available (X)

The function is not available for any data source in the package.
 - limited availability (!!)
- The function is not available for some data sources in the package.

- limited support (!)


The function is available for all data sources in the package but is not naturally supported for that data source. IBM Cognos Analytics with Watson uses a local approximation for that function. Because an approximation is used, performance can be poor and the results may not be what you expect.

- unconstrained (check mark)

The function is available for all data sources.



When inserting literal strings in an expression, you must enclose the string in single quotation marks. If the string contains a quotation mark, it must be escaped. For example, if you want to insert the string ab'c, you must type 'ab"c'.




Procedure

1. Click the **Toolbox** icon  and drag **Query calculation** to the report.
2. Type a meaningful name for your expression in the **Name** box.


For example, if you are calculating the difference between 2012 revenue and 2011 revenue, you could name your expression **2012 - 2011 Revenue**.

3. In the **Available Components** pane, define the calculation:

- To add data items that are not shown in the report, on the source tab , double-click the data items.
- To add data items that are in the report but not necessarily in the model, such as calculations, on the data items tab , double-click the data items.

- To add data items from a specific query, on the queries tab , double-click data items.
- To add functions, summaries, and operators, on the functions tab , double-click elements.
- To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.



Parameters define prompts, drill-through reports, and master detail relationships.

- To add a macro, on the macros tab , double-click the parameter maps, session parameters, or macro functions you want to add to the macro expression.

Tip: Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.

You can also type the calculation directly in the **Expression Definition** box.

When typing date values, ensure that the date format is correct for your database type.

To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .

4. Click the validate button .





Any validation errors appear on the **Errors** tab of the **Information** pane.


Create a Layout Calculation

Create a layout calculation to add run-time information to your report, such as current date, current time, user name, and a baseline in a visualization.

When creating layout calculations, only report functions are available to you in the expression editor. These functions are executed in the report layout, as opposed to the other functions which are executed in the query.

Procedure

1. Click the **Toolbox** icon  and drag **Layout calculation** to the report.
2. In the **Available Components** box, define the calculation:
 - To add data items from a specific query, on the queries tab , double-click data items.
 - To add functions, summaries, and operators, on the functions tab , double-click elements.
 - To add a value that is derived from a parameter, on the parameters tab , double-click a parameter.Parameters define prompts, drill-through reports, and master detail relationships.

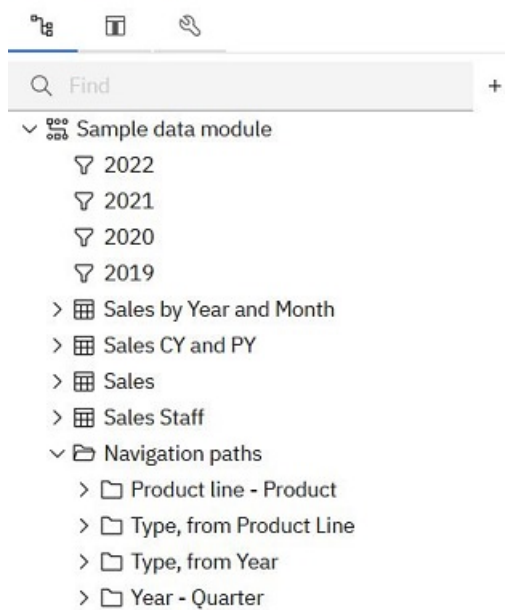
Tip: You can also type the expression directly in the **Expression Definition** box.
3. Click the validate button .


Using navigation paths

A navigation path is a collection of non-measure columns that business users might associate for data exploration. Navigation paths are created in data modules, and can be used in reports and dashboards.

If navigation paths were defined in a data module, they are located in the **Navigation paths** folder in the data tree. The columns in the **Navigation paths** folder are also listed under their tables in the data tree.


Insertable objects



If you want to use the navigation path in your report, add any of its columns to the report. You can add the columns either from the **Navigation paths** folder or from the table. When you view the report in the preview mode or in the viewer, you see the navigate icon  in the report toolbar which indicates that a navigation path exists for the selected column.

| Planned revenue | Knives | < Product line - Product > n | | Watches | Eyewear |
|-----------------|-----------------|------------------------------|----------------|-----------------|------------------|
| Web | \$21,012,813.82 | Product line | 631.92 | \$16,949,170.91 | \$318,084,254.62 |
| Special | \$389,333.97 | ✓ Product type | 827.42 | \$249,689.11 | \$391,773.42 |
| E-mail | \$2,492,246.02 | Product | 709.18 | \$1,509,734.88 | \$22,802,104.01 |
| Sales visit | \$3,601,154.63 | | 057.16 | \$1,995,436.90 | \$9,574,019.46 |
| Mail | \$548,202.94 | \$262,578.84 | \$579,633.78 | \$274,685.73 | \$1,570,843.42 |
| Fax | \$341,197.13 | \$125,601.02 | \$237,742.11 | \$156,990.16 | \$3,477,532.78 |
| Telephone | \$3,191,948.71 | \$2,121,753.69 | \$3,339,701.97 | \$2,214,487.53 | \$12,384,434.45 |

Users can click any column in the navigation path to navigate between levels of information. The users don't need to follow the order of columns in the navigation path.

Note: Columns in the navigation path are typically single data module items. If a column is a complex expression which uses functions or macros, or references multiple columns, the navigation path is not available for this column in Reporting (the navigate icon  is not available).



For more information, see the *Creating navigation paths* in the *IBM Cognos Analytics with Watson Data Modules Guide*.

Chapter 12. Dimensional Reporting Style


The dimensional reporting style is recommended for dimensionally-modeled relational (DMR) and Online Analytical Processing (OLAP) data sources. Dimensional data is best represented by crosstabs, maps, and charts. This data is shown in IBM Cognos Analytics - Reporting in dimensions, hierarchies, levels, and members.

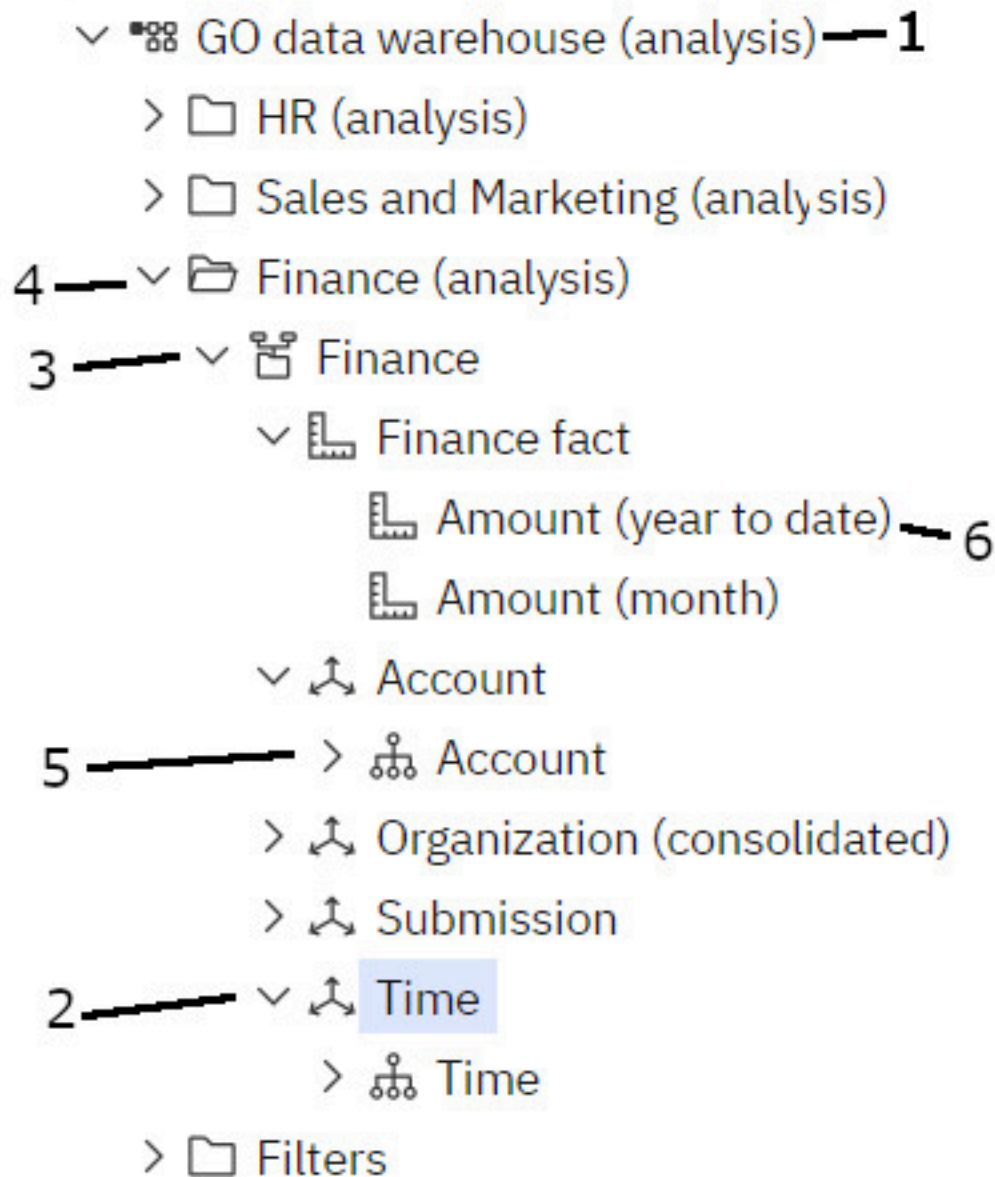
In dimensional reporting, you summarize data by using member summaries and within set aggregation. You focus data in dimensional reporting by adding only the relevant members to the edge of a crosstab or to the context filter. You can also enable drilling up and drilling down in dimensional reports.

Add dimensional data to a report

For dimensional and mixed model data sources, you can view the full data tree by clicking the **Options** icon  (**Data** icon , **Source** tab) and then clicking **View metadata tree**. You can switch to the dimensional-only data tree by clicking the **View members tree** option.

Note: Use dimensional data in the dimensional reporting style. However, if you are using relational data, see [“Add Relational Data to a Report”](#) on page 277.

If you are working with a dimensional data source, data items are organized hierarchically. Dimensional data sources include OLAP and dimensionally-modeled relational (DMR) data sources. The **Source** tab  shows a metadata-based view of the data.



Note: The names of levels and members in a dimension come from the model. It is the responsibility of the modeler to provide meaningful names.

1. Package

Packages are subsets of a model containing items that you can insert in a report.

2. Dimension

Dimensions are broad groupings of descriptive data about a major aspect of a business, such as products, dates, or markets.

3. Level hierarchy

Level hierarchies are more specific groupings within a dimension. For example, for the **Years** dimension, data can be organized into smaller groups, such as **Years**, **Current Month**, and **Last Month**.

4. Members folder

Members folders contain the available members for a hierarchy or level. For example, the **Members** folder for the **Years** level hierarchy contains everything found in the **Year**, **Quarter**, and **Month** levels.

5. Level

Levels are positions within the dimensional hierarchy that contain information at the same order of detail and have attributes in common. Multiple levels can exist within a level hierarchy, beginning with a root level. For example, the **Years** level hierarchy has the following related levels.

| Level | Level name | Description |
|--------|----------------|--|
| Root | Years | The root level. |
| First | Year | Years in the Years root level. For example, 2013, 2012, and 2011. |
| Second | Quarter | Quarters for each year in the Year level. For example, 2013 Q1, 2013 Q2, and 2013 Q3. |
| Third | Month | Months for each quarter in the Quarter level. For example, Jan., Feb., and Mar. |

Tip: The **Measures** dimension contains the measures available in the data source.

6. Member property




Member properties are attributes that each member possesses. For example, gender could be a property for all employee members. For more information about member properties, see [“Insert a Member Property”](#) on page 318.

Customize the Source Tree

When using dimensional data, you can customize how you see data in the source tree. You can select a full package tree view that shows dimensions, hierarchies, levels, an optional members folder, and member properties.

Or you can select a members-only tree view, such as the one in IBM Cognos Analysis Studio. This view allows you to add only members in your report.

Procedure

1. Click the **Insertable objects** icon , click the **Source** tab , and then click the **Options** icon .
2. To view the members-only tree view, click **View members tree**.
3. To view the full package tree, click **View package tree**.
4. To change what is included in the tree, right-click a data item and click **Package Tree Settings**.

Use the **Preview** pane to choose the appropriate settings.

Insert a member

By default, when you insert members from the source tree into your report with IBM Cognos Analytics - Reporting, single members are inserted without any details or children. You can change how members are inserted. For example, you may want to insert a member along with all its children or insert only the member's children. Or you may want to insert members as a set.




When you double-click a member that you have already inserted in your report, by default, its children are inserted after the parent member. You can control whether the children are inserted before or after,

nested, or not inserted at all: click the **More** icon , **Options**, and in the **Edit** tab, click a setting under **Double-click on member action**.

When inserting members into a crosstab, ensure that you insert members from the same hierarchy on only one of the crosstab edges. If you insert members from the same hierarchy on both edges of the crosstab, you may encounter unexpected results. For example, a report that uses members from years in the rows and Quarters in the columns is very difficult to read because the useful numbers are distributed over a large area of mostly blank cells.


Calculated members from the data source also appear in the source tree. However, calculated members in Microsoft SQL Server Analysis Services (SSAS) cubes do not appear in the list of descendants in the query. If you want these calculated members to appear in a report or a prompt, you must insert them explicitly.

Procedure





1. Click the **Insertable objects** icon , click the **Source** tab , and then click the **Options** icon .
2. Under **Insert**, click **Individual Members**.
3. Under **Member Insert Options**, select how you want to insert members.
4. If you want to insert members within a set instead of inserting individual members, under **Insert**, click **Create sets**.
5. Do one of the following:
 - To insert a member above or below another member, drag the new member above or below a cell. A flashing black bar appears where you can drop the new member.
 - To replace a member, drag the new member to the cell with the member to replace. A flashing black box appears where you can drop the new member.

Search for a Member

You can perform a member search to quickly find data.

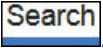
You can control the number of members that are returned in a search by specifying a value for the **Member display count limit (in source tree)** option (**More** icon , **Options, Advanced** tab).

Procedure

1. Click the **Insertable objects** icon , click the **Source** tab , select and then right-click a hierarchy  or level  and click **Search**.
2. In the **Keywords** box, type the words or characters for which to search.
3. Click the search parameter to use.
4. To search all descendants instead of just the immediate children, select the **Search all descendants** check box.

For example, when performing a search in a hierarchy, selecting this check box returns members found in all the levels of the hierarchy.
5. Click **Search**.

Results

The search results appear in a hierarchical structure on the **Search** tab . You can browse the hierarchy to explore members at lower levels.

Tip: You can insert members directly from the **Search** tab into a report. This can save you time, because you do not have to define a filter. For example, instead of inserting **Product line** from the **Source** tab and adding a filter for **Camping Equipment**, you can insert **Camping Equipment** from the **Search** tab.

Nest Members

When you insert members in your report, you may want to nest them in another row or column to make your report easier to use. You can nest members from different dimensions. You can also nest sets.

For example, in the following report, the quarters (Q1 to Q4) were selected from the Time dimension and nested only for the GO Americas member, which is from a different dimension.

| Amount (year to date) | | <#2010#> |
|----------------------------------|-------------|----------|
| <#GO Americas#> | <#Q1 2010#> | <#1234#> |
| | <#Q2 2010#> | <#1234#> |
| | <#Q3 2010#> | <#1234#> |
| | <#Q4 2010#> | <#1234#> |
| <#GO Consolidated corporate#> | | <#1234#> |
| <#GO Consolidated eliminations#> | | <#1234#> |
| <#GO CONSOLIDATED#> | | <#1234#> |
| <#GO Asia Pacific#> | | <#1234#> |

Figure 40. Crosstab showing the year to date amount for all four quarters nested beside GO Americas

When you filter out children from nested sets, the parent set still appears in your report. To avoid this, filter only the top level set and nest only the complete set of descendants at the desired levels.

Procedure

Click the **Insertable objects** icon , click the **Source** tab , drag the members to the work area.

A flashing black bar indicates where you can drop an item.

Insert a Hierarchy




You can quickly insert entire hierarchies in a report.

When using an IBM Cognos PowerCube, a SSAS cube, or a dimensionally-modeled relational data source, you can insert multiple hierarchies from the same dimension in a crosstab. For example, you can place one hierarchy from a dimension on an edge of the crosstab and nest another hierarchy from the same dimension on the same edge, on another edge, or in the **Context filter** area.

You can also perform arithmetic, percentage, and ranking calculations using multiple hierarchies.

Summary or analytic calculations that refer to different hierarchies from the same dimension, such as total, count, average, minimum, and maximum, are not supported. These calculations cause an OP-ERR-0250 error.

Procedure


1. Click the **Insertable objects** icon , click the **Source** tab , drag the hierarchy  to the report.
2. In the **Insert hierarchy** dialog box, choose which members to insert:
 - To insert only the root members of the hierarchy, click **Root members**.
 - To insert all members of the hierarchy, click **All members**.

Tip: The default **Level indentation** property for all members is to show the hierarchical structure when the report is run.

Insert a Member Property


You can insert member properties, which are attributes of a member, in your report. Member properties provide additional information about the member. For example, an employee level may have a property named gender.

About this task

In the data tree of the **Source** tab , member properties are identified by the icon .

You can only insert properties. You cannot group them. Do not insert member properties in the series or categories of a chart because by default, IBM Cognos Analytics - Reporting groups items that are inserted in these areas. Grouping member properties produces a warning when you validate the report.

Procedure

Click the **Insertable objects** icon  and from the **Source** tab , drag the member property  to the report.





Create a Set of Members

Use sets to group members that are logically related for various actions, such as formatting, nesting, and sorting. Creating sets is also useful when members may be dynamic over time. For example, the child accounts of a total assets account may change from year to year. By creating a set, you do not have to modify the report each time accounts are added or removed.

After you create a set of members, you can add or remove members within the set.

You can perform operations on the set such as excluding specific members, moving members within the set, showing only the top or bottom members, filtering the set, and expanding or collapsing the members within a set. You can view the set definition to see and edit operations that are performed on the set.

Procedure

1. Click the **Insertable objects** icon , click the **Source** tab , and then click the **Options** icon .
2. Under **Insert**, click **Create sets**.
3. From the **Source** tab, select the items to include in the set and drag them to the work area.
4. To add or remove members, select the set, click the **More**  icon in the application bar,, and click **Edit Members**.

Tip: You can also select the set, click the **Show properties** icon , and in the **Properties** pane, double-click the **Members** property.

Sharing sets between reports

When you are working with dimensional data, you can share a set to make it available for inclusion in multiple reports.





You must first create a set in a source crosstab report, create a shared set definition, then refer to it in a target report.

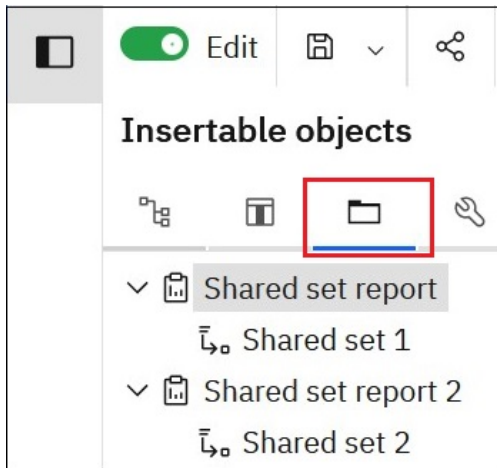
A shared set definition is copied from one report to another. As a result, the set definition must not depend on any context from the source report. For example, it must meet the following criteria:




- It cannot reference other shared sets.
- It cannot reference other data items.
- It cannot contain calculated members.

You cannot change the definition of a shared set from within the target report. However, you can carry out other set operations on it, such as excluding a member or creating a top 10 list.

Procedure

1. In the source crosstab report, create a set that you want to share.
2. Select the set, click the **Show properties** icon , and in the **Properties** pane, in the **Sharing** property, enter a name and description for the set.
3. Save the report.
4. Click the **Insertable objects** icon , and then click the **Source** tab . Select the data source name, and from the **More**  menu in the application bar, select **Add shared set report**.
5. Select the source report that contains the shared set definition.
If it does not exist, a new tab named **Shared sets** is created in the **Insertable objects** panel.



6. Optional: To add, delete, or change the order of reports on the **Shared sets** tab, from the **More**  menu in the application bar, select **Manage shared set reports**.
7. Create or open a crosstab target report that you want to refer to the shared set definition.
8. In the **Insertable objects** panel, click the **Shared sets** tab. Open the source report that contains the shared set definition that you want to use.
9. Add the shared set definition into your target report.
10. Select the shared set in the target report, click the **More** icon , and click **Edit Set**.
11. In the **Set definition** box, select the shared set.
12. Click **Edit** .
The **Set Reference Properties** window opens.
13. Set the **Inclusion** property.
 - a) Select **Run time** to retrieve the latest shared set definition every time that the report runs.
 - b) Select **Design time** to store the shared set definition in the target report.
This definition is used until you refresh it.
14. Click **OK**, then save the report.

Managing shared set references

After you share a set to make it available for inclusion in multiple reports, you can manage references to it. You can also copy it locally.



You can manage set references in the following ways:

- Create a copy of a shared set to be used in a report.

Converting a shared set reference into a copy replaces the reference with a set definition that is stored in the report. The report does not reference the shared set from the source report. Any changes that are made to the shared set in the source report are not reflected in the target report. Instead of converting the reference to a copy, you can change the **Inclusion** property of the reference to **Design time**. Design time references use a static stored version of the shared set definition. However, you can later change the **Inclusion** property to be **Run time** to use the latest shared set definition.

- Modify the properties of a set reference in the target report, including its **Inclusion** property. You can also modify a set reference in the target report by changing the set definition it refers to.
- Refresh an existing set reference after a set changed in a source report and you want to use the updated set. To use the updated set if the **Inclusion** property is set to **Design time**, you must refresh its reference.
- Review problems with an existing set reference.

Procedure

1. Open the target report that contains the reference to the shared set that you want to work with.
2. Click the **More** icon ******* and then click **Shared sets**.
3. To create a copy of a shared set to be used in a report, do the following steps:
 - a) Select the shared set reference that you want to copy.
 - b) Click **Convert Reference to Copy**.
The **Confirm Convert** window is displayed.
 - c) If you want to convert the set reference into a copy that is stored in this report, click **Yes**. If you do not want to create a copy, click **No**.
Important: If you convert the set reference into a copy, it is not updated when the set in the original report changes.
4. To modify an existing set reference in a target report, do the following steps:
 - a) Select the shared set reference that you want to modify.
 - b) Click **Edit Reference**.
 - c) To modify the set reference properties, select the reference, then click **Edit** .
The **Set Reference Properties** window opens. You can now modify the set reference properties.
 - d) To modify the definition of the set, click **New** .
The **Set Definition** window opens. You can now modify the set definition.
5. To refresh an existing set reference after a set changed in a source report, do the following steps:
 - a) Select the set reference that you want to refresh.
 - b) Click **Refresh Reference**.
6. To review problems with an existing set reference in a target report, do the following steps:
 - a) Select the set reference that is causing the problem.
 - b) Review and act upon the message that is displayed.
7. Save the report.

Edit a Set

After you create a set, you can view its definition to see, change, add, or delete operations, such as the following, that are performed on the set:




- excluding a member
- moving members to the top or bottom of a set
- applying a top or bottom filter
- filtering the set

- expanding or collapsing members in a set

The definition of a set shows you, in the graphical tree, the history of all the operations that are performed on the set.

You can see and change the order in which the operations are performed. For example, you apply a top three filter and then exclude one member. Your set now contains only two members. You can choose to exclude the member before the top three filter so that your set still contains three members.



Procedure

1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
A graphical tree shows all the operations that are performed on the set of members.
2. To see the details of an operation, hover your mouse over an operation node.
3. To change the order of an operation, click the operation node, and click the right or left arrow.
4. To edit an operation, click the operation node and click the edit button .
5. To add a new operation, click the new button .

Exclude Members from a Set

You can choose to remove individual items that are not needed in your analysis.



Procedure

1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
2. Click the new button  and click **Exclude**.
3. In the **Exclude** box, choose the members to exclude and use the right arrow to move them to the **Members** pane.

Move Members Within a Set

You can move one or more members to the top or bottom of a set.

Procedure

1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
2. Click the new button  and click **Move to Top** or **Move to Bottom**.
3. In the **Available members** list, select the member to move to the top or bottom and click the right arrow.

The members appear in the order shown in the **Members** list.

Limit Data to Top or Bottom Values

You want to focus your report on the items of greatest significance to your business question. For example, you want to identify your top 100 customers and what that group of customers is worth.

You can limit the data to the top or bottom values of a set. This keeps the amount of data shown in the work area small, even when using large data sources.





You can define a top or bottom rule by specifying

- a number, such as the 50 top or bottom performing sales people
- a percentage, such as customers who contribute to the top 10% of overall revenue
- a cumulative sum, such as customers who contribute to the first ten million dollars of overall revenue

If the selected set contains a user-defined filter, the top or bottom rule applies only to the included values. For example, if you apply a filter to show only retailers with revenue greater than one million dollars, the bottom rule applies to the lowest values within those results.

You can filter a set of members to show only those at the top or bottom and base the filter on the measure you are using and the set of members on the opposite edge. You can also specify a custom filter.

Procedure

1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
2. Click the new button  and click **Top** or **Bottom**.
3. Under **Type**, select whether to filter the **Top** or **Bottom** values.
4. To choose how and how much you want to filter, under **Number of items**, click **Count**, **Percent**, or **Sum** and type the number of data items to show, the percent of data items to show, or the value to sum.
5. Choose the intersection on which to base your filter by clicking the ellipsis button and selecting the members and measure for the intersection from either the **Source** tab  or the **Calculated members and measures** tab .

For more information, see [“Create an intersection \(tuple\)”](#) on page 357.

Filter the Members Within a Set

You can remove members from within a set by specifying filter conditions so that only the members that you require remain. You can filter a set based on

- member captions

For example, your set includes employee names and you want to keep only the employees with names that begin with a specific letter.

- properties that are numeric or strings

For example, your set includes employee names and you want to filter employees using the gender property.



- intersection of values (tuple)



For example, you want to keep only the employees who used less than ten sick days for the year 2012.

If you want to create a more complex filter, you can combine multiple conditions using AND, OR, and NOT operators. By default, multiple conditions are combined with an AND operator, which means that all conditions must be met for the filter to take effect.

Filtering the members in a set is not the same as relation detail or summary filters.

Procedure



1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
2. Click the new button  and click **Set filter**.
3. Select how you want to filter.
 - If you want to filter the set using a caption, click **Caption**.
 - If you want to filter the set using a member property, click **Property** and select from the drop-down list.
 - If you want to filter the set using an intersection of members, or tuple, click **Intersection (tuple)** and click the ellipsis button. Then, from **Available members and measures**, select the desired items and click the right arrow to move them to the **Intersection members and measures** list.
4. Specify the **Operator** and **Value** to complete your condition and click **OK**.

5. To add additional conditions, click the new button.
6. If you include multiple conditions in your filter, use the AND, OR, and NOT operators to combine them.
 - To add an operator, select the conditions that you want to combine, and click an operator.
 - To change an operator, double-click the operator to toggle among available ones or select the operator and then select a different one from the list.
 - To remove an operator, select it in the condition string, and then click the delete button .
7. To change a condition, click the edit button .

Expand and Collapse a Member Within a Set

You can expand a member to add its child members below it as new rows, and you can collapse expanded members to remove the expanded member's child members.

Procedure

1. Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
2. Click the new button  and click **Expand** or **Collapse**.
3. In the **Available members** list, select the member to expand or collapse and click the right arrow to move it to the **Members** list.

Extended Data Items

Extended data items differ from the traditional, expression-based text strings by enabling you to add children, view details, select sets, sort sets, and apply contextual calculations.

Extended data items are created when you insert data items from dimensional packages. Extended data items do not apply to relational packages or non-dimensionally modeled packages.

You can do the following with extended data items that are not available with traditional data items:

- Add an extended data item's child members

You can double-click an extended data item to insert its child members beside it in the report object.


- View an extended data item's details

You can select an extended data item and see where the data item appears in the package in the **Properties** pane under **Data Item**.

- Select member sets


You can select a member in a set to highlight it as the primary selection and the other members as secondary selections.

- Sort sets

You can select an extended data item, click the sort button  in the report object toolbar, and click **Edit set sorting** to sort a set in ascending or descending order, to sort hierarchically, and to sort by caption, by a property, or by an intersection (tuple).

- Apply contextual calculations

You can select an extended data item and then, from the report object toolbar, click the **Insert**

Calculation icon  to see a contextual list of calculations that are available for this extended data item.

Tips for working with ragged or unbalanced hierarchies

In ragged or unbalanced hierarchies, some members that are not at the lowest level of the hierarchy may have no descendants at one or more lower levels. Support for these hierarchy gaps in relational data sources is limited. More complete support is provided for OLAP data sources, but some reports may still result in unexpected behavior.

For example, the following may occur:

- Groups corresponding to missing members may appear or disappear when grouped list reports are pivoted to a crosstab. This happens with set expressions using the `filter` function, and detail filters on members.
- Ragged and unbalanced sections of the hierarchy are suppressed when set expressions in that hierarchy are used on an edge.
- When a crosstab is sectioned or is split into a master detail report, sections corresponding to missing members become empty.
- Cells that were suppressed may still appear in the report output for reports with ragged or unbalanced hierarchies.

Some of these behaviors may be corrected in a future release, while others may be codified as supported behavior. To avoid these behaviors, do not use levels from ragged or unbalanced hierarchies. Instead of using levels, use the descendants, children, or ancestors.

We consider the following scenarios to be safe:

- One or more nested level references on an edge with no modifying expression.
- A hierarchy reference on only one level of one edge.
- One or more explicit members or sets of explicit members as siblings on only one level of one edge.
- Summaries of the previous three scenarios.

In all cases, you should test reports based on ragged and unbalanced hierarchies to confirm that hierarchy gaps are handled correctly.

For more information about ragged or unbalanced hierarchies, see the *IBM Cognos Framework Manager User Guide*.

Creating dimensional custom groups

Create custom groups to classify existing data items into groups that are meaningful to you.

You can reduce the number of values into smaller, more meaningful groups. For example, you can change a list of employees into my team and others.






When you are working with dimensional data and crosstabs or charts, you can create custom groups only on sets of members. After you create a custom group in a set, the members in the set are replaced by the custom groups.

When you create custom groups in a list, a new column is added to the report, with the name ***data_item (Custom)***. You can use this new column to group or sort the report. If you want to show only the new groups, you can delete the original column.

When you are creating custom groups on sets of members, consider the following constraints:

- Members included in a custom group must be from the same level in a hierarchy.
- If you insert a hierarchy that is used in a custom group elsewhere in the data container, it must be inserted as a sibling of the custom group.
- Automatic aggregation on a custom group might not work as expected. For example, you might encounter error cells (- -).

Procedure

1. To add custom groups in a crosstab or chart that includes sets of members, do the following steps:
 - a) Select a set, click the **More** icon  in the toolbar, and click **Edit Set**.
 - b) Click the **New** icon  and select **Custom Grouping**.
 - c) In the **Custom grouping** window, click the **New Group Entry** icon .
 - d) Type a name for the new group.
 - e) Select members from the **Available members** list and move them to the **Members** list.
2. To add custom groups to a list, do the following steps:
 - a) Click the column that you want to group on, click the **Show properties** icon , and in the **Properties** pane, double-click the **Set definition** property.
Tip: You can click either the column heading or one of the column cells.
 - b) Click **New Group Entry** .
 - c) To group by values that you select, click **New Select Values Group**, type a **New Group Name**, select the required values from the **Values** box, and move the values to the **Selected Values** box.
 - d) To group by a range of values, click **New Range Group**, type a **New Group Name**, and enter the **From** and **To** values.
3. If you do not want a group name to be displayed for remaining values, select **Do not show remaining values**. Clicking this option produces empty cells for remaining values.
4. If you want the group name for remaining values to match each value, select **Use each remaining value as a group name**.
5. If you want to specify your own group name for all remaining values, select **Group remaining values into a single group** and type the name that you want.
6. If you are adding custom groups in a list, under **New data item name**, select either the default data item name or type a new data item name.

Summarizing data dimensionally

Summarize data in your reports to obtain totals, averages, and so on.

The summary options that you can use depend on the type of data source that you are using. If you are querying an OLAP data source, all measure values that appear in reports are pre-summarized because the data source contains rolled up values. The type of summary that is used is specified in the data source itself. As a result, we recommend that you use the Automatic summary when creating dimensional style reports. This ensures that the report always uses the type of summary that the data modeler specified in the data source.

For example, the modeler may have specified that the rollup for revenue is total and the rollup for stock prices is average.

If you use other types of summaries with dimensional style reports, you may encounter unexpected results.

You can also add summaries, which are supported for any data source. Summaries specify how data items are totaled in the headers and footers of a list and in the total rows and columns of a crosstab. For list reports, these summaries only summarize the data that is visible on that page of the report.

| Revenue | 2010 | 2011 | 2012 | 2013 | Total |
|--------------------------|-------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Camping Equipment | \$332,986,338.06 | \$402,757,573.17 | \$500,382,422.83 | \$352,910,329.97 | \$1,589,036,664.03 |
| Personal Accessories | \$391,647,093.61 | \$456,323,355.90 | \$594,009,408.42 | \$443,693,449.85 | \$1,885,673,307.78 |
| Outdoor Protection | \$36,165,521.07 | \$25,008,574.08 | \$10,349,175.84 | \$4,471,025.26 | \$75,994,296.25 |
| Golf Equipment | \$153,553,850.98 | \$168,006,427.07 | \$230,110,270.55 | \$174,740,819.29 | \$726,411,367.89 |
| Mountaineering Equipment | | \$107,099,659.94 | \$161,039,823.26 | \$141,520,649.70 | \$409,660,132.90 |
| Total | \$914,352,803.72 | \$1,159,195,590.16 | \$1,495,891,100.90 | \$1,117,336,274.07 | \$4,686,775,768.85 |

Figure 41. Crosstab showing automatic summaries for rows and columns

You can specify summary aggregation in different ways by using any of the following:

- aggregation properties that are specified in the model
- the **Auto group & summarize** property
- the summarize button in the toolbar
- aggregation properties for a data item
- the solve order of calculations

Tip: When you add a summary by clicking the summarize button in the toolbar, a data item is created in the query for the summary. In lists, the data item that is created is called a list summary. In crosstabs and charts, the data item that is created is called a dimensional edge summary.

Limitation

If a summary is applied to a report that contains binary large object (BLOB) data, such as images or multimedia objects, you cannot also perform grouping or sorting.

The Type of Data

How data is summarized also depends on the type of data that you are summarizing. Summary rules are applied differently to facts, identifiers, and attributes. For example, if you summarize a data item that represents part numbers, the only summary rules that apply are count, count distinct, count non-zero, maximum, and minimum. For information about how to determine the type of data that a data item represents, see [“Add Relational Data to a Report” on page 277](#) and [“Add dimensional data to a report” on page 313](#).

For information about how null or missing values are handled in summaries, see [“Null \(Missing\) Values in Calculations and Summaries” on page 492](#).

Limitations on Measure Rollups

For all OLAP data sources except IBM Cognos PowerCube and Microsoft SQL Server 2005 Analysis Services (SSAS), aggregation and re-aggregation are supported only for calculations and measures that use the following rollups: Sum (Total), Maximum, Minimum, First, Last, and Count.

All other types of rollup either fail or return error cells, which typically appear as two dash characters (--).


This problem occurs in, but is not limited to, the following:

- footers
- aggregate function
- context filters that select more than one member of a hierarchy that is used elsewhere on the report

Summarizing Sets

When working with Microsoft SQL Server Analysis Services (SSAS) data sources, we recommend that you not summarize values for sets which contain members that are descendants of other members in the same set. If you do so, SSAS double-counts values for automatic summaries and all data sources double-counts values for explicit summaries.

Add a Simple Summary

You can add simple summaries in a report by using the summarize button . This button provides a subset of the summary functions available in IBM Cognos Analytics - Reporting.



The summarize button sets the summary property for the data item to the selected summary, and places the data item into an appropriate footer. A footer is created for each set, hierarchy, or level.

In crosstabs and charts, the summary appears as a node.

In crosstabs, you can add multiple summaries at the same level. For example, you have a crosstab with Product line as rows, Order year as columns, and Revenue as the measure. For Product line, you can add the **Total** summary as a header, which will total all revenue for each order year. You can then add the **Average** summary as a footer, which will give the average revenue of all product lines for each order year.

For information about adding a rolling or moving average, see [“Rolling and Moving Averages” on page 330](#).

Procedure

1. Select the item for which you want to add a summary.
2. In the report object toolbar, click the summarize button  and click a summary type.
3. To change the summary label, do the following:
 - Click the label.
 - Click the **Show properties** icon , and In the **Properties** pane, under **Text Source**, set the **Source type** property to the source type to define the label.

For example, set it as **Data item value** to produce a dynamic label for the summary based on data item values.
 - Set the property under **Source type** to specify the label.

This property depends on the source type you chose. For example, if you chose **Data item value** as the source type, set the **Data item value** property to the data item to use to define the label.
4. To change a summary, select it and, in the **Properties** pane, under **Data Item**, click **Summary** and choose a different function.

Summarizing values in crosstabs

In crosstabs, summaries are calculated using two summary expressions.

The expressions used to summarize data are:

- `aggregate ([measure within set [data item]])` summarizes the member values from the data source within the current content.
- `aggregate ([measure within detail [data item]])` summarizes the lowest level of details in the report.

The expression that is used to calculate a summary is controlled by the summary's **Use set aggregation** property. For example, in the following crosstab, if you specified **Total** as the summary, the following aggregate expressions are produced when the **Use set aggregation** is set to **Yes** and **No** respectively:

| | | |
|--------------------|-----------|-------------|
| | | <#Revenue#> |
| <#Quarter#> | <#Month#> | <#1234#> |
| | <#Month#> | <#1234#> |
| <#Total(Quarter)#> | | <#1234#> |

- Total ([Revenue] within set [Quarter])

This expression totals the quarter values from the data source at the intersecting product line. It totals the aggregate over all product lines for each quarter. The total appears after other values.

- Total ([Revenue] within detail [Quarter])

This expression totals the month values visible in the report at the intersecting product line. It totals all of the intersecting month - product line values visible in the report. The total appears after other values.

In simple cases, the members and values visible in the report and the aggregate rules in the report are the same as those in the data source and all of these expressions produce the same results.

For example, for the quarter and month values, if you are totaling the values for all months in all quarters, it makes no difference whether the visible values, the values in the cube, or the month and quarter values are used. The result is the same.

| | | Revenue |
|-----------------------|-----------|-------------------------|
| 2005 Q 3 | 2005/Sep | \$5,300,599.08 |
| 2005 Q 4 | 2005/Oct | \$11,778,348.92 |
| | 2005/Nov | \$3,353,399.48 |
| | 2005/Dec | \$4,645,069.28 |
| 2006 Q 1 | 2006/Jan | \$3,119,227.22 |
| | 2006/Feb | \$3,045,478.88 |
| | 2006/Mar | \$6,867,919.18 |
| 2006 Q 2 | 2006/Apr | \$8,306,586.26 |
| | 2006/May | \$5,129,112.24 |
| | 2006/June | \$6,927,447.24 |
| 2006 Q 3 | 2006/Jul | \$5,078,789.96 |
| | 2006/Aug | \$5,180,166.38 |
| | 2006/Sep | \$4,892,742.38 |
| 2006 Q 4 | 2006/Oct | \$15,887,237.28 |
| | 2006/Nov | \$3,609,599.42 |
| | 2006/Dec | \$6,240,652.88 |
| Total(Quarter) | | \$171,576,387.88 |

Tip: The Total Revenue by Country or Region sample report in the GO Data Warehouse (query) package includes a totalsummary function.

Different results appear when you start filtering, changing aggregation types, or using set expressions or unions.

For example, the following crosstab shows the quantity of products sold across all product types for each product line. The crosstab has two summary values that show the average quantity of products sold by product line.

| | | Quantity |
|--------------------------------|----------------------|----------------------|
| Camping Equipment | Cooking Gear | 13,400,351.00 |
| | Tents | 3,164,285.00 |
| | Sleeping Bags | 3,153,218.00 |
| | Packs | 2,756,540.00 |
| | Lanterns | 4,826,755.00 |
| Mountaineering Equipment | Rope | 418,560.00 |
| | Safety | 1,135,194.00 |
| | Climbing Accessories | 5,850,251.00 |
| | Tools | 2,496,086.00 |
| Personal Accessories | Watches | 4,299,195.00 |
| | Eyewear | 20,311,396.00 |
| | Knives | 7,229,314.00 |
| | Binoculars | 1,075,087.00 |
| | Navigation | 1,992,713.00 |
| Outdoor Protection | Insect Repellents | 5,800,964.00 |
| | Sunscreen | 5,384,127.00 |
| | First Aid | 829,354.00 |
| Golf Equipment | Irons | 391,445.00 |
| | Woods | 317,939.00 |
| | Putters | 1,284,570.00 |
| | Golf Accessories | 3,119,747.00 |
| Average - within detail | | 4,249,385.29 |
| Average - within set | | 17,847,418.20 |

Each summary value uses a different expression that is set by the value specified for the **Use set aggregation** property.

- Average (Product line) - within detail

This summary is the average of the detail values in the crosstab.

- Average (Product line) - within set

This summary is the average of the product type values rolled up into sets at the Product line level. The values are obtained from the data source. If filters or slicers exist, the values are recomputed using the aggregation rules defined in the data source.

In most cases, you should use the `within detail` expression because the results are easiest to understand and the same as the results for footers in a grouped list report. The `within set` expression should be reserved for reports with a purely dimensional focus, such as when there are no detail or summary filters defined in the report.

Summarizing Member Sets

When you work with dimensional data sources and you summarize member sets, if an explicit summary function such as **Total** is used and the set contains duplicates, the result is double-counted. If you are using an OLAP data source, the result produced for the automatic summary function depends on the data source.

For example, the following product line rows were defined using the expression

union ([Product line], [Camping Equipment], ALL)
 where [Product line] is the level that contains Camping Equipment.

| | Revenue |
|--------------------------|------------------|
| Camping Equipment | 1,589,036,664.03 |
| Mountaineering Equipment | 409,660,132.9 |
| Personal Accessories | 1,885,673,307.78 |
| Outdoor Protection | 75,994,296.25 |
| Golf Equipment | 726,411,367.89 |
| Camping Equipment | 1,589,036,664.03 |
| Summary | 4,686,775,768.85 |
| Total | 6,275,812,432.88 |

Figure 42. Crosstab showing revenue by product line with an aggregate row and a total row

For PowerCubes, Aggregate (Product line) is the sum of the product lines excluding duplicates. For more information about how the aggregate function is processed, see [“Summary functions” on page 331](#).

Rolling and Moving Averages

Use rolling and moving averages to analyze data for specific time series and to spot trends in that data. When viewing these averages on a line chart, use a longer period of time to reveal long-term trends.

In IBM Cognos Analytics - Reporting, to add a rolling or moving average, you must create summary and custom calculations using layout expressions [“Insert a Query Calculation” on page 355](#).

The Rolling and Moving Averages interactive sample report includes rolling and moving calculations.

Rolling Average

A rolling average continuously updates the average of a data set to include all the data in the set until that point. For example, the rolling average of return quantities at March 2012 would be calculated by adding the return quantities in January, February, and March, and then dividing that sum by three.

Tip: The Historical Revenue sample report in the Sales and Marketing (Cube) package also includes a rolling average.

Moving Average

A moving average calculates the average of a data set for a specified period. For example, the moving average of return quantities at March 2012 with a specified period of two would be calculated by adding the return quantities in February and March and then dividing that sum by two. In IBM Cognos Analytics - Reporting, you can use a prompt to specify the period.


Show Data for Specific Time Periods

Show data for a specific time period to associate a report with a business time period rather than the execution time. For example, you have a monthly report that you run at the beginning of each month, and you want the last business day of the previous month to appear rather than the day on which you run the report.


If the report functions `AsOfDate` and `AsOfTime` are added to the report, they will return a value based on the results of the **As of Time Expression** object. If the **As of Time Expression** object is not added to the report, these two functions return the date and time at which the report is run.

If the **As of Time Expression** object is added more than once in the report, the first occurrence of the object in the layout that returns a valid value is used.

Procedure


1. Click the **Toolbox** icon  and drag **As-of-time Expression** to the report.
2. Double-click **As-of-time Expression**.
3. In the **Expression Definition** box, type the expression.

The expression must return a date-time value.

Tip: You can drag a function that returns a constant from the **Constants** folder in the **Functions** tab . You can then change the constant to the value to use.

If you do not specify a time, the default time 12:00:00.000 AM is used.

Summary functions

This section describes the summary, or aggregation, functions that are available in IBM Cognos Analytics - Reporting. Some functions, such as **Custom**, are available only when you click the summarize button  on the report object toolbar. Additional summary functions are available in the expression editor.

Default summary

Depending on the type of data item, applies the function **None**, **Summarize**, or **Calculated** based on the context in which the data item appears. This is the default function.

Calculated is applied if the underlying data source is OLAP. It is also applied in the following situations:

- When the data item expression contains a summary function
- When the data item expression is an **if then else** or case expression that contains a reference to at least a modeled measure in its condition
- When the data item expression contains a reference to a model calculation or to a measure that has the **Regular Aggregate** property set to a value other than **Unsupported**
- When the data item expression contains a reference to at least one data item that has the **Summary aggregation** property set to a value other than **None**

If the underlying data source is relational and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported**, **Summarize** is applied.

If the underlying data source is OLAP and if the data item expression contains no summary functions and a reference to at least one fact that has the **Regular Aggregate** property set to a value other than **Unsupported**, **Calculated** is applied.

If the underlying data source is SAP BW, reports containing aggregations and summaries run more efficiently if the aggregation applied to a query item matches the aggregation rule for the underlying key figure on the SAP BW server. In Cognos Analytics - Reporting, the easiest way to accomplish this is to change the value of the **Detail aggregation** property to **Default**.

In all other contexts, **None** is applied.

For relational and dimensionally modeled relational (DMR) data sources, if this function is applied to a data item expression that has the average function, weighted averages are computed based on the lowest level detail values in the data source.

Average

Adds all existing values and then divides by the count of existing values.

Calculated

Specifies that all the terms within the expression for a data item are aggregated according to their own rollup rules, and then the results of those aggregations are computed within the overall expression.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Total**. You add a query calculation named Quantity Calculated. You define its expression as Quantity + 100 and you set its **Detail aggregation** property to **Calculated**. When you run the report, the values for Quantity Calculated are computed by first adding all values for Quantity and then adding 100 to each value.

Note: In crosstabs, this function overrides any solve orders that are specified.

Count

Counts all existing values.

If the underlying data source is OLAP, Count behaves as described in the following table if it is specified in the **Summary Aggregation** property for a data item.

| Object | Behavior |
|------------|---|
| Level | Count distinct is used. A warning appears when you validate the report. |
| Member set | Count distinct is used. A warning appears when you validate the report. |
| Attribute | Not supported. An error is returned when you run the report. |
| Measure | Supported. |

If the underlying data source is dimensionally modeled relational (DMR), Count behaves as described in the following table if it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

| Object | Behavior |
|------------|---|
| Level | Count distinct is used. A warning appears when you validate the report. |
| Member set | Count distinct is used. A warning appears when you validate the report. |
| Attribute | Supported. |
| Measure | Supported. |

If you add the count summary to a non-fact column in a list and then group the column, the column will not be grouped when you run the report. To resolve this issue, group the column first before adding the count summary.

Count distinct

Returns the total number of unique non-null records.

If the underlying data source is OLAP, count distinct behaves as described in the following table if it is specified in the **Summary aggregation** property for a data item.

| Object | Behavior |
|--------|------------|
| Level | Supported. |

| Object | Behavior |
|------------|--|
| Member set | Supported. |
| Attribute | Not supported. An error is returned when you run the report. |
| Measure | Not supported. An error is returned when you run the report. |

If the underlying data source is dimensionally modeled relational (DMR), `count distinct` is supported for levels, member sets, attributes, and measures when it is specified in the **Detail aggregation** or **Summary aggregation** property for a data item.

Custom

Summarizes data based on an expression that you define.

Maximum

Selects the largest existing value.

Median

Returns the median value of the selected data item.

Minimum

Selects the smallest existing value.

None

Does not aggregate values.

If the underlying data source is relational, the data item is grouped when the query property **Auto group & summarize** is set to **Yes**.

Not Applicable

This function is available only for the **Detail aggregation** property. It specifies that the aggregate attribute is ignored. For example, the calculation is applied after the data is aggregated.

This function differs from the **Calculated** function, which applies aggregation to the rows and then performs the calculation.

For example, for the `average ([Quantity]) + 5` expression, when the **Detail aggregation** property is set to **Not Applicable**, five is added to the average of the single Quantity value. When the function is set to **Calculated**, five is added to the average of a set of numbers.

This setting should not be applied to a simple model reference.

This setting is relevant only for reports that are upgraded from IBM Cognos ReportNet 1.x.

Standard deviation

Returns the standard deviation of the selected data item.

Note: This function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

Summarize

Aggregates data based on model or data type information. This function can be thought of as a calculate and then aggregate rule. Data is aggregated using the following rules:

If the underlying data source type is relational and the data item or calculation is a reference to a single fact query item in the model that has the **Regular Aggregate** property set to **Sum, Maximum, Minimum, Average, or Count**, aggregate data using this function. Otherwise, data is aggregated according to the data type of the data item as follows:

- **Total** is applied for numeric and interval values
- **Maximum** is applied for date, time, and date-time values
- **Count** is applied for everything else

The underlying data source type can be dimensional and the data item or calculation a reference to a single item in the model. In this case, if the **Regular Aggregate** property of the model item is not **unknown**, the summary function that corresponds to the **Regular Aggregate** property is applied. If the **Regular Aggregate** property is **unknown**, set the function to **Calculated**.

For example, a list contains the data item Quantity with the **Detail aggregation** property set to **Average**. You add a query calculation named Quantity Summarize. You define its expression as Quantity + 100 and you set its **Detail aggregation** property to **Summarize**. When you run the report, the values for Quantity Summarize are computed by first adding 100 to each value for Quantity and then calculating the total. The total is calculated because Quantity contains numeric values and the expression for Quantity Summarize is not a simple data item reference. If Quantity Summarize is defined as Quantity, the function **Average** is applied to each value.

Total

Adds all existing values.

Variance

Returns the variance of the selected data item.

Note: From a mathematical perspective, this function is not useful for small numbers of items and is not supported if the query property **Auto group & summarize** is set to **Yes**.

Mapping Summary Functions From Data Sources to Framework Manager and Reporting

The summary functions available in IBM Cognos Framework Manager and IBM Cognos Analytics - Reporting reflect summary functions supported by relational and dimensional data sources. The following table shows how summary functions in data sources are mapped to Framework Manager and Reporting.

| Data source | Framework Manager | Reporting |
|-------------------------|-------------------|----------------|
| None specified, or none | Unsupported | None |
| average (avg) | Average | Average |
| count | Count | Count |
| count distinct | Count Distinct | Count distinct |
| maximum (max) | Maximum | Maximum |
| minimum (min) | Minimum | Minimum |

| Data source | Framework Manager | Reporting |
|-----------------------------|--------------------|--------------------|
| median | Median | Median |
| standard deviation (stddev) | Standard Deviation | Standard Deviation |
| sum | Sum | Total |
| variance (var) | Variance | Variance |
| count non zero | Count Non-Zero | Automatic |
| average non zero | unknown | Automatic |
| external | unknown | Automatic |
| any | unknown | Automatic |
| calculated | unknown | Automatic |
| unknown | unknown | Automatic |
| first_period | unknown | Automatic |
| last_period | unknown | Automatic |

The following summary functions exist only in either Framework Manager or Reporting. There is no corresponding summary function in data sources.

| Framework Manager | Reporting |
|-----------------------------------|----------------|
| Automatic | Automatic |
| Calculated | Calculated |
| No corresponding summary function | Summarize |
| No corresponding summary function | Not Applicable |

Focusing Dimensional Data

In IBM Cognos Analytics - Reporting, there are three approaches to focusing dimensional data in a crosstab:

- drag data items to the edges of your crosstab
- drag data items to the context filter area
- create set expressions on the edges of your crosstab that return members or sets of members, such as the `filter` function

Note: Detail filters are supported and can be used with dimensional sources, but it's recommended to use set expressions if possible. In general, summary and detail filters are recommended only for focusing data in relational reporting.

The approach you choose should depend on the capabilities of the data source, the performance requirements, the persistence of the dataset, and how complex you want the report to be.

If you filter values that are floating-point numbers, you may encounter imprecise filtering results due to rounding or data truncation. Floating-point numbers may appear differently in the report than how they are stored in the data source. To ensure accurate results, your filter criteria should account for any rounding issues.

Consider the limitations when filtering dimensional data and when filtering data from SAP BW data sources.

You can also use prompts, or prompt controls, to allow users to provide input for the filter.

Create a context filter

When working with dimensional data, you can use context filters, or slicer filters, to quickly focus your report on a particular view of the data.

For example, the following crosstab contains product lines in the rows, years in the columns, and revenue as the measure. We want to filter the values to show us the revenue for only Web orders from Asia Pacific. To change the context, you drag Asia Pacific and Web from the source tree to the **Context filter** section of the overview area. The crosstab then shows the revenue for only Asia Pacific and Web. Changing context changes only the values that appear. It does not limit or change the items in the rows or columns.

| Asia Pacific | | | | |
|--------------------------|---------------|---------------|----------------|----------------|
| Web | | | | |
| Revenue | 2010 | 2011 | 2012 | 2013 |
| Camping Equipment | 36,415,479.91 | 77,222,359.67 | 121,312,260.99 | 83,023,522.78 |
| Mountaineering Equipment | | 18,115,550.83 | 37,258,799.5 | 31,810,456.11 |
| Personal Accessories | 67,562,845.5 | 94,998,084.39 | 136,872,087.64 | 106,879,947.27 |
| Outdoor Protection | 4,135,482.66 | 4,388,590.73 | 2,241,092.7 | 1,107,629.48 |
| Golf Equipment | 8,586,746.5 | 27,061,602.93 | 49,822,888.09 | 39,248,971.12 |

Figure 43. Crosstab showing revenue by product line by year filtered to show only Asia Pacific and web orders

The members that are used as the context filter appear in the report header when you run the report.

Any summary values in the report are recomputed to reflect the results returned by the context filter.

You can create multiple context filters to filter across two or more different hierarchies.

Tip: The Budget vs. Actual sample report in the Sales and Marketing (cube) package includes a context filter.

Note: There are limitations when using context filters:

- Calculated measures do not get suppressed by the filter. To avoid this, drag the desired members from the **Source** tab directly onto the row or column edge instead of using the members in the context filter.
- Suppression can be slow on large cubes, because all of the data is retrieved and then filtered.

If the desired data in the context filter is from a hierarchy that appears on the crosstab edge, drag the desired members from the **Source** tab directly onto the crosstab edge.

If the desired data is from a hierarchy that does not appear on the crosstab edge, use a context filter in conjunction with other means to limit the data, such as a top or bottom filter.

To use a calculation or expression to define a context filter, create a slicer member set using the query explorer. A slicer member set is an expression that returns a set of members from the same dimension. For example, you can define a slicer member set that filters for the top five products with the greatest revenue.

Context filters are different from other filters. When you filter data, members that do not meet the filter criteria are removed from the report. A context filter does not remove members from a report. Instead, their values are filtered or you see blank cells.

You can also use context filters as prompts when the report is run.



When creating context filters,

- use only members from hierarchies that are not already projected on an edge of the crosstab
- use only one member per hierarchy

Create a simple context filter

When working with dimensional data, you can use context filters, or slicer filters, to quickly focus your report on a particular view of the data.



Procedure

1. Click the **Insertable objects** icon , click the **Source** tab , select or search for one or more items on which to filter.
2. Drag the item on which to filter into the **Context filter** section of the overview area.
3. To change context, select a new item from the **Context filter** box.

Create an advanced slicer filter

To use a calculation or expression to define a context filter, create a slicer member set using the query explorer. A slicer member set is an expression that returns a set of members from the same dimension. For example, you can define a slicer member set that filters for the top five products with the greatest revenue.

Procedure

1. Click the **Queries** icon , and click the query for which you want to add a slicer.
2. Click the **Toolbox** icon  and drag **Slicer member set** to the **Slicer** pane.
3. Drag the members to the **Expression Definition** box.

You must join the members in the expression by using the set function. For example, the following expression contains the Fax and Telephone members from the Order Method dimension:

```
set ([Fax],[Telephone])
```

4. To add members from another dimension, repeat step 2 to create a separate slicer member set.

Define a Prompt Using a Context Filter

If context filters (or slicers) are defined, you can use these filters to create prompts in the report.

Prompts provide questions that help users to customize the information in a report to suit their own needs. For example, you create a prompt so that users can select a region. Only data for the specified region is retrieved and shown in the report.

Before you begin

Before you define a prompt, you must create context filters.

Procedure

1. In the **Context filter** section of the overview area, click the down arrow next to the filter to use as a prompt.
2. Click **Prompt** and do one of the following:
 - To remove the prompt, click **No Prompt**.
 - To allow users who run the report to select any member from the hierarchy, click **Prompt on Hierarchy**.

- To allow users who run the report to select from a list of members in the current level, click **Prompt on Level**.

Sorting Dimensional Data

You can sort items to view them in your preferred order. By default, IBM Cognos Analytics - Reporting retrieves items in the order defined in the data source. OLAP data sources always have a defined order. The data modeler defines the sorting options in the model.

For more information about data modeling, see the IBM Cognos Framework Manager *User Guide*.

Tip: The Sales Growth Year Over Year sample report in the GO Data Warehouse (analysis) package includes sorting.

Limitations When Sorting SAP BW Data

If you use a SAP BW data source, each level in a hierarchy has an item with the same name as the level and a role of `_businessKey`. Such items are known as level identifiers. You should use only the level identifier of all the time-related characteristics, such as `OCALDAY` and `OCALMONTH`, for sorting. All other (attribute) items in these hierarchies are formatted string representations of the characteristic values with which they are associated. These formatted values sort alphanumerically and not chronologically.

Tip: By level identifier, we are referring to a query item with the same name as the level that has the role of `_businessKey`. Each level in a SAP BW hierarchy has a level identifier.

Sort Sets by Label

You can sort sets of members based on their label (or caption). By default, when you select **Sort by Label, Ascending** or **Descending**, the members within the set are sorted only by their labels. You can also perform advanced sorting to sort sets using an intersection (tuple) or a member property.

For example, a set contains regions and you sort the regions within the set in descending alphabetical order. Only extended data items that represent sets support set sorting.

Before you can perform set sorting, you must create sets for the members in your report.

You cannot sort data items from different dimensions that are intermixed. For example, if you have years and products on the same edge and at the same level in your crosstab, you can sort the years, and you can sort the product lines, but you cannot sort them as combined set because years and products come from different dimensions.

Procedure

1. In a crosstab, select a set to sort.
2. In the report object toolbar, click the sort button  and under **Sort by Label**, click **Ascending** or **Descending**.

Tip: To remove a sort order, click **Don't Sort**.

Sort Sets in the Opposite Axis by Value

You can sort members in the sets on the opposite axis based on the value of a member or measure that you select.

For example, a crosstab contains years inserted as individual members in the columns, product lines inserted as a member set in the rows, and revenue as the measure. You select the 2012 column and then select **Sort by Value, Descending**. The values in the 2012 column are sorted.

| Revenue | 2012 | 2013 |
|--------------------------|----------------|----------------|
| Personal Accessories | 594,009,408.42 | 443,693,449.85 |
| Camping Equipment | 500,382,422.83 | 352,910,329.97 |
| Golf Equipment | 230,110,270.55 | 174,740,819.29 |
| Mountaineering Equipment | 161,039,823.26 | 141,520,649.7 |
| Outdoor Protection | 10,349,175.84 | 4,471,025.26 |

Figure 44. Crosstab showing revenue by year by product line with the 2012 column sorted in descending order

Before you can perform this sorting, you must create sets for the members in your report.

In nested crosstabs, items are sorted based on the values of the innermost nested row or column of the opposite axis. For example, a crosstab contains years in the columns and retailers nested within product line in the rows. Select 2012, sort in descending order, and you see retailers listed from the largest value to the smallest value for each product line.

Procedure

1. In a crosstab, select a member or measure to sort.

For example, to sort a set in the row axis, select a member or measure in the column axis.

2. In the report object toolbar, click the sort button  and under **Sort by Value**, click **Ascending** or **Descending**.


Tip: To remove a sort order, click **Don't Sort**.

Perform Advanced Set Sorting

If you use dimensional data, you can sort using the property of a member.

For example, your report includes employee names and you want to sort the employees using the gender property. You can also sort using an intersection of members, also known as a tuple. For example, you want to sort the employees using the value of sick days taken for the year 2012.

Procedure

1. Select a set.
2. In the report object toolbar, click the sort button  and under **Other Sort Options**, click **Edit set sorting**.
3. Specify the sorting options.
4. If you are sorting members from different levels and want to preserve the hierarchy, select the **Hierarchized sorting** check box.
5. To sort items using a member property, under **Sort by**, click **Property**, navigate the tree, and select the member property to use.
6. To sort items using an intersection of members, or a tuple, under **Sort by**, click **Intersection (tuple)** and click the ellipsis button. Then, from the **Available members and measures** box, select the items to use and click the right arrow to move them to the **Intersection members and measures** box. You

can also select items from the **Calculated members and measures** tab .

Working with Dimensional Queries

Queries specify what data appears in the report. In IBM Cognos Analytics - Reporting, you create and modify queries using Query Explorer.

Query Explorer provides an alternative way to modify existing reports or to author new reports. You can use Query Explorer to perform complex tasks and other tasks that are more difficult to do in the report layout. For example, use Query Explorer to

- improve performance by changing the order in which items are queried from the database, or by changing query properties to allow the report server to execute queries concurrently where possible

Note: Only queries that are referenced in the report layout can be executed concurrently. If a query is defined in Query Explorer by joining two or more existing queries, IBM Cognos Analytics with Watson cannot execute the source queries concurrently. By default, queries run sequentially. Your administrator must enable the concurrent query execution feature. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

- view or add filters and parameters and modify their properties
- view or add dimensions, levels, and facts
- incorporate SQL statements that come from other reports or reports that you write
- create complex queries using set operations and joins

Specify a List of Data Items for an Object

Specify the list of data items for an object when you must reference a data item that is in a query but is not in the layout.

For example, you want to add a layout calculation to a list that uses a data item that is in the query definition. If the data item does not appear in the list, you must reference it in order to make the layout calculation work. You must also specify the list of data items if you apply conditional formatting that uses a data item that is not in the query.

Procedure




1. Click a layout object.
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Properties** property and select data items.

Relate a Query to a Layout

Queries and layouts work together. After you decide the type of data that you need, you must create a layout in which to show the results. Each column of data must be both selected for the query and shown in a layout unless there are some columns that you do not want to show. The query and layout portions of a report must be linked to produce a valid report.

IBM Cognos Analytics - Reporting automatically links query and layout. For example, when you use Reporting and the list report layout, query and layout are automatically linked.

Procedure

1. Select a data container.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Query** property to a query.
3. Click the **Insertable objects** icon , click the **Data items** tab , drag data items from the query to the data container.

Using Dimensional Data Sources with Queries

When you are working with SAP BW data sources, you can use only a single hierarchy in a query.

Creating queries using a mix of OLAP and relational data is not supported. If you create queries using a database for which you do not know the type, consult your database administrator or modeler.

When performing multi-cube queries using dimensional data sources, the following restrictions apply:

- Only basic operators (+, *, /,-) are available for cross-cube calculations.
- Inner joins are not supported.
- All joins for multi-cube queries are outer joins.
- Viewing MDX using the **Generated SQL/MDX** query property may not show you the actual MDX that is executed. This is because when a multi-cube query is executed, a number of smaller queries are actually executed.

Connecting Queries Between Different Data Sources

This section lists the data sources between which you can and cannot connect queries.

IBM Cognos Analytics with Watson supports the following:

- RDBMS to RDBMS joins
- set operations of any two queries
- master detail relationships between any two queries
- drill from any query to any other query

You cannot create the following types of joins:

- cube-to-cube (homogeneous)
- cube-to-cube (heterogeneous)
- cube-to-RDBMS
- cube-to-SAP BW
- SAP-BW-to-RDBMS

Multiple-fact Queries

You must understand the result of a query on more than one fact table to achieve the results that you want. The result of a multiple-fact query varies depending on whether you are working with conformed or non-conformed dimensions, on the level of granularity, and on the additive nature of the data.

The GO Data Warehouse (analysis) package has characteristics that affect the results if you use a multiple-fact query with the Inventory and Sales namespaces. Granularity for time differs in that inventory levels are recorded monthly and sales are recorded daily. Also, Sales includes a non-conformed dimension, Order method.

The following examples will help you interpret the results of a multiple-fact query and understand the options for changing a query to obtain the results that you want.

Conformed Dimensions

Individual queries on Inventory and Sales by Quarter and Product yield the following results.

| Quarter | Product | Opening inventory | Closing inventory | Quantity |
|--------------------------|---------------------|-------------------|-------------------|---------------|
| Q1 2011 | Husky Rope 50 | 0 | 4,853 | 9,259 |
| | Aloe Relief | 10,614 | 6,513 | 8,805 |
| | Course Pro Umbrella | 34,907 | 37,327 | 70,256 |
| Q1 2011 - Average | | 15,174 | 16,231 | |
| Q1 2011 - Total | | | | 88,320 |
| Q2 2011 | Husky Rope 50 | 4,853 | 5,728 | 8,725 |
| | Aloe Relief | 6,513 | 7,379 | 8,266 |
| | Course Pro Umbrella | 37,327 | 39,870 | 57,964 |
| Q2 2011 - Average | | 16,231 | 17,659 | |
| Q2 2011 - Total | | | | 74,955 |

A query on multiple facts and conformed dimensions respects the cardinality between each fact table and its dimensions and returns all the rows from each fact table. The fact tables are matched on their common keys, Product and Time.

Product and Time apply to both Inventory and Sales. However, inventory levels are recorded monthly and sales are recorded daily. In this example, results are automatically aggregated to the lowest common level of granularity. Quantity, which comes from Sales, is rolled up to months.

Nulls are often returned for this type of query because a combination of dimensional elements in one fact table may not exist in the other. For example, if Husky Rope 50 was available in inventory in Q1 2011, but there were no sales of this product in the same time period, Quantity would show a null in the Husky Rope 50 row.

IBM Cognos Analytics with Watson does not support conformed dimensions generated by IBM Cognos Framework Manager for SAP BW data sources.

Non-conformed Dimensions

If a non-conformed dimension is added to the query, the nature of the results returned by the query is changed.

| Quarter | Product | Order method type | Opening inventory | Closing inventory | Quantity | |
|---------|--------------------------|-------------------|-------------------|-------------------|---------------|---------------|
| Q1 2011 | Husky Rope 50 | Fax | 0 | 4,853 | 388 | |
| | Husky Rope 50 | Telephone | 0 | 4,853 | 1,015 | |
| | Husky Rope 50 | Mail | 0 | 4,853 | 240 | |
| | Husky Rope 50 | E-mail | 0 | 4,853 | 210 | |
| | Husky Rope 50 | Web | 0 | 4,853 | 5,031 | |
| | Husky Rope 50 | Sales visit | 0 | 4,853 | 1,961 | |
| | Husky Rope 50 | Special | 0 | 4,853 | 414 | |
| | Aloe Relief | Fax | 10,614 | 6,513 | 411 | |
| | Aloe Relief | Telephone | 10,614 | 6,513 | 1,513 | |
| | Aloe Relief | Mail | 10,614 | 6,513 | 433 | |
| | Aloe Relief | E-mail | 10,614 | 6,513 | 839 | |
| | Aloe Relief | Web | 10,614 | 6,513 | 4,740 | |
| | Aloe Relief | Sales visit | 10,614 | 6,513 | 732 | |
| | Aloe Relief | Special | 10,614 | 6,513 | 137 | |
| | Course Pro Umbrella | Fax | 34,907 | 37,327 | 1,568 | |
| | Course Pro Umbrella | Telephone | 34,907 | 37,327 | 17,120 | |
| | Course Pro Umbrella | Mail | 34,907 | 37,327 | 2,885 | |
| | Course Pro Umbrella | E-mail | 34,907 | 37,327 | 7,213 | |
| | Course Pro Umbrella | Web | 34,907 | 37,327 | 37,123 | |
| | Course Pro Umbrella | Sales visit | 34,907 | 37,327 | 2,793 | |
| | Course Pro Umbrella | Special | 34,907 | 37,327 | 1,554 | |
| | Q1 2011 - Average | | | 15,174 | 16,231 | |
| | Q1 2011 - Total | | | | | 88,320 |

Order method type exists only in Sales. Therefore, it is no longer possible to aggregate records to a lowest common level of granularity because one side of the query has dimensionality that is not common to the other side of the query. Opening inventory and Closing inventory results are repeated because it is no longer possible to relate a single value from these columns to one value from Quantity.

Grouping on the Quarter key demonstrates that the result in this example is based on the same data set as the query on conformed dimensions. Summary values are the same. For example, the total quantity for Q1 2011 is 88,320 in both examples.

Filters on Non-conformed Dimensions

By default, to improve performance, filters are applied at the database level. The default behavior can result in unexpected nulls when you add a filter to a multiple-fact query. If you create a filter on the Order method dimension to show only the fax order method and apply the filter at the data source, the report includes nulls.

| Quarter | Product | Order method type | Opening inventory | Closing inventory | Quantity |
|--------------------------|---------------------|-------------------|-------------------|-------------------|--------------|
| Q1 2011 | Husky Rope 50 | Fax | 0 | 4,853 | 388 |
| | Aloe Relief | Fax | 10,614 | 6,513 | 411 |
| | Course Pro Umbrella | Fax | 34,907 | 37,327 | 1,568 |
| Q1 2011 - Average | | | 15,174 | 16,231 | |
| Q1 2011 - Total | | | | | 2,367 |
| Q2 2011 | Husky Rope 50 | Fax | 4,853 | 5,728 | 419 |
| | Aloe Relief | Fax | 6,513 | 7,379 | 103 |
| | Course Pro Umbrella | | 37,327 | 39,870 | |
| Q2 2011 - Average | | | 16,231 | 17,659 | |
| Q2 2011 - Total | | | | | 522 |
| Q1 2012 | Husky Rope 50 | Fax | 5,188 | 9,199 | 327 |
| | Aloe Relief | Fax | 7,093 | 6,395 | 277 |
| | Course Pro Umbrella | Fax | 39,911 | 38,343 | 4,040 |
| Q1 2012 - Average | | | 17,397 | 17,979 | |
| Q1 2012 - Total | | | | | 4,644 |
| Q2 2012 | Husky Rope 50 | Fax | 9,199 | 7,038 | 424 |
| | Aloe Relief | Fax | 6,395 | 5,085 | 86 |
| | Course Pro Umbrella | | 38,343 | 31,799 | |
| Q2 2012 - Average | | | 17,979 | 14,641 | |
| Q2 2012 - Total | | | | | 510 |
| Overall - Average | | | 16,695 | 16,627 | |
| Overall - Total | | | | | 8,043 |

The filter is applied only to one subject area, Sales. Because Order method type does not exist in Inventory, all products still appear in the report. For example, Course Pro Umbrella was in inventory in Q2 2012. Because there were no sales using the fax order method for this product in Q2 2012, Order method type and Quantity are null.

To remove the nulls, change the filter so that it is applied to the result set instead of the data source. By applying the filter to the result set, you get the same results that you would get if you were working with conformed dimensions. Only the products that were ordered using the fax order method appear in the report.

| Quarter | Product | Order method type | Opening inventory | Closing inventory | Quantity |
|--------------------------|---------------------|-------------------|-------------------|-------------------|--------------|
| Q1 2011 | Husky Rope 50 | Fax | 0 | 4,853 | 388 |
| | Aloe Relief | Fax | 10,614 | 6,513 | 411 |
| | Course Pro Umbrella | Fax | 34,907 | 37,327 | 1,568 |
| Q1 2011 - Average | | | 15,174 | 16,231 | |
| Q1 2011 - Total | | | | | 2,367 |
| Q2 2011 | Husky Rope 50 | Fax | 4,853 | 5,728 | 419 |
| | Aloe Relief | Fax | 6,513 | 7,379 | 103 |
| Q2 2011 - Average | | | 5,683 | 6,554 | |
| Q2 2011 - Total | | | | | 522 |
| Q1 2012 | Husky Rope 50 | Fax | 5,188 | 9,199 | 327 |
| | Aloe Relief | Fax | 7,093 | 6,395 | 277 |
| | Course Pro Umbrella | Fax | 39,911 | 38,343 | 4,040 |
| Q1 2012 - Average | | | 17,397 | 17,979 | |
| Q1 2012 - Total | | | | | 4,644 |
| Q2 2012 | Husky Rope 50 | Fax | 9,199 | 7,038 | 424 |
| | Aloe Relief | Fax | 6,395 | 5,085 | 86 |
| Q2 2012 - Average | | | 7,797 | 6,062 | |
| Q2 2012 - Total | | | | | 510 |
| Overall - Average | | | 12,467 | 12,786 | |
| Overall - Total | | | | | 8,043 |

The overall summary for Quantity is 8,043 using either filter method, which shows that the results are based on the same data set.



In IBM Cognos Analytics - Reporting, there are two types of filters. A detail filter is applied to the data source. A summary filter is applied to the result set.

Add a Query to a Dimensional Report

You can create multiple queries in Query Explorer to suit your particular needs. For example, you can create a separate query for each data container in a report to show different data.

Tip: The Briefing Book sample report in the GO Sales (analysis) package and the Top 10 Retailers for 2011 sample report in the GO Data Warehouse (analysis) package include multiple queries.


Procedure

1. Click the **Queries** icon , and click **Queries**.
2. Click the **Toolbox** icon  and drag one of the following objects to the work area.



| Object | Description |
|------------------|-----------------------------|
| Query | Adds a query. |
| Join | Adds a join relationship. |
| Union | Adds a union operator. |
| Intersect | Adds an intersect operator. |


| Object | Description |
|---------------|------------------------------------|
| Except | Adds an except (minus) operator. |
| SQL | Adds SQL commands. |
| MDX | Adds MDX commands. |

Note: When adding queries to the report

- right-click the work area and click **Show Package Sources** to see the queries that use data items from a package
 - right-click the work area and click **Expand References** to see the relationships that exist between queries in the report, which is useful when you are creating complex queries
3. Select an object, click the **Show properties** icon , and in the **Properties** pane, set the object properties.

Note: The **Maximum execution time** property for a report query applies only to compatible query mode.

4. Double-click a query.
5. Click the **Insertable objects** icon , click the **Source** tab , drag data items to the **Data Items** pane.

Tip: You can add data items to the query that you do not want to appear in the layout. For example, to filter on Product line code and show Product line in the layout, you must add both data items to the query.
6. To create a new data item, click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
7. To add a filter, click the **Toolbox** icon and drag **Filter** to the **Detail Filters** or **Summary Filters** pane and define the filter expression.

Tip: You can also create a filter by dragging a data item from the **Source** tab to one of the filters panes and completing the filter expression. When working with a dimensional data source, you can quickly filter data by dragging a member to a filter pane instead of dragging the level to which the member belongs. For example, dragging the member 2012 from the Years level will filter data for the year 2012. This method is quicker than dragging the Years level and specifying data only for the year 2012 in the filter expression.

Add Dimension Information to a Query

Add dimension information to a query when the data source has no dimension information available or when you want to override, extend, or restrict the information.

Add dimension information if any of the following apply:

- There is no dimension information available in the data source.



For example, the data source contains flat data that you want to model dimensionally.
- You want to override the dimension information in the data source.
- You want to extend or restrict dimension information in the data source.

If you do not add dimension information and the data source contains dimensions, then the dimension structure of the data source is used. If the data source contains no dimensions, IBM Cognos Analytics with Watson creates a default dimension structure.

Dimension information is not intended to define the presentation of information, but to help query planning. Dimension information can be considered as a form of query hint. In addition, users will not be able to drill down on dimensions that you add to a report.

Note: Adding dimension information is not supported in reports that use the dynamic query mode.


Procedure

1. Click the **Queries** icon , and click a query.
2. Click the **Show properties** icon , and in the **Properties** pane, set the **Override dimension info** property to **Yes**.
3. Double-click the query.

The **Dimension Info** tab appears in the work area.

4. Click the **Dimension info** tab.
5. Click the **Insertable objects** icon , click the **Source** tab , drag the data item to the **Dimensions** pane.

IBM Cognos Analytics - Reporting automatically generates the entire dimension.

6. To create a new dimension, click the **Toolbox** icon , and drag **Dimension** to the **Dimensions** pane, and then build the new dimension by adding objects to the dimension:
 - To create a level, drag **Level**.
 - To create a level hierarchy, drag **Level hierarchy**.
 - To create a member hierarchy, drag **Member hierarchy**.

For information about these objects, see [“Add dimensional data to a report”](#) on page 313.

7. Click the **Data** icon, and from the **Source** tab, drag data items to the objects you added in the previous step.

For example, if you created a level, define a key by dragging a data item to the **Keys** folder.

8. To create a fact, from the **Source** tab, drag a data item to the **Facts** pane.

Create a Master Detail Relationship

Create a master detail relationship to deliver information that would otherwise require two or more reports. For example, you can combine a list with a chart. The list can contain product lines and the chart can show details for each product line.

Master detail relationships must appear in nested frames to produce the correct results. You can create a master detail relationship in two ways:

- Use a parent frame for the master query and a nested frame for the detail query.
- Associate a report page with the master query and use a data container, such as a list or crosstab, for the detail query.

You cannot display parent data in the child frame or child data in the parent frame. Also, you cannot perform calculations across master detail queries.

When you are working with dimensional data, IBM Cognos Analytics - Reporting does not support master detail relationships that use a custom group.

You can use a master detail relationship to show data from separate data sources in a single report. However, the data sources must be contained in the same package.


With the dynamic query mode, master detail reports with a crosstab report object are optimized to use a single query whenever possible, rather than a separate query for each report object instance.



If you are working with an SAP BW data source, you cannot use a data item from the master query that contains non-ASCII values.

Before you begin



To create a master detail relationship using queries that reference two different dimensional data sources, you must first [link the members](#) by aliasing the levels that contain the members.

Procedure

1. To use a parent frame for the master query and a nested frame for the detail query:
 - Click the **Toolbox** icon  and drag a **List**, **Repeater Table**, or **Repeater** to the report.
 - Add a second data container to the object you inserted.

You can insert a list, crosstab, chart, repeater table, or repeater into a list. You can add a list to a repeater table or repeater.
 - Add data items to both data containers.
2. To associate a report page with the master query and use a data container for the detail query:
 - Click anywhere in the report page.
 - Click the **Show properties** icon , and In the **Properties** pane, click the **Select ancestor** icon  and click **Page**.
 - Set the **Query** property.
 - Click the **Toolbox** icon, drag a data container to the report.
3. To link a data item in the master query to a parameter in the detail query instead of to another data item, create the parameter in the detail query.

Use parameters to filter values at a lower level in the detail query.

- Click the **Queries** icon , and click the detail query.
 - Click the **Toolbox** icon  and drag the **Filter** object to the **Detail Filters** box.
 - In the **Expression Definition** box, create the parameter.
4. In the navigation menu, click **Report**, and then under **Pages** click the report page.
 5. Click the data container containing the details.
 6. In the on-demand toolbar, click the **Select ancestor** icon and click **Page**.
 7. In the **Properties** pane, click the **Master detail relationships** property.
 8. Click **New Link**.
 9. In the **Master** box, click the data item that will provide the primary information.
 10. To link the master query to a data item, in the **Detail** box, click the data item that will provide the detailed information.
 11. To link the master query to a parameter, in the **Parameters** box, click the parameter that will provide the detailed information.


Tip: To delete a link, select the link and press the Delete key.

12. If your detail query object is a chart, you can disconnect a chart title from the master query.
 - Click the chart title, and from the **Properties** pane, click **Master detail relationships**.
 - Clear the **Use the master detail relationships from the chart** check box.
13. If the master detail relationship includes a chart as the detail and you are using automatic axis ranges, you can set the same axis range for all the detail charts:
 - Select the axis.
 - In the **Properties** pane, under **General**, double-click the **Axis range** property.
 - Under **Maximum** and **Minimum**, click **Automatic**.

The master detail report option is only available with automatic axis ranges.

 - Under **Master detail reports**, select the **Same range for all instances of chart** check box.

For more information about axis ranges, see [“Change the axis scale of a chart” on page 211](#).

Tip: To avoid seeing the same data item twice in the report, click the data item in the data container driven by the detail query. In the report object toolbar, click the **More** icon  and click **Cut**. This removes the item from the report display but keeps it in the query.





Link Members from Two Data Sources

If you create a master detail relationship using queries that reference two different dimensional data sources, you may need to create a relationship between levels with the same member captions but different Member Unique Names (MUNs).

For more information about MUNs, see [“Recommendation - Use Member Unique Name \(MUN\) Aliases” on page 497](#).

For example, you may want to link the Americas member in the Sales territory level in the Sample Outdoors cube with Americas in the GO Subsidiary level in the Sample Outdoors Finance cube. To create the relationship, you must alias the levels that contain the members to link.

Procedure

1. Select the parent frame or the report page, click the **More** icon , and click **Go to query**.
2. Add a query calculation to the query.
 - a) Click the **Toolbox** icon  and drag the **Query calculation** tool to the **Data Items** box.
 - b) In the **Create calculation** window, click the **Other expression** radio button and click **OK**.
 - c) In the **Name** box, type a name for the calculation.
 - d) In the **Expression Definition** box, type the following expression:
caption (data item name)
For example, caption ([great_outdoors_company].[Sales Territory].[Sales Territory].[Sales territory])
3. Replace the level that contains the member that will provide the primary information with the calculation.
 - a) Click the report page from step 1.
 - b) Click the **Insertable objects** icon  and then click the **Data items** tab .
 - c) From the query where you created the query calculation, drag the calculation to the parent frame or the report page, beside the level that you are replacing.
 - d) Delete the level.
4. Repeat steps 1 to 3 for the level in the data container that contains the details.

A caption alias is created for each level. You can now use the caption alias for each level to create a master detail relationship using member captions, which are the same, instead of MUNs, which are different.

Results

You can now create the master detail relationship between the two levels.

Working with Queries in SQL or MDX

For each query in a report, you can work with the SQL or MDX that is executed when you run a report.



Note: MDX is not available with DMR data sources.

View the SQL or MDX for an Entire Report or a Query


View the SQL or MDX to see what is passed to the database when you run a report.

Only SQL is available when using DMR data sources because these data sources were relational.

Procedure

1. To view the SQL or MDX for the entire report, click the **Queries** icon , right-click the **Report** icon , and click **Show Generated SQL/MDX**.

This option shows the SQL or MDX that will be executed in the data source. The SQL or MDX is organized by query and by query result. If a query is used in more than one data container, a query result is generated for each data container.

2. To view the SQL or MDX for a specific query, do the following:
 - Click the **Queries** icon, and click the query.
 - Click the **Show properties** icon , and In the **Properties** pane, double-click the **Generated SQL** property.

The **Generated SQL** property shows the SQL or MDX that is executed when you view tabular data (right-click a query and click **View Tabular Data**). Tabular data shows the data that is produced by the query in the form of a list. You can use this property to help you build advanced queries.

Results

The SQL or MDX for the query appears in the **Generated SQL** dialog box. For SQL, you can choose to view native SQL, which is the SQL that is passed to the database when you execute the query, or IBM Cognos SQL, which is a generic form of SQL that IBM Cognos Analytics - Reporting uses. Cognos SQL is converted to native SQL before the query is executed.

Build a Report Using Your Own SQL or MDX




You can build a report by adding SQL or MDX from an external source, such as another report.

If you are working with MDX, you must be aware of the [MDX syntax](#) that IBM Cognos Analytics - Reporting supports.

If you edit the SQL of a query, you must change the **Processing** property for that query to **Limited Local**.

You cannot build a report by adding your own MDX if the data source is IBM Cognos TM1®. IBM Cognos TM1 does not support custom MDX.

Procedure

1. Create a new report and choose the **Blank** template.
 2. Click the **Queries** icon , and click **Queries**.
 3. Click the **Toolbox** icon  and drag **Query** to the work area.
 4. From the **Toolbox**, do one of the following:
 - To build an SQL query, drag **SQL** to the right of the query.
 - To build an MDX query, drag **MDX** to the right of the query.
- Tip:** You can drag **SQL** or **MDX** anywhere in the work area, and Cognos Analytics - Reporting will automatically create a query.
5. Click the **Show properties** icon , and In the **Properties** pane, double-click the **Data source** property and click a data source.
 6. If required, set the **Catalog** property to the name of the catalog.
 7. Double-click the **SQL** or **MDX** property and type the SQL or MDX.
 8. Click **Validate** to check for errors.
 9. If you are working with SQL, select the query, and in the **Properties** pane, set the **Processing** property to **Limited Local**.
 10. Double-click the query.

If the SQL or MDX is valid, the data items defined in the SQL or MDX appear in the **Data Items** pane.

11. Click the **Pages**, and click a report page.
12. Click the **Toolbox** icon and drag an object to the work area.



For example, drag a list, crosstab, chart, or repeater.

13. Click the data container.

14. Click the **Show properties** icon, and In the **Properties** pane, click the **Select ancestor** icon  and click the container you just created.

For example, if you created a list, click **List**.

Tip: You can also click the container selector (three orange dots) of the container to select it.



15. Set the **Query** property to the query for the report type.
16. Click the **Insertable objects** icon  and then click the **Data items** tab . Drag the items from the query you chose in the previous step to the data container.

Convert a Query to SQL

You can convert a query to SQL to edit it. You may want to do this to improve performance or to use SQL features that are not supported directly by IBM Cognos Analytics - Reporting.

Converting a query to SQL is an irreversible process.


Procedure

1. Click the **Queries** icon , and click the query.
2. Click the **Show properties** icon , and In the **Properties** pane, double-click the **Generated SQL** property.
3. Click **OK** and then click **Convert**.
4. Click **Validate** to check for errors.
5. Select the query, and In the **Properties** pane, set the **Processing** property to **Limited Local**.

Edit the SQL or MDX

You can edit the SQL or MDX for a query that has been created as an SQL or MDX query or that has been converted to SQL.

Procedure

1. Click the **Queries** icon , expand the query, and click the SQL or MDX item under the query.
2. In the work area, double-click the SQL or MDX item.
3. Make changes in the text box.

If you are working with MDX, you must be aware of the [MDX syntax](#) that IBM Cognos Analytics - Reporting supports.

4. Click **Validate** to check for errors.

First-Rows Optimization

The SQL produced by IBM Cognos Analytics - Reporting depends on the report format you choose. For example, if you specify HTML format, first-rows optimization is requested. All-rows is requested if you specify PDF.

It is important for database administrators and programmers to remember that Cognos Analytics - Reporting does not always use first-rows optimization. If you assume first-rows optimization is always requested, this can cause the RDBMS optimizer to process the query differently than you expect.

Supported MDX Syntax

If you are working with MDX, you must be aware of the syntax that IBM Cognos Analytics - Reporting supports. Cognos Analytics - Reporting supports the MDX grammar as specified in Microsoft Data Access Software Developer Kit version 2.8.

Cognos Analytics - Reporting supports the following MDX functions. This is a partial list and applies only when you are working with the following data sources:

- cubes
- SAP BW
- IBM Cognos TM1
- IBM Db2 OLAP
- IBM Cognos Consolidation
- IBM Cognos Contributor

For these data sources, IBM Cognos Analytics with Watson uses a variation of the Microsoft SQL Server Analysis Services syntax.

- Acos
- Aggregate
- Ancestor
- Ancestors
- Asin
- Atan
- Avg
- BottomCount
- BottomPercent
- BottomSum
- Children
- ClosingPeriod
- CoalesceEmpty
- Convert
- Cos
- Cosh
- Count
- Cousin
- Crossjoin
- CurrentMember
- DefaultMember
- Descendants
- Dimension
- Distinct
- Except
- Exp
- Filter
- FirstChild
- FirstSibling

- Generate
- Head
- Hierarchize
- Hierarchy
- IIf
- Intersect
- Is
- IsAncestor
- IsEmpty
- Item
- Lag
- LastChild
- LastPeriods
- LastSibling
- Lead
- Level
- Levels
- LinkMember
- Ln
- Log10
- Max
- Median
- Members
- Min
- Mtd
- Name
- NextMember
- OpeningPeriod
- Order
- Ordinal
- ParallelPeriod
- Parent
- PeriodsToDate
- PrevMember
- PreviousMember
- Properties
- Qtd
- Rank
- Siblings
- Sin
- Sinh
- Stddev
- Subset

- Sum
- Tail
- Tan
- Tanh
- TopCount
- TopPercent
- TopSum
- Union
- Value
- Var
- Wtd
- Ytd

Using Dimensional Calculations

Insert a calculation to make your report more meaningful by deriving additional information from the data source. For example, you create an invoice report, and you want to see the total sale amount for each product ordered. Create a calculated column that multiplies the product price by the quantity ordered.

You build calculations in the expression editor using functions.

If a calculation is used in multiple reports, or by different report authors, ask your modeler to create the calculation as a standalone object in the model and include it in the relevant package.

Create a Simple Member Calculation


When working with dimensional data sources, you can select members in your report and create simple calculations.

In addition to simple arithmetic calculations, you can perform the following calculations:

| Calculation | Description |
|--------------|---|
| Rollup | Summarizes, or rolls up, all the values of the selected items in a hierarchy. |
| % | Calculates the value of a selected item as a percentage of another item. |
| % Difference | Calculates the difference between two items as a percentage. |

| Calculation | Description |
|-------------|---|
| % Of Base | <p>This calculation is only available if you select two members from different hierarchies, each from a different edge.</p> <p>This calculation takes the first selected member from edge A and the second selected member from edge B. The calculation result of a percent of base should be such that all the values for member A will compare itself to the intersect value of member A and B.</p> <p>For example, you have a crosstab showing quantity sold by year by product line. You select 2012 and Camping Equipment, right-click the selection, click Calculate, and then click % of Base (2012, Camping Equipment). The calculated row shows the percentage value of each product line for 2012 as compared to Camping Equipment for 2012.</p> |
| Custom | <p>Allows you to specify your own value when performing a simple arithmetic calculation. Also allows you to change the order of operands or type a custom name for the new calculated row or column.</p> |

Procedure

1. Select the items in the report to calculate.
2. In the report object toolbar, click the insert calculation button  and select the calculation to perform.
 - Tip:** Calculations that are not applicable to the items you selected are grayed out.
3. To change the order of the operands or the name of the calculated item added to the report, click **Custom**.

Results

The calculation appears as a new row or column in the report.

Insert a Query Calculation

When working with dimensional data, insert a query calculation into your report to add a new row or column with values that are based on a calculation. For example, you create a query calculation named Euros that converts dollars to euros by multiplying an existing dollar measure by a conversion rate. Euros can then be displayed to end users in a separate row or column.

In IBM Cognos Analytics - Reporting you can create the following types of calculations:

- Create calculated members or calculated measures where the expression is a member or a tuple-based (as opposed to property-based) value expression. For example, [2013] - [2012] is a calculated member and [Revenue] - [Planned Revenue] is a calculated measure.
- Use set expressions to create calculated sets of members. For example, children ([2012]) is a set expression that displays the child members of 2012.

You must base each set expression on a hierarchy and the set expression must contain only members from this hierarchy.


- Create value expressions when you want to insert a string, number, date, or interval value.

You can also create a calculation that uses an intersection (tuple) that you already defined.









If you are using an IBM Db2 data source, the subtract operator is invalid if you combine the datatypes timestamp2 and packed decimal.

When creating an expression that will be used in a double-byte environment, such as Japanese, the only special characters that will work are ASCII-7 and ~ -- || - \$ ¢ £ ¬.

Procedure

1. Click the **Toolbox** icon  and drag **Query calculation** to the report.
2. Click the type of calculation you want to create and if required, select the hierarchy that contains the data that is the focus of your calculation.
3. In the **Name** box, type a meaningful name for the calculation.



For example, if you are calculating the difference between 2012 revenue and 2011 revenue, you could name your expression **2012 - 2011 Revenue**.

4. In the **Available Components** pane, define the calculation:
 - Specify how you want to view the available data items in your data package by clicking the view member tree button  or the view metadata tree button .
 - To add data items that are not shown in the report, on the source tab , double-click the data items.
 - To add data items that are in the report but not necessarily in the model, such as calculations, on the data items tab , double-click the data items.
 - To add data items from a specific query, on the queries tab , double-click data items.
 - To add functions, summaries, and operators, on the functions tab , double-click elements.
 - To add a value that is derived from a parameter, on the parameters tab , double-click a parameter. Parameters define prompts, drill-through reports, and master detail relationships.
 - To add a macro, on the macros tab , drag the parameter maps, session parameters, or functions you want to add to the macro.

Tip: Use **Insert macro block** to get you started with creating the macro expression. **Insert macro block** inserts number signs in the expression. Make sure that the macro expression you create is between the number signs.



You can also type the calculation directly in the **Expression Definition** box.

When typing date values, ensure that the date format is correct for your database type.

To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .

5. Click the validate button .

Any validation errors appear on the **Errors** tab of the **Information** pane.

Tip: To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .






Create a Layout Calculation

Create a layout calculation to add run-time information to your report, such as current date, current time, and user name.




When you create layout calculations, unsupported functions do not appear in the **Functions** tab of the expression editor. Specifically, there is no **Summaries** folder, and some operators, constants, and constructs are also unavailable. These functions are not available because only the database can perform them. Report expressions and calculations based on layout expressions are performed in IBM Cognos Analytics - Reporting.

To see the complete list of functions available in the expression editor, except for report functions, create a query calculation. All functions are available when you create a query calculation because these calculations are performed in the database and not in Cognos Analytics - Reporting.

Procedure

1. Click the **Toolbox** icon  and drag **Layout calculation** to the report.
2. In the **Available Components** box, define the calculation:
 - To add data items that are not shown in the report, on the source tab , double-click data items.
 - To add data items from a specific query, on the queries tab , double-click data items.
 - To add functions, summaries, and operators, on the functions tab , double-click elements.
 - To add a value that is derived from a parameter, on the parameters tab , double-click a parameter. Parameters define prompts, drill-through reports, and master detail relationships.

Tips:

- You can also type the calculation directly in the **Expression Definition** box.
 - When typing date values, ensure that the date format is correct for your database type.
 - To copy and paste expression components in the **Expression Definition** pane, you can use the copy button  and the paste button .
3. Click the validate button .



Create an intersection (tuple)

When you work with dimensional data, an intersection, also known as a tuple, is useful for obtaining a value from the combination of two or more members that you specify. Each member must be from a different hierarchy. The intersection can include only one measure.

For example, the intersection (Revenue, 2012, Cooking Gear) shows the revenue value for the year 2012 and for the product line Cooking Gear.

Use tuples to avoid report summaries that do not reflect the visible data. For more information, see "Summaries in a report do not correspond to the visible members" in the *IBM Cognos Analytics with Watson Troubleshooting Guide*.

Procedure

1. Click the **Toolbox** icon  and drag the **Intersection (Tuple)** object to the report.
2. From the **Available members and measures** pane, select items and click the right arrow to move them to the **Intersection members and measures** box. You can also use items from the **Calculated members and measures** tab .
3. To define the hierarchy for this intersection, click a parent object in the **Intersection hierarchy** box.

Assigning a Hierarchy or Dimension

You must assign each calculated member, set expression, and intersection (tuple) to a hierarchy or dimension. We recommend that you select the hierarchy or dimension upon which your calculation focuses. For example, if your calculated member is based on years, select the Time hierarchy. If you create a calculated measure, select the Measures dimension.

Select only a hierarchy that cannot affect the value of the calculation. For example, the hierarchy Camping Equipment has the same value no matter what Products context it appears in the report. Therefore,

- the calculation ([Camping Equipment]-[Mountaineering Equipment]) has a well-defined meaning only in the Products hierarchy, so select that hierarchy.
- the calculation tuple ([Revenue], [Camping Equipment]) can be assigned to either the Products or Measures hierarchy, as it is not affected by either context.
- the calculations ([2013] - [Camping Equipment]) and ([Fiscal Year 2013] - [Calendar Year 2013]) do not have a well-defined meaning in any hierarchy, and therefore cannot be used reliably at all.

Drilling Up and Drilling Down in Dimensional Reports

When working with dimensional or dimensionally-modeled relational (DMR) data sources, you can create reports that allow the reader to view more general or more detailed information on your data within a predefined dimensional hierarchy (such as Years - Year - Quarter - Month) without having to create different reports.

You can link groups of data items from different queries so that when you drill up or drill down in one query, the data item also drills up or drills down in the linked queries. Linking data items is useful if your report includes more than one query with the same data item. For example, if your report shows a list and a crosstab that each include the Product Line data item, you can link the Product Line data item from the crosstab query to the Product Line data item from the list query so that when you drill up in the crosstab Product Line data item, the list Product Line data item also drills up.

Member Sets

Member sets are used to group data items that are logically related for various actions, such as drill actions, zero suppression, and ranking. They can be defined as a flat list or as a tree structure in which member sets in the same parent chain are considered related.

For example, for drill operations, a member set defines the set of items that can potentially change when a given item in the set is drilled on. The values of other items in the query or even those in the same hierarchy are preserved when any item in this set is drilled on. Usually, a member set references items that have logical roles in a drill action, such as a detail, a summary of the detail, or a parent of the detail. A single data item can belong to only one member set.

If you do not define member sets for items, the IBM Cognos Analytics with Watson server associates items into default member sets and behaviors using simple dimension rules on item expressions. You can override the behavior for a particular item while other items continue to use the default.





When you define a member set, you must explicitly define behaviors for each item in the set. Items in the set that have no behaviors have their values preserved.

Drill behaviors always act from a root member set. This means that when an item is drilled on, the root member of its member set is found and all items from the root down are processed. Although calculations and aggregates are not directly related by hierarchy, they respond because of their dependence on the items upon which they are based.

Create Member Sets

Create a member set when you want to define a non-default drill behavior. You specify what items respond to a drill action by adding them to the member set.

Procedure

1. Click the **Queries** icon , and click the query in which to create a member set.
2. Click the **Show properties** icon , and In the **Properties** pane, set the **Define member sets** property to **Yes**.
3. Double-click the query and click the **Member sets** tab.
4. Click the **Insertable objects** icon , and from the **Data items** tab , drag items to the work area.

To define a member set as a tree structure, drag the item that will serve as the root item of the set to the work area, and then drag other items over the root item to create the tree structure.

Note: You can also nest member sets.

Create a drill-up and drill-down report

You can link groups of data items from different queries so that when you drill up or drill down in one query, the data item also drills up or drills down in the linked queries.





When you drill down or up, you can specify whether the column title shows the member caption value or the level label value. By default, titles use member captions. Using level labels may be more meaningful. For example, within the Country or Region column, you drill down on Australia. By default, the column title becomes Australia, the member caption. It may be more meaningful to use Country or Region, the level label, as the column title.

Tip: The Returned Items sample report in the GO Data Warehouse (analysis) package includes drilling.

Before you begin

Before you begin, ensure that you are using a dimensional data source.

Procedure

1. Click the **Insertable objects** icon , or the **Queries** icon , and click the **Report** icon .
2. Click the **Show properties** icon , and in the **Properties** pane, double-click the **Advanced drill behavior** property.
3. On the **Basic** tab, in the **Report output drill capabilities** box, select the **Allow drill-up and drill-down** check box.

By default, IBM Cognos Analytics - Reporting determines which items can be drilled on based on the dimensional structure.


4. To enable the report to be used as the source during a package drill-through, select the **Allow this report to be a package-based drill-through source** check box and click **OK**.

For more information about package drill-through, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.


5. When the report is a drill-through target, to specify whether to apply additional filtering when names from the context in the source report matches names of items in the target report, select the **Accept dynamic filters when this report is a drill-through target** check box.
6. To disable drill-up or drill-down for a data item, select the data item in either the **Disable drill-up for** box or the **Disable drill-down for** box.
7. From the **Advanced** tab, you can change the drill-up or drill-down behavior for any data item by selecting the data item and then choosing one of the following behaviors.

| Behavior name | Drill-up behavior | Drill-down behavior |
|-----------------|--|--|
| Preserve | The data item's value will remain unchanged. | The data item's value will remain unchanged. |

| Behavior name | Drill-up behavior | Drill-down behavior |
|-------------------------------|--|--|
| Empty Set | The set of values associated with this data item is set to be the empty set (novalues). For crosstabs, the data item will effectively be removed from the report. | The data item will be removed from the report. |
| Replace Item | The data item's value will change to become the parent (if a lowest-level summary was drilled up on) or the grandparent (if a lowest-level detail of a dimension was drilled up on) of the item that was drilled on. | The data item's value will change to become the item that was drilled on. |
| Replace Expression | The data item's value will change to become the children of the parent (if a lowest-level summary was drilled up on) or the children of the grandparent (if a lowest-level detail of a dimension was drilled up on) of the item that was drilled on. | The data item's value will change to become the children of the item that was drilled on. |
| Change Expression | The data item's value will change to become the value of some other data item in the query. | The data item's value will change to become the value of some other data item in the query. |
| Depth Based Expression | The data item's value will change to become all data items n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the Depth value. | The data item's value will change to become all data items n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the Depth value. |
| Ancestor | The data item's value will change to become the data value of the ancestor n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the Depth value. | The data item's value will change to become the data value of the ancestor n generations higher in the dimensional hierarchy than the item that was drilled on. The number of generations or levels is determined by the Depth value. |

8. In the **Column title drill behavior** box, specify whether to use member captions or level labels as the columns titles for each data item.
9. From the **Data items linking** tab, you can link groups of data items:
 - Click the **New Group of Linked Data Items** icon .
 - Type a name for this group of linked data items and click **OK**.

To rename a group of linked data items, click the group, click the **Rename Group of Linked Data**

Items icon , type a name, and click **OK**.

- Use the arrows to move data items from the queries on the left to the groups on the right.

Note: You can only add a data item to one group.

Results

The report will generate links for any item that can be drilled up or down on.

When you run a report, you can drill down or drill up by right-clicking the data item and choosing the action from the context menu. The menu items will be disabled if an item cannot be drilled up or down on.

Recommendation - Drilling Down in Very Large Data Sources

When you drill down in a report that uses a very large data sources query results can be much larger than what can be held in memory. For example, if you insert the lowest level of four hierarchies that each contain 1000 members, the report can contain 1,000,000,000,000 cells. At best, this query will take a very long time to run. While this large query executes, all other queries for the same server process will likely be blocked. For most data sources, the query will likely fail due to insufficient memory or timing out. Then the memory is released and normal services resume.

However, when using a Microsoft SQL Server 2005 Analysis Services (SSAS) cube, the memory consumed by the SSAS client is not always released in a way that other queries can effectively re-use. The server continues to run with insufficient memory, causing new queries to either run very slowly or fail completely. You may encounter an error, and, to continue, the system administrator must manually stop and restart the IBM Cognos Analytics with Watson service.

To avoid these problems, consider the size of hierarchy levels and sets when creating reports and avoid combining them in ways that create large queries. To determine the size of a set, create and run a very small report that includes only a count of the members within that set. You can also use filtering techniques to focus your data.

Drilling up and down in a visualization in a report

If you use a dimensionally modeled data source, you can create a visualization and drill down to lower-level data or drill up to higher-level data.

Drilling up and down provides more general or more detailed information on your data within a predefined dimensional hierarchy.

An example of a dimensional hierarchy:

Years - Year - Quarter - Month

Before you begin





Before you begin, ensure that you are using a dimensionally modeled data source.

Note: Drill up and drill down are not available for the following visualizations:

- Boxplot
- Bullet
- Map

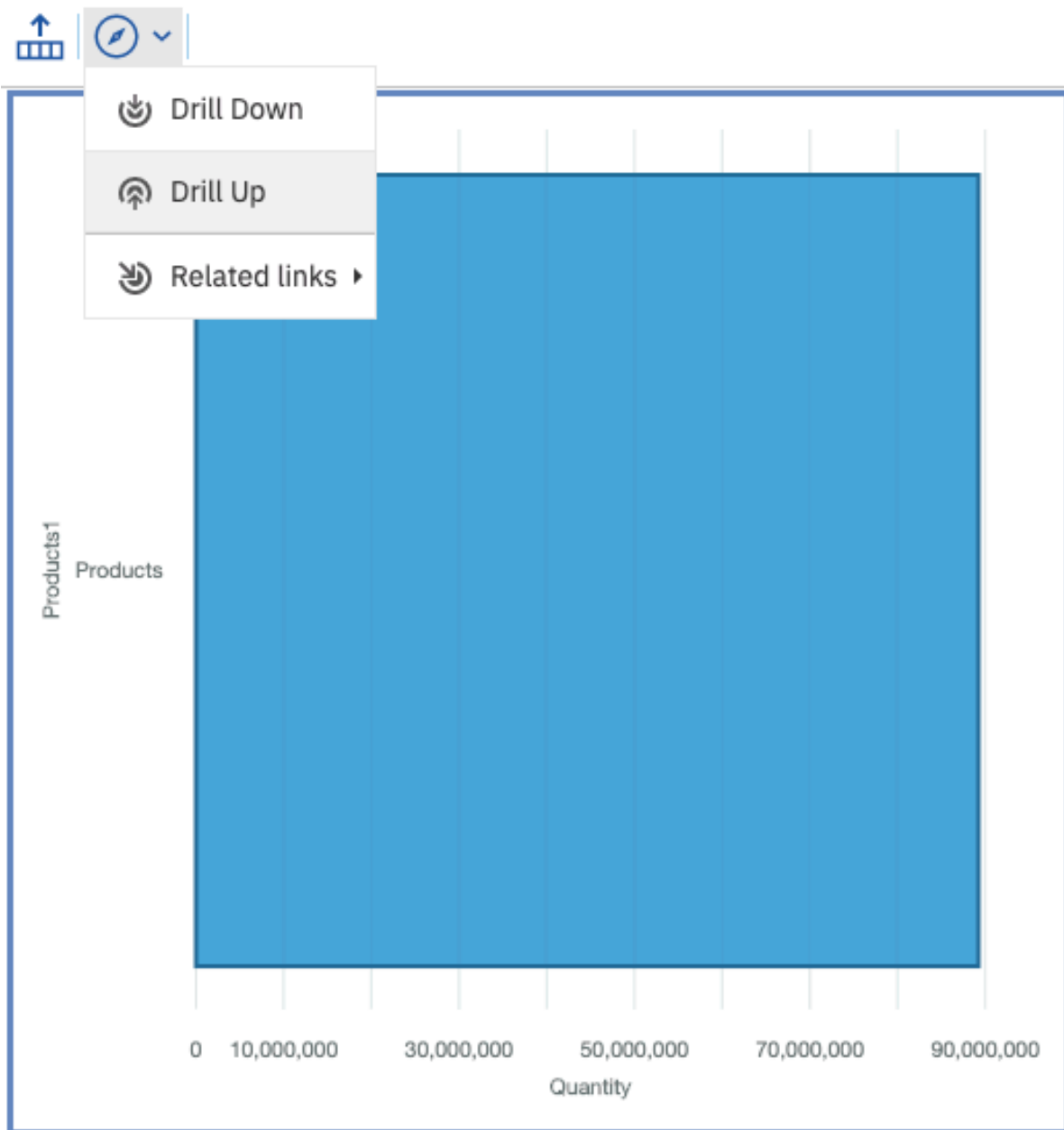
Procedure

1. Open a visualization and use a dimensionally modeled data source. For example, Team content > Samples > Models > GO sales (analysis).

- To drill down, select the datapoint in the visualization and click **Explore**  and then click **Drill Down** . You can also double-click a datapoint to drill down.
You can drill down by double clicking on a data point.
- To drill up, select the datapoint in the visualization and click **Explore**  and then click **Drill Up** .
By default, the system determines which items can be drilled on based on the dimensional structure.

Example

The following example shows how to drill up and drill down on products and their sold quantity.




Chapter 13. Adding Prompts to Filter Data

You can add prompts to a report to add interactivity for users. Prompts act as questions that help users to customize the information in a report to suit their own needs. For example, you create a prompt so that users can select a product type. Only products belonging to the selected product type are retrieved and shown in the report.

Prompts are composed of three interrelated components: parameters, prompt controls, and parameter values. Parameters are based on parameterized filters and form the questions to ask users. Prompt controls provide the user interface in which the questions are asked. Parameter values provide the answers to the questions.

IBM Cognos Analytics - Reporting provides several ways to create prompts. You can

- use the **My parameters**  panel to access parameters that were customized by your administrator
- use the [Build Prompt Page tool](#)
- [build your own prompt and prompt page](#)
- [create a parameter to produce a prompt](#)
- [insert prompts directly into the report page](#)
- in dimensional reporting, you can also [define prompts using context filters](#)

If you include reports from different packages in an interactive dashboard that uses global filters, ensure that you use the same parameter name for the prompt in all the reports. You can also create prompts in the package. For more information, see topics on modeling. You can also use context filters, also known as slicer filters, to focus the data in your report.

Syntax of Prompt Expressions

Prompt expressions use the following syntax, where p represents the parameter name.


You can also use these expressions to create parameterized data items that you can then use in master detail relationships.

The type of expression you use depends on whether you have chosen relational or dimensional reporting style. For more information about reporting styles, see [“Relational and dimensional reporting styles”](#) on page 13.

| Relational: Detail Filter Expressions | Dimensional: Context (Slicer) or Edge Expressions |
|---|---|
| <p>[data item] = ?p?</p> <p>for single-select prompts and master detail relationships</p> | <p>[level or hierarchy]->?p?</p> <p>For single-select member prompts and master detail relationships</p> |

| Relational: Detail Filter Expressions | Dimensional: Context (Slicer) or Edge Expressions |
|---|---|
| <p>[<i>data item</i>] in ?p? for multi-select prompts</p> | <p>set([<i>level or hierarchy</i>]->?p?) For multi-select member prompts</p> <p>filter ([<i>set</i>], [<i>property expression</i>] = ?p?) For single-select value prompts and master detail relationships</p> <p>A property expression is an expression that is assigned to a property to enable dynamic update of the property when the report runs.</p> <p>filter ([<i>set</i>], [<i>property expression</i>] IN ?p?) For multi-select value prompts</p> <p>A property expression is an expression that is assigned to a property to enable dynamic update of the property when the report runs.</p> |

Using customized parameters

You can use the **My parameters**  pane to tailor reports according to your role and to maintain consistency across reports.

Your administrator can define global parameters that have default values. These global parameters can be used by all report authors. You can set your own values for the parameters, which are then automatically applied to reports when they run.

You can apply parameter values with or without prompts:

- If applied on a prompt page, the parameter defaults to the value you defined in **My parameters**
- If applied in a filter expression, the report runs with the default values that you selected previously

About this task

You can use global parameters when you perform these tasks:

- [“Create a detail or summary filter” on page 292](#)
- [“Create a drill through definition” on page 461](#)
- [“Build Your Own Prompt and Prompt Page” on page 365](#)
- [“Create a parameter to produce a prompt” on page 368](#)
- [“Relative date analysis” on page 54](#)

Procedure

1. Click the **My parameters** icon .

Note: If you don't see the **My parameters** icon, then your administrator hasn't defined any global parameters for your role.

The **My parameters** pane opens. Parameters that were created by your administrator are listed. For each parameter, values appear. Check boxes are selected next to values that your administrator specified as the default values.

2. If you want to use a different default value than the one assigned by your administrator, you can select a different value.

Tip: Check with your administrator before you change default parameter values. There might be a reason why the administrator set a value.

3. If you changed one or more default values, but then decide to revert to the values set by your administrator, click **Reset**.

Use the Build prompt page tool

Use the **Build prompt page** tool to quickly add filters and prompts to a report. This tool creates filters in the query using the prompt information properties that are set in the IBM Cognos Framework Manager model. For more information about the prompt information properties, see the Framework Manager *User Guide*.

Note: The Promotion Success sample report in the GO Data Warehouse (analysis) package includes a prompt page. The Historical Revenue sample report in the Sales and Marketing (cube) package and the Eyewear Revenue by Brand and Size sample report in the GO Data Warehouse (analysis) package include multiple prompts.

Before you begin

Note: The **Build prompt page** tool creates a static report specification, so if the prompt information properties are updated in the Framework Manager model, those updates will not be reflected in your report.

Procedure

1. Click the column or row on which users will be prompted.

To create multiple prompts or a cascading prompt, click more than one column or row.

2. From the report object toolbar, click the **More** icon *******, and then click **Build prompt page**.

A prompt page is created that has the following items:

- a page header
- a prompt control for each selected column
- a page footer containing **Cancel**, **Back**, **Next**, and **Finish** buttons


Build Your Own Prompt and Prompt Page

Create your own prompt and prompt page to control how they appear in a report.


Note: The Promotion Success sample report in the GO Data Warehouse (analysis) package includes a prompt page.

Procedure

1. In the navigation menu, click **Report** and then click **Prompt pages**.

2. Click the **Toolbox** icon , and drag **Page** to the **Prompt pages** box.

3. Double-click the page you just created.

4. Click the **Toolbox** icon , expand **Prompting**, and then drag one of the following prompt controls to the prompt page.

| Prompt control | Description |
|-----------------------------------|---|
| Text box prompt | Retrieves data based on a value that users type. Use this control when users know exactly what value they want to enter, such as a name or account number. |
| Value prompt | Retrieves data based on values that users select from a list. Use this control to show a list of possible values from which users can choose. Note: The maximum number of items that can appear in a list is 5000. |
| Select & search prompt | Retrieves values based on search criteria that users specify. Data is then retrieved based on values users select from the search results. Use this control instead of a value prompt if the list of values is very long, which can slow down performance. Tip: Users have the option of performing a case sensitive or case insensitive search. A case sensitive search is faster, while a case insensitive search usually returns more values. You cannot use this control if you are working with SAP BW data sources. |
| Date prompt | Retrieves data based on a date that users select. Use this control to filter a date column. Users can retrieve data for a specific day, a set of days, or a range of days. |
| Time prompt | Retrieves data based on a time that users select. Use this control to restrict a report to a particular time or time range. For example, users can see how many orders are received after business hours. Users can then use this information to determine the number of staff needed to work after hours. |
| Date & time prompt | Retrieves data based on a date and time that users select. Use this control to filter a datetime or timestamp column. This control is useful for specifying ranges. For example, users can retrieve all orders received from Monday at 12:00 a.m. to Friday at 5:00 p.m. |

| Prompt control | Description |
|-------------------------|---|
| Interval prompt | Retrieves data based on a time interval that users specify. Use this control to retrieve data that is related to the passage of time. For example, users can retrieve a list of products that were returned 30 or more days after they were purchased. |
| Tree prompt | Retrieves data based on values that users select from a list. Values are organized hierarchically. This control is useful when you are working with dimensional data sources. Data is shown from the top of a dimension hierarchy to the most detailed member, and users can choose the level of detail they want to view in the report. For more information about tree prompts, see “Control the Data That Appears in a Tree Prompt” on page 374. Tree prompts let you page through large numbers of prompt values with a More link at the bottom of the tree. |
| Generated prompt | Selects a prompt control based on the data type of the data item. This control acts like a placeholder. When users run the report, the control is replaced by the appropriate prompt control. For example, if users are prompted for date values, the control is replaced by a date & time prompt. |

The **Prompt Wizard** dialog box appears.

5. If you are creating a text box, date, time, date and time, interval, or generated prompt, do the following:
 - Create a new parameter for the prompt or use an existing or global parameter.
 - Click **Next**.
 - If you created a new parameter, define the expression by selecting a data item from the package and the operator to use.

Tip: Make the prompt optional by selecting the **Make the filter optional** check box.

 - Go to step 7.
6. If you are creating a value, select & search, or tree prompt, do the following:
 - Create a new parameter for the prompt or use an existing or global parameter.
 - Click **Next**.
 - If you created a new parameter and you want to use the parameter to filter data, select the **Create a parameterized filter** check box and define the expression by selecting a data item from the package and the operator to use.

If you are creating a tree prompt, you must choose **in** in the **Operator** box.

You can also use a parameter to provide a value for a layout calculation, such as showing a user's name in the report. When the report is run, you can use a parameter to prompt the user to type his name and have it appear in the report.

Tip: Make the prompt optional by selecting the **Make the filter optional** check box.

- Click **Next**.
- If you created a parameterized filter and you have more than one query defined in the report, select the check box for the query on which to filter and click **Next**.
- Select the **Create new query** check box to create the query that will be used to build the list of data values shown when the report is run.

Tip: Do not create a new query if you want to link the prompt to an existing query or if you intend to create the query at a later time.

- Click the ellipsis button beside **Values to use** and click the data item on which to prompt.
- To choose a data item that is different than what users will see when they are prompted, click the ellipsis button beside **Values to display** and click the data item.
- To create a cascading prompt, in the **Cascading source** box, click the parameter that represents the cascade source.

7. Click **Finish**.

Results

The prompt control is added to the prompt page. A prompt page is like a report page. You can insert graphics and text and apply formatting.

You can also modify the properties of the prompt control by clicking it and making changes in the **Properties** pane.


Create a parameter to produce a prompt


IBM Cognos Analytics - Reporting can automatically generate prompted reports based on parameters you create. When you run the report, Reporting can generate a prompt page for each parameter not associated to an existing prompt page depending on whether the prompt run option is selected or not.

Note: When Reporting automatically generates a prompt, it creates filters in the query using the prompt information properties that are set in the IBM Cognos Framework Manager model. For more information about the prompt information properties, see the Framework Manager *User Guide*.




You can also define parameters when you want to create a drill-through report or define master detail relationships.

Procedure

1. From the report object toolbar, click the **Filters** icon .

2. On the **Detail Filters** tab, click the add button .

The **Detail Filter** dialog box appears.

3. In the **Available Components** box, click the **Source** tab , the **Data Items** tab , or the **Parameters** tab  to select the data item to use for the prompt:

- To filter data based on data items not shown in the report, double-click a data item on the **Source** tab.
- To filter data that appears in the report but not necessarily in the model, such as calculations, double-click a data item on the **Data Items** tab.
- To filter data using standardized parameters that were created by your administrator, double-click a data item on the **Parameters** tab in the **Global Parameters** folder.

The data item appears in the **Expression Definition** box.

4. In the **Expression Definition** box, type an operator after the data item or select an operator from the

Functions tab 

The operator sets some of the default properties of the prompt. For example, if the operator is equals (=), users will be able to select only a single prompt value and the prompt's **Multi-Select** property is set to **No**.

For more information about creating expressions, see [“Using relational calculations” on page 306](#) or [“Using Dimensional Calculations” on page 354](#).

5. Type a name after the operator to define the prompt parameter. A question mark must precede and follow the name.
6. To specify whether the prompt is mandatory, in the **Usage** box, click **Required**, **Optional**, or **Disabled**.


Create a Prompt Directly in a Report Page

You can add prompt controls directly in a report page instead of creating a prompt page.

Prompt controls that are added to report pages will not appear in the following:


- saved reports
- PDF reports
- reports that are sent to users by email
- scheduled reports

Prompt controls are interactive. They are used to satisfy parameter values before running a report. As a result, prompt controls added to a report page only appear when you run the report in HTML format. When you run a report in HTML format, users select which values they want to see, and the report is refreshed, producing a new report.

For the previously listed non-interactive reports, prompt parameter values must be collected and satisfied before the report is run. You provide the parameter values using the **Run options** tab in the IBM Cognos Analytics with Watson portal. If you do not provide all the required values, the report will fail to run. You can access the Run options tab by clicking the set properties icon  for the report.

Tip: The Revenue by Product Brand (2011) sample report in the Sales and Marketing (cube) package and the Rolling and Moving Averages interactive sample report include value prompts.

Procedure

1. Click the **Toolbox** icon , drag a prompt control to the report.

The **Prompt Wizard** dialog box appears.

2. Provide the information necessary to create the prompt.

Tip: Make the prompt optional by selecting the **Make the filter optional** check box. Otherwise, when you run the report for the first time, the prompt appears in a generated prompt page rather than in the report page. Alternatively, you can specify a default selection for the prompt.

3. In the work area, click the prompt.
4. In the **Properties** pane, set the **Auto-submit** property to **Yes**.

If you do not set the **Auto-submit** property to **Yes**, the report will not refresh when users select a different prompt value.

Tip: An alternative to setting the prompt to auto-submit is to add a prompt button from the **Toolbox** icon and set its **Type** property to **Finish**.

Results

The prompt control is added to the report page. You can modify its properties by clicking it and making changes in the **Properties** pane.

Modifying prompts

For each prompt you create, you can modify its properties by specifying values in the **Properties** pane.

For example, you can

- [change the prompt control interface](#)
- [require user input](#)
- [enable multiple selections](#)
- [show or hide prompt statuses](#)
- [specify default selections](#)
- [specify prompt values](#)
- [add prompt buttons](#)
- [create cascading prompts](#)

Some properties you set for a prompt may be overridden under some conditions. For example, some properties set for the filter associated with a prompt may override the corresponding prompt property.

Change the Prompt Control Interface

By default, when you create a prompt, IBM Cognos Analytics - Reporting selects the prompt control interface. You can change the prompt control interface depending on the type of prompt you created. For example, for a value prompt, you can choose a drop-down list, a list box, or a radio button group.



Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Select UI** property to the interface.

Specify that a prompt requires user input

You can specify that a prompt requires user input before the report can run.

Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Required** property to **Yes**.
3. Click the **Pages** icon , and click a report page.
4. Click the report object associated with the prompt, from the report object toolbar, click **Filters**  and then click **Edit filters**.
5. Click the filter associated with the prompt.
6. In the **Usage** box, click **Required**.

Results

When you run the report, a star appears next to the prompt indicating that the user must select or type a value.

If you have a [cascading prompt](#) and the parent prompt control is required, the child prompt control is disabled. This ensures that users choose at least one value in the parent prompt before they can choose a value in the child prompt. Conversely, if the parent control is optional, then the child control is populated.

This gives users the ability to choose values in the child prompt without having to choose a value in the parent prompt.



Selecting multiple values in a prompt

You can create a prompt in which a user can select more than one value. For example, you have a prompt to select a product line. You can set the prompt so that users can select more than one product line.

If you enable multiple selections, the **Auto-submit** property is always set to no.

Note: If you have a prompt that is used in both a single value context and a multi-value context, the most restrictive context (usually the single value context) takes precedence. If you run into a problem where you have a multi-value prompt but can only select one value, then check to see if the prompt is used in more than one context.

Procedure

1. Click the prompt control.
2. In the **Properties** pane, choose whether to allow users to specify more than one value or a range of values:
 - To allow users to specify more than one value, set the **Multi-select** property to **Yes**.
 - To allow users to specify a range of values, set the **Range** property to **Yes**.
3. Click the **Pages** icon , and click a report page.
4. Click the report object associated with the prompt, from the report object toolbar, click **Filters**  and then click **Edit filters**.
5. Double-click the filter associated with the prompt.
6. Change the operator to one of the following:
 - If you are creating a multi-select prompt, change the operator to **in**.
For example, [Product_line] in ?Product line? where [Product_Line] is the name of the data item allows users to select multiple product lines.
 - If you are creating a range prompt, change the operator to **in_range**.
For example, [Margin] in_range ?Margin? where [Margin] is the name of the data item allows users to specify a margin range.

Show or Hide Prompt Status

Each prompt you create in a report provides dynamic validation when the report is run. Validity checks are performed to ensure that the data is correct and that required values are supplied. For example, a star appears next to each required prompt. An arrow appears next to a prompt if you must select or type a value. If you type an incorrect value, a dotted line appears. You can choose whether to show the star and arrow for each prompt.


Procedure

1. Click the prompt control.
2. In the **Properties** pane, set the **Hide adornments** property to **Yes** to hide the prompt characters or **No** to show them.

Specify a Default Selection for a Prompt

You can specify a default selection for a prompt so that users do not have to select or type a value when they run the report.

Procedure

1. Click the prompt control.
2. To define a range of values, in the **Properties** pane, set the **Range** property to **Yes**.
3. To specify more than one default selection, in the **Properties** pane, set the **Multi-select** property to **Yes**.
4. In the **Properties** pane, double-click the **Default selections** property.
5. Click the add button  and do one of the following:
 - If you chose to define a single value, type the value as the default selection.
 - If you chose to define a range of values, type the minimum and maximum values of the range in the **Minimum value** and **Maximum value** boxes, respectively.
6. Repeat step 4 to specify other default selections.

Customize Prompt Text

You can customize the instructional text that appears around prompts. For example, a value prompt with multiple selections includes a **Select all** link below the choices that you can customize to text other than **Select all**. You can also specify translated text in many languages for international report users.

Procedure

1. Click the prompt control.
2. To change the default prompt text, in the **Properties** pane, double-click any of the properties under **Prompt Text**.

Note: When you select a property in the **Properties** pane, its description appears in the information pane below the **Properties** pane.
3. Click **Specified text**, and then click the ellipsis button.
4. In the **Localized Text** dialog box, type the text that you want to appear.
5. To add customized text for other languages:
 - Click **Add**.
 - Select the countries and regions for which you want to specify localized text and click **OK**.
 - To specify text for a country and region, select the country and region and click **Edit**, and then type the localized text in the text box.

Specify Prompt Values

You can provide your own values in a prompt instead of the default values that come from the database.

You can specify your own prompt values to



- show something different from what is in the database
- improve performance by not accessing the database
- provide text for optional prompts, such as Select a value
- restrict the number of values available

For example, you have a prompt in which users choose a country or region. For the database value United States, you want USA to appear in the prompt.

Tip: The Rolling and Moving Averages interactive sample report includes a value prompt.

Procedure

1. Click the prompt control.




2. In the **Properties** pane, double-click the **Static Choices** property.
3. Click the add button .
4. In the **Use** box, type the prompt value to add.
5. In the **Display** box, type the value that will appear in the prompt.
6. Repeat steps 3 to 5 to add other prompt values.
7. To link a prompt value to a condition, do the following:
 - In the **Variable** box, choose the variable to use or create your own.
For information about creating variables, see [“Add a variable from the condition explorer”](#) on page 414.
 - In the **Value** box, click one of the possible values for the variable.
 - Click the static value to link to the variable and click the edit button .
 - In the **Display** box, type the value to appear in the prompt.
 - Repeat this procedure for each additional value.

Add a Prompt Button

Add prompt buttons so that users can submit selected items, cancel reports, or navigate between pages.

When you are building prompts and prompt pages, you may have to add prompt buttons to submit selections. Some prompt controls, such as the value prompt, can be set to submit selections automatically. Other prompt controls, such as the date prompt, require a prompt button.

Procedure

1. Click the **Pages** icon , and click the page to which to add a prompt button.
2. Click the **Toolbox** icon , drag **Prompt button**  to the work area.
3. Click the prompt button and, in the **Properties** pane, set the **Type** property to one of the following actions.

| Goal | Action |
|--|-----------------|
| Cancel the report | Cancel |
| Go to the previous prompt page | Back |
| Go to the next prompt page | Next |
| Run the report | Finish |
| Reprompt the user Tip: Reprompting users is useful when you have cascading prompts . | Reprompt |




Create a Cascading Prompt

Create a cascading prompt to use values from one prompt to filter values in another prompt. For example, a report contains the columns Product line and Product type. You create prompts for these columns, and you specify that the Product type prompt is a cascading prompt that uses Product line as the source. When users select a product line, they see only the product types related to the selected product line.

Tip: The Employee Training by Year sample report in the GO Data Warehouse (analysis) package includes cascading prompts.

Procedure

1. To make the cascading source a required prompt, select it and, in the **Properties** pane, set the **Required** property to **Yes**.
2. Click the prompt control to use as a cascading prompt.
3. In the **Properties** pane, double-click the **Cascade source** property.
4. Click the parameter that represents the cascade source.
5. If the prompt allows users to select multiple values, add a prompt button to the cascade source to provide the cascading prompt with the appropriate values:


- Click the **Toolbox** icon , drag **Prompt button**  to the report.
- Click the prompt button and, in the **Properties** pane, set the **Type** property to **Reprompt**.
- To change the text in the prompt button, click the **Toolbox** icon, drag the **Text item** icon  to the prompt button and type the text.

Control the Data That Appears in a Tree Prompt

You can control what data appears in a tree prompt and how the data is structured to get the results that you want. To do this, you add various functions to the filter expression.

In addition, the operator that you chose in the **Prompt Wizard** dialog box controls what appears next to each prompt value. If the operator is in or not in, check boxes appear next to each prompt value. If the operator is equals (=), no check boxes appear.

Procedure

1. Click the **Queries** icon , and click the query that is associated with the prompt.
2. In the **Data Items** pane, double-click the data item on which you are prompting.
3. In the **Expression Definition** box, type one of the following functions.

| Goal | Function |
|---|---|
| Show the hierarchical structure of all members in the hierarchy. If this function is not used, all members are shown in a flat list. | <code>rootmembers (data_item)</code> |
| Show the descendants of the data item in a hierarchical structure where x represents the level. For example, if you are prompting on the Year hierarchy and x=1, you will see 2010, 2011, and 2012 in the tree. If x=2, you will see 2010 Q1, 2010 Q2, and so on. | <code>descendants (rootmembers (data_item), x)</code> |
| Show the children of a member. For example, 2012 Q1, 2012 Q2, 2012 Q3, and 2012 Q4 appear for the member 2012. | <code>children (member)</code> |

Using in_range Filters with Character Data


If you use an `in_range` filter with character data, and the **From** value is greater than the **To** value, the filter returns no results. For example, if the **From** value is "Zone" and the **To** value is "Aloe Relief", the report returns no data.

To allow results within a range regardless of whether the **From** value is greater than the **To** value, your IBM Cognos administrator can enable a prompting setting. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Showing prompt values in generated SQL or MDX

You can show prompt values when viewing the generated SQL or MDX of a query or report.

Procedure

1. Click the **Queries** icon , and click the query for which you want to view the generated SQL or MDX.
2. In the **Properties** pane, set the **Use SQL parameters** property to **Literal**.

Chapter 14. Laying Out a Report

When creating a report, a good layout is essential to ensure that the information in the report is presented in a clear and effective manner.

Report layout

When you create a report, consider the following structural elements:

- Define the page structure.

Determine what goes into the page header, body, and footer. The page header contains information that appears at the top of each page. The page body contains information that starts on the first instance of the page. If there is too much data to fit on a single page, it continues across all instances of the page. The page footer contains information that appears at the bottom of each page.

- Identify horizontal bands of information.

Look for natural bands of information running across the page. Each of these bands typically translates into a block.

- Identify vertical bands of information.

In each horizontal band of information, look for bands that run up and down the page. Each of these bands typically translates into table cells.

- Decide which data frames to use to lay out the data.

Choose a list, crosstab, chart, repeater, or text frame.

- Set properties at the highest level item possible.

By setting properties at the highest level, you set them once instead of setting them for each child object. For example, if you want all text items in a report to appear in a specific font, set the font for the page.

Tip: When setting properties for an object, click the **Select ancestor** icon  in the **Properties** pane title bar to see the different levels available.

- Use padding and margins to create white space.

Do not use fixed object sizing unless it is absolutely necessary. When you specify that an object has a fixed size, your layout becomes less flexible.

The Page Structure View

When you add objects to a report, you usually work in the layout. An alternative view of the report is available.

To view the report in a different way, click the **Page views** icon , and then click **Page structure**.

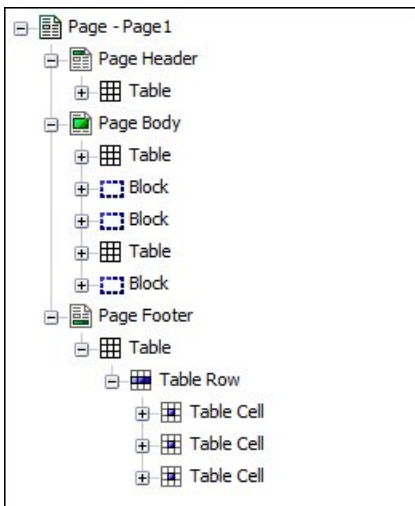


Figure 45. Example of the page structure view

Use the page structure view

- to view the entire contents of a report page in a tree structure

Using a tree structure is useful for locating the objects in a page and troubleshooting problems with nested objects.

- to quickly move objects from one area of a page to another

If you have a complex layout, it may be difficult to select, cut, and paste objects in the layout view. Objects are easier to locate in the page structure view.

- to modify object properties


You can modify object properties in the layout or in the page structure view.

Tip: To switch back to the report layout, click the **Page views** icon  and then click **Page design**.

Copy object formatting

You can quickly copy the formatting of items in your report, such as fonts, colors, borders, and number formats, and apply that formatting to other items.

Procedure

1. Click an item that has the formatting to copy.
2. Do one of the following:
 - To copy all the formatting applied to the item, from the object toolbar, click the **Pick up style** icon , click the item to format, and then click the **Pick up style** icon again.
 - To copy only one of the formatting styles, click the down arrow to the right of the pick up style button and click the style to copy. Then click the item to format and click the apply style button.
3. If you want to make changes to a style that you copied, click the down arrow to the right of the pick up style button and click **Edit Dropper Style**.
4. In the **Style** dialog box, specify basic and advanced style characteristics.

Add a header or footer to a report or list

Add a header or footer to make a report easier to read. Headers and footers are containers in which you can add objects like text, images, and report expressions such as the current date and page numbers. You can add headers and footers to pages and lists.

Tip: The Revenue by Product Brand (2011) sample report in the Sales and Marketing (cube) package includes a customized header and footer.

Add a page header or footer when you want information to appear on every page in the report, such as a title or page numbers. You can use combinations of text, data items, and report expressions in titles.

You can add the following headers and footers to lists to organize data into logical sections or to identify every change in value of a column.




| Type | Description |
|-------------------------|---|
| List page header | Adds a header that appears at the top of the list on every page in which list data appears. |
| Overall header | Adds a header that appears once at the top of the list. |
| Group or section header | Adds a header that appears for each group of a grouped column or each section. |
| Group or section footer | Adds a footer that appears for each group of a grouped column or each section. |
| Overall footer | Adds a footer that appears once at the bottom of the list. |
| List page footer | Adds a footer that appears at the bottom of the list on every page in which list data appears. Note that summary calculations in list page footers only summarize the data that is visible on that page of the list report. |



You can also add section footers by adding a summary.

Before you begin



To see the headers and footers, ensure that the visual aids are turned on.

Procedure

1. If you want to add a page header or footer, from the report object toolbar, click the **More** icon , click **Headers & footers > Page header & footer**, select the appropriate check boxes, and click **OK**.
2. If you want to add a list header or footer, from the report object toolbar, click the **More** icon , click **Headers & footers > List headers & footers**, select the appropriate check boxes, and click **OK**.
3. If you want to add objects to a header or footer, click the **Toolbox** icon  and drag the objects to the appropriate location.


To add objects to a list header or footer, you must first unlock the report. Click the **More** icon , then click the **Locked** icon .

Tip: To add data items to the page header or footer, you must associate a query to the page.

4. To split a header or footer into multiple cells that span the list, select the cell to be split and then, from the report object toolbar, click the **Split cell** icon .
5. To merge multiple cells in a list header or footer, select the cells that you want to merge, and, from the report object toolbar, click the **Merge cells** icon .


Add borders to an object

You can add borders to objects in a report such as a column, a header, or a footer or to the whole report.

Tip: You can also add borders using the report object toolbar by clicking the **Border** icon .

Procedure


1. Click the object to which to add a border.

Tip: To quickly select the parent of an object, click the object, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.

2. In the **Properties** pane, double-click the **Border** property and select values in the **Color**, **Style**, and **Width** boxes.

Note: Specifying a width using % as the unit of measure is not supported when producing reports in PDF.

3. Apply the selected values to the top, bottom, left side, right side, or all sides of the object by clicking the appropriate button in the **Preview** section.

Tip: To clear the border applied, click the clear borders button .



Add a Text Item to a Report

You can add text to a report. You can insert text in other objects, such as a block or table cell, or directly in the report page.

You can also add multilingual text to a report.

You can now format the text by changing the font, color, size, and so on. Select the text and make the appropriate changes in the **Properties** pane.

Procedure

1. Click the **Toolbox** icon , drag the **Text Item** object  to the report.

The **Text** dialog box appears.

2. Type the text and click **OK**.

Tip: You can also paste text from another part of the report.

Specify the font for a report


You can specify the font for text in a report.


Procedure

1. Click the object.

Tip: To specify the default font for the report, click the page.

2. Do one of the following:

- From the report object toolbar, click the **Font** icon  and then specify the font properties.
- In the **Properties** pane, double-click the **Font** property and specify the font properties.

To specify the color of the text, from the report object toolbar, click the **Font** icon , and then click **Foreground color**. Alternatively, you can specify the color of the text by clicking the **Foreground color** property for the object.

Tip: Type a list of fonts in the **Family** box if you are not sure whether a specific font is installed on a user's computer. For example, if you type Times New Roman, Arial, monospace, IBM Cognos Analytics - Reporting checks to see if Times New Roman is installed. If it is not, Reporting checks for Arial. If Arial is not installed, the monospace font used by the computer is used.

Results

If you clicked (**Default**) for any of the font properties, the default value for the property is used. Default values are stored in a style sheet that is used across all IBM Cognos Analytics with Watson tools. You can modify default values by modifying classes.

Insert an Image in a Report

You can insert an image in a report. You can insert images in other objects, such as blocks or table cells, directly in the report page or as the background image of another object.



Before you begin

The images that you insert must first be uploaded to the IBM Cognos Analytics with Watson server or another web server and must be .gif or .jpg format.

About this task

The images that are included with Cognos Analytics are in a different location than in IBM Cognos Business Intelligence releases. In Cognos Analytics, the images are located in `install_location\webcontent\bi\images`. If you have existing reports with hard coded links to IBM Cognos Business Intelligence images, you must copy the images to this folder, or update the image references to the folder.

Procedure

1. Click the **Toolbox** icon , select **Layout**, drag the **Image** object  to the report, and then double-click it.

2. From the **Image Picker** box, specify an image in one of these ways:

- Double-click an image in the **Image Gallery**.

Tip: The image gallery must first be created by your administrator. For more information, see the IBM Cognos Analytics with Watson *Managing Guide*.

- In the text box, type the URL of an image.
- Click **Browse** to go to the location that contains the image.

Tip: To browse images on a web server, you must enable Web-based Distributed Authoring and Versioning (WebDAV) on your web server. For more information about configuring web servers, see the IBM Cognos Analytics with Watson *Installation and Configuration Guide*.

Insert a Background Image in an Object

You can insert a background image for objects in a report. For example, use a background image to add a watermark to a page.

You can also create your own background visual effects, such as drop shadows and gradient fills. For more information, see [“Add background effects”](#) on page 382.

Before you begin

The images that you insert must first be uploaded to the IBM Cognos Analytics with Watson server or another Web server and must be .gif or .jpg format.

Procedure

1. Select the object.
2. In the **Properties** pane, under **Color & Background**, double-click the **Background Image** property.
3. To use the background from the default style for the object (Cascading Style Sheet (CSS) class), click **Default**.
4. To explicitly not insert a background image, click **None**.

This option overrides any default background images including background gradients on objects that appear in the 10.x report styles.

5. To insert a specific image, click **Specified**, and then do one of the following:

- In the **Image URL** box, type the URL of an image.
- Click **Browse**, and double-click an image in the **Image Gallery**.

Tip: The image gallery must first be created by your administrator. For more information, see the IBM Cognos Analytics with Watson *Managing Guide*.

- Click **Browse**, and go to the location on the web server that contains images.

Tip: To browse images on a web server, you must enable Web-based Distributed Authoring and Versioning (WebDAV) on your web server. For more information about configuring web servers, see the IBM Cognos Analytics with Watson *Installation and Configuration Guide*.

6. In the **Position** box, choose how to align the image in the object.
7. In the **Tiling** box, click a tiling option.

Add background effects

You can add background effects to enhance the appearance of your report. You can enhance objects, such as data containers (lists, crosstabs, and charts), headers, footers, page bodies, and so on with borders, gradient fill effects, drop shadows, and background images. You can also apply background effects as a class style.

The background effect is rendered within the area that bounds the object. To use a generated background in a chart, the chart must have a fixed size.

If the background image is complex and large, the size of the report output may be affected proportionately.


Background effects are rendered only if the data container has a fixed height and width; if a percentage size is used, the effects are ignored.

Resizing or overflow behavior is ignored for generated images in HTML reports.

Add background effects to a chart

Background effects include borders, fills, drop shadows, images, texture effects, and bevel effects.


Procedure

1. Click the chart object.
 2. To apply a preset background fill effect, from the report object toolbar, click the **Background effects presets** icon .
 3. In the **Properties** pane, under **Color & background**, double-click the **Background effects** property.
 4. Select one or more of the following:
 - To apply a border, click **Border** and specify settings for border style, width, color, corner radius for rounded rectangles, and transparency.
If the element also includes a fill with a transparency setting, select the **Allow transparent bleed** check box to apply the same transparency to the border.
 - To apply a fill effect, click **Fill** and specify the settings. The fill effect can either be a solid color, a gradient, or a pattern. You can define a gradient fill effect as a linear, radial line, or radial rectangle gradient.
 - To apply a drop shadow effect, click **Drop shadow** and specify the shadow color, transparency value, color, and offset settings. The default horizontal and vertical offset is 5 pixels.
 - To specify one or more images as a background, click **Images**. You can specify the transparency value and the position for each defined image. You can also specify a custom position for each image.
- Tip:** To remove the effect, clear its check box.
5. To add a texture effect, in the **Properties** pane, under **Color & Background**, select an option under **Material effects**.
 6. To add a bevel, in the **Properties** pane, under **Color & Background**, double-click the **Bevel** property and click a bevel effect.
- Note:** To see the **Bevel** property in a bar chart, you must first select the **Series (primary axis)** object in the chart.

Add a background gradient to a page

A background gradient is a shading that goes from one color to another either horizontally or vertically across your page.

Procedure

1. Click anywhere in the report page.
 2. In the **Properties** pane title bar, click the **Select ancestor** icon  and click **Page**.
 3. Under **Color & Background**, double-click the **Gradient** property.
 4. Select the **Gradient** check box and then select the colors and direction for the gradient.
- Tip:** To remove the effect, clear the **Gradient** check box.

Add a drop shadow to a container

A drop shadow is a border on the bottom and right of an object. You can specify the color and transparency of this shadow.

Procedure

1. Click the crosstab, list, repeater table, or table in the report.

- In the **Properties** pane title bar, click the **Select ancestor** icon  and click **Crosstab, List, Repeater table, or Table**.

Tip: You can also click the container selector (three orange dots) of the container to select it.

- Under **Color & Background**, double-click the **Drop shadow** property.

- Select the **Drop shadow** check box and then select the color, offset, and transparency values.

If you add a drop shadow, ensure that you also specify a background color for the object. Otherwise, if you keep the default transparent background, data values also have a drop shadow and are difficult to read.

Tip: To remove the effect, clear the **Drop shadow** check box.

Insert a Formatting Object in a Report

In addition to text and images, the **Toolbox** icon  contains other objects that you can add to the report layout.

| Object | Description |
|-----------------------------|---|
| Block | <p>Adds an empty block, which is a container in which you can insert other objects. This is useful for controlling where objects appear.</p> <p>Tip: You can use blocks to add space between objects. However, empty blocks are not rendered. You must insert an object or specify the height and width.</p> <p>Tip: The Revenue by GO Subsidiary 2011 sample report in the GO Data Warehouse (analysis) package includes an empty block.</p> |
| Table | Adds a <u>table</u> , which is a container in which you can insert other objects. This is useful for controlling where objects appear. |
| Field set | Adds an empty block that has a caption. This is similar to the Block object, but with a caption. |
| Intersection (tuple) | Adds an intersection (tuple). For more information, see “Create an intersection (tuple)” on page 357 . |
| Query calculation | Adds a calculated column. For more information, see “Using relational calculations” on page 306 or “Using Dimensional Calculations” on page 354 . |
| Layout calculation | Adds run-time information to the report layout, such as the current date. For more information, see “Create a Layout Calculation” on page 309 in the Relational Reporting Style chapter or “Create a Layout Calculation” on page 357 in the Dimensional Reporting Style chapter. |
| Crosstab space | <p>Inserts an empty cell on a crosstab edge. Allows for the insertion of non-data cells on an edge. Blank cells appear for the edge when the report is run.</p> <p>Insert this object when a crosstab edge does not produce useful data and you want blanks to appear in the cells instead.</p> |

| Object | Description |
|---|--|
| Crosstab space (with fact cells) | <p>Inserts an empty cell on a crosstab edge. Allows for the insertion of non-data cells on an edge. The contents of the fact cells for the edge are rendered when a measure is added or the default measure is specified.</p> <ul style="list-style-type: none"> • If the crosstab space is nested, the scope of the fact cells is the scope of the item that is at the level before the space. • If the crosstab space is not nested and there are no items nested below it, the scope of the fact cells is the default measure. |
| Singleton | <p>Inserts a single data item. For more information, see “Inserting a single data item” on page 24</p> |
| Conditional blocks | <p>Adds an empty block that you can use for conditional formatting.</p> |
| HTML item | <p>Adds a container in which you can insert HTML code. HTML items can be anything that your browser will execute, including links, images, multimedia, tooltips, or JavaScript.</p> <p>HTML items appear only when you run the report in HTML format.</p> <p>Note: You cannot include <form> tags in HTML items.</p> <p>Tip: The Table of Contents sample report in the GO Sales (analysis) package includes an HTML item.</p> <p>Note: When you upgrade to the next version of IBM Cognos Analytics with Watson, the report upgrade processes do not account for the use of undocumented and unsupported mechanisms or features, such as JavaScript, that refers to IBM Cognos HTML objects.</p> |
| Rich text item | <p>Inserts an object that is used to render HTML in the layout. This object is similar to the HTML Item, except that rich text items also render in PDF output. Using rich text items is useful when you want to add annotations defined in a data source to a report.</p> <p>Note: Rich text items <u>support</u> only a restricted set of well-formed XHTML.</p> |
| Hyperlink | <p>Adds a hyperlink so that users can jump to another place, such as a Web site.</p> |
| Hyperlink button | <p>Adds a hyperlink in the form of a button.</p> |
| As-of-time expression | <p>Adds an As of Time expression so that you can show data for a specific time period.</p> |
| Date | <p>Adds the current date.</p> |
| Time | <p>Adds the current time.</p> |
| Page number | <p>Inserts page numbers that you can customize.</p> |

| Object | Description |
|-----------------------------------|---|
| Row number | Numbers each row of data returned when the report is run. Note: You can add row numbers only to lists and repeaters. |
| Layout component reference | Adds a reference to another object. Useful when you want to reuse an object . |
| Table of contents | Creates a table of contents that is rendered in the output of a report. |
| Table of contents entry | Adds a table of contents marker. |
| Bookmark | Inserts a bookmark so that users can move from one part of a report to another. |
| Custom control | Adds a custom user interface in JavaScript. For more information, see “Adding JavaScript to a report” on page 387 . |

For information about each prompt control and prompt buttons, see Chapter 13, “Adding Prompts to Filter Data,” on page 363. The **Toolbox** contains other objects when you work in other areas such as Query explorer and Condition explorer.

Before you begin

Before you can add a hyperlink, HTML item, or hyperlink button, you must have the **HTML items in report** capability. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Procedure

To add an object, click the **Toolbox** icon  and double-click it or drag it to the report.

Elements supported in rich text items

Rich text items support all XHTML character entities, such as (non-breaking space), and the following elements: a, div, span, ul, ol, and li.

Each element supports only the style attribute, which must contain a valid CSS style. In addition, ul and ol elements support list-style attributes. Specifically, the ol element supports decimal, and the ul element supports circle, disc, and square, as well as list-style-image.

For example, the following code produces an unordered list entitled List: with three items. Each list item is in a different color, and the list-style attribute used is circle.

```
<div style="font-size:14pt; text-decoration:underline">List:</div>
<ul style="list-style-type:circle">
<li style="color:green">Item <span style="font-weight:bold">A</span></li>
<li style="color:red">Item B</li>
<li style="color:blue">Item C</li>
</ul>
```

The a element defines a hyperlink, which is used to link from one page to another. The supported attributes for the a element are:

- **class:** A space-separated list of the classes of the element.
- **style:** Contains CSS styling declarations to be applied to the element.

- `href`: A URL that the hyperlink points to.
- `target`: Where to display the linked URL, as the name for a browsing context.

For example, the following code produces a URL that opens the website `www.ibm.com` in a new window or tab.

```
<a href="https://www.ibm.com/" target="_blank">IBM</a>
```

Tip:

If you want to render more elements than `div`, `span`, `ul`, `ol`, and `li`, try enclosing the rich text in `<HTML>` tags. When rich text is enclosed in `<HTML>` tags, IBM Cognos Analytics with Watson supports more element types. For example, the following code produces the output "The word **text** is bold and the word *italics* is italicized."

```
<html>The word <strong>text</strong> is bolded and the word <em>italics</em> is italicized.</html>
```

Box type property

Each report object has a container, or box, which can be set to display the contents (the default) or not.

This property specifies whether to override the default box type for the object.

When set to **None**, the object is not rendered and its space is not reserved in the report. You could use this property to remove an object completely from a report when a specific condition is met. When set to **Inline**, you can insert other objects on the same line as the object. When set to **Block**, you can insert other objects only on the lines above and below the object.

When set to **Non-Inline** or **Non-Block**, the objects will have an property `display:none`. This property is necessary because the report server renders different HTML/CSS based on whether the box type is **Inline** or **Block**. **Non-Inline** and **Non-Block** are useful if you want to initially not display the object and will display it at some point using java script.

Adding JavaScript to a report

Add JavaScript to a report to provide your own user interfaces when the report is run in HTML.

About this task

In IBM Cognos Analytics with Watson, you can add JavaScript in the following ways.

- As with IBM Cognos Business Intelligence releases, you can add JavaScript in HTML item objects.

In Cognos Analytics, JavaScript in HTML items is run only when the report is run with limited interactivity (the report property **Run with full interactivity** is set to **No**).

Note: If you run a report with full interactivity, use HTML items to insert only static HTML or static CSS into the report output.

- You can add JavaScript to reports by using two types of Asynchronous Module Definition (AMD) modules.

With this choice, JavaScript is run when the report is run with full interactivity (the report property **Run with full interactivity** is set to **Yes**).

The JavaScript must exist in a separate file that your browser can access.

The two types of AMD modules that you can use are






1. A module that implements the `CustomControl Module` interface.
2. A module that implements the `Page Module` interface.

You add a `CustomControl` Module interface to a report by referencing the interface in a custom control object. The reference is a file location that you specify in the **Module path** property of the custom control. Add a custom control to provide your own user interface for a prompt-like control that reads and sets parameters or for page navigation buttons. You can configure the custom control by setting the **Configuration** property. It allows authors to change parameters without having to go into the JavaScript code itself, make changes, save it, and upload it to the server. One JavaScript file can have multiple uses.

You add a `Page` Module interface by referencing the interface in a report page or a prompt page. The reference is a file location that you specify in the **Module path** property of the page. Add a page module to set the initial state of prompt controls, set prompt control custom validation functions, or read current selections from a prompt control.

For information about the JavaScript that Cognos Analytics supports, see https://public.dhe.ibm.com/software/data/sw-library/cognos/mobile/scriptable_reports/index.html and article describing the list of [JavaScript samples](https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2018/03/22/updated-javascript-samples-for-ibm-cognos-analytics-11010?CommunityKey=6b10df83-0b3c-4f92-8b1f-1fd80d0e7e58&tab=recentcommunityblogsdashboard) (<https://community.ibm.com/community/user/businessanalytics/blogs/steven-macko/2018/03/22/updated-javascript-samples-for-ibm-cognos-analytics-11010?CommunityKey=6b10df83-0b3c-4f92-8b1f-1fd80d0e7e58&tab=recentcommunityblogsdashboard>).

Procedure

1. To add a custom control, from the toolbox  under **ADVANCED**, drag the **Custom control** icon  to the report.
 - a) To add a data set to the custom control, select the custom control and click the **Add data set** icon  in the on-demand toolbar. Drag data items from the Sources tab  into the data set.
 - b) Select the custom control and click the **Show properties** icon .
 - c) To specify the location of the file that contains the JavaScript that you want to use for the control, click the **Module path** property.
 - d) To add JSON that configures the custom control, click the **Configuration** property. For example, add JSON that sets the orientation, alignment, and background color of the control.
Note: The JavaScript must be written to accept these configuration elements.
 - e) To specify how you want the control to interact with the report, click the **UI type** property.
If you do not want to render an interface, set the property to **None**. If you do not want events, such as mouseup, to propagate from the control to the report, set the property to **UI without event propagation**. If you want events to propagate to the report, set the property to **UI with event propagation**.
2. To add a page module interface, open the property sheet of the report page or prompt page, click the **Module path** property, and specify the location of the file that contains the JavaScript that you want to use.

Align an Object in a Report

You can specify a horizontal and vertical alignment for an object in a report to determine where they appear.

Tables can also be used to determine where objects appear in a report.

Note: The **Justify** horizontal alignment works with HTML output but does not apply to PDF output.

Procedure

1. Select the object to align.
2. From the toolbar, click one of the available horizontal or vertical alignment buttons.

Using a table to control where objects appear

You can use tables in your report to control where objects appear. Tables can be inserted anywhere in a report, such as a header, a footer, or the page body. After you create a table, insert the objects you want in the cells.


You can also apply a predefined [table style](#) to tables.

The [alignment buttons](#) can also be used to determine where objects appear in a report.


Tip: The Singletons on Page Body sample report in the GO Sales (analysis) package includes a table to control the report layout.

Procedure

1. Click the **Toolbox** icon , drag **Table**  to the report.

Tip: You can also insert a table in an object from the report object toolbar by clicking the **Insert table**  icon.

The **Insert table** dialog box appears.

2. In the **Number of columns** and **Number of rows** boxes, type the number of columns and rows for the table.
3. If you want to have the table span the width of the report page, select the **Maximize width** check box.
4. If you want to add borders to the table, select the **Show borders** check box.
5. If you want to merge cells in the table, select the cells and click the merge cells  button.
6. Select the table object.
7. In the **Properties** pane, under **Positioning**, double-click the **Table Properties** property.
8. To display both the inside and outside borders, do the following:
 - Clear the **Collapse borders** check box.
 - Type a number in the **Cell spacing** text box to define how much space to add between the table cells.
 - Select the **Show empty cell borders** check box to display the borders even for empty cells.
9. To fix the size of the columns in the table, check the **Fixed size** check box.

When this check box is cleared, the table columns expand to fit the text.

Apply a Table Style

Apply a table style to quickly format tables. You can also apply a table style to lists, crosstabs, and repeater tables.

About this task

By default, when a new object is inserted in a list or crosstab, the object inherits the style from an object of the same type in the data container. For example, if you insert a measure in a list, the measure inherits the style of a measure that is already in the list, if there is one. If you do not want objects to inherit styles, clear the **Table Style inheritance** option in the **More options (More, Options, Report tab)**.

The following rules explain how style inheritance is applied to lists and crosstabs.

- Styles are inherited in the following order: custom, client default, and server default.

A custom style is a style that you manually apply. A client default style is one of the styles available in the **Apply Table Style** dialog box. The server default style is the style applied when **Default** is selected in the **Apply Table Style** window.

- When a new column or row is inserted, it inherits the style from the sibling of the same type that is on its right or below it.
- If there is no sibling of the same type, then the style of the nearest sibling that is on its left or above it is applied.
- If there is no sibling of the same type in the container, then the client or server default table style is applied.
- If a custom style is applied to a column or row and the object is then moved to another location, the object retains the custom style.

Custom styles applied to part of an object, such as the header, body, or footer, may be lost. For example, if a container has a footer, the footer is recreated when a column is moved. The recreated footer is rendered using the style that was applied to the footer before you customized its style.

- Deleting a column or row has no impact on the styles of the other objects in the container.
- Styles are preserved if a column is grouped or ungrouped. The same applies when creating or removing sections.
- When drilling up or down, the style of the parent item is applied.

Procedure

1. Click the table, list, crosstab, or repeater table.
2. From the report object toolbar, click **More > Style > Apply table style**.
3. In the **Table styles** box, click a table style.

Tip: Some styles are unique to tables, lists, or crosstabs.

4. If you are applying a table style to a table or list, in the **Apply special styles to** section, select or clear the various column and row check boxes based on how you want to treat the first and last columns and rows.

Some check boxes may not be available for particular table styles, or to particular columns or rows.

5. If you are applying a table style to a list or crosstab and you want the style to be applied to all lists or crosstabs in the report, select the **Set this style as the default for this object type** check box.

For a list, you may need to clear the **First column** and **Last column** check boxes in the **Apply special styles to** section before you can select this check box. In addition, some table styles cannot be set as the default.

Apply Padding to an Object

Apply padding to an object to add white space between the object and its margin or, if there is a border, between the object and its border.

Tip: You can quickly apply before or after padding by pressing Tab or Shift+Tab.

Tip: The GO Balance Sheet as at Dec 31 2012 sample report in the GO Data Warehouse (analysis) package includes padding.

Procedure

1. Select the object to which to apply padding.
2. In the **Properties** pane, double-click the **Padding** property.
3. Specify top, bottom, left, and right padding by typing values in the corresponding boxes and choosing the unit of measure.

Note: Specifying padding using % as the unit of measure is not supported when producing reports in PDF.

Set Margins for an Object

Set the margins for objects in a report to add white space around them.

For Date, Time, Row Number, and Page Number objects, you can only set the left and right margins. If you want to set the top or bottom margins for these objects, place them in a table or a block. Then set the margin or padding properties on the table or block object.

Procedure


1. Select the object.
2. In the **Properties** pane, double-click the **Margin** property.
3. Specify the top, bottom, left, and right margins by typing values in the corresponding boxes and choosing the unit of measure.

Note: Specifying margins using % as the unit of measure is not supported when producing reports in PDF.

Add multiple items to a single column

You can add multiple items to a single column to condense a report. For example, you have a list report that contains many columns. You can reduce the number of columns in the list by putting related information in a single column.

Procedure

1. Click the **More** icon , and then click **Locked** to unlock the report.
2. From the content pane, drag the items to the column.



For example, you can add data items from the **Source** tab  or text items from the **Toolbox** tab



Reuse a Layout Object

You can save time by reusing layout objects that you add to a report instead of re-creating them. For example, you have a multiple-page report and you want to show the company logo in the page header of each page. Insert the logo once and reuse it on all other pages.

Procedure

1. Click the object to reuse.
Tip: To quickly select the parent of an object, click the object, and then click the **Select ancestor** icon  in the title bar of the **Properties** pane.
2. In the **Properties** pane, set the **Name** property to a value beginning with a letter to uniquely identify the object and press the Enter key.
IBM Cognos Analytics - Reporting may have already specified a name for the object.
3. To reuse the object in another report, open that report.
4. Click the **Toolbox** icon , drag the **Layout component reference** object to the location in which it will be reused.
5. In the **Component Location** box, do one of the following:

- To reference an object in the current report, click **This report**.
- To reference an object in another report, click **Another report**, click the ellipsis button, and open the report.

Note: In active reports, you cannot reference objects from another active report.

6. In the **Available components to reference** box, click the object and click **OK**.

7. If the referenced object is in another report, click the **Layout component reference** object and in the **Properties** pane, set the **Embed** property to specify how to store the referenced object in the report:

- Click **Copy** to store a copy of the object.

The copy is not automatically updated if the source object is modified.

Note: In active reports, you can store referenced objects only by copying them to the report.

- Click **Reference** to store a reference, or pointer, of the object.

The reference of the object is automatically updated if the source object is modified. For example, if you open or run the report, you see the modified object.

Results

A copy or reference of the object appears where you placed the **Layout component reference** object. If a source object is changed, you can update reused objects.

Tip: You can also create a new report or template and add all the objects to share. All your shared objects then reside in a single location, like a library.

Change a Reused Object

If you reuse an object that contains other objects, you can change the child objects to something different. For example, you have a block object containing a text item in the page header and you decide to reuse the block in the page footer. However, you want the text item in the page footer block to show different text from that in the page header.

About this task

If you reuse a visualization, you cannot change the data container of the visualization.

Procedure

1. In the parent object to reuse, click the child object to change.
2. In the **Properties** pane, set the **Name** property to a value beginning with a letter to uniquely identify the object.

IBM Cognos Analytics - Reporting may have already specified a name for the object.

3. Select the copy of the parent object you created with the **Layout component reference** object.
4. In the **Properties** pane, double-click the **Overrides** property.
5. In the **Overrides** dialog box, select the child object to change and click **OK**.

The child object in the copy of the parent object is replaced by the following text:

Drop item to override component child.

6. Drag an object to replace the child object.

You can replace the child object with any other object, not just an object of the same type. For example, if the child object is a text item, you can replace it with an image.

Update Reused Objects

If a report contains objects referenced in another report, you can quickly update the referenced objects if the source objects have changed. Shared objects are stored in the layout component cache.

Procedure

1. Open the report to update.

2. Click the **More** icon , click **Layout components**.

The **Layout component cache** dialog box appears, showing all reports that contain referenced objects and the source reports where the objects exist.

3. To view which components are reused, click a source report.

The components that are reused appear in the **Components used** pane.

4. Click **Reload Components** to refresh all referenced objects.


Although referenced objects are automatically refreshed when you open or run a report, clicking this button updates components that were changed while the report is open.

5. Click **Update All Component Copies** to refresh all copied objects.

6. Click **Close**.

Specify text and container direction

You can specify text and container direction by choosing any of these options.

| Option | Description |
|----------------------|--|
| Direction | <p>Sets the reading order of an object, such as right-to-left. If Inherit is selected, the direction is inherited from the parent object. The default is left-to-right.</p> <p>For text objects, an additional choice named Contextual exists. This choice sets the text direction based on the first letter in the text. If the letter belongs to a right-to-left script, the text direction is right-to-left. Otherwise, the text direction is left-to-right. Numbers and special characters do not influence the text direction. For example, if the text starts with a number followed by an Arabic letter, the direction is right-to-left. If the text starts with a number followed by a Latin letter, the direction is left-to-right.</p> <p>Tip: You can also set the direction of text objects by clicking the Text direction icon  in the toolbar. This icon is visible only when the IBM Cognos Analytics with Watson portal user preference Enable bidirectional support is selected.</p> |
| Writing mode | Sets the direction and flow of content in an object. |
| Bidirectional | <p>Sets the level of embedding in an object.</p> <p>For text objects, if the Direction option is set to a value other than (Default) and no value is selected for this option, this option is set to Embed. Setting this option to Embed ensures that the base text direction specified for the text is applied.</p> |
| Justification | Sets the type of alignment used to justify text in an object. |
| Kashida space | Sets the ratio of kashida expansion to white space expansion when justifying lines of text in the object. This property is used in languages that use the Arabic writing script. |

About this task

Specifying text direction and container direction depends on the object selected in the report. The following list describes the types of objects in Reporting that you can specify text or container direction.

- Compound objects

Compound objects are container objects that contain text. Examples include charts, maps, active reports, and prompts. You cannot set text direction for specific text objects in a compound object.

To specify container direction for compound objects, click the **Direction & justification** property for the object. To specify text direction for text in compound objects, click the **Contained text direction** property for the object.

- Container objects

You can specify only container direction for container objects, such as a report page. Click the **Direction & justification** property for the object to specify container direction.

By default, the text direction of text in a container object is inherited from the container.

- Text objects

For all text objects, the **Direction & justification** property specifies the text direction.

In charts, container direction impacts all aspects of a chart. The following list describes the parts of a chart that are affected by container direction.


- The chart itself.
- The location of the Y-axis and the horizontal run direction of the X-axis.
- The labeling, including the orientation of angled labels on axes.
- The location of the legend as well as the legend content.

Container direction has no impact on rotary axes. For example, the slices in a pie always progress in the same direction around the pie. However, container direction does affect labelling as well as position and direction of the legend.

Note: You cannot specify base text direction and container direction for legacy charts.

Procedure

1. Click an object.

Tip: To specify the base text direction of a text object that is inside another object, such as a list column, you must first unlock  the report.

2. In the **Properties** pane, click one of the following properties:

- **Direction & justification**
- **Contained text direction**

This property applies only to compound objects.

3. Specify the text direction and container direction options that you want.

Specify line spacing and breaking

You can specify text properties by choosing any of these options.

| Option | Description |
|-------------|---|
| Line height | Sets the distance between lines of text in an object. |

| Option | Description |
|---|---|
| Letter spacing | Sets the amount of additional space between letters in an object. |
| Text indent | Sets the indentation of the first line of text in an object. Note: This property works with HTML output but does not apply to PDF output. |
| Word break | Sets line-breaking behavior within words. |
| Break words when necessary | Sets whether to break words when the content exceeds the boundaries of an object. |
| Enforce stricter line-breaking rules for Japanese Text | Sets line-breaking rules for Japanese text. |

Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Spacing & breaking** property.
3. Specify the text properties.

Specify the Height and Width of an Object

You can specify the height and width of objects using various units of measurement. In addition, if the object is a field set, text box prompt, prompt button, hyperlink button, block, or a conditional block, you can specify how to handle content overflow. Specify the height and width by choosing any of these options.

| Option | Description |
|---|--|
| Height | Sets the height of the object. |
| Width | Sets the width of the object. |
| Content is not clipped | If the contents of the block exceed the height or width of the block, the block automatically resizes to fit the contents. |
| Content is clipped | If the contents of the block exceed the height or width of the block, the content is clipped. Note: The clipped content still exists. It is just not visible in the block. |
| Use scrollbars only when necessary | If the contents of the block exceed the height or width of the block, scrollbars are added to the block. |
| Always use scrollbars | Scrollbars are added to the block. |

Do not use percentages to resize charts and maps that contain interactive elements that are activated when you pause the pointer over them, such as tooltips or drill-through links, because the browser is unable to realign the hard-coded hot spots after an image is resized.

When you use a percentage to specify the size of an object, the percentage is relative to the object's parent. In some cases, setting the size of an object using percentages will not give you the results that you want unless you also specify the size of the parent container.

Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Size & overflow** property and specify the height and width.

Control how other objects flow around an object

You can control how objects flow around other objects by choosing any of the following options.

| Option | Description |
|---|--|
| Float | Sets how other objects flow around the object. |
| Allow floating objects on both sides | Allows other objects to flow on both sides. The Float property must be set. |
| Move below any floating object on the left side | If there are other objects to the left of the object, the object moves below those objects. The Float property must be set. |
| Move below any floating object on the right side | If there are other objects to the right of the object, the object moves under those objects. The Float property must be set. |
| Move below any floating object | Moves the object under any other object in which the Float property was set. |


Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Floating** property.
3. Specify how other objects flow around the object by specifying the floating options.

Specify report properties

You can change the default report property settings.


Procedure

1. Click the **Show properties** icon , and navigate to the report level properties.
2. To specify the classes that IBM Cognos Analytics - Reporting uses to format objects, click **Report styles version** and choose one of the available options.

| Report styles version | Cognos Analytics version |
|-----------------------|--------------------------|
| 11.x | 11.0.0 |

| Table 7. Mapping of report styles versions to Cognos Analytics versions (continued) | |
|---|--------------------------|
| Report styles version | Cognos Analytics version |
| 11.4 | 11.0.4 |
| 11.5 | 11.1.2 |
| 11.6 | 11.1.7 |

- For reports with multiple data containers, to render the default number of rows of each data container on each HTML page, you must set the **Page break by data container for interactive HTML** option to **Yes**. The default value is **No**.
- To show each report page in its own tab in HTML output, click the **View pages as tabs** menu and select the location where you want the tabs to appear in browsers.
- To create a single, scrollable HTML page when you run and save this report as HTML from the IBM Cognos Analytics with Watson portal, clear the **Paginate saved HTML output** checkbox.

The default is to paginate HTML reports with the same page breaks as PDF reports. The single, scrollable HTML page will be available from the IBM Cognos Analytics with Watson portal when you click the view report output versions action .

- If you work with reports that are created in IBM Cognos ReportNet and you want to create CSV report output, click **Use 1.x CSV export**.

This option ensures that all the query columns are exported. In IBM Cognos ReportNet, if a data item was referenced by using the **Properties** property of a list, it was included in the CSV output. The default is to export only the columns in the list.

Related concepts

[Create and modify report and object styles](#)

[Controlling the Rows Per Page for Multiple Containers in HTML and PDF](#)

Related tasks

[Producing tabbed reports](#)

Create and modify report and object styles

Create your own classes or modify existing classes in a report to format objects across a report according to your particular needs.

In IBM Cognos Analytics - Reporting, objects in reports are assigned a Cascading Style Sheet (CSS) class that provides a default style for the object. For example, when you create a new report, the report title has the class property **Report title text** assigned to it. In addition, objects inherit the classes set on their parent objects.


You can use classes to highlight data using conditional styles.

Classes you create or modify can be applied only to the current report. To create or modify classes for all reports, you must [modify a layout style sheet](#). In addition, some classes can be used to [format Query Studio reports](#).

Modify the report style

You can define whether your report uses the default styles for this version or the styles from a previous version.

Procedure

- Click the **Show properties** icon .
- Click **Report styles version** and select one of the following options:
 - To work with classes in the default style sheet, click **10.x**.

- To work with classes that were used in IBM Cognos 8, click **8.x**.

Use 8.x report styles when you are working with reports created in IBM Cognos 8 and you want to preserve their original appearance.

- To work with classes that were used in IBM Cognos ReportNet, click **1.x**.

Use 1.x report styles when you are working with reports created in ReportNet and you want to preserve their original appearance.

- To work with classes that have minimal styling defined, click **Simplified**.

This option is useful when creating financial reports.

- To work with the latest style version, click **Latest**.

Currently, the latest style version is **11.6**.

Modify object styles

You can change global classes to modify the style of all objects in a report or you can modify local classes and apply them to specific objects.

Procedure

1. Click the **Pages** icon , and click **Classes**.

2. To create a new class, click the **Toolbox** icon , drag **Class** to the **Local Classes** pane.

3. To modify an existing class, in the **Local Classes** or **Global Class Extensions** pane, click the class.

Modify a global class to apply a change to all objects that use that class. For example, if you modified the style **List column title cell**, all column titles in lists will reflect your modifications.


Tip: Ctrl+click classes to make the same change to more than one class.

4. In the **Properties** pane, modify the properties to specify your desired formatting.

Tip: Look at the **Preview** pane to preview your changes for different report objects, such as blocks, table cells, and text items.

If you modify a global class, a pencil symbol appears beside the global class icon to indicate that the class was modified.

5. Apply the class to objects:

- Click the **Pages** icon, and click a report page.
- Click an object to which to apply a class.
- In the **Properties** pane, double-click the **Class** property.
- Click the classes to apply from the **Local classes** and **Global classes** panes and click the right arrow button .

- If you applied more than one class, in the **Selected classes** pane, specify the order in which the classes are applied using the up and down arrow buttons.

Classes in the **Selected classes** pane are applied from top to bottom. The style properties from all classes are merged together when they are applied. However, if the classes have style properties in common, the properties from the last class applied override those from previous classes.

Reusing styles from another report

You can apply local and global styles or themes from one report in another report.

About this task



Local styling is kept when you reference styles from another report. However, you can remove some or all local styling from the target report.

If the referenced report is renamed or moved, the reference information in the target report is automatically updated.



You can reference local classes only if local classes with the same name exist in the target report. You can reference styles from a report only if you have the permissions to access the report. If you referenced styles from a report and the permissions for the report are changed so that you can no longer access it, the referenced styles are still applied when the target report is run.

You cannot use a report that contains referenced styles as the source report for style references for other reports.

If the target report contains more than one page, the **Preview** pane in the **Report Style References** window shows how the referenced styles are applied in the report page that you are currently viewing.

Tip: You can see which global classes contain inherited styles when you click **Pages > Classes**. Global classes that reference styles from another report are identified by the referenced styles icon . You can also modify classes that contain referenced styles. Such classes are identified by the modified referenced styles icon .

Procedure

1. Click the **Show properties** icon , click the select ancestor icon , click **Report**, and then, in the **STYLE** section, click **Theme**.
2. Select the **Apply style from report** check box.
3. Click the ellipsis icon and open the report that contains the styles that you want to reuse.
4. To remove local styles in the report, in the **Remove custom styles from the current report** section, select the check boxes of the styles that you want to remove.
5. To specify when to refresh styles when styles in the referenced report are modified, in the **Refresh report styles** section, select one of the following options.
 - To refresh styles automatically, click the **Run time** radio button.
 - To control when styles are refreshed, click the **Manually** radio button.

When this choice is selected, styles are refreshed only when you click the **Refresh now** icon.

(Don't Print) class

The **(Don't Print)** class allows HTML items to display in the Web browser but not to print.

The **(Don't Print)** class behaves as follows in the various report output formats:

- HTML

The Web browser defines the behavior. The HTML standard is that the item appears on the screen in the Web browser but is excluded by the print operation of the Web browser.

- PDF

The item is excluded from the output.

- Microsoft Excel 2002 spreadsheet software

The class is specified in the HTML that IBM Cognos uses to render Microsoft Excel 2002 output. However, Microsoft Excel 2002 does not appear to honor it and displays the item as missing some or all other style definitions.

- Microsoft Excel 2007 spreadsheet software

The item is excluded from the output.

- CSV

The item is included in the output.

- XML

The item is included in the output.

An alternative way to consistently exclude a report object from HTML, PDF and Microsoft Excel output is to set the **Box Type** property for the object to **None**. CSV and XML report outputs will still contain the object.

Modify classes to format Query Studio reports

Some global classes are specific to IBM Cognos Query Studio or can be applied to Query Studio reports. You can modify the following classes to format Query Studio reports.

To format a Query Studio report using the modified classes, the template must be applied to the report. For more information about applying a template to a Query Studio report, see the *Query Studio User Guide*.

| Class | Description |
|------------------------|--|
| List column body cell | Style used to format list data. |
| List column title cell | Style used to format list column titles. |

To modify classes, you must

1. Create a Query Studio template.
2. Modify the global classes.
3. Save the template.

Modifying the default layout style sheet

In addition to creating or modifying classes in a report, you can create and modify classes that will apply to all reports. Default styles are stored in a style sheet named `GlobalReportStyles.css`.

For more information about modifying the style sheet, see the following topics:

- [“Modify object styles” on page 398](#)
- [“Reusing styles from another report” on page 399](#)
- [“Creating a color palette” on page 56](#)

Add color to an object

You can add background and foreground color to objects in the report. The foreground color applies to the text within objects.

Tip: The TOC Report sample report in the GO Data Warehouse (query) package includes objects with color.


About this task

When you open one of the color windows, such as the **Foreground Color** window, you can save up to eight colors as favorites. Saving colors as favorites is useful when you define a custom color. When you save a custom color as a favorite, you do not need to reenter the RGB color values when you want to use the color elsewhere in the report.



Favorite colors are stored in cookies. As a result, favorite colors are shared across all Reporting users.

Procedure

1. Select the object.

Tip: To quickly select the parent of an object, click the object, and then, from the title bar of the **Properties** pane, click the **Select ancestor** icon . You can also find a version of the **Select ancestor** icon in the report object toolbar.

2. Do one of the following:

- From the report object toolbar, click the **Background color** icon  or click the **Font** icon , and then click **Foreground color**.
- In the **Properties** pane, double-click the **Background color** or **Foreground color** property.

3. To apply an existing color, click the **Basic colors** tab or **Color swatch** tab and choose one of the available colors.

Use a basic color to select a color from a small set of colors. Use the color swatch to select from 216 available colors.

4. To apply a custom color, click the **Custom color** tab and type values in the **Red**, **Green**, and **Blue** boxes.

The values must be hexadecimal.

5. If the object is an extensible visualization and you want to specify the transparency, under **Transparency (%)**, type a percentage value or use the slider to set the transparency to the value that you want.

6. To save a color as a favorite, click **Set as favorite**.

If you save a color with a transparency value as a favorite, the transparency is applied only when you add the favorite color to an extensible visualization.

Tip: You can modify or replace a color that was saved as a favorite. Click the favorite color, make the changes that you want, and click **Set as favorite**.

Chapter 15. Working with your external data

You can supplement your enterprise data with your own external or personal data file.

You can create a report that uses an external file that contains data that is not part of your IBM Cognos Analytics with Watson enterprise data. For example, you are an analyst and you receive a spreadsheet that contains what-if data about opening new branches of your retail store. You are asked to analyze the impact of these possible new branches on existing sales volumes. You link this scenario data with your enterprise data and create a professional report in Cognos Analytics.

You import your own data file and start reporting on it right away. After you import the file, it is protected by the same Cognos Analytics security as your enterprise data. As a result, you can report on your data in a secure and private environment.

You can import your external data in different tools.

Upload files tool

You can import the following types of files:

- Microsoft Excel (.xls and .xlsx) spreadsheet software files
- Delimited text files, such as .csv files. You can compress multiple .csv files into a .zip file for a quick upload.

After you import your data, it is saved in a database. You then publish a package that contains your data and you can then report on your data. You can grant other users access to your personal data by sharing the corresponding packages.

Manage External Data tool

You can import the following types of files:

- Microsoft Excel (.xls and .xlsx) spreadsheet software files
- Tab-delimited text (.txt) files
- Comma-separated (.csv) files
- XML (*.xml) files

After you import your data, you then publish a package that contains your data in addition to the data contained in an existing package. You can then report on your data.

For an up-to-date list of the environments that are supported by Cognos Analytics, including information about operating systems, patches, browsers, web servers, directory servers, database servers, and application servers, see [Software Product Compatibility Reports \(https://www.ibm.com/software/reports/compatibility/clarity-reports/report/html/prereqsForProduct?deliverableId=DA295E70A6F611E88A70560C75A2DCDE\)](https://www.ibm.com/software/reports/compatibility/clarity-reports/report/html/prereqsForProduct?deliverableId=DA295E70A6F611E88A70560C75A2DCDE).

Manage external data

You can supplement your enterprise data with your own external or personal data file by using the

Manage External Data tool in IBM Cognos Analytics - Reporting.

You import your own data file and start reporting on it right away. After you import the file, it is protected by the same IBM Cognos security as your enterprise data. As a result, you can report on your data in a secure and private environment.

You can use the following types of files:

- Microsoft Excel (.xls) spreadsheet software files

The **Manage External Data** tool supports external data sources from Microsoft Excel up to version Microsoft Excel 2007.

For an up-to-date list of the environments that are supported by Cognos Analytics, including information about operating systems, patches, browsers, web servers, directory servers, database servers, and application servers, see [Software Product Compatibility Reports](https://www.ibm.com/software/reports/compatibility/clarify-reports/report/html/prereqsForProduct?deliverableId=DA295E70A6F611E88A70560C75A2DCDE) (<https://www.ibm.com/software/reports/compatibility/clarify-reports/report/html/prereqsForProduct?deliverableId=DA295E70A6F611E88A70560C75A2DCDE>).

- Tab-delimited text (.txt) files
- Comma-separated (.csv) files
- XML (*.xml) files

Your XML files must adhere to the IBM Cognos schema specified at `c10_location/bin/xmldata.xsd`. For more information, contact your IBM Cognos administrator.

This schema consists of a dataset element, which contains a metadata element and a data element. The metadata element contains the data item information in item elements. The data element contains all the row and value elements.

For example, the following simple XML code produces a table with two columns (Product Number and Color) and two rows of data.

```
<?xml version="1.0" ?> <dataset xmlns="http://developer.cognos.com/schemas/xmldata/1/" xmlns:xs="http://www.w3.org/2001/XMLSchema-instance"> <metadata> <item name="Product Number" type="xs:string" length="6" scale="0" precision="2" /> <item name="Color" type="xs:string" length="18" scale="0" precision="8" /> </metadata> <data> <row> <value>1</value> <value>Red</value> </row> <row> <value>2</value> <value>Blue</value> </row> </data> </dataset>
```

To work with your external data by using the **Manage External Data** tool, you start with an existing IBM Cognos package. You import data from your external file into the package and create links between data items in your file and data items in your enterprise data source. You then publish a new package that you can use to create reports that use your data and your enterprise data, or reports that use only your data. You can link your external data with both dimensional and relational data sources.

Before you can import your own external data file, your IBM Cognos administrator must grant you permission for the **Allow External Data** capability that is found within the **Reporting** capability. You must also have permissions to use IBM Cognos Analytics - Reporting.

Packages that contain external data

When you import external data into a package with the **Manage External Data** tool, you do not overwrite the original package. You create a new package that includes the original package, the new external data, and any links or relationships that you defined between the two. By default, the new package is saved in the **My content** area of the IBM Cognos Analytics with Watson portal, with **External Data** appended to the original package name. You can change where your package is published.

Note: The current content language is used to create the new package, and users cannot select the language for the package. For example, the content language in the IBM Cognos Analytics with Watson portal is set to English. External data is imported into the GO Sales (query) package, and a new package called GO Sales (query) External Data is created. If the content language is changed to a different language, the package name is not translated, even though GO Sales (query) is a multilingual package.

IBM Cognos samples

Sample external data sources in Microsoft Excel (.xls) format are provided with IBM Cognos Analytics with Watson. You can import these sample files into the Sample Outdoors Company sample reports that are found in the **GO Data Warehouse (analysis)** or **GO Data Warehouse (query)** package.

You can find sample external data source files on the server where IBM Cognos Analytics with Watson is installed. Locate the **Team content > Samples > Models > Sample file_GO sales.xls** file to explore how to work with external data.

To obtain these files, contact your IBM Cognos administrator.

Preparing to work with your external data

To work with your external data, follow the process in this section.

There are four steps to preparing to work with your external data. The following diagram details these steps.

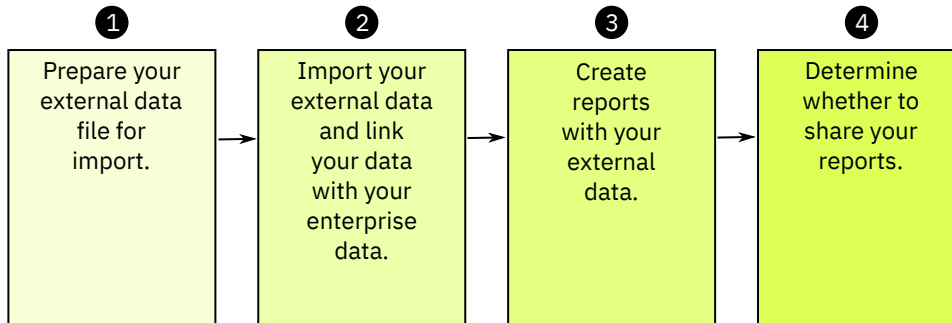


Figure 46. Process to prepare to work with external data

1. Prepare your external data file for import.

Ensure that your external data file matches your enterprise data for your reporting needs. For example, if your external data file contains sales values by month, ensure that the formatting of months in your file matches the formatting used in your enterprise data source. Ensure that you can uniquely link at least one column from your external data file, such as product codes or years, with your enterprise data source.

The maximum file size that you can import is 2.5 MB, with a maximum of 20000 rows. You can import a maximum of one external data file per package. Your IBM Cognos modeler can override these governors in IBM Cognos Framework Manager.

2. Import your external data.


You import your external data file from your own computer or from a location on your network into an existing IBM Cognos package.

A step-by-step wizard guides you through importing your data. If you want to create reports that contain data from both your external data file and your enterprise data source, you must link data items from the two data sources. You can import all or a subset of data columns from your external file.

By adding external data, you extend an existing IBM Cognos package definition with the new data items from your file and you create a new package.

3. Create reports with your external data file.

After you import and link your external data, it appears as a new namespace in the data tree of the

Source tab  and is integrated with the IBM Cognos content.

You can then create reports with your data and perform any operation, such as filtering, sorting, grouping, or adding calculations. When you run the report, it uses data items from your external data file.

You can save reports that contain your external data within the **My content** area of the IBM Cognos Analytics with Watson portal.

4. Determine whether you want to share your reports that use external data with other people in your organization. If you decide to share, take into account these considerations.

Working with Date Data

If the data that you import contains dates, ensure that the dates use the format yyyy-mm-dd.

Working with Dimensional Data Sources

If your enterprise data source is dimensional, such as OLAP or dimensionally-modeled relational, and you want to link your external data with your enterprise data, you must first create a tabular or list report. Create and save a list report with your enterprise data that contains the data items that you want to use to link with your external data. Ensure that you remove the aggregate rows that are automatically added in the footer of the list. This list is a projection of your dimensional data source.

When you import your external data, use the list report that you created to link your external data with the query subject from your enterprise data.

Data in your external file is relational by nature because it consists of tables and rows. If your enterprise data source is dimensional, you can still import and work with your external data. However, you cannot mix relational data from your external data files, and dimensional data from your enterprise data source within the same query. For example, a data container, such as a list, crosstab, or chart, uses one query and you cannot mix relational and dimensional data within the same list, crosstab, or chart. Doing so will cause an error.

If you want to use data from both the external data file and the original package within the same query, you must link the external data to a query subject within the current package instead of another report.

Working with External Data in an Unsecured IBM Cognos Application

If your IBM Cognos application is not secured, and users can log on anonymously, you may encounter issues if multiple people import external data in the same package.

For example, Robert imports his external data into package A and saves the package and reports he created in **My content**. Then, Valerie also imports her external data into the same package A and saves the package in **My content**. Valerie has therefore overwritten Robert's external data in package A. Now, if Robert tries to run one of his reports, he encounters errors because his external data is no longer in package A.

To avoid this problem,


- save packages that contain external data with a unique name.
- apply security to your IBM Cognos applications so that users do not share the same **My content** area.

Import data

You select the file to import from your own computer, or from your local area network.



You select which columns to import.

You then specify a namespace to use. The namespace provides a unique name to associate with the data

items that you import. The namespace appears in the data tree in the **Source** tab  and is used to organize the data items. By default, the namespace is the imported file name without the extension.

If you change the default name for the namespace, you are prompted to select the external data file each time that you run the report. To avoid this prompt, select the **Allow server to automatically load file** check box.

Procedure

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.
2. On the **Select Data** page of the wizard, under **External data file**, click **Browse** and select your external data file to import.

If you want the server to load the file without prompting users when they run the report, select the **Allow the server to automatically load the file** check box.

If selected, you must use the Universal Naming Convention (UNC) path, such as `\servername\filename`, and you must ensure that the IBM Cognos server has access to the file.

3. Under **Data items**, select the check box for the data items that you want to import.
4. Type a name for the namespace and click **Next**.

The namespace appears in the **Source** tree, and identifies the external data within the package. By default, the name is the name of your imported external data file.

5. If you do not want to link your data or change the data attributes, click **Finish** now.

Map data

If you want to create reports that contain data from both your external file and from your enterprise data, you must link at least one query subject from your package or from an existing report to a data item in your external data. This mapping creates a relationship between your external data and your enterprise data. For example, your external data contains information about employees, including an employee number. You map the employee number from your external data file to the employee number in your enterprise data. This ensures that your data is integrated smoothly.

About this task

Mapping a data item in your external data to a query subject that references other query subjects is not supported. For example, the query subject cannot contain a calculation that references a query item from another query subject. Such a mapping produces the following error message:

MSR-PD-0001 Failed to relate external data to objects in the underlying package. The item [query item] does not lead to a query subject.

Procedure

1. On the **Data Mapping** page, link existing query subjects in your enterprise data to data items in your external data file.
2. Under **Existing query subject / report**, click the ellipsis button and do one of the following:
 - If you want to select a query subject from the data tree, click **Choose Query Subject** and select a query subject.
3. Click the two data items that you want to link and click the **New link** button.

You cannot link a data item in your external data to a calculation in a query subject.

A link appears linking two data items.

Tip: You can create multiple links for multiple data items. To delete a link, select the link and click **Delete Link**.

4. If your report is using the dynamic query mode, specify the type of filter to generate for the join relationship by clicking the **Join filter type (DQM only)** menu and choosing one of the available values.


A join relationship is created when you link data items. The filter type is used to optimize the join relationship. In generates an IN predicate of constant values. Between generates a BETWEEN predicate using the minimum and maximum values of the join keys. Table generates a table row constructor form of the IN predicate. The default value is In.

5. Click **Next**.

Finish importing data

You can change how query items from your external data file appear after they are imported into IBM Cognos Analytics with Watson. For example, you can change the number of decimal places or the default summary.

If you want to use numeric data from your external data source as a measure in a crosstab, you must assign that data item a default summary other than **Unsupported**. A specified default summary makes

the data item appear as a measure in the data tree in the **Source** tab . Otherwise, if you add the data item with an **Unsupported** default summary as the measure in a crosstab, no values appear.

| Attribute | Description |
|-----------------|---|
| Data type | Identifies whether data in the file is one of the following types: Integer , which represents numeric values. Decimal , which represents integer values that are scaled by a variable power of 10. Text , which represents values that contain letters and symbols. Date or Date Time , which represent dates and times. |
| Default summary | Identifies Sum, Average, Max, Min, Count or Unsupported as the default type of summary for the data item. Applies only to Integer and Decimal data types. |
| Decimal places | Specifies the number of decimal places for the data item. Applies only to the Decimal data type. |

If you mapped links between data items in your external data and data items in your enterprise data, specify the options that define the relationships between the data items.

For each data item that you import and link, specify whether values are unique or exist more than once in both your external data and in your enterprise data. You can also specify how to handle rows that contain missing values in the report results.

Procedure

1. On the **Data Attributes** page, specify the attributes for each data item after it is imported and click **Next**.

For example, if you import numeric data items, you can change the default summary and number of decimal places.

2. On the **Mapping Options** page, specify the relationships between the linked data items and how to process the results in the report output.
3. Click **Finish**.

Publish the package


You can change the name and location of the package with your external data to help you differentiate between data packages.

Procedure

1. If you want to rename the package that will be published or change the location where it is published, do the following:
 - In the **Manage external data** dialog, under **Package name**, click the ellipsis button.
 - Type a new name for the package and select the location where to save it.
 - Click **Save**.
2. Click **Publish**.

Results

IBM Cognos Analytics with Watson imports your external data into a new package. A namespace with the


data items from your external file appears in the data tree in the **Source** tab .

You can now create reports with your external data.

Edit your external data




After you import your data, you can change the data mappings and options that you originally specified and republish the package.

You can

- Rename the namespace, which renames the organizational folder that appears in the data tree in the **Source** tab . If you change the namespace, you are prompted for the external data file when you run the report.
- Change which columns to import.
- Change the data mapping links.
- Change the data attributes.
- Change the mapping options.

You can also import multiple external data files into the same package. To do this, your data modeler must modify governors in the model and republish the package that contains your enterprise data. For more information, see the *IBM Cognos Framework Manager User Guide*.

Procedure

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.
2. In the **Manage external data** dialog box, select the external data to edit and click the **Edit** icon .
3. In the left pane, select the options that you want to change.
4. Click **OK** and then republish the package.

Results

IBM Cognos Analytics with Watson reimports your external data and updates the data items that appears




in the data tree in the **Source** tab .

You can now create and update reports with your external data.

Delete your external data

You can delete your external data from within the package that you created if you no longer need it.

Procedure

1. Click the **Data** icon , click the **Source** tab , right-click the package for which you want to add external data and then click **Manage external data**.
2. In the **Manage external data** dialog box, select the external data package to delete and click the delete button .
3. Click **Publish**.

Results

The external data namespace is removed from the package.

If you also no longer require the external data package or any reports created with the package, you can delete it from within the IBM Cognos Analytics with Watson portal.

Running a report that contains external data

Reports that contain external data run the same way as reports that contain only enterprise data. If you have access to the report, you will also have access to the external data included within the report.

You may be prompted to select the location of the external data file when you run the report if either

- the report author did not specify to automatically load the file.
- the IBM Cognos Analytics with Watson server cannot locate the file.

However, you are not re-prompted within the same Web browser session.

You can determine whether data in a report uses external data by tracing its lineage. For more information, see [“View lineage information for a data item” on page 47](#).

Making your reports public

After you create a report that uses your external data, you may want to make it public to share it with coworkers. They can run your report using your external data file that you made available on a public network drive that the IBM Cognos server can access. They can also use their own version of the file. If they use their own version, the file must contain the same columns as your original external data file that you used to import the data and create the report. In addition, you must clear the **Allow server to automatically load file** check box in the **Select Data** page of the **Manage external data** wizard.

To make reports public, you must save them in the **Team content** area of the IBM Cognos Analytics with Watson portal. To save content in **Public Folders**, you must have the appropriate permissions. Contact your IBM Cognos administrator to obtain permissions and to inform him or her that you are sharing a package or files.

If you share your reports, ensure that you maintain the reports.

Chapter 16. Using conditions

You can define conditions to control what users see when they run a report. Conditions can apply to specific items in a report. For example, you can define a conditional style to highlight exceptional data, such as product revenue that exceeds your target.

Conditions can also apply at the report layout level. Conditional layouts are useful for delivering reports to a multilingual audience. For example, you can have text items, such as titles and cover pages, appear in the same language as the data in the report.

Highlight data using a conditional style

Add conditional styles to your report to better identify exceptional or unexpected results. A conditional style is a format, such as cell shading or font color, that is applied to objects if a specified condition is true.

For example, you want to automatically highlight in green the departments in your organization that meet their budget quotas and highlight in red the departments that go over budget. Creating conditional styles color-codes information in your reports so that you can find areas that need attention.

You can apply multiple conditional styles to objects. For example, you can apply one style in specific cells and another style for the overall report. If multiple styles set the same property, such as font color, the last style in the list is applied.

You can apply conditional styles based on any data item in your report.

You can create the following types of conditional styles.

| Type | Description |
|-----------------|--|
| Numeric Range | Highlights straight numerical data, such as revenues and losses. |
| Date/Time Range | Highlights data from specific dates and times. |
| Date Range | Highlights data from specific dates. |
| Time Range | Highlights data from specific times. |
| Interval | Highlights data falling between set intervals. |
| String | Highlights specific alphanumeric items in a report. For example, you can highlight all instances of a specific word or phrase, such as Equipment. String criteria are case-sensitive. If multiple string conditions are met, only the first conditional style is applied. |
| Advanced | Creates conditional styles that use calculations or expressions. If multiple advanced conditions are met, only the first conditional style is applied. |

You can also apply a conditional color palette to a chart.

Note: Conditional styles and conditional data formatting do not work on chart axis labels. If you apply a conditional style or conditional data formatting to a chart axis, only the first style defined is applied.

You can perform a search to find objects in your report that use conditional styles. You can also view all the conditional styles used in your report to delete or modify them.

You can also use variables to highlight data. If a report contains both conditional styles and style variables, the style variables are applied first and then the conditional styles are applied.

Tip: The Return Quantity by Order Method sample report in the GO Data Warehouse (analysis) package includes conditional highlighting.

Create a new conditional style


You can apply conditional styles based on any data item in your report.

Procedure

1. Click the object for which you want to define a conditional style and click the **Conditional styles** icon





Tip: You can also click the object, and then, in the **Properties** pane, set the **Conditional styles** property.

2. Click the add button  and click **New Conditional Style**.
3. Select the data item to determine the condition and click **OK**.

The type of conditional style that you can use depends on the type of data item you select.


4. In the **Name** box, type a name for the conditional style.
5. To define a numeric value, date/time, date, time, or interval condition:

- Click the new button  and select a value to define a threshold.
The value appears in the **Range** column, and two ranges are created.
- For each range, under **Style**, click one of the predefined styles to apply to the range or click the edit button  and create a new style.

Tip: You can also define a style for the cells in your report that have missing values.

- Repeat these steps to add other conditions.

Tip: Under **Style**, pause the pointer over each range  to see the condition produced for that range.

- To move a value above or below a threshold, click the arrow button  next to the value.
For example, you insert a threshold value of five million. By default, the ranges are less than or equal to five million and greater than five million. Moving the five million value above the threshold changes the ranges to less than five million and greater than or equal to five million.


6. To define a string condition:
 - Click the new button and select how to define the condition.
 - To select more than one individual value, click **Select Multiple Values** and click the values.
 - To type specific values, click **Enter Values** and type the values.
 - To specify your own criteria, such as values that begin with the letter A, click **Enter String Criteria** and specify the condition.
 - For each condition, under **Style**, click one of the predefined styles to apply or click the edit style button and create a new style. Specify the style to apply to remaining values by clicking one of the predefined styles beside **Remaining values (including future values)**.
 - Specify the order in which to evaluate the conditions.

Conditions are evaluated from top to bottom, and the first condition that is met is applied.

Reuse an existing conditional style

You can create a conditional style once and reuse it on multiple objects in your report. You can specify the order in which conditional styles are applied. You can also use existing local classes as your conditional styles.

Procedure

1. Click the data item for which you want to define a conditional style, and then click the **Conditional styles** icon .

Tip: You can also click the data item, and then, in the **Properties** pane, set the **Conditional styles** property.


2. Click the add button , click **Use Existing Conditional Style**, and select the style.

Create an advanced conditional style



You can create advanced conditional styles that use calculations or expressions.

If multiple advanced conditions are met, only the first conditional style is applied.

Procedure

1. Click the data item for which you want to define a conditional style, and then click the **Conditional styles** icon .

Tip: You can also click the data item, and then, in the **Properties** pane, set the **Conditional styles** property.

2. Click the add button  and click **Advanced Conditional Style**.
3. Type a name for the conditional style.
4. Click the add button and specify the expression that defines the condition.
5. For each condition, under **Style**, click one of the predefined styles to apply or click the edit button  and create a new style. Specify the style to apply to remaining values by clicking one of the predefined styles beside **Remaining values (including future values)**.
6. Specify the order in which to evaluate the conditions by clicking a condition and then clicking the move up or move down arrow.


Conditions are evaluated from top to bottom, and the first condition that is met is applied.

Manage conditional styles

You can view, modify, or delete the conditional styles that are applied to your report. You can also define a new conditional style.

In the IBM Cognos Analytics - Reporting options, you can specify whether to automatically delete conditional styles that are no longer used in a report.

Procedure

Click the **More** icon , and then click **Conditional styles**.

Highlight data using a style variable

Highlight data in your report to better identify exceptional results. For example, you want to identify sales representatives who have exceeded their quota. You create a condition that checks whether each representative's sales for the year is greater than their quota for the year.

Style variables are useful if you are working with reports that were created in a previous version of IBM Cognos Analytics with Watson or if you want to use language variables to specify conditional styles.

You can also use conditional styles to highlight data. If a report contains both conditional styles and style variables, the style variables are applied before the conditional styles.

Procedure

1. Create a **variable** and define the condition that determines if the data will be highlighted.
2. In the work area, click the column to highlight based on the condition.
3. In the **Properties** pane, double-click the **Style variable** property.
4. Click **Variable**, click the variable to assign to the object, and click **OK**.
5. If you assigned a string variable, in the **Values** box, select the values for the condition to support.

Tip: A default value exists for the variable, and it is always selected.

6. If you assigned a language variable, in the **Values** box, select the languages for the condition to support.

Tip: A default value exists for the variable, and it is always selected.

7. Click **OK**.

8. Click the **Condition explorer** icon  and click a value other than the default value.

Tip: When you select a value in the condition explorer, the Explorer bar becomes green to indicate that conditional formatting is turned on and that any changes you make to the report apply only to the variable value.

For example, if you created a Boolean variable, click **Yes**.

9. In the **Properties** pane, specify the formatting with which to highlight the column when the condition is satisfied.

For example, click the **Border** property to create a thicker border around the column.

10. Repeat steps 8 to 9 for other possible values defined for the variable.

Tip: To view the report with no variables applied, click the **Condition explorer** icon and click (**No variable**) or triple-click the Explorer bar.

Results

When you run the report, the report objects to which you applied the variable are highlighted when the condition is satisfied. For example, if you created a Boolean variable, the objects are highlighted when the condition is met. If the condition is not satisfied for any object, no conditional formatting is applied.

Adding conditional rendering to a report



You can specify which objects are rendered when a report is run.

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

Add a variable from the condition explorer

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

Procedure

1. Click the **Condition explorer** icon  and click **Variables**.
2. Click the **Toolbox** icon , drag one of the following variables to the **Variables** pane:
 - To create a variable that has only two possible values, **Yes** and **No**, drag **Boolean Variable**.
 - To create a variable whose values are string-based, drag **String Variable**.
 - To create a variable whose values are different languages, drag **Report Language Variable**.
3. If you created a Boolean variable, in the **Expression Definition** box, define the condition and click **OK**.

For example, the following expression returns the value **Yes** if revenue is less than one million and the value **No** if revenue is greater than or equal to one million:



```
[Revenue]<1000000
```

For information about creating expressions, see [“Using relational calculations” on page 306](#) or [“Using Dimensional Calculations” on page 354](#).

4. If you created a string variable, do the following:
 - In the **Expression Definition** box, define the condition and click **OK**.
For example, the following expression returns the value **high** if revenue is greater than one million and the value **low** if revenue is less than or equal to one million:

```
if ([Revenue]>1000000) then ('high') else ('low')
```


For information about creating expressions, see [“Using relational calculations” on page 306](#) or [“Using Dimensional Calculations” on page 354](#).

- Click the add button  in the **Values** pane.
- For each value that the variable can assume, type the name of the value that corresponds with the possible outcomes defined in the expression.
For example, in the previous expression, you must create two values for the variable, high and low.
Tip: You can create a group by clicking two or more values and then clicking the group values button . For example, you can create a group that includes the available French languages.

5. If you created a language-specific variable, in the **Languages** dialog box, select the languages to support.

Add a variable from the properties pane

Before you can add conditional formatting or conditional rendering to your report, you must add a variable. You can create a variable in the condition explorer or in the **Properties** pane.

Procedure

1. Select the report object.
2. In the **Properties** pane, under **Conditional**, double-click the conditional property to which to assign the variable.

The following conditional properties are available:

| Goal | Conditional Property |
|---|-----------------------------|
| Specify a variable based on which text can be conditionally shown. For example, you want different text to appear when a report is run in a different language. | Text source variable |
| Specify a variable based on which object can be conditionally rendered. For example, you want to make a revenue report smaller by not rendering rows that are below a threshold. | Render variable |
| Specify a variable based on which object can be conditionally styled. For example, you want data that meets some criterion to appear in a different color. | Style variable |
| Specify a variable based on which objects in a block can be conditionally rendered. Applies only to conditional block objects that you insert in a report. | Block variable |

3. In the **Variable** box, click an existing variable or one of the following variable types:

- **<New language variable>**
- **<New string variable>**
- **<New boolean variable>**

4. In the **New variable** dialog box, in the **Name** box, type the name of the variable.

5. If you created a string variable, click the add button , type the string values to define, and click **OK**.

6. If you created a language variable, select the languages to support and click **OK**.

7. In the **Expression Definition** box, define the condition.

Hide or show an object

You can hide and show objects in a report based on a condition you define.


You can also specify that an object should not be rendered based on a condition.

Tip: The Global Bonus Report sample report in the GO Data Warehouse (analysis) package includes hidden objects.

Procedure

1. Create a variable, and define the condition that determines if the object is shown or hidden.

Tip: Create a Boolean variable to show and hide objects, as this type of variable has only two possible values.

2. Click the **Toolbox** icon , drag a **Conditional blocks** object to the work area.
3. Select the conditional block.
4. In the **Properties** pane, double-click the **Block variable** property.
5. In the **Variable** box, click the variable you created and click **OK**.
6. Set the **Current block** property to **Yes**.

7. From the content pane, drag the object to show or hide to the conditional block.

For example, drag a data item from the **Source** tab or from the **Data items** tab.

You may need to link the report page to a query before you can add a data item to the block.

Results

When you run the report, the report objects to which you applied the variable are visible when the condition is satisfied and invisible when it is not.


Add conditional rendering

Add conditional rendering to specify which objects are rendered when a report is run. This is useful when your report contains sensitive data.

Conditional rendering is not the same as [hiding objects](#). When you hide an object, the object exists but is transparent. If an object is not rendered, it is not in the report.

Procedure

1. Select the list column to be rendered conditionally.

Tip: You must select the list column, not the list column body or the list column title. If the body or title is selected, as indicated in the **Properties** pane, click the **Select ancestor** icon  and click the list column.

2. In the **Properties** pane, double-click the **Render variable** property.

3. Click **Variable** and click the variable that will determine if the column will be rendered.

4. In the **Render for** box, select the values that the condition will support.

Tip: A default value exists for the variable, and it is always selected.

Add multiple layouts

Add multiple layouts to show a report in different ways. For example, you can define a different layout for each language in a multilingual report. This allows you to create a single report that can be viewed by report consumers that use different regional settings.

Procedure

1. [Create a variable](#) and define the condition that will be used for each layout.


For example, create a report language variable that includes each language that requires a conditional layout.

Note: Expressions used in a conditional layout cannot reference a query.

2. Click the **Show properties** icon , in the **REPORT** section, click **Conditional layouts**.

3. Select a variable, and then select the values that require a separate layout.

Results

A layout is created for each value you selected. Use the **Pages** icon  to navigate the different layouts. For each layout, click **Report pages** to create a report page or **Prompt pages** to create a prompt page and add objects.

Tip: You can create new variables from the **Conditional layouts** dialog. The variables are added to the condition explorer. For more information, see [“Add a variable from the condition explorer”](#) on page 414.

Setting up a multilingual reporting environment

You can create reports that show data in more than one language and use different regional settings. This means that you can create a single report that can be used by report consumers anywhere in the world.

The samples databases provided with IBM Cognos store a selection of text fields, such as names and descriptions, in more than 25 languages to demonstrate a multilingual reporting environment. For information about how data is stored in the samples databases and how the samples databases are set up to use multilingual data, see the *Administration and Security Guide*.

Here is the process for creating a multilingual reporting environment:

- Use multilingual metadata.

The data source administrator can store multilingual data in either individual tables, rows, or columns.

For more information about configuring your database for multilingual reporting, see the *Administration and Security Guide*.

- Create a multilingual model.

Modelers use the modeling capabilities of IBM Cognos Analytics with Watson or IBM Cognos Framework Manager to add multilingual metadata to the model from any data source type except OLAP. They add multilingual metadata by defining which languages the model supports, translating text strings in the model for things such as object names and descriptions, and defining which languages are exported in each package. If the data source contains multilingual data, modelers can define queries that retrieve data in the default language for the report user.

For more information, see the Framework Manager *User Guide*.

- Create multilingual maps.

Administrators and modelers use a Microsoft Windows operating system utility named Map Manager to import maps and update labels for maps in IBM Cognos Analytics - Reporting. For map features such as country or region and city names, administrators and modelers can define alternative names to provide multilingual versions of text that appears on the map.

For more information, see the Map Manager *Installation and User Guide*.

- Create a multilingual report.

The report author uses Reporting to create a report that can be viewed in different languages. For example, you can specify that text, such as the title, appears in German when the report is opened by a German user. You can also add translations for text objects, and create other language-dependent objects.

- Specify the language in which a report is viewed.

You can use the IBM Cognos Analytics with Watson portal to do the following:

- Define multilingual properties, such as a name, screen tip, and description, for each entry in the portal.
- Specify the default language to be used when a report is run.

Tip: You can specify the default language on the run options page, in the report properties, or in your preferences.

- Specify a language, other than the default, to be used when a report is run.

For more information, see the IBM Cognos Analytics with Watson portal *User Guide*.

The data then appears in the language and with the regional settings specified in

- the user's Web browser options
- the run options
- the IBM Cognos Analytics with Watson portal preferences

Any text that users or authors add appears in the language in which they typed it.

Create a multilingual report in Reporting

You can create a report in IBM Cognos Analytics - Reporting that can be viewed in different languages.

For example, you can specify that text such as the title appears in German when the report is opened by a German user. You can also add translations for text objects and create other language-dependent objects.

Before you begin

If you want the report to show data in different languages, the model must also be multilingual.

Procedure

1. Create a report language variable.
2. In the work area, select the object to modify based on a language.
3. In the **Properties** pane, double-click the **Style variable** property.
If you are changing the language of a text string, click **Text source variable** instead.
4. Click **Variable** and click the language variable you created.
5. In the **Values** box, select the languages for the condition to support and click **OK**.

Tip: A default value exists for the variable, and it is always selected.

6. Click the **Condition explorer** icon  and a language for the variable.

When you select a value in the condition explorer, the conditional formatting is turned on and any changes you make to the report apply only to the variable value.

7. In the **Properties** pane, specify the formatting for the language.

For example, to change the language of a text string, double-click the **Text** property and select the new string.

8. Press Enter when you are done.
9. Repeat steps 6 to 8 for all other languages specified for the variable.

Tip: To view the report with no variables applied, pause the pointer over the condition explorer button and click **(No variable)** or triple-click the Explorer bar.

Results

When you run the report, the report objects to which you applied the variable are formatted according to the browser's language.

Chapter 17. Bursting reports

Burst a report to distribute its contents to various recipients. Bursting is the process of running a report once and then dividing the results for recipients who each view a subset of the data.

For example, salespeople in different regions each need a report showing the sales target for their country or region. You use burst reports to send each salesperson only the information they need. Burst reports can be distributed by email or saved to a folder for viewing in the IBM Cognos Analytics with Watson portal.

Tip: The package Bursted Sales Performance Report sample report in the GO Data Warehouse (analysis) includes bursting.

To burst a report against a dimensional data source, see [“Creating Burst Reports Using Dimensional Data Sources”](#) on page 425.

You cannot burst crosstab or chart reports. However you can burst a report where a container includes a crosstab or chart that is part of a master detail relationship. In this situation, you can burst only HTML, PDF, and XLS output formats; you cannot burst CSV or XML output formats.

For information about avoiding disk space exhaustion when bursting charts or crosstabs, see "Master Detail or Burst Reports with Charts or Crosstabs May Result in Denial of Service" in the *IBM Cognos Analytics with Watson Troubleshooting Guide*.

Procedure

1. [define burst recipients](#)
2. [specify burst groups](#)
3. [set burst options](#)
4. [enable bursting](#)

Defining Burst Recipients



Define the recipients who will receive data when the report is run. You can distribute burst reports to individual users, groups, roles, distribution lists, and contacts.

To define the recipients, you create a calculated field, create the burst table in the source database, and then import the table into a package.

Create a Calculated Field

You can use a calculated field to dynamically create burst report recipients.

Procedure

1. Click the **Queries** icon , and click the query that will produce the data to distribute.
2. Click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
3. To give the data item a more meaningful name, in the **Name** box, replace the default name.
4. In the **Expression Definition** box, type the expression that will generate the list of recipients and click **OK**.

For example, typing the following expression builds the list of the employees of The Samples Outdoors Company. The expression concatenates the first letter of each employee's first name with their last name.

```
lower(substring([Employee summary (query)].[Employee by organization].[First name],1,1) + [Employee summary (query)].[Employee by organization].[Last name])
```

Creating the Burst Table in the Source Database

You can create a burst table in the source database for the list of recipients. The steps you must follow depend on the database system you are using. The burst table must contain the following columns:

- A unique identifier

Tip: Some database systems do not require a unique identifier for each table.

- A recipient column
- The data item on which to burst

You can also include other columns that provide additional information. For example, if you plan to distribute reports by email, you can add a column for the email address of each recipient.

After you create the table, add the recipients who will receive the report. You can create a mixed recipients list that includes individual users, groups, roles, contacts, distribution lists, or email addresses. For example, a burst table may contain the following recipients.

| Recipient example | Recipient type |
|--|--|
| CAMID("":Canada") | Group |
| CAMID(":")/contact[@name='Silvano Allessori'] | Contact |
| CAMID(":")/distributionList[@name='European Partners'] | Distribution list |
| CAMID("LDAP_Local_ID :u:uid=gbelding,ou=people") | Authentication provider user or group, where LDAP_Local_ID is the name of an LDAP namespace ID, and people is the name of an organizational unit |
| c10@ibmcognos99.com | Email address |

CAMID stands for Cognos Access Manager ID, and it represents an internal search path to the recipients. Specify search paths when you want to save burst reports in a folder. You can obtain the search path in the IBM Cognos Analytics with Watson portal by opening the **Properties** page for each recipient and clicking **View the search path**. Ensure that you use the proper syntax when adding recipients to the burst table.

In the case of NTLM namespaces, user IDs in the search path use alphanumeric or numeric characters that make them difficult to read. You can use the following alternate search path syntax:

```
directory/namespace[@name="Local NT"]//account[@userName="gbelding"]
```

where Local NT is the name of a namespace and gbelding is the name of a user. The double slash before the account element indicates that you are searching all accounts under the specified namespace.

Note: If you have a mixed recipients list, do not mix email address recipients and alternate path recipients. Because the alternate path syntax contains the @ symbol, it will be mistaken for an email address.

For more information about users, groups, roles, contacts, and distribution lists, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Importing the Table into a Package

After you create the burst table in the source database, you must add it to the package that you will use to create the report.

For more information about importing tables and creating relationships, see the *Framework Manager User Guide*.

Procedure

1. Open the package.
2. Import the table.
3. Define the relationship between the burst table and the table containing the data item on which to burst.


For example, you are bursting on country or region code. You define a relationship between country or region code in the burst table and country or region code in the Country or Region table.


4. Save and publish the package.

Specify a Burst Group

Specify burst groups to set how the report will be distributed. Burst groups are defined by a data item that you create in the report or that you add from the burst table.

Procedure

1. Click the **Queries** icon , and click the query that will produce the data to distribute.
2. If you are creating a data item, do the following:



- Click the **Toolbox** icon  and drag **Data Item** to the **Data Items** pane.
- In the **Expression Definition** box, type the expression that defines the burst key.

For example, the following expression builds an email address for each sales representative in The Sample Outdoors Company. The expression incorporates the calculated field that was previously created, which is named `userID` in the following expression, with `ibmcognos99.com` as the domain name.

```
[userID]+'@ibmcognos99.com'
```

Tip: To give the data item a more meaningful name, replace the default name in the **Name** box.

3. To specify a burst table column as the data item, do the following:

- Click the **Data** icon , and from the **Source** tab , expand the burst table.
- Drag the data item to the **Data Items** pane.

For example, if you are bursting reports by email, drag the data item containing email addresses.







Set Burst Options

Set burst options for the report to indicate the data item on which to burst and the recipients.

Before you begin

Before you set burst options, ensure that the data item on which you intend to burst is in the report and is grouped. The grouped column will create the appropriate subsets of data. In addition, you must associate the burst key with this level of grouping.

Procedure

1. Click the **Pages** icon  or the **Queries** icon , and click the **Report** icon .
2. Click the **Show properties** icon , and in the **Properties** pane, click the **Burst options** property.
3. Select the **Make report available for bursting** check box.
4. Under **Burst Groups**, in the **Query** box, click the query that contains the data item on which to burst.
Tip: You can choose a query that does not appear in the layout. This is useful to distribute the same report to all burst recipients.
5. In the **Label** box, click the data item with which to label each burst report.
6. Click the edit button .
7. In the **Data items** box, drag the data item on which to burst to the **Groups** folder and click **OK**.
Tip: You can specify the sort order of data within each group by dragging data items to the **Sort list** folder and then clicking the sort order button .
8. Under **Burst Recipient**, in the **Query** box, click the query that contains the data item to be used as the distribution list.
9. In the **Data Item** box, click the data item that contains the recipients.
10. In the **Type** box, choose the method to burst the report:
 - Click **Automatic** to let IBM Cognos Analytics with Watson determine from the data item whether to email reports or send them to folders in the Cognos Analytics portal.
 - Click **Email addresses** to distribute reports by email.
 - Click **Directory entries** to distribute reports to folders that recipients can access in the Cognos Analytics portal.
Note: To burst reports to multiple mobile device users, you must choose to distribute reports to folders. You can choose **Directory entries**, or you can choose **Automatic** if the data item returns directory entries instead of email addresses. To view the reports, the recipients must have IBM Cognos Analytics Mobile Reports installed on their mobile devices.


When recipients log into IBM Cognos Analytics with Watson, they will see only the report that is specific to them.
11. If the report contains two nested data containers, such as a list and a chart, click the ellipsis button beside **Master detail relationships** and define the relationship between the data containers.

For information about master detail relationships, see [“Create a Master Detail Relationship”](#) on page 347.

Enable Bursting

When the report is ready to be distributed, enable bursting for the report in the IBM Cognos Analytics with Watson portal.

Procedure

1. Locate the report in the Cognos Analytics portal.
2. Click the **More** icon  and click **Run as**.
3. Enable **Run in background**.
4. Expand **Advanced**.
5. Make sure that the **Burst the report** check box is selected.
6. If you are distributing reports by email, open the **Delivery** slide out menu and select the **Send this report by email** check box.


Tip: If you are bursting the report to a folder, you can also send the report by email if the **Send the report by email** check box is selected. Reports will be emailed if the recipient's email address is stored in the authentication source you are using or if they are entered in the recipient's personal information in the Cognos Analytics portal.

7. If the burst report contains a drill-through link to another report and you are distributing the burst report by email, select the **Include a link to the report** check box.

If you do not select the check box, the drill-through links in the burst report will not work.

8. Run the report.

Results

Allow a few moments for the report to run. If you are an administrator, you can view all outputs for the report. Click the **More** icon  and then click **View versions**. When burst recipients log into the Cognos Analytics portal or access their email accounts, they will see only the data that is meant for them.

Creating Burst Reports Using Dimensional Data Sources

You can burst a report using a dimensional data source by using burst information that is stored in the data source. Because you do not want to append bursting information to existing dimensional data sources, you can create a relational data source that contains the burst information.

Report bursting is limited when the underlying data source is a cube (MOLAP data source such as IBM Cognos PowerCube, Microsoft Analysis Services, Oracle Essbase, or IBM Db2/OLAP). The burst report must be a grouped report, and the burst is restricted to the outermost grouping in the report. For example, if you have a report grouped on Country or Region and State, then you can burst the report only on Country or Region.

Procedure

1. In IBM Cognos Framework Manager, include both the dimensional data source that is the basis for reporting and the relational burst table in the model.

For more information about models, see the Framework Manager *User Guide*.

2. In IBM Cognos Analytics - Reporting, create a master detail report in which the master query drives the report and the detail query contains the burst information.

You must group the master query on the data item on which you are bursting. This data item must have a corresponding data item in the relational burst table.

Author the detail query against the relational burst table. The burst table must contain two columns: the data item corresponding to the data item used in the master report for bursting and the data item that contains the recipient information. The recipient can be an email address or an expression that results in a search path to an object in IBM Content Manager, such as an account, group, role, contact, or distribution list.

For more information about master detail queries, see [“Create a Master Detail Relationship”](#) on page 347.

3. Ensure that the detail query, which must be evaluated by IBM Cognos Analytics with Watson when the report is executed, is not visible:
 - Place a list that is based on the detail query in a conditional block with a box type of **None**.
 - Link the master and detail queries using the following expression:
[Master Burst Key] = [Detail Burst Key]

Results

When you set the burst options for the report, the master query provides the data items for the burst key and the detail report provides the data items for the burst recipients.

Chapter 18. Format data

Format data in a report to improve readability. For example, you can show all date values in the order year, month, and day. If you do not set **Data Format** properties here, data is formatted according to the properties set in the model. If the properties were not set in the model, data is formatted according to the International Components for Unicode (ICU) formats.

Special cells, such as overflow or underflow, errors, or not applicable values, appear with two dash (--) characters unless you override them.




You can also format data based on a condition or specify the format for a particular object.

When you create a calculation that uses mixed currency values or other mixed units of measure, an asterisk character (*) might appear as the unit of measure. To avoid this problem, change the format of the column or row that contains the result of the calculation so that the wanted unit of measure appears.

Set the default data formats

Set the default data properties for each type of data, including text, number, currency, percent, date, time, date/time, and time interval.

Procedure

1. Click the **Show properties** icon , click the select ancestor icon , click **Report**, and then, in the **DATA** section, click **Data formats**.
2. In the **Format type** box, click a format type.
The properties that you can set for the selected format type appear in the **Properties** box.
3. If you clicked the **Currency** format type and require different currencies in the report, click the add button  and select currency check boxes.

For example, you may have one column with values are in euros and another column whose values are in US dollars.

4. Set the properties.

If you added currencies in step 3, click each one and set the properties. If you did not add any currencies, any properties you set will apply to all currencies.

For properties in which you type meta-characters that represent certain types of information, such as YYYY-MM-DD for dates, the meta-characters that are required depend on the authoring language specified for the report. For more information, see [“Using patterns to format data” on page 433](#).

If you set a value for the **Pattern** property, all other formatting properties are ignored with the following exceptions:

- **Missing value characters**
- **Zero value characters**
- **Negative pattern**

Some properties are [language-sensitive](#) and should be changed only with caution.

Results

The data formatting properties you set are applied to objects only in the current layout. If a data item contains values in multiple currencies but only a subset of those currencies have defined formats, the default format for the locale in which you are working is applied to values with no specified format.

Specify the data format for an object

Specify the format for a particular object if you are not getting the results you want.



For example, you add a measure to a report and you want to see two decimals when you run the report. You set the number of decimals to two for the **Number** format type for the current layout. However, when you run the report, you see more than two decimals for the measure. To get the results you want, you must map the measure to the **Number** format type.

About this task

Data formats are not applied in delimited text (CSV) and XML report outputs.

The time interval data format assumes that input values are in milliseconds. As a result, when the time interval format is applied to an object, the values that appear in the report output are in milliseconds. You can apply the `cast` function to return the interval type that you want.

Procedure

1. Click the object.
2. In the report object toolbar, click the **Data format** icon .
- Tip:** You can also click the **Show properties** icon , and then double-click the **Data format** property.
3. Under **Format type**, click the format type to apply to the object.
4. To override any of the properties of the format type that were defined for the current layout, in the **Properties** box, click the property and specify its value.

Specifying the number of decimals in numbers

When specifying the number of decimals, IBM Cognos Analytics with Watson uses the IEEE 754 default rounding mode known as half even. With half even rounding, numbers are rounded toward the nearest truncated value, unless both truncated values are equidistant, in which case the value ending in an even digit is chosen, as follows:

- If the digit immediately after the precision to be shown is greater than 5, the number is rounded up.
- If the digit immediately after the precision to be shown is less than 5, the number is rounded down.
- If the digit immediately after the precision is a 5, the number is rounded down when the preceding digit is even and rounded up when the preceding digit is odd.

For example, the number 78.5 is rounded to 78, while the number 73.5 is rounded to 74.

In addition, if the maximum number of decimals is less than the actual number of decimals in the number, the number is rounded to the maximum number of decimals.

Digit shaping in charts and maps

When working with bidirectional content, you cannot specify digit shaping at the chart or map level. You can specify digit shaping for the objects in charts and maps.

To understand how digit shaping is applied to charts and maps, you must know which chart and map objects are considered text and which objects are considered numeric values.

The following table describes the chart and map objects that are considered text.

| <i>Table 8. Chart and map objects that are considered text</i> | |
|--|---|
| Container | Object |
| Chart | chart title, subtitle, footer, notes, legend item, legend title, regression label, marker label, background image label, axis titles, discrete axis label (for example, category axis label, x-axis), baseline labels |
| Map | map title, subtitle, footer, legend title, notes, axis labels |

The following table describes the chart and map objects that are considered numeric values.

| <i>Table 9. Chart and map objects that are considered numeric values</i> | |
|--|---|
| Container | Object |
| Chart | numeric axis label (for example, measure axis label, y-axis), numeric values that appear in the legend (you can select to show the first, last, maximum, minimum value for each item in legends), numeric values that appear in the chart |
| Map | legend items |

The following list describes the different digit shaping options and how digit shaping is applied to charts and maps.

- The digit shape options for text objects, which include titles, footers, and labels, are Default, None, National, and Contextual. Digit shape options for numeric values are Default, None, and National. There is no Contextual option for numeric values.
- By default, digit shaping is not applied to numbers that appear on an object that is considered text. For example, if a chart shows year data on the x-axis and the content language specified in the IBM Cognos Analytics with Watson portal is Arabic (Egypt), no digit shaping is applied because the x-axis label is considered a string.

The following list describes the default digit shaping behavior for charts and maps when the content language implies non-European digits, such as Arabic (Egypt).

- Numeric values that have a specific format, such as decimal or currency, are displayed as Arabic-Indic.
- Except for matrix charts, numeric axis labels for charts and maps are displayed in European digits.

This is due to the way that charts and maps are rendered. The engine used to render charts and maps does not perform any formatting for numeric axis labels. No locale information is passed, and consequently the labels are displayed as European digits. To display the labels as Arabic-Indic, select the digit shaping option National.

Matrix charts are rendered using International Components for Unicode (ICU) to format numbers. Locale information is passed and the numbers are shaped accordingly. For example, when the content language is Arabic (Egypt), ICU displays numbers as Arabic-Indic.

- Numbers within text labels are displayed as is. That is, no digit shaping is applied.

The following list describes the default digit shaping behavior for charts and maps when the content language is Thai.

- Numeric values that have a specific format, such as decimal or currency, are displayed as European digits.
- Numbers within text labels are displayed as is. That is, no digit shaping is applied.

Locale-sensitive properties

IBM Cognos Analytics - Reporting contains an extensive library of customized properties adapted to users from different regions who speak different languages. For example, if a modeler specifies that a given data item is a currency, only the proper currency symbol must be specified. When reports are created,

Reporting automatically adapts the format of the currency numbers to each user according to the content language specified in the IBM Cognos Analytics with Watson portal.

When modelers or report authors specify properties, these properties override user preferences and risk creating inconsistent formatting for users of other cultures. It is usually much easier and safer to let Reporting take care of formatting. For example, for the date format type, different regions use different characters to represent the date separator. If you specify a date separator, you may confuse users in other regions.

The following data formatting properties are locale-sensitive:

- **Currency symbol position**
- **Date separator**
- **Date ordering**
- **Calendar type**
- **Time separator**
- **Display AM/PM symbols**
- **Clock**
- **Decimal symbol**
- **Negative sign position**
- **Thousands separator**
- **Group size (digits)**
- **Secondary group size (digits)**
- **Missing value characters**
- **Zero value characters**
- **Pattern**
- **Negative pattern**

Locale-sensitive expressions

Expressions in Cognos Analytics - Reporting are locale-dependent and need to use locale-specific characters as list separators and decimal separators, as defined in the ISO standard.

The Cognos Analytics default format values are based on the ISO standard for specific locales. If changing the report locale, the expressions need to be updated accordingly, depending on the rules for the locale.

For example, if the **Content language** in user preferences is set to French, German, English (South Africa), and most European languages, the expressions must use the semicolon (;) character as a list separator in functions such as `cast`, or other functions that contain a list of parameters in their definition. For these languages, the following examples use the correct list separator:

```
TRIM ( cast([in-1] ; char(6)) ) || (' - ') || TRIM ( [description] )
```

```
cast([SQL1].[day_date] ; date)
```

Using a different character as a list separator for these languages would result in a validation error. To resolve the error, you could change the list separator to the semicolon (;), and save the expression.

For numeric values, the character that is used as a decimal separator is also locale-dependent. For example, in most languages, the decimal separator is the period (.) character. However, in French the decimal separator is a comma (,). Processing the expression `coalesce(2,3)` returns the numeric value of 2 in English. The same expression returns the value of 2,3 in French.

Resolving locale-related problems with list separators and decimal separators

To avoid problems with list separators and decimal separators in expressions, use a semicolon (;) as a list separator in any locale, and a period (.) as a decimal separator in any locale.

If a validation error occurs, edit the expression in the expression editor by replacing the list separator or decimal separator characters with characters that are supported for your locale.

If you don't want to use the ISO-defined defaults for list separators and decimal separators, you can override them in the `i18n_res.xml` configuration file in the following way:

1. Open the `cognos_analytics_install\configuration\i18n_res.xml` file in a text editor.
2. Find the line `<locale csvEncoding="windows-1252" lcid="7177">locale_name</locale>` for the locale you want to modify.

For example, for the en-za locale, find `<locale csvEncoding="windows-1252" lcid="7177">en-za</locale>`.

3. Edit this line by adding the following parameters with the changed characters for the list separator and decimal separator:

- `decimalSeparator="value"`
- `listSeparator="value"`
- `groupingSeparator="value"`

For example, for the en-za locale, the line can be modified in the following way: `<locale csvEncoding="windows-1252" lcid="7177" decimalSeparator="." listSeparator="," groupingSeparator=",">en-za</locale>`.

The list separator for the en-za locale is now a comma (,), and the decimal separator is a period (.).

4. Restart the Cognos Analytics service.

Suppress empty cells

Sparse data may result in crosstabs showing empty cells. For example, a crosstab that matches employees with products results in many rows of empty values for the revenue measure if the employee does not sell those products.

You can suppress rows, columns, or rows and columns based on divide by zero, missing, and overflow values. Suppressing rows or columns without data gives you a more concise view of your report.


Calculations are performed before suppression is applied. If you have multiple crosstabs or charts, you must select one in order to access suppression options.

Within a list report, suppression applies only to rows and is based on non-grouped data items. If details of a group are null, then the header and footer are also suppressed.

Suppression can also be applied to charts, repeaters, and repeater tables.

Access to the suppression feature depends on the settings in your modeling component, IBM Cognos Transformer, IBM Cognos Framework Manager, and IBM Cognos Administration.

Procedure

1. From the report object toolbar, click the **Suppress** icon  and click **Suppression options**.
2. Under **Suppress**, choose what sections to suppress.
3. Under **Suppress the following**, choose which values to suppress.

Related concepts

[Limitations When Formatting Empty Cells in SAP BW Data Sources](#)

Suppressing null cells by using filters

You can also use filters to suppress null cells in your reports. Using filters ensures that calculations take suppression into account. You may also obtain better report performance because the filtering is done at the data source.

If your report includes more than one measure or fact expression, it is best to base the filter on only one underlying fact or measure.

Relational-style Reports

In relational-style reports, you can use detail and summary filters.

Dimensional-style Reports

In dimensional-style reports, you can use the `filter` function.

For example, insert a set expression in your crosstab and use the expression `filter (descendants ([Set]) is not null)`. If your crosstab includes three or more levels within the same dimension on an edge, use the expression `filter (descendants (currentMember([Hierarchy]) is not null)`.

If your crosstab includes nested sets, filter the sets using a cascading approach to improve performance. For example, first filter the outermost (or highest nested level) set, and then filter the remaining sets proceeding inward.

Specify what appears for data containers that contain no data

You can specify what appears in a data container when no data is available from the database.

When no data is available, you can show one of the following options:


- An empty data container, such as a blank list.
- Alternate content, such as another data container or an image. You can insert any object from the **Toolbox** tab.
- Text, such as *There is no data available for this month*. If you show text, you can format it. By default, the text **No Data Available** appears.


You can specify what appears when no data is available for the following data containers: lists, crosstabs, charts, maps, repeaters, repeater tables, and tables of contents.


If your report includes multiple data containers, you can specify different no data contents for each container.

Tip: The No Data sample report in the GO Sales (query) package includes data containers that have no data.

Procedure

1. Select a data container.
2. In the **Properties** pane, click the select ancestor icon  and click the data container type.
3. Click the ellipsis button next to the **No data contents** property and select what should appear for data containers that contain no data:
 - To show an empty data container, click **No contents**.
 - To show alternate content, click **Content specified in the No data tab**.

Two tabs appear at the top of the data container and the **No data contents** tab  is selected automatically.

Click the **Toolbox** icon , insert the objects to appear when there is no data available into the **No data contents** tab.

- To show text, click **Specified text** and type the text that you want to appear.

Using patterns to format data

You can format data so that it matches any pattern of text and numbers when default formats are not appropriate. For example, you can format dates to use full text including the era, or you can format them to only use numbers and show the last two digits of years to save space.

Using symbols and patterns can provide similar results as basic data formatting tasks. For example, you can set how many digits appear after the decimal point. You can achieve these types of results with a pattern, or you can set the **Number of decimal places** property. Patterns allow flexibility for more complex requirements.

Each supported content language code requires a specific set of symbols to be used in patterns. For each language code, there are two tables you will need; one for date and time symbols, and one for decimal symbols. The decimal symbols are the same for all locales, however, date and time symbols are grouped into six locale groups. Check the Date and Time Symbol section to see which locale group is used for your locale.

To define patterns, open the **Data format** dialog box, and edit the **Pattern** property for each format type. Use the symbols that are defined in the language code tables, and follow these guidelines.

Pattern guidelines

When you define a pattern, the number of symbols you use affects how the data will be shown. There are different rules for text, numbers, and values that can take the form of text or numbers.

Text

You can specify whether text is produced in full or abbreviated form.

| Number of symbols | Meaning | Example |
|-------------------|------------------|----------------------|
| 4 or more | Full text form | EEEE produces Monday |
| Less than 4 | Abbreviated form | EEE produces Mon |

Numbers

The number of symbols you use in a pattern sets the minimum number of digits that are produced in a report. Numbers that have fewer digits than specified are zero-padded. For example, if you specify mm for minutes, and the database value is 6, the report will show 06.

Note: The year value is handled differently. If you specify two symbols for year, the last two digits of the year value is produced. For example, yyyy produces 2013, and yy produces 13.

Text and Numbers

For values that can produce text or numbers, such as months, you can specify whether text or numbers are produced, and whether words are abbreviated.

| Number of symbols | Meaning | Example |
|-------------------|---------|---|
| 3 or more | Text | MMMM produces January MMM produces Jan |
| Less than 3 | Numbers | MM produces 01 M produces 1 |

Date and time symbols

Date and time symbols are divided into locales, each of which is detailed in the following sections.

Locale Group A

Locales: af-za, en, en-au, en-be, en-bw, en-ca, en-gb, en-hk, en-ie, en-in, en-mt, en-nz, en-ph, en-sg, en-us, en-vi, en-za, fo-fo, gl-es, id, id-id, is, is-is, it, it-ch, it-it, kk-kz, ms, ms-bn, ms-my, nb-no, nl, nl-be, nl-nl, no, no-no, om-et, om-so, pl, pl-pl, pt, pt-br, pt-pt, so-dj, so-et, so-ke, so-so, sv, sv-fi, sv-se, sw-ke, sw-tz

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|-----------------|---------------------|
| Era | G | Text | AD |
| Year | y | Number | 2013 |
| Year (of 'Week of Year') | Y | Number | 2013 |
| Month in year | M | Text and number | July and 07 |
| Week in year | w | Number | 27 |
| Week in month | W | Number | 2 |
| Day in year | D | Number | 189 |
| Day in month | d | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | a | Text | pm |
| Hour in day (1 to 24) | k | Number | 24 |
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |
| Hour in a.m. or p.m. (1 to 12) | h | Number | 12 |

| Meaning | Symbol | Presentation | Example |
|-----------------------|--------|--------------|-----------------------|
| Hour in day (0 to 23) | H | Number | 0 |
| Minute in hour | m | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | z | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Locale Group B

Locales: be-by, bg-bg, el, el-gr, fi, fi-fi, hr, hr-hr, hu, hu-hu, ja, ja-jp, ko, ko-kr, ro, ro-ro, ru, ru-ua, ru-ru, sh-yu, sk, sk-sk, sl-si, sq-al, sr-sp, th, tr, tr-tr, uk-ua, zh, zh-cn, zh-hk, zh-mo, zh-sg, zh-tw

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|-----------------|---------------------|
| Era | G | Text | AD |
| Year | a | Number | 2013 |
| Year (of 'Week of Year') | A | Number | 2013 |
| Month in year | n | Text and number | July and 07 |
| Week in year | w | Number | 27 |
| Week in month | W | Number | 2 |
| Day in year | D | Number | 189 |
| Day in month | j | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | x | Text | pm |
| Hour in day (1 to 24) | h | Number | 24 |
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|--------------|-----------------------|
| Hour in a.m. or p.m. (1 to 12) | k | Number | 12 |
| Hour in day (0 to 23) | H | Number | 0 |
| Minute in hour | m | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | z | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Locale Group C

Locales: ca-es, cs, cs-cz, da, da-dk, es, es-ar, es-bo, es-cl, es-co, es-cr, es-do, es-ec, es-es, es-gt, es-hn, es-mx, es-ni, es-pa, es-pe, es-pr, es-py, es-sv, es-us, es-uy, es-ve, eu-es, mk-mk

| Meaning | Symbol | Presentation | Example |
|---------------------------|--------|-----------------|---------------------|
| Era | G | Text | AD |
| Year | u | Number | 2013 |
| Year (of 'Week of Year') | U | Number | 2013 |
| Month in year | M | Text and number | July and 07 |
| Week in year | w | Number | 27 |
| Week in month | W | Number | 2 |
| Day in year | D | Number | 189 |
| Day in month | t | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | a | Text | pm |
| Hour in day (1 to 24) | h | Number | 24 |

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|--------------|-----------------------|
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |
| Hour in a.m. or p.m. (1 to 12) | k | Number | 12 |
| Hour in day (0 to 23) | H | Number | 0 |
| Minute in hour | m | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | z | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Locale Group D

Locales: de, de-at, de-be, de-ch, de-de, de-lu

| Meaning | Symbol | Presentation | Example |
|---------------------------|--------|-----------------|---------------------|
| Era | G | Text | AD |
| Year | j | Number | 2013 |
| Year (of 'Week of Year') | J | Number | 2013 |
| Month in year | M | Text and number | July and 07 |
| Week in year | w | Number | 27 |
| Week in month | W | Number | 2 |
| Day in year | D | Number | 189 |
| Day in month | t | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | a | Text | pm |
| Hour in day (1 to 24) | h | Number | 24 |

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|--------------|-----------------------|
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |
| Hour in a.m. or p.m. (1 to 12) | k | Number | 12 |
| Hour in day (0 to 23) | H | Number | 0 |
| Minute in hour | m | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | z | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Locale Group E

Locales: fr, fr-be, fr-ca, fr-ch, fr-fr, fr-lu

| Meaning | Symbol | Presentation | Example |
|---------------------------|--------|-----------------|---------------------|
| Era | G | Text | AD |
| Year | a | Number | 2013 |
| Year (of 'Week of Year') | A | Number | 2013 |
| Month in year | M | Text and number | July and 07 |
| Week in year | w | Number | 27 |
| Week in month | W | Number | 2 |
| Day in year | D | Number | 189 |
| Day in month | j | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | x | Text | pm |
| Hour in day (1 to 24) | h | Number | 24 |

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|--------------|-----------------------|
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |
| Hour in a.m. or p.m. (1 to 12) | k | Number | 12 |
| Hour in day (0 to 23) | H | Number | 0 |
| Minute in hour | m | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | z | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Locale Group F

Locales: ga-ie

| Meaning | Symbol | Presentation | Example |
|---------------------------|--------|-----------------|---------------------|
| Era | R | Text | AD |
| Year | b | Number | 2013 |
| Year (of 'Week of Year') | B | Number | 2013 |
| Month in year | M | Text and number | July and 07 |
| Week in year | t | Number | 27 |
| Week in month | T | Number | 2 |
| Day in year | l | Number | 189 |
| Day in month | L | Number | 10 |
| Day of week in month | F | Number | 2 (2nd Wed in July) |
| Day of Week (1=first day) | e | Number | 2 |
| Day in week | E | Text | Tuesday |
| a.m. or p.m. marker | a | Text | pm |
| Hour in day (1 to 24) | u | Number | 24 |

| Meaning | Symbol | Presentation | Example |
|--------------------------------|--------|--------------|-----------------------|
| Hour in a.m. or p.m. (0 to 11) | K | Number | 0 |
| Hour in a.m. or p.m. (1 to 12) | k | Number | 12 |
| Hour in day (0 to 23) | U | Number | 0 |
| Minute in hour | n | Number | 30 |
| Second in minute | s | Number | 55 |
| Millisecond | S | Number | 978 |
| Time zone | c | Text | Pacific Standard Time |
| Escape used in text | ' | n/a | n/a |
| Single quote | " | n/a | ' |

Decimal format symbols

All locales

| Symbol | Meaning |
|--------|---|
| 0 | A digit that is shown even if the value is zero. |
| # | A digit that is suppressed if the value is zero. |
| . | A placeholder for decimal separator. |
| , | A placeholder for thousands grouping separator. |
| E | Separates mantissa and exponent for exponential formats. |
| ; | Separates formats for positive numbers and formats for negative numbers. |
| - | The default negative prefix. |
| % | Multiplied by 100, as percentage. |
| ‰ | Multiplied by 1000, as per mille. |
| ¤ | The currency symbol. If this symbol is present in a pattern, the monetary decimal separator is used instead of the decimal separator. |

| Symbol | Meaning |
|--------|---|
| ⌘ | The international currency sign. It will be replaced by an international currency symbol. If it is present in a pattern, the monetary decimal separator is used instead of the decimal separator. |
| X | Other characters that can be used in the prefix or suffix. |
| ' | Used to quote special characters in a prefix or suffix. |
| /u221E | Infinity symbol. |
| /uFFFD | Not a Number symbol. |

Chapter 19. Using query macros

A macro is a fragment of code that you can insert in the Select statement of a query or in an expression. For example, add a macro to insert a new data item containing the user's name.

You can include references to session parameters, parameter maps, and parameter map entries in macros. Parameter values are set when you run the query. For example, you can use the language session parameter to show only the data that matches the language setting for the current user.

Macros can be used in these different ways:

- They can be inserted in the SQL.

An example is `Select * from Country where Country.Name = #myMap{$runLocale}#`

- They can supply an argument to a stored procedure query subject.

If a value is not hard-coded for the argument, the stored procedure query subject can be used to return different data.

- They can be inserted in expressions, such as calculations and filters.

An example is a filter `[gosales].[Sales staff].[Staff name] = #UserLookUpMap{$UserId}#`

- They can be used as a parameter wizard.

Parameters can reference other parameters. An example is `Map1, Key = en-us, Value = #myMap{$UserId}#`

You can also add query macros to the IBM Cognos Framework Manager model. For more information, see the Framework Manager *User Guide*.

Support for query macros in IBM Cognos Analytics - Reporting includes the same capabilities as macros used in Framework Manager. However, Reporting query macros do not extend to the layout. Therefore, when making changes to the query using macros, you must bear in mind the side-effects on the layout. For example, if a macro removes a column from the query that the layout refers to, a run-time error will occur.

Syntax

Use the following syntax to reference session parameter and parameter values.

| Object | Syntax | Example |
|---|-----------------------------------|------------------------------------|
| Session key | <code>\$session_key</code> | <code>#my_account#</code> |
| Parameter map key | <code>\$map{<key>}</code> | <code>#map_one{'abc'}#</code> |
| Parameter map entry whose key is defined by a session parameter | <code>\$map{\$session_key}</code> | <code>#map_one{my_account}#</code> |

You can add the following elements to further define the macro expression.

| Symbol | Purpose |
|--|---|
| Single quotation marks ' ' | <p>Delineates a literal string that has a single quotation mark as part of the string.</p> <p>If the single quotation mark displays in a string, such as a query item, the string must be enclosed in a single quotation mark on both sides of the string and the single quotation mark must be doubled. For example, ab'c is written as 'ab' 'c'</p> <p>If the single quotation mark displays in a macro, the string must be enclosed in square brackets. For example, ab'c is written as [ab' c]</p> <p>If the single quotation mark displays in a prompt, there is no need to enclose the string.</p> <p>To escape a single quotation mark in an expression, use &apos ;</p> |
| Square brackets [] | Encloses model objects, such as a namespace or query subject and macro names that contain restricted characters, such as a number sign, hyphen, or space. |
| Curly brackets, also known as braces { } | <p>Calls a function that is unknown to the parser, such as dateadd in IBM Db2, and whose first argument is a keyword.</p> <p>Example:</p> <pre data-bbox="873 1087 1469 1178">dateadd ({month}, 2, <date expression>)</pre> |
| + operator | Concatenates two strings, such as 'abc' + 'xyz' |
| Single quote function (sq) | <p>Surrounds the result of a string expression with single quotation marks. If the single quotation mark displays in a string, such as a query item, the string must be enclosed in a single quotation mark on both sides of the string and the single quotation mark must be doubled. You can use this function to build clauses to test against literal parameter-driven values.</p> <p>Here is an example:</p> <pre data-bbox="873 1633 1469 1675">#sq(\$my_sp)#</pre> <p>If a session parameter (my_sp) has the value ab'cc, the result is</p> <pre data-bbox="873 1780 1469 1822">'ab"cc'</pre> |

| Symbol | Purpose |
|------------------------------|--|
| Double quote function (dq) | <p>Surrounds the result of a string expression with double quotation marks. You can use this function to refer to table and column names with non-identifier characters, such as a blank space or a percent sign (%).</p> <p>Here is an example:</p> <pre>#dq ('Column' + \$runLocale)#</pre> <p>If runLocale=en-us, the result is</p> <pre>"Column en-us"</pre> |
| Square bracket function (sb) | <p>Inserts a set of square brackets into the argument to build object references in a model query and model expressions, such as filters and calculations.</p> <p>Here is an example:</p> <pre>#sb ('my item in ' + \$runLocale)#</pre> <p>If runLocale=en-us, the result is</p> <pre>[my item in en-us]</pre> |

Add a query macro

Add a query macro to allow run-time changes to be made to SQL queries.

About this task

When you reference a parameter, you must do the following:



- Use a number sign (#) at the beginning and end of each set of one or more parameters.

Everything between the number signs is treated as a macro expression, which is processed at runtime. Framework Manager removes anything that is outside the number signs.

- Precede each parameter map entry with a dollar sign (\$)
- Use a name that starts with an alpha character (a..z, A..Z)

Do not insert macros between existing quotation marks or square brackets because IBM Cognos Analytics - Reporting does not execute anything within these elements.

Procedure

1. To add a macro to an expression, in the Expression Editor, click the macros tab .
2. Click the **Queries** icon , and click **Queries**.
3. If the query to which you are adding a macro was built by using your own SQL, do the following:
 - Click the **SQL** object that is linked to the query.
 - In the **Properties** pane, double-click the **SQL** property.
 - In the **SQL** dialog box, type the macro.

4. If the query to which you are adding a macro was not built by using your own SQL, do the following:

- Click the query.
- In the **Properties** pane, double-click the **Generated SQL/MDX** property.
- In the **Generated SQL/MDX** dialog box, click **Convert**.
- In the **SQL** dialog box, type the macro.

Creating prompts using query macros

You can create mandatory and optional prompts in reports using query macros.

Use the prompt macro functions `prompt` and `promptmany` to create single-value and multiple-value prompts. You can use prompt macro functions when working with a relational data source or a dimensionally-modeled relational (DMR) data source.

If you want to use a prompt macro in an expression such as a calculation, you must specify the data type when using an overloaded operator, such as a plus sign (+). You can use the plus sign to concatenate two items and to add two items.

If you want to define a filter on a dimension level and have the filter use the `prompt` or `promptmany` macro, you must provide the data type as `memberuniquename` and a default value.

Here is an example:

```
members( [MS_gosales].[New Dimension].[PRODUCTLINE].[PRODUCTLINE])  
  
in ( set( #promptmany('what', 'memberuniquename',  
  
' [MS_gosales].[PROD1].[PRODUCTLINE].[PRODUCTLINE]  
  
->[all].[1]')# ) )
```

Here is an example of a mandatory prompt:

```
select  
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,  
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,  
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,  
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME  
from  
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL  
where COUNTRY_MULTILINGUAL.COUNTRY = #prompt('CountryName')#
```

When default values are specified in the syntax of macro prompts, you may see an error. Use prompt syntax such as `where Country = ?Enter Country?`.

The `prompt` and `promptmany` functions have the following mandatory and optional parameters. All argument values must be specified as strings.

Name

This mandatory parameter is the name of the prompt. Name can also refer to the name of a parameter on a user-created prompt page, in which case the user-created prompt page appears when the report is run instead of the default prompt page that the macro would generate.

Datatype

This optional parameter is the prompt value data type. The default value is string. Prompt values are validated. In the case of strings, the provided value is enclosed in single quotation marks and embedded single quotation marks are doubled.

Values include the following:

- boolean
- date
- datetime
- decimal
- double
- float
- int
- integer
- interval
- long
- memberuniquename

Memberuniquename is not an actual data type. This value must be used when the data type of the parameter is member unique name (MUN).

- numeric
- real
- short
- string
- time
- timeinterval
- timestamp
- token

Token is not an actual data type. It is a way to pass SQL. A token does not pass values.

DefaultText

This optional parameter is the text to be used by default. If a value is specified, the prompt is optional.

If you use a space and no values are provided in the **Prompt Value** dialog box, a Where clause is usually not generated.

If you use text and no values are provided in the **Prompt Value** dialog box, a Where clause is usually generated using the default value.

Ensure that the text you provide results in a valid SQL statement.

Note: If the data type is memberuniquename, a value for the DefaultText parameter must be provided. For example:

```
(#prompt('WhichLevel', 'memberuniquename', '[goSalesAgain].[PRODUCT1].  
[PRODUCT].[PRODUCT(All)]->[all]')#)
```

Text

This optional parameter is text that precedes any user-provided values, such as 'and column1 = '.

QueryItem

This parameter is optional. The prompt engine can take advantage of the **Prompt Info** properties of the query item. Descriptive information can be shown, although the prompt value is a code.

TextFollowing

This optional parameter is the closing parenthesis that is used most often for the `promptmany` function. This parameter is also useful when the prompt is optional and is followed by hardcoded filters in the SQL statement.

Examples - selecting country or region prompts

When a report is run, you want your users to be prompted to choose the country or region for which they want to see data. The following code examples describe how you can use macros to create different prompts.

Mandatory prompt with no data type specified

Note the following:

- The `Datatype` argument is not specified. Therefore, it is a string, which is correct in this case.
- The `DefaultText` argument is not specified. Therefore, it is a mandatory prompt.

```
select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY = #prompt('CountryName')#
```

Mandatory prompt with the data type specified

Note the following:

- This prompt requires a valid integer value as response.
- The `DefaultText` argument is not specified. Therefore, it is a mandatory prompt.

```
select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE >
  #prompt('Starting CountryCode',
    'integer',
    '',
    '[gosales].[COUNTRY_MULTILINGUAL].[COUNTRY_CODE]')#
```

Optional prompt and mandatory filter with the data type and default value specified

Note the following:

- This prompt allows the user to supply a valid integer response.
- The `DefaultText` argument is specified. Therefore, the user may omit entering a value, in which case the value 10 is used. This makes it an optional prompt, but not an optional filter.

Example 1:

```
select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
```

```

        COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
    from
        gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
    where COUNTRY_MULTILINGUAL.COUNTRY_CODE >
        #prompt('Starting CountryCode',
            'integer',
            '10'
        )#

```

Example 2:

```

[gosales].[COUNTRY].[COUNTRY] = #prompt('countryPrompt','string','''Canada''')#
Result 2:
[gosales].[COUNTRY].[COUNTRY] = 'Canada'

```

Note the following:

- The defaultText parameter must be specified such that is literally valid in the context of the macro, because no formatting takes place on this value. See details below.
- The default string Canada in Example 2 is specified as a string using single quotes, in which the embedded single quotes are doubled up, thus 3 quotes. This results in the string being properly displayed within single quotes in the expression.
- As a general rule for the string datatype, the defaultText should always be specified as in the previous note, except in the context of a stored procedure parameter.
- For the defaultText of types date or datetime, a special format should be used in the context of SQL. Examples of these formats are 'DATE ''2012-12-25'' ' and 'DATETIME ''2012-12-25 12:00:00'' ' . In all other contexts, you use the date/datetime without the keyword and escaped single quotes (e.g., '2012-12-25').

Prompt that appends text to the value

Note the following:

- The DefaultText argument is specified as a space character. In this case, the generated text is just the space character, which eliminates the Where clause from the query.
- The Text argument is specified, which is written into the generated SQL before the user-provided prompt value.

```

select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
#prompt('Starting CountryCode',
    'integer',
    '10',
    'where COUNTRY_MULTILINGUAL.COUNTRY_CODE >'
)

```

Syntax substitution

Note the following:

- The Datatype argument is set to token, which means that the user-provided value is entered without any checking on the provided value.

Because checking is not performed on the value, the expression editor may indicate that the expression is not valid. When a valid user-provided value is supplied or if you provide a valid default value, expression editor will interpret the expression as valid.

- Token should be used only if there is a list of pick-values for the user.

- The DefaultText argument is specified. Therefore, this is an optional prompt and group by COUNTRY is used in the generated SQL.

```

Select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
#prompt('Sort column',
        'token',
        'group by COUNTRY',
        'group by '
)##

```

Examples - creating prompts that use parameter maps

When a report is run, you want your users to select a language for the data in the report. The following examples describe several ways you can do this.

Prompt that uses session variables

Note the following:

- The name of the prompt is specified using a lookup in the parameter map named PromptLabels. The key value is the session variable \$language.
- The Where clause is using a parameterized column.

```

select
  ORDER_METHOD.ORDER_METHOD_CODE as ORDER_METHOD_CODE,
  ORDER_METHOD.ORDER_METHOD_#language#
  as ORDER_METHOD_EN
from
  gosales.gosales.dbo.ORDER_METHOD ORDER_METHOD
#prompt($PromptLabels{$language},
        ' ',
        ' ',
        'where ORDER_METHOD.ORDER_METHOD_' + $language + '
>'
)##

```

A parameter map that nests prompts

Note the following:

- In the model, there is a parameter map DynPromptLabels with #{\$PromptLabels{\$language}}#
- Part of the prompt information is run from a parameter map instead of being coded directly inside the SQL.
- The whole macro containing the prompt can be a value in a parameter map.

```

select
  ORDER_METHOD.ORDER_METHOD_CODE as ORDER_METHOD_CODE,
  ORDER_METHOD.ORDER_METHOD_#language#
  as ORDER_METHOD_EN
from
  gosales.gosales.dbo.ORDER_METHOD ORDER_METHOD
#prompt($DynPromptLabels{'ex9'},
        ' ',
        ' ',
        'where ORDER_METHOD.ORDER_METHOD_' + $language + '
>'
)##

```

Examples - creating a multiple value prompt

When a report is run, you want your users to select one or more values. The following examples describe several ways you can do this.

Prompt with a required minimum

Note the following:

- The user must enter at least a single value.
- This resembles the first example on prompting for a country or region [“Mandatory prompt with no data type specified”](#) on page 448.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY IN (#promptmany('CountryName')#)
```

Prompt with a required minimum with the data type specified

Note the following:

- This resembles the second example on prompting for a country or region [“Mandatory prompt with the data type specified”](#) on page 448.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN (
    #promptmany('Selected CountryCodes',
        'integer',
        ',',
        ',',
        '[gosales].[COUNTRY_MULTILINGUAL].[COUNTRY_CODE]')#
    )
```

Optional prompt with the data type and default value specified

The In clause and both parentheses are part of the SQL statement.

```
select
    COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
    COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
    COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
    COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
    gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN (
    #promptmany('Selected CountryCodes',
        'integer',
        '10'
    )#
    )
```

Prompt that adds text before the syntax

Note the following:

- This example uses the TextFollowing argument.

```

select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL
#promptmany('Selected CountryCodes',
             'integer',
             ' ', // < = = this
is a space
             'where COUNTRY_MULTILINGUAL.COUNTRY_CODE IN
( ',
             ' ',
             ')')
)#

```

Optional prompt that adds text before the syntax

```

Select
  COUNTRY_MULTILINGUAL.COUNTRY_CODE as COUNTRY_CODE,
  COUNTRY_MULTILINGUAL.COUNTRY as COUNTRY,
  COUNTRY_MULTILINGUAL."LANGUAGE" as LANGUAGE1,
  COUNTRY_MULTILINGUAL.CURRENCY_NAME as CURRENCY_NAME
from
  gosales.gosales.dbo.COUNTRY_MULTILINGUAL COUNTRY_MULTILINGUAL,
  gosales.gosales.dbo.COUNTRY XX
where COUNTRY_MULTILINGUAL.COUNTRY_CODE = XX.COUNTRY_CODE
#promptmany('Selected CountryCodes',
             'integer',
             ' ',
             ' and COUNTRY_MULTILINGUAL.COUNTRY_CODE IN ( ',
             ' ',
             ')')
)#

```

Chapter 20. Drill through access

Using drill through access, you can move from one report to another within a session while maintaining your focus on the same piece of data. For example, you select a product in a sales report and move to an inventory report about that product.

Drill through access helps you to build analytical applications that are bigger than a single report. drill through applications are a network of linked reports that users can navigate, retaining their context and focus, to explore and analyze information.

Drill through access works by defining the target report or object and then using information from the source report to filter the target. IBM Cognos Analytics with Watson can match data from the source to metadata in the target report, or you can define parameters in the target for greater control.

Note: In the dimensional reporting style, you can also enable drilling up and drilling down. For more information about drilling up and drilling down, see [“Create a drill-up and drill-down report” on page 359](#).

Note: Drill through is not available for box plot and bullet visualizations.

What you should know

For a drill through link to work, it is necessary to know the following things:

- The source
- The target
- How the data in the packages that contain these objects is related

Depending on the underlying data, you may create a drill through definition and have IBM Cognos Analytics with Watson match the data (dynamic drill through) or create parameters in the target (parameterized drill through).

- Whether to run the target report or to open it

The target of drill through access is usually a saved report definition. The report can be created in IBM Cognos Analytics - Reporting, IBM Cognos Query Studio, IBM Cognos PowerPlay Studio, or IBM Cognos Analysis Studio. The target of drill through access can also be a package that contains an IBM Cognos PowerCube, in which case a default view of the PowerCube is created.

- Whether the users of the drill through link in the source report have the appropriate permissions to view or run the target report
- If the target is being run, in what format to run it, and what filters to use on the target

If you do not want to run the target report on demand, you may link to a bookmark in the saved output instead of running the report. For more information, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

Sources and targets

In IBM Cognos Analytics with Watson, there are many different examples of source and target. For example, you can drill through in the following ways:

- Between reports created in different packages against different data source types, such as from an analysis against a package that contains a PowerCube to a detailed report against a package based on a relational data source
- From one existing report to another report using definitions created in Reporting
- Between IBM Cognos Viewer reports authored in Reporting, Query Studio, and Analysis Studio
- To and from a package built on a PowerCube

Tip: In the GO Data Warehouse (analysis) package, the Positions to Fill sample report is a drill through target report and the Recruitment Report sample report is a drill through source report.

Understanding drill-through concepts

Before you set up drill-through access, you must understand the key concepts about drilling through. Knowing these concepts will help you to avoid errors so that report consumers drill through as efficiently as possible.

Drill through paths

You can create a drill through path in a source report, or using drill through definitions. A drill through path is the definition of the path that is taken when moving from one report to another, including how the data values are passed between the reports.

Using **Drill Through Definitions**, you can create a drill through path from any report in the source package to any target report in any other package. This type of drill through definition is stored in the source package.

For any target report that contains parameters, you should map the target parameters to the correct metadata in the drill through path. This ensures that the values from the source report are passed to the correct parameter values, and that the target report is filtered correctly. If you do not map parameters, then the users may be prompted for values when the target report is run.

A report-based drill through path refers to a path created and stored in a source report. This type of drill through path is also called authored drill through. The path is associated with a specific data column, chart, or cross tab in the source report, and is available only when users select that area of the report. If an authored drill through definition is available, a hyperlink appears in the source report when it is run.

Report-based drill through is limited to reporting source reports and any target reports. Use this type of drill through access when you want to pass data item values or parameter results from within a source report to the target report, pass the results of a report expression to a target report, or a use URL link as a part of the drill through definition.

Selection contexts

The selection context represents the structure of the values selected by the user in the source.

In IBM Cognos Analysis Studio, this includes the context area. When a package drill through definition is used, the selection context is used to give values for mapped parameters (parameterized drill through) or also to map the appropriate data items and values.

Drill through links can also be defined to open the target object at a bookmark. The content of this bookmark may also be specified by the selection context.

Drill through access is possible between most combinations of the IBM Cognos Analytics with Watson studios. Each studio is optimized for the goals and skills of the audience that uses it, and in some cases for the type of data source it is designed for. Therefore, you may need to consider how the various studios manage the selection context when you drill through between objects created in different studios, and how the data sources are conformed. During testing or debugging, you can see how source values are being mapped in different contexts using the drill through assistant.

Drilling through to different report formats

The settings in the drill through definition determine the format in which users see the report results.

For example, the users may see the reports in IBM Cognos Viewer as an HTML Web page, or the reports may open in IBM Cognos Query Studio, IBM Cognos PowerPlay Studio, or IBM Cognos Analysis Studio. If your users have PowerPlay Studio, then they may also see the default view of a PowerCube.

Reports can be opened as HTML pages, or as PDF, XML, CSV, or Microsoft Excel spreadsheet software formats. When you define a drill through path, you can choose the output format. This can be useful if the expected use of the target report is something other than online viewing. If the report will be printed, output it as PDF; if it will be exported to Excel for further processing, output it as Excel or CSV, and so on.

To run reports, or drill to targets that run reports in the delimited text (CSV), PDF, Microsoft Excel spreadsheet (XLS), or XML output formats, users require the generate output capability for the specific format.

Note: PDF drill through is supported only in Chrome and Firefox browsers. The version of the Firefox browser must at least be ESR 80.

If you define a drill through path to a report that is created in Analysis Studio, PowerPlay Studio, or Query Studio, consumers can open the report in its studio instead of in IBM Cognos Viewer. This can be useful if you expect a consumer to use the drill through target report as the start of an analysis or query session to find more information.

For example, if an application contains a dashboard style report of high-level data, you can define a drill through link to Analysis Studio to investigate items of interest. The Analysis Studio view can then be drilled through to a PDF report for printing.

Note: IBM Cognos Analytics - Reporting does not display data results.

PDF drill-through behavior

PDF drill-through behavior is slightly different in different versions of Cognos Analytics.

In Cognos Analytics 11.1.7 and earlier versions, PDF drill through is supported only in Internet Explorer, using Adobe Acrobat Reader. Acrobat Reader provides a mechanism that allows for generation of self-contained PDFs where the drill-through information is encapsulated in the PDF. Drill-through links work as long as the PDF is viewed in Acrobat Reader.

Starting in Cognos Analytics 11.2.0, PDF drill through is available in all supported browsers and their respective PDF viewers. Because some of the viewers don't provide the same functionality as Acrobat Reader, the PDF output needs to be saved in Cognos Analytics for the drill-through links to work.

For cases where the PDF output is not saved in Cognos Analytics, a change is delivered in Cognos Analytics 11.2.4 that allows the drill-through links to work like they did in Cognos Analytics 11.1.7: in self-contained PDF reports that can be viewed in Adobe Acrobat Reader. The drill-through links don't work if the PDF report is opened outside of Cognos Analytics, in a viewer other than Adobe Acrobat Reader.

Downloaded PDF reports can be opened in any PDF viewer. However, drill-through links work only in the following situations:

- The downloaded PDF report is viewed in Adobe Acrobat Reader.
- The report output is saved in Cognos Analytics, such as when running a report in the background and selecting the **Save** delivery option.

PDF reports that are viewed within Cognos Analytics work in all supported browsers.

Drilling through between packages

You can set up drill through access between packages.

The two packages can be based on different types of data source, but there are some limits. The following table shows the data source mappings that support drill through access.

| Source data source | Target data source |
|--------------------|---|
| OLAP | OLAP Note: OLAP to OLAP drill through is supported only if the data source type is the same, for example, SSAS to SSAS. |

Table 10. Data source mappings that support drill through access (continued)

| Source data source | Target data source |
|----------------------------------|--|
| OLAP | Dimensionally modeled relational |
| OLAP | Relational data Note: For more information, see “Business keys” on page 458. |
| Dimensionally modeled relational | Dimensionally modeled relational |
| Dimensionally modeled relational | Relational |
| Relational | Relational |

Bookmark references

When you drill through, the values that you pass are usually, but not always, used to filter the report. IBM Cognos Analytics with Watson supports bookmarks within saved PDF and HTML reports so that a user can scroll a report to view the relevant part based on a URL parameter.

For example, you have a large inventory report scheduled to run daily or weekly during off hours because of resource considerations. Your users may want to view this report as a target because it contains detailed information, but you want them to view the saved output rather than run this large report. Using this Action option and bookmark settings, users can drill through from another source location based on products to open the saved report to the page that shows the product they want to focus on.

When a bookmark in the source report is used in a drill through definition, it provides the value for the URL parameter. When report consumers drill through using this definition, they see the relevant section of the target report.

Note: Bookmarks are not supported with drill through on visualizations.

Bookmark references are limited to previously run reports that are output as PDF or HTML and contain bookmark objects.

Members and values

Dimensionally modeled data, whether stored in cubes or stored as dimensionally modeled relational (DMR) data, organizes data into dimensions. These dimensions contain hierarchies. The hierarchies contain levels. And the levels contain members.

An example of a dimension is Locations. A Locations dimension may contain two hierarchies: Locations by Organization Structure and Locations by Geography. Either of these hierarchies may contain levels like Country or Region and City.

Members are the instances in a level. For example, New York and London are members in the City level. A member may have multiple properties, such as Population, Latitude, and Longitude. Internally, a member is identified by a Member Unique Name (MUN). The method by which a MUN is derived depends on the cube vendor.

Relational data models are made up of data subjects, such as Employees, which are made up of data items, such as Name or Extension. These data items have values, such as Peter Smith.

In IBM Cognos Analytics with Watson, the methods of drilling through available are

- Dimensional (member) to Dimensional (member)
- Dimensional (member) to Relational (data item value)
- Relational (data item value) to Relational (data item value)

If the target parameter is a member, the source must be a member. The source and target should usually be from a conformed dimension. However, if the data supports it, you may also choose to define a mapping using different properties of the source metadata item.

If the target parameter is a value, the source can be either a value or a member. If the source is a dimensional member, you must ensure that the level or dimension is mapped to the target data item correctly in the drill through definition. The business key from which the member is sourced should usually match the relational target value, which is most often the business key. However, if the data supports it, you may also choose to define a mapping from the caption of the source metadata item.

Member unique names

The member unique name (MUN) is a unique identifier for a member in IBM Cognos reports. It is stored in the report specification when the member is referenced in the report directly.

The MUN is used in drill through between OLAP data sources. The member keys in the MUN for the different OLAP data sources must match.

The MUN is used to find the member in the data source, which is similar to how business keys are used to find records in a table. For example, when you create OLAP dimension Products, you use the Product Line database column as a label for the members in your Product Line level. However, you use the Product Line Code business key from the database table to ensure that all the Product lines are unique in that level. The source value that you used to create the members is used in combination with the data source name, hierarchy, and level information in the member unique name.

If the MUN changes, members that are directly referenced in expressions, filters, or reports are no longer found. Changes to the MUN may be related to other changes. For example, changes to the hierarchy and level structures may change the level unique name, and changes to the business key values may change the member key path. Other factors that can affect the MUN are application changes during the design stage or over time, IBM Cognos PowerCube category codes that are unpredictably unique, the production environment that has more members than the test environment, or removing the member from the data source.

To avoid potential problems, we recommend the following best practices when you build OLAP data sources:

- Use unique codes and keys within a dimension for the member keys.
- Define your OLAP and relational packages using unique conformed values for the source values (business keys) within similar dimensions or data values where drill through between applications may be required.
- Ensure that the business keys and dimension metadata structure are the same in the production and test environments.
- Do not change the business keys in IBM Cognos Framework Manager in the production environment.
- Resolve the non-unique keys in a dimension in the data source before you build the cube.

Ensure that there are no duplicate source values in all levels of a dimension before you build a PowerCube. We do not recommend using the tilde character (~) in the category codes.

Conformed dimensions

If you work with more than one dimensional data source, you may notice that some dimensions are structured the same, and some are not.

The reason that dimensions can be structured differently is that the data sources may serve different purposes.

For example, a Customer dimension appears in a Revenue data store, but not in an Inventory data store. However, the Products dimension and the Time dimension appear in both data stores.

Dimensions that appear in multiple data stores are conformed if their structure is identical for all of the following:

- hierarchy names
- level names
- level order
- internal keys

Drilling through is possible between different dimensional data stores only if the dimensions are conformed, and if the dimension data store is of the same vendor type, such as IBM Cognos PowerCube as the source and the target. For example, in two data stores for Revenue and Inventory that contain Products and Time dimensions, it is possible to define the Products and Time dimensions differently for each data store. However, for drill-through between the Products and Time dimensions to work, their structures must be identical in each data store.

If you are not sure whether your dimensions are conformed, then you should check with the data modeler to ensure that the drilling through will produce meaningful results.

IBM Cognos Analytics with Watson does not support conformed dimensions generated by IBM Cognos Framework Manager for SAP BW data sources.

Dimensionally modeled Relational Data Sources

Ensure that each level contains a business key that has values that match your PowerCube or other DMR models. Also, you must also ensure that the **Root Business Key** property is set and uses the business key of the first level in the hierarchy. This helps to ensure that you have a conformed member unique name when attempting to drill through using members from this dimension.

Business keys

When drill-through access is defined from a member to a relational value, the business key of the member is passed by default.

This means that your relational target parameter must be set up using the data item with a matching value, which is most often the business key data item. You can also choose to pass the caption of the source metadata item.

For example, employees are usually uniquely identified by an employee number, not by their name, because their name is not necessarily unique. When you drill through from a dimensional member to a relational data item, the value provided is the business key. Therefore, the parameter in the target report must be defined to accept a business key value. The exact logic used to define the business key value supplied depends on the cube vendor. For IBM Cognos PowerCubes, the business key value is the **Source** property defined for the level in IBM Cognos Transformer. IBM Cognos Series 7 Transformer PowerCubes pass the source value if the drill-through flag was enabled before the cube was built. Otherwise, the category code is used.

In IBM Cognos Analytics - Reporting, you can determine what the member business key is using an expression such as `roleValue('_businessKey', [Camping Equipment])`. This expression is case-sensitive.

SSAS 2005 multipart business keys are not supported in drill-through operations.

Tip: When other users run your drill-through report, you may not want them to be prompted for a business key. In Reporting, you can build a prompt page with a text that is familiar to the users, but filters on the business key. Your IBM Cognos Framework Manager modeler can also set the **Display Item Reference** option for the **Prompt Info** property to use the business key when the data item is used in a prompt.

Scope

Scope is specific to drill-through definitions created using drill-through definitions (package drill-through definitions). The scope you set defines when the target report is shown to the users, based on the items they have in the source report.

Usually, you define the scope of a drill-through path to match a parameter that it passes. For example, if a target report contains a list of employees, typically you want to display the report as an available drill-through choice only when a user is viewing employee names in a source report. If employee names are not in the source report and the scope was set on the employee name in the drill-through definition, the employee report does not appear on the list of available drill-through target reports in the **Go To** page. You can set the scope to a measure or to an item in the report.

In report-based drill-through access, where the drill-through path is associated with a specific report column, the column serves as the scope.

Mapped parameters

Drill-through targets may contain existing parameters or you can add parameters to the target for greater control over the drill-through link.

You usually map all parameters in a drill-through target to items from the source.

When you map source items that are OLAP or DMR members to target parameters, you can select from a set of related member properties to satisfy the requirements of the target parameter. For a dimensional target, a dimensional source item uses the member unique name by default. For a relational target, a dimensional source item uses the business key by default.

For example, you could change the source member property that is used for a mapping to the member caption instead of the business key to match the parameter in a relational target. For a dimensional target, you could define a parameter that accepts a particular property (such as business key or parent unique name), then pass the appropriate source property to satisfy that target.

Note: If you define drill through between non-conformed dimensions, you should test carefully to ensure that the results behave as expected.

If you do not specify parameter mappings, then by default, you will be prompted for any parameters required in the target when you use the drill-through link. To customize this behavior, use the display prompt pages setting.

When the action is set to **Run the report using dynamic filtering**, then additional filtering is applied if names from the context in the source report match names of items in the target. Use this action as well when there are no parameters defined in the target.

If parameters are not mapped correctly, then you may receive an empty report, the wrong results, or an error message.

The source and target cannot contain identical parameter names when they are from different packages, even if the data structure is conformed. If the source and target are from the same package, there is no restriction.

If you have the necessary permissions, you can use the drill-through assistant to look at what source parameters are passed, and what target parameters are mapped for a given drill-through link.

You can change the dynamic drill-through filter behavior if you want drill-through to generate a filter using the Member Business Key instead of the default Member Caption. For more information, see *Changing Drill-Through Filter Behavior* in the *IBM Cognos Administration and Security Guide*.

Drilling through on dates between PowerCubes and relational packages

The usual method of drilling through from OLAP to relational packages requires that the target report parameter is set using the business key in the relational data, which does not work well for dates.

OLAP data sources typically view dates as members, such as Quarter 1 2012, while relational data sources view dates as ranges, such as 1/Jan/2012 to 31/March/2012.

A special feature exists for drilling through between PowerCubes and relational packages. Ensure that the target report parameter is set up using `in_range`. The parameter must be of type date-time, and not integer.

An example follows:

```
[gosales_goretailers].[Orders].[Order date] in_range ?Date?
```

Also ensure that the drill-through definition maps the parameter at the dimension level and that the PowerCube date level is not set to suppress blank categories. Enabling the option to suppress blank categories in the Transformer model before you build the cube may cause the drill-through on dates to be unsuccessful. This happens because there are missing values in the range.

Set up drill through access in a report

Set up drill through access in a source report to link two reports containing related information.

You can then access related or more detailed information in one report (the target) by selecting one or more data item values from another report (the source). IBM Cognos passes values from the source to the target and uses the passed values to filter the target object. If the data in the source and target is conformed or if the data item names are the same, then the system may map the source values to filter the target (dynamic drill through). If you require greater control, you may define parameters in the target object (parameterized drill through).

Note: Dynamic drill through is not supported on visualizations.

For instructions about creating parameters in other kinds of targets, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

When you define the drill through path in IBM Cognos Analytics - Reporting, you can pass a value from a different data item that is hidden from the user for display purposes but still in the query. For example, users see the Product Name data item and can drill through on that item, but the drill through definition passes the Product Number value for the product name the user chose. You can also define the target parameter to accept multiple values or a range of values from the data item in the drill through source report or to accept a value from a parameter in the source report.

Drill through definitions that have been authored inside a Reporting report appear in the source report as blue underlined links. Users click the hyperlink to select the value they want passed to the target and to drill through to the target report. If a user selects multiple items within a single column then when the drill through target report is run, the values from each selected row are passed to the target parameters. This occurs as an *and* condition.

You can also drill through within the same report by creating bookmarks. As well, you can create drill through definitions in the source package instead of the Reporting report. Users can use package drill through definitions to navigate to a target report from an IBM Cognos Analysis Studio analysis, an IBM Cognos Query Studio report, an IBM Cognos PowerPlay Studio report or IBM Cognos PowerCube package, or a Reporting report. For more information, see the *Administration and Security Guide*.

If you have the IBM Cognos Software Development Kit, you can use URLs to set up drill through access to and from third-party sources.

You can also drill through from a map.

Create a parameter in the target

Set up drill through access in a source report to link two reports that contain related information. You can then access related or more detailed information in one report (the target) by selecting one or more data item values from another report (the source).

If you are using an SAP BW data source for the target report and the target report contains a variable for a hierarchy node, values from the source report can be values only of the data item representing the leaf-level identifier of the hierarchy.

Before you begin

Before you begin, ensure that you have a report that will serve as the source report and another report that will serve as the target report.

Procedure

1. In IBM Cognos Analytics - Reporting, open the target report.
2. Create a parameter that will serve as the drill through column or that will filter the report.

For example, to drill through or filter Product line, create the following parameter:

[Product line]=?prodline_p?

Tip: Use the operators `in` or `in_range` to enable the target report to accept multiple values or a range of values.

3. In the **Usage** box, specify what to do when a value for the target parameter is not passed as part of a drill through:

- To specify that users must select a value, click **Required**.

If a value for the target parameter is not passed, users are prompted to choose a value.

- To specify that users do not need to select a value, click **Optional**.

Users are not prompted to choose a value and so the value is unfiltered.

- To specify not to use the parameter, click **Disabled**.

The parameter is not used during the drill through. It will also not be used in the report for any other purposes.

Tip: If the parameter is needed in the report for other reasons, then you can also specify not to use it in the drill through definition (**Parameters** table, **Method**, **Do not use parameter**).

Create a drill through definition

Create a drill through definition to link two reports containing related information (the source report and the target report).

Drill through definitions that have been authored inside an IBM Cognos Analytics - Reporting report appear in the source report as blue underlined links. Users click the hyperlink to select the value they want passed to the target and to drill through to the target report. If a user selects multiple items within a single column then when the drill through target report is run, the values from each selected row are passed to the target parameters. This occurs as an *and* condition.

Before you begin

Before you begin, ensure that you have a report that will serve as the source report and another report that will serve as the target report.

Procedure


1. Check the drill through target:
 - Confirm that the drill through users have access to the target.
 - If necessary, check what parameters exist in the target.
2. Open the source report.
3. Click the element in the report that will serve as the starting point for the drill through link.

You can select a data item that your report users are likely to choose to drill on for more detailed information, such as an Employee Name data item.

Click the individual parts of the visualization or the legend to drill through on. You can also select a combination of visualization parts and the legend.

Click the Data panel in the visualization to create a drill through definition.

Tip: If you are passing only parameter values to the target report, you do not have to drill on a data item. Instead, you can drill on any object in the report, such as the report title. Therefore, you can drill from outside the context of a query.

4. Click the **Show properties** icon , in the **DATA** section, double-click the **drill through definitions** property.

5. Click the **Add** icon .

A drill through definition is created.

Tip: To change the drill through name, click the rename button, type the new name, and click **OK**.

6. On the **Target report** tab, click the ellipsis button next to the **Report** box and select the drill through target report.
7. In the **Action** box, decide how users will view the target report when they click the drill through link in the parent report:
 - To view the latest data in IBM Cognos Viewer, select **Run the report**.
 - To edit an IBM Cognos Query Studio, IBM Cognos Analysis Studio, or IBM Cognos PowerPlay Studio target, select **Edit the report**.
 - To have IBM Cognos Analytics with Watson match values from the selection context with data in the target (dynamic filtering), select **Run the report using dynamic filtering**.

Note: If you chose this option, any parameters in the target report are still used for the drill through access.

- To view the most recently saved output version of the target report from the IBM Cognos Analytics with Watson portal, select **View the most recent report**.
 - To use the default action specified for the report in the IBM Cognos Analytics with Watson portal, select **(Default)**.
8. If the target report contains parameters, then, under the **Parameters** box, click the edit button.

Each required and optional parameter defined in the target report appears in the **Parameters** dialog box.

9. For each parameter, specify the **Method** of treatment:

- To specify not to pass any value, click **(Default)**.
- To specify not to use this parameter, click **Do not use parameter**.

The target report will not be filtered by this parameter.

- To pass values from a data item, click **Pass data item value**, click **Value**, and then click the data item.

Values for the selected data item are passed to the target report.

- To pass values from a source report parameter, click **Pass parameter value**, click **Value**, and then click the parameter.

Values for the selected parameter are passed to the target report.

- If you choose to pass parameters, and the source report is based on a dimensional package, then click an item from the drop-down list in the **Source metadata item properties** column. You can pass the default property of the source metadata item (business key) or another property, such as the member caption.

10. Click **OK**.

11. If you chose to run the target report, in the **Format** box, click the output format for your report.

Tip: Click **(Default)** to run the report using the default format specified for the report in the IBM Cognos Analytics with Watson portal.

12. To open the target report in a new window, select the **Open in new window** check box.

13. In the **Display prompt pages** box, choose how to display prompt pages:

- To always display prompt pages when the drill through action occurs regardless of whether values were specified for the required parameter values, click **Always**.
- To use the prompt settings of the target report (specified by the **Prompt for Values** check box in the IBM Cognos Analytics with Watson portal, **Report Properties, Report** tab) to determine whether to show the prompt pages, click **Based on the default prompt settings of the target report**.

Tip: If you leave the **Prompt for values** check box selected (the default) and run a report that contains the same parameter name that appears in your **My parameters** panel, you are not prompted to provide a value for the parameter. The system automatically uses the default values that were set for the user's role. Even if the parameter on the report is optional, the default value for the global parameter is passed.

- To not display prompt pages when the required parameter values are provided by the drill through definition, click **Only when required parameter values are missing**. This is the default setting.

Results

The drill through text appears as a blue hyperlink in text items in the non-chart areas of the report. Report consumers can also start the drill through action by clicking the **Go To** button or by right-clicking the item and clicking **Go To, Related links**. If you have the necessary permissions, you can view which parameters were passed from the source and how they are mapped in the target object from the **Go To** page using the drill through assistant.

Note: The right-click method is not available for visualizations. Use the **Related links** option.

For more information, see the *Administration and Security Guide*.



Defining independent drill through definitions for crosstabs

By default, you can create only one drill through definition for fact cells in a crosstab, regardless of how many facts there are. This topic describes how to define different drill through definitions for different measures in crosstab fact cells.

For example, a crosstab has Quantity and Revenue as measures. For the Quantity cells, you want to define a drill through definition to a target report that contains more information about quantities sold. For the Revenue cells, you want to define a drill through definition to a different target report that shows details about revenue generated.

Procedure

1. Open the source report.


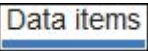
2. Click the **More** icon  and then click the **Locked** icon .

3. In the crosstab, click the white space inside one of the fact cells of the measure for which you want to define a drill through definition.

Do not click the measure text. You want to select the crosstab intersection and not the text item. In the **Properties** pane title bar, ensure that **Crosstab intersection** appears.

4. In the **Properties** pane, set the **Define contents** property to **Yes**.

The text item in the crosstab intersection disappears.

5. Click the **Data** icon  and then click the **Data items** tab .

6. From the crosstab query, drag the measure that disappeared in step 4 to the empty crosstab intersection.
7. Click the measure in the crosstab intersection and then, in the **Properties** pane, click **Drill-through definitions**.
8. Create the drill through definition.

Results

A drill through definition is defined for the selected measure. Repeat the steps to define different drill through definitions for other measures in the crosstab. When users run the report, clicking values from different measures takes them to a different target report.

Specify the drill through text

You can specify the drill through text that appears when users can drill through to more than one target.

For example, if users from different regions view the report, you can show text in a different language for each region.

Procedure


1. Click the drill through object and then, from the **Properties** pane, click **Drill-through definitions**.
2. If more than one drill through definition exists for the object, in the **Drill-through definitions** box, click a drill through definition.
3. Click the **Label** tab.
4. To link the label to a condition, in the **Condition** box, do the following:
 - Click **Variable** and click an existing variable or create a new one.
 - Click **Value** and click one of the possible values for the variable.
5. In the **Source type** box, click the source type to use.
6. If the source type is **Text**, click the ellipsis button that corresponds to the **Text** box and type text.
7. If the source type is **Data item value** or **Data item label**, click **Data Item** and click a data item.
8. If the source type is **Report expression**, click the ellipsis button that corresponds to the **Report expression** box and define the expression.
9. If the label is linked to a condition, repeat steps 5 to 8 for the remaining possible values.

Results

When users run the source report and click a drill through link, the **Go to** page appears. The drill through text you specified appears for each target. If you did not specify the drill through text for a target, the drill through name is used.

Chapter 21. Working with multiple pages

Divide a report into multiple pages and add navigation elements to make it easier to use.

Note: The pages that you see in the **Pages** icon  differ from physical, printed pages. For example, if you create page breaks in a long report, the **Pages** icon could show only one page, but your report could include several physical pages when you print it.

Add a page to a report

Add pages to create a multiple-page report.

About this task


Reports may contain pages with a variety of content. For example, you are creating a sales report and you want to include general information about the company. You decide to create an introduction page to show this information. When you run the report, page 1 of the report is the introduction page and the following pages contain data

Tip: The TOC Report sample report in the GO Data Warehouse (query) package includes multiple pages.

Procedure

1. Click the **Pages** icon  and click **Report pages**.

Tip: Click **Prompt pages** to add a prompt page.

2. Click the **Toolbox** icon , drag **Page** to the work area.
3. To change the order of pages, drag pages above or below other pages.
4. To associate a query to the page, in the **Properties** pane, set the **Query** property to the query.

Associate the page to a query to add data-related objects directly to the page header, body, or footer, such as data items and filters.

5. Double-click the page to open it in page design view.
6. Add objects to the page.

Page breaks, page sets, and page layers

You can create simple page breaks, advanced page sets, or page layers to associate pages with a query structure to force page breaks.

For example, a query contains the data item Product line, which is grouped. Creating a page set that is associated with this query adds page breaks for each product line. When working with dimensional data, you can use the **Page layers** area to show values on a separate page for each member.

When you are working with dimensional data, IBM Cognos Analytics - Reporting does not support page breaks or page sets that are based on custom groups.

Tip: The Global Bonus Report sample report in the GO Data Warehouse (analysis) package includes page sets.

Reports in Excel 2007 format

When you produce reports in Excel 2007 format, you can configure IBM Cognos Analytics with Watson to dynamically name the Excel worksheet tabs, based on the data items that are used to break pages. For example, you specify to break pages by Product line. In Excel 2007 output, the five

worksheet tabs that are generated are named Camping Equipment, Mountaineering Equipment, Personal Accessories, Outdoor Protection, and Golf Equipment. To dynamically name Excel worksheet tabs, ask your administrator to add the RSVP.EXCEL.PAGEGROUP_WSNAME_ITEMVALUE advanced setting to the report service. For more information, see the *IBM Cognos Analytics with Watson Administration and Security Guide*.

If a report contains two page sets that use the same grouping data item, the suffix *<number>* is appended to the Excel tabs. For example, a report contains two page sets that use Product line as the grouping item. In the Excel output, worksheet tabs are named Camping Equipment, Golf Equipment, Camping Equipment_2, Golf Equipment_2, and so on. Similarly, page set header and footer pages are named Camping Equipment, Camping Equipment_2, Camping Equipment_3, and so on.

If a report contains nested page sets, worksheet tab names are a concatenation of the nested items separated by commas. For example, a report contains a page set with Product line as the grouping item. The page set has a nested page set that uses Product type as the grouping item. Examples of worksheet tab names that are generated are Camping Equipment,Cooking Gear and Camping Equipment,Lanterns.

Note: In Excel, tab names cannot exceed 30 characters. Tab names with more than 30 characters are truncated. If truncated tab names produces duplicate names, the prefix *s_<worksheet indexing>* is added to the names. For example, multiple pages are named Camping Equipment,Cooking Gear. The first tab name is Camping Equipment,Cooking Gea. The second tab name is s_2Camping Equipment,Cooking.

Creating page breaks




Create page breaks in a report by adding page sets.


About this task

Page sets define sets of pages within a report. You customize the grouping and sorting of each page set to produce the results that you want.

You cannot create page sets if you set the option to show report pages as tabs in HTML output (**Show properties > View pages as tabs**).

Procedure

1. Click the **Pages** icon , and click **Report pages**.
2. Create the report pages.
3. Click the **Toolbox** icon  and drag the **Page set** object to the **Report pages** pane.
4. Click the **Show properties** icon , and in the **Properties** pane, set the **Query** property to the query that you want to associate with the page set.

Tip: You can also create a page set and associate it to a query by clicking the **Data** icon , right-clicking a query and clicking **Insert**.


5. Organize the pages in the report by dragging report pages to the page set.
6. Insert the page containing details in the **Detail Pages** folder.

Detail pages are the pages that repeat based on the items by which you group in the following step.

Tip: You can insert multiple detail pages into the same page set and link them using a master detail relationship.

7. Define the grouping structure for the page set:
 - Click the page set.
 - In the **Properties** pane, double-click the **Grouping & sorting** property.

- In the **Data items** pane, drag the data item by which to group data items to the **Groups** folder in the **Groups** pane.
- To sort the data within each group, in the **Data items** pane, drag the data item by which to sort to the

Detail Sort List folder, and then click the sort order button  to specify the sort order. For more information about sorting data, see [“Sorting Relational Data”](#) on page 296 or [“Sorting Dimensional Data”](#) on page 338.

Note: Grouping an item for a page set is not the same as grouping a column in the layout. Grouping a column in the layout visually shows groups in a report. Grouping an item for a page set groups the item in the query. If you want to use an item that is already grouped in the layout, you must still perform step 7.

8. Repeat steps 3 to 7 to create other page sets.

Tip: You can nest page sets and join them by defining a master detail relationship. Create nested page sets to have pages occur within other pages. For example, you want pages containing product type information to occur within pages containing product line information.

Join nested page sets

If you have nested page sets in your report, define a master detail relationship between them to see data in the nested page set that is related to the data in the parent page set.

For example, you have a page set that shows pages of product line information. The page set contains a nested page set that shows pages of product type information. For each product line page, you want to see the related product type pages, as shown in the following example:

Product line_1


- Product type_1
- Product type_2
- Product type_3

Product line_2

- Product type_4
- Product type_5
- Product type_6

For more information about master detail relationships, see [“Create a Master Detail Relationship”](#) on page 347.

Procedure

1. Click the **Pages** icon  and click **Report pages**.
2. In the **Report pages** pane, click the nested page set.
3. In the **Properties** pane, double-click the **Master detail relationships** property.
4. Click the **New Link** button.
5. In the **Master Query** box, click the data item that provides the primary information.
6. Link the master data item to the details by doing one of the following:
 - To link to another data item in the detail query, in the **Detail Query** box, click the data item that provides the detailed information.
 - To link to a parameter, in the **Parameters** box, click the parameter that provides the detailed information.
7. Repeat steps 4 to 6 to create other links.

Tip: To delete a link, select it and press the Delete key.

Create page layers

When working with dimensional data, you can create page layers in a report to show values for each member on a separate page. For example, your report contains payroll information for the entire company. You want to view values for each department on a separate page.

After you create page layers, a caption appears in the header to indicate the contents of each page. You can navigate between the different pages using links below the report.

Creating page layers is similar to filtering using context. However, with context filters, values are filtered according to the member you add to the **Context filter** area. With page layers, the report is split into a separate page for each child of the member you add to the **Page layers** area.

To create more complex page layers in your reports, such as a report book with title and end pages, create page sets.

Procedure

1. In the source tree, select or search for one or more items on which to filter.
2. Drag the item into the **Page layers** section of the overview area.

The crosstab shows the results for the children of the selected item on separate pages, and a list appears under **Page layers**.

Tip: To navigate between pages, click **Page down** and **Page up** below the report.

3. To replace the page breaks with items from the same dimension, select an item from the list. To delete the page breaks, from the list, click **Delete**. To delete all the page breaks, right-click the **Page layers** area and click **Delete All**.

Add a bookmark

Add a bookmark so that users can quickly move from one part of a report to another. For example, a list report contains many rows of data. You add bookmarks so that users can move to specific rows.

You can also drill through to another report.

If you want to use page numbers to move from one part of a report to another, you can also create a table of contents.

Bookmarks work for reports produced in HTML format or PDF. In HTML format, they work best when viewing saved report outputs, as the entire report appears in a single HTML page. When reports are run interactively, more than one HTML page may be generated, and a bookmark works only if the target exists in the page currently being viewed.

If you run a saved report using a URL, and you specify a bookmark within the URL, you always go to the first page of the report. The bookmark defined in the URL is not honored. For more information about using URLs to run reports, see the *Administration and Security Guide*.

Tip: You can reduce the number of HTML pages generated when a report is run interactively by specifying a value for the **Rows per page** property for a data container in the report.

Tip: The Briefing Book sample report in the GO Sales (analysis) package includes bookmarks.


Procedure

1. Click the **Toolbox** icon , drag a **Bookmark**  object to the report.
2. Click the bookmark and, in the **Properties** pane, set the **Source type** property to a source type.

| Source type | Description |
|--------------------------|--|
| Text | Creates a static bookmark using a text value. For example, a list has sections and you want users to jump from each section to the top of the report. |
| Report expression | Creates a dynamic bookmark whose values are derived from an expression that you define. |
| Data item value | Creates a dynamic bookmark that has data as possible values. This is useful for creating a context-based bookmark. For example, a list has sections and you want users to jump from the top of the report to a specific section. Note: This source type appears only if the bookmark is inserted next to a data item. |
| Data item label | Creates a bookmark that has the label of a data item as its value. Use this source type to jump to the first occurrence of a data item label. For example, a list is divided into sections using Product line. You want users to jump to the first product line section that appears in the list rather than to a specific section, such as Camping Equipment. Note: This source type appears only if the bookmark is inserted next to a data item. |
| Member caption | In a crosstab, creates a dynamic bookmark that uses member captions as possible values. |
| Cell value | In a crosstab, creates a dynamic bookmark that uses cell values as possible values. |

- Set the property that appears under the source type you chose to the bookmark value.

For example, if the source type is **Data item value**, set the **Data item value** property to the data item.

- Click the object that will jump to the bookmark, from the report object toolbar, click the **More** icon , and then click **Drill-Through Definitions**.

For example, click a data item, image, chart, or text item.

Tip: The object can exist in a different report, so you can jump from one report to another.

- Click the **New Drill-Through Definition** icon .

- Click the **Bookmark** tab.

- Click **Source type** and click one of the source types described in step 3.

Click the source type to use to produce the value needed to jump to the bookmark. For example, click **Data item value** if you want the value to come from a data item such as Product line.

- If you clicked one of the following source types, specify the value to use to jump to the bookmark.

- For **Text**, click the ellipsis button next to **Text** and type a text value.

- For **Data item value** or **Data item label**, in the **Data item** list, choose a data item.
- For **Report expression**, click the ellipsis button next to **Report expression** and define the expression.

Create a table of contents

You can create a table of contents that appears in the rendered output of your report. A table of contents is useful for reports that include sectioned items, grouped items, or multiple pages in the layout. The report output indicates page numbers and allows for easy navigation.

You can include multiple tables of contents in your report, which are useful if your report contains grouped lists. You can also add section numbers in front of entries in the table of contents by modifying the heading level property.

Table of contents entries are logical markers placed anywhere in a report. For example, you can place entries at the top of a page or in a list group header to mark each grouped data value. Although table of contents entries are visible in IBM Cognos Analytics - Reporting, they cannot be seen when a report is run.

A table of contents works only for reports produced in PDF or non-interactive HTML format. In HTML format, they work best when viewing saved report outputs, as the entire report appears in a single HTML page. When reports are run interactively, more than one HTML page may be generated, and a table of contents works only if the target exists in the page currently being viewed.

Tip: You can reduce the number of HTML pages generated when a report is run interactively by specifying a value for the **Rows per page** property for a data container in the report.

If you want to quickly move from one part of a report to another without using page numbers, you can add bookmarks.

Tip: The Briefing Book sample report in the GO Sales (analysis) package includes a table of contents.

Before you begin

You must first create a table of contents before adding entries in the report. All entries must be inserted after the table of contents in the report layout.

Procedure

1. Click the **Toolbox** icon , drag the **Table of contents** object to the new location, which can be anywhere in the report.

A table of contents placeholder appears.

2. Drag the **Table of contents entry** object to the location of your first table of contents marker.

The new entry appears in the table of contents.

3. Double-click the **Double-click to edit text** box of the new marker.
4. In the **Text** box, type the text to appear in the table of contents and click **OK**.

5. To edit the heading level of a table of contents entry, click the entry and, in the **Properties** pane, set the **Heading level** property to the level.

The heading level is used to insert section numbers in front of entries in the table of contents using layout calculations.

6. When you finish creating the table of contents, run the report. By clicking the arrow to the right of the run report button, you can specify whether to run the report as HTML or PDF.

Insert page numbers in a report

You can insert page numbers in a report and specify the number style to use.

You can select a predefined page numbering scheme or create a custom scheme. You can easily insert page numbers using the **Page number** object.

You can also manually create an expression to insert page numbers by inserting a layout calculation and using the different page report functions in the expression editor.

Procedure


1. Click the **Toolbox** icon , drag **Page number** to the report.

Tip: When you create a new report using one of the existing report layouts, **Page number** is already inserted in the page footer.

2. Double-click the page number symbol and choose the style to use.

The first three choices apply only to vertical page numbers. The remaining choices specify how vertical and horizontal page values appear.

Note: The 1 of 3 number style works only for reports produced in PDF or non-interactive HTML format. In HTML format, the 1 of 3 number style works when viewing saved report outputs, as the entire report appears in a single HTML page.

3. If you want to customize the choice that you made in the previous step, click the edit button , make your changes, and click **OK**.

A custom number style is created. If you later choose a different number style, the custom style is removed from the list.

Tip: In the **Custom number style** dialog box, when you pause the pointer over a box, a tooltip describes how that box affects page numbers. For example, the **Separator** box contains the text, such as a hyphen, that separates page values for both vertical and horizontal pages.

Control page breaks and page numbering

You can control page breaks and page numbering in a list, crosstab, table, or report page by choosing any of these options.

The options that are available depend on which object you have selected. All the options for all the objects are described in the following table.

| Option | Description |
|---------------------------|--|
| Keep with header | Keeps all headers on the same page with the number of detail rows specified. |
| Keep with footer | Keeps all footers on the same page with the number of detail rows specified. |
| Keep with previous | Keeps the object with the specified number of preceding objects on the same page, if space permits. |
| Keep with next | Keeps the object with the specified number of subsequent objects on the same page, if space permits. |

| Option | Description |
|---|---|
| Reset page count | Resets the page count after a page break to the value specified. |
| Reset page number | Resets the page number after a page break to the value specified. |
| Repeat every page | If the report renders multiple pages, this object is repeated on every page. |
| Allow contents to break across pages | Allows contents to break across pages. In lists and crosstabs, controls whether a cell is broken across pages, which is useful when there is a lot of text. |
| Allow horizontal pagination | <p>In PDF output, allows the columns of a list or crosstab to break across horizontal pages if they do not fit on a single page.</p> <p>Tip: In lists, you can select the Repeat every page option for list columns that show on every horizontal page.</p> <p>If the Allow horizontal pagination option is not selected, the size of the list or crosstab is scaled down when necessary so that it fits on a single page.</p> <p>Tip: The Horizontal Pagination sample report in the GO Sales (analysis) package includes horizontal pagination.</p> <p>If your report includes nested data frames such as a list within a list, horizontal pagination is supported on either the parent or child frame, but not both. If horizontal pagination is enabled on both the parent and child frame, it will be ignored on the child frame when the report runs. We recommend that you do not enable horizontal pagination on both the parent and child frames. Horizontal pagination is not supported for data containers, such as a list or crosstab, that are nested in repeater tables.</p> <p>You can also specify page number options that use compound numbering schemes. For example, you can use the numbering scheme 1-1, 1-2, 2-1, 2-2, and so on. For more information, see “Insert page numbers in a report” on page 471.</p> |

| Option | Description |
|---|---|
| Enable horizontal page numbering | <p>Increments page numbers of horizontal pages separately from the main page numbers when you select a page numbering style that includes horizontal pages. For example, if a page has three page breaks horizontally and you selected the page number style 1a, the horizontal pages are numbered 1a, 1b, and 1c. If you did not select a numbering style that includes horizontal pages, the horizontal pages are all numbered 1 for the first vertical page, 2 for the second vertical page, and so on.</p> <p>If this option is not selected and there are horizontal pages, all pages are numbered sequentially. For example, if a report has two vertical pages and three horizontal pages, the PDF pages are numbered from 1 to 6. Pages 1 to 3 are the three horizontal pages for the first vertical page and pages 4 to 6 are the three horizontal pages for the second vertical page.</p> |
| Allow row contents to break across pages | <p>In tables, allows the contents of a row to break across pages. For example, if a row contains four lines of text, the first two lines from the row appear on the first page, and the last two lines appear on the next page.</p> |
| Repeat table rows on page break | <p>In tables, if a row breaks across pages, repeats the rows that were previously rendered on each page. By default, table rows are repeated.</p> <p>Note: This option applies to saved reports only. In interactive HTML reports, table rows are always repeated even if this option is not selected.</p> |

You can also specify the style to use for page numbers.

Procedure

1. Click an object.
2. In the **Properties** pane, double-click the **Pagination** property.
3. Specify the page break and numbering options.

Creating a report booklet

In Cognos Analytics reports, you can add references to other reports to create a report booklet. Each report reference represents a booklet item.

About this task

You can insert or move report references before and after pages and page sets. However, you cannot add report references to a page set.



You can copy a report reference and paste it in a valid area in the report. If you try to paste a report reference in a page set, the report reference is added to the end of the report.

You can create a table of contents entry for a report reference. When the table of contents is generated, by default, the report name is used for the table of contents entry. You can edit the entry by selecting it in the table of contents. If the report name is changed, you must manually update the table of contents entry. If you change the order of pages in the report, the table of contents is automatically updated when it is generated.

You cannot add references to other reports if you set the option to show report pages as tabs in HTML output (**Show properties > View pages as tabs**).

Reports with the **Run with full interactivity** property turned on, as well as any reports with custom controls, are not supported for booklets. For more information, see [“Limited and fully interactive reports” on page 29](#).

Procedure

1. Click the **Pages** icon  and click **Report pages**.
2. Click the **Toolbox** icon , drag **Report reference** to the **Report pages** pane.
The **Choose report** window opens.
3. Locate the report that you want to add as a report reference and double-click it.
Tip: If you want to change the report reference, from the **Properties** pane, double-click the **Referenced report** property and choose a different report.
4. Optional: Create a table of contents entry for the booklet item by modifying properties in the **Properties** pane, in the **Table of contents** group.
 - a) Set the **Table of contents entry** property to **Yes**.
 - b) To roll up table of content entries for the booklet item into the report booklet, set the **Roll up table of contents** property to **Yes**.
 - c) Specify the starting heading level for the booklet item by typing a value in the **Start heading level** property.
For example, if you specify 2, all table of content entries for the booklet item have section numbers that start at 2.
5. To render prompt pages that exist in the booklet item when the report is run, set the **Show prompt pages** property to **Yes**.
6. Specify how to handle saved parameter values that come from the booklet item when the report is run by clicking one of the options in the **Saved parameter values** property.

Parameter values include signon, validation, and prompt information, and they are saved on the IBM Cognos server.

- If you do not want to use saved parameter values from the booklet item, select **Ignore**.
- If you want to use saved parameter values from the booklet item, select **Merge**.

When **Merge** is selected, parameter values that come from the booklet item are merged with parameter values that come from the report. If the same value exists for both the booklet item and the report, the booklet item value is ignored.

Producing tabbed reports

When you produce reports in HTML format, you can show each report page as a tab.

Report page names are used to name each tab in the output. In Excel output, each tab becomes a single sheet within the same workbook.

The option to show pages as tabs is not supported when a report is used as a report reference in a report booklet. This option is also not supported when a report contains page sets. Page sets are created in a report when you add a page set object, page layers, and page breaks.

About this task

You can optimize tab rendering when a tabbed report is run. When optimized rendering is used, each tab is rendered individually. Optimized rendering is faster; however, it has the following limitations:

- It's not suitable for reports with conditional pages or reports that rely on continuous page numbers across tabs.
- Pages with no content are still rendered as tabs.

Note: The batch requests always run without optimized tab rendering because in this case performance is not an issue.

The tab rendering behavior is determined by the advanced report service property **RSVP.OPTIMIZED_TABS** for all reports. This property can have the following values:

No

Optimized tab rendering is not used. This is the default value. If the property is not specified, the default value is applied automatically.

Yes

Optimized tab rendering is used.

Even if you set the advanced property **renderPageWhenEmpty** to `False` for the report service, the empty pages are rendered.


Auto

The report service determines whether to use optimized tab rendering, which is based on the presence of conditional pages. With this value, the reports run as fast as possible without the risk of displaying tabs that have no content.

To overwrite the advanced property **RSVP.OPTIMIZED_TABS**, specify the **Optimized tab rendering** property in the report.

The properties **RSVP.OPTIMIZED_TABS** and **renderPageWhenEmpty** are specified in the classic **Administration console**. For more information, see "Advanced settings configuration" in the *IBM Cognos Analytics with Watson Administration Guide*.

Procedure

1. Click the **Show properties** icon , and go to the Report properties.
2. Click the **View pages as tabs** menu and select the location where you want the tabs to appear in browsers.
3. Click **Optimized tab rendering** to specify how to render the tabs in the report.

The following values can be specified for this property:

Default

The advanced report server property **RSVP.OPTIMIZED_TABS** is used to determine the tab rendering behavior for the report.

No

Optimized tab rendering is not used. This is the default value. If the property is not specified, this value is applied automatically.

Yes

Optimized tab rendering is used.

Auto

The report service determines whether to use optimized tab rendering, which is based on the presence of conditional pages. With this value, the report runs as fast as possible without the risk of displaying tabs that have no data.

Chapter 22. Managing existing reports

After you have created a report, you can make changes or enhancements, such as setting up the report for bursting.

Before you modify an existing report, ensure that you have the proper security permissions. For more information, see the IBM Cognos Analytics with Watson *Administration and Security Guide*.

Copy a report to the clipboard in Firefox

You can copy a report specification to the clipboard so you can open it from the clipboard later. The clipboard works differently in each web browser.

Procedure

1. Click the **More** icon in the toolbar and click **Copy report to clipboard**.
2. Open a text editor and paste the report specification. Save it as a .txt file.

Open a report from the clipboard

You can open a report specification that was previously copied to the clipboard.

To copy a report to the clipboard, see [“Copy a report to the clipboard in Firefox”](#) on page 477. This is useful for importing an XML report specification from outside the IBM Cognos Analytics with Watson environment.

Although IBM Cognos Analytics - Reporting attempts to validate the report specification, it is your responsibility to ensure that it is correct. For more information, see the IBM Cognos Software Developer Kit *Developer Guide*.

Procedure

1. Click the **More** icon in the toolbar and click **Copy report to clipboard**.
2. Open a text editor and paste the report specification. Save it as a .txt file.

Open a file from another studio

You can open reports, templates, or analyses that were created in IBM Cognos Query Studio or IBM Cognos Analysis Studio in IBM Cognos Analytics - Reporting. All the capabilities of Reporting are available to you so you can change formatting, layout, calculations, and queries.

Note: If you make and save changes to a Query Studio report or an Analysis Studio analysis in Reporting, the report or analysis can no longer be opened in Query Studio and Analysis Studio.

Procedure

1. To locate an item, from the **Home page** window, click **Team content** , **My content**, or to search for an item by name, click **Search** and enter a name.
2. Double-click to open folders and then click the report, template, or analysis.

Analysis Studio query specification

IBM Cognos Analysis Studio defines each group of rows and columns as a set. When you import an analysis into IBM Cognos Analytics - Reporting, the report will have one query that processes all the sets found on the crosstab. Each set is defined by data items that segment and summarize the base set

definition. To maintain reports converted from Cognos Analysis Studio, you must understand what each of these items represents and how they relate to each other.

Before you modify any of the data items in the Cognos Analysis Studio set definitions, we recommend that you fully understand each data item and its dependencies. Modifying the data items may cause unpredictable results and may slow the performance of your report.

The data items for a set specify the following:

- the set definition
- set segments, including which members were excluded and hidden individually
- filter rules for defining which members are to be retrieved
- calculations for Subtotal (N items), More & Hidden, Subtotal (included), Subtotal (excluded), and the total

For more information, see the *IBM Cognos Analysis Studio User Guide*.

- which subtotals should appear
- any user-defined calculations

The default measure identifies which measure is the default for the crosstab or chart. If no default measure is specified, the default measure may be empty.

Set Definitions

The following table shows the definitions and dependencies for the data items in the set definition.

| Data item | Definition | Dependencies |
|------------------------|--|--------------|
| <set name> (base) | Defines the set of members to be used for sorting, filtering, and summary operations. This data item provides a generic reference for all other data items and may reference one of the other set definitions. | None |
| <set name> (level) | Identifies the level for a level-based set. | None |
| <set name> (list) | Defines the list of members in a selection-based set. | None |
| <set name> (depth N) | Defines the set of members at N, number of levels down. | None |
| <set name> (named set) | References a predefined set. | None |

Set Segments Definitions

The following table shows the definitions and dependencies for the data items in the set segment definition.

| Data item | Definition | Dependencies |
|--------------------------------------|---|---------------------------------|
| <set definition> (hidden list) | Lists the members that are manually hidden using the Hide command in Cognos Analysis Studio. This set appears when you try to unhide a member. | <set definition> |
| <set definition> (included set) | Lists the set of members after filters are applied and hidden items are excluded, but before the More limit is applied. Sort or order operations, if any, are defined in this data item. | <set definition> (hidden list) |
| <set definition> (visible items set) | Limits the set to show the number of members according to the More limit with a small tolerance. The tolerance allows showing the last two members if they are all that remain in the More portion of the set. The choice of visible members can be based on a sort order. | <set definition> (included set) |
| <set definition> (excluded list) | Identifies members that were manually excluded from the analysis. If no members were manually excluded, the expression defines an emptySet. This set appears when you try to remove a member from the Excluded items list in the Properties pane. | <set definition> |

Filters

The following table shows the definitions and dependencies for the data items in the filter.

| Data item | Definition | Dependencies |
|-------------------------------------|--|--|
| <set definition> (filter rules) | Specifies the user-defined filter rules to reduce the set definition using operators such as greater than or less than based on measures, calculations, or attributes. | <set definition> |
| <set definition> (excluded filters) | Removes members that were manually excluded from the results after applying the user-defined rules. | <set definition> (excluded list), <set definition> (filter rules) |

| Data item | Definition | Dependencies |
|--------------------------------------|---|--|
| <set definition> (filter top bottom) | Focuses on the members based on top / bottom / first <i>n</i> where <i>n</i> can be a count or a percentile. For more information about Top/ Bottom filters, see the <i>IBM Cognos Analysis Studio User Guide</i> . | <set definition> (excluded filters) and totals for sets on the opposite axis |
| <set definition> (filter rules) | Specifies the user-defined filter rules to reduce the set definition using operators such as greater than or less than based on measures, calculations, or attributes. | <set definition> |

Subtotals and Related Conditions

The following table shows the definitions and dependencies for the data items in the subtotals and related conditions.

| Data item | Definition | Dependencies |
|---|---|--|
| <set definition> (subtotal) | Aggregates the visible items in the set. | <set definition> (visible items set) |
| <set definition> (subtotal display) | Shows the subtotal if the number of included items is greater than the number of visible items. | <set definition> (visible items set), <set definition> (included set), <set definition> (subtotal) |
| <set definition> (more and hidden subtotal) | Calculates the More & hidden subtotal by subtracting the aggregation of the included members from the aggregation of those members that were manually hidden or hidden by exceeding the maximum display limit. Not available for selection-based sets. | <set definition> (included set), <set definition> (visible items set), <set definition> |
| <set definition> (more and hidden subtotal as set) | Converts the More & hidden subtotal member to a set for use in set operations. | <set definition> (more and hidden subtotal) |
| <set definition> (more and hidden subtotal as member) | Generically references the More & hidden subtotal. | <set definition> (more and hidden subtotal) |
| <set definition> (more and hidden subtotal display) | Shows the More & hidden subtotal if the number of items hidden or clipped is greater than zero. | <set definition> (more and hidden subtotal) |

| Data item | Definition | Dependencies |
|--|--|--|
| <set definition> (included subtotal) | Calculates the Subtotal (included) . For selection-based sets, this data item references the summary data item for the set. | <set definition> (included set) |
| <set definition> (included subtotal display) | Shows the Subtotal (included) if any members passed the filter criteria. | <set definition> (included set) |
| <set definition> (excluded subtotal) | Calculates the value for Subtotal (excluded) . This data item is not available for selection-based sets. | <set definition> (total), <set definition> (included subtotal), <set definition> |
| <set definition> (excluded subtotal display) | Shows Subtotal (excluded) if the number of members in the filtered set is less than the base set. This means that the filter rule is filtering out something. | <set definition> (excluded subtotal), <set definition> |
| <set definition> (total) | Identifies the total for the set. This value is calculated directly from the data store. The expression used to calculate the summary depends on the set type: <ul style="list-style-type: none"> • Details-based set: The selected member. • Level-based and depth-based sets: The root member for the hierarchy. • Selection-based set: The aggregate, typically the sum, of the selected members. | <set definition> |

Managing changes in the package

If changes were made to the package that was used to create a report, the report might need to be updated.

When you open a report, IBM Cognos Analytics - Reporting automatically checks to see if the package has changed. If it has, a message appears indicating that the report will be updated to the latest version of the package.

However, you might need to make additional changes to the report if the namespace name or query subject and data item names in the package have changed. Validate the report to identify the changes that are required, or to verify the changes that you implemented.

Note: When the package name is changed, the name is automatically updated in reports and data modules that are based on this package.

Update a name reference

If the namespace name or query subject and data item names in the package have changed, you must update reports that were created with the package to reflect the change.


The names of data items in a report are a concatenation of the namespace name, the query subject name, and the data item name. For example, if you add Order number from the GO Data Warehouse (query) sample package to a filter expression, you will see [Sales (query)].[Sales order].[Order number] in the expression. Similarly, package filter names are a concatenation of the namespace name and the filter name.

Procedure

1. To update a data item name reference:

- Click the data item.
- In the **Properties** pane, double-click the **Expression** property.
- In the **Expression Definition** box, update the data item name reference.

2. To update a package filter name reference:

- From the report object toolbar, click **Filters** .
- Double-click the package filter.
- In the **Expression Definition** box, update the namespace name.

Appendix A. Limitations when using dimensional data sources

There are limitations when authoring or running reports against dimensional data sources.

Data modules that contain dimensional data sources

Data modules that contain dimensional data sources such as PowerCubes, dynamic cubes, TM1 data sources, and dimensionally modeled relational (DMR) data sources are not supported for reporting. Data modules that contain IBM Planning Analytics cubes are supported in reporting.

Note: You can use a dimensional data source directly as a data source.

Running a Report Against a Dimensional Data Source

You can cancel a report that is running against Microsoft SQL Server Analysis Services only during the initial portion of its execution. After this time, the report runs to completion.

The same behavior applies to SAP BW data sources.

In IBM Cognos Framework Manager, you can also control the number of levels within a hierarchy from which members, or values, are extracted from the hierarchy to populate a tree prompt.

For SAP BW, you can reduce the number of hierarchy levels to limit the number of nodes by setting the SAP BW variable property `trimHierarchyLevels` to 1. This removes the lowest level from the hierarchy prior to creating the list of nodes.

Units of Measure Notation

When running a report against an SAP BW data source, units of measure are included in the same column as the data values, separated by one space. For example, Celsius and Fahrenheit notations are appended to the end of the value.

If you see an asterisk character (*), one of the following was detected:

- an unknown currency
 - a value with an unknown or questionable unit of measure, such as a mixed currency calculation or rollup
- Mixed currency values occur when you calculate values with different currencies.

This behavior occurs when you are using an IBM Cognos cube as a data source.

This behavior also occurs for SAP BW data sources.

Unsupported SAP Variable Properties

The following SAP variable properties are not supported:

- Exclusionary ranges appear as an inclusionary prompt.
- Mandatory not initial appears as a mandatory prompt.

When using Business Explorer (BEx) to define variables in your SAP data source, avoid using exclusionary ranges and the mandatory not initial property.

Limitations When Using Set Expressions in List Reports

In list reports, we recommend that you avoid using set expressions. When in a list, set expressions, such as `TopCount`, may produce fewer rows than in the corresponding crosstab.

For example, the following list includes Year in the first column, followed by a column containing an expression that returns the top three months by revenue. Only three rows appear in the report and they correspond to the top three months across all years. If you group by Year, the report still shows only three months. However, the corresponding crosstab, you see three months for each year.

| Year | Top 3 Months | Revenue |
|------|--------------|----------------|
| 2013 | March 2013 | 171,457,960.73 |
| 2013 | July 2013 | 166,441,982.56 |
| 2013 | June 2013 | 161,995,729.54 |

| Revenue | | Revenue |
|---------|---------------|----------------|
| 2010 | December 2010 | 84,197,463.09 |
| | June 2010 | 82,169,806.98 |
| | July 2010 | 80,723,457.3 |
| 2011 | December 2011 | 109,868,142.48 |
| | November 2011 | 103,650,656.99 |
| | June 2011 | 100,066,807.17 |
| 2012 | June 2012 | 141,875,242.63 |
| | December 2012 | 130,525,197.76 |
| | August 2012 | 129,235,970.16 |
| 2013 | March 2013 | 171,457,960.73 |
| | July 2013 | 166,441,982.56 |
| | June 2013 | 161,995,729.54 |

Figure 47. List showing the top three revenue months in 2013, and the corresponding crosstab

In crosstab reports in IBM Cognos Analytics with Watson, set evaluation is always done in the context of what the set is nested under in the report. However, in list reports set evaluation is done independently of the grouping. For example, if the first column contains Country or Region instead of Year, you see the top three months for each country or region (across all years) in both cases.

In the case of different dimensions, you can force context independence by replacing [Revenue] in the topCount expression with tuple ([Revenue], X), where X is the default member of the hierarchy that contains Month.

However, for nested levels in the same hierarchy, there is no such workaround at this time.

Limitations When Using Clauses in Summary Functions

A summary function that uses a `for` clause may yield unexpected results. These may include error messages, warnings, incorrect numbers, and more or fewer than expected rows, columns, or chart points and lines.

To avoid these problems, ensure that the parameters that follow the `for` clause adhere to the following constraints:

- Parameters must be simple data item references.
- All data items in the parameter list must appear on every list, crosstab, or chart that uses that summary.
- For any edge used in the `for` clause, data items listed in the `for` clause must start with the first data item on that edge.
- Data items must be listed in the order in which they appear on each edge of the report with no gaps.
- In crosstabs and charts, there must be no sibling data items that are considered details. Summaries are normally not considered details.
- Section headers must not be included in the parameter list.

If following these constraints does not resolve the problems and your report uses dimensional data with no detail or summary filters, consider using the `within` set clause instead of the `for` clause.

Limited Support for Relational Functions When Used with OLAP Data Sources

When working with an OLAP data source, we recommend that you not use relational functions, such as `substring` and concatenation functions, in a report that also contains a measure with the **Aggregate Function** property set to **Calculated** or **Automatic** in the model. If you do so, you may encounter unexpected results. For example, some summaries are calculated using the **Minimum** function instead of the aggregate function derived from the individual query items.

In the expression editor, an exclamation mark (!) that precedes a function indicates that the function is not naturally supported for that data source. IBM Cognos Analytics with Watson uses a local approximation for that function. Because an approximation is used, performance can be degraded and the results may not be what you expect.

For example, you create an IBM Cognos Query Studio report that contains the data items Product line and Retailer site count. The footer summary is set to **Calculated**. You then insert a calculated column that returns the first three characters of the Product line item, which uses the relational concatenation function. The footer summary now shows the lowest gross margin value.

| Product line | First Three Characters | Retailer Site Count |
|--------------------------|------------------------|---------------------|
| Camping Equipment | Cam | 632 |
| Mountaineering Equipment | Mou | 265 |
| Personal Accessories | Per | 810 |
| Outdoor Protection | Out | 639 |
| Golf Equipment | Gol | 367 |
| Summary | | 265 |

Figure 48. A report that contains a calculated footer summary

Limitations When Summarizing Measures in DMR Data Sources

There are limitations when summarizing dimensionally-modeled relational (DMR) measures and semi-additive measures in crosstabs using the aggregation function `count distinct`, `median`, `standard-deviation`, or `variance`. The following limitations can produce empty or error cells when the report is run:

- The aggregation function must apply to all members of a level or all children of a member.
- To use OLAP functions in detail filters that are applied to a dimension that is not in the report, or is at a level below what is being reported, only the functions `children`, `level`, `members`, `roleValue`, and `rootMembers` will work.
- You cannot define detail filters that reference one or more measures and are set to **After auto aggregation**.
- You cannot define context filters that have more than one member from a dimension that does not appear in the report.
- Context filters that have more than one member from a dimension that appears in the report produce errors in all cells that are ancestors of the slicer members.
- If a crosstab has a row that is a set of members from one dimension (dimension A) and another row that is a set of members from another dimension (dimension B), and a context filter containing members

from dimension A is defined, error cells are produced in the row that contains members from dimension B.

- If a context filter contains members from a dimension, and a crosstab has a row that is a set of members from a higher level than the slicer members, error cells are produced for that row.
- Error cells are produced when drilling down on a crosstab that has two nested levels.

If you do not consider these limitations in a calculation, the report may return inaccurate results.

If there is a non-measure calculation that returns a constant or contains a summary function, and the calculation has a lower solve order than the measure being aggregated, error cells are returned for the aggregated measure.

In list reports, error cells are produced as a result of these limitations if the list uses an OLAP function other than `children`, `filter`, `level`, `members`, `roleValue`, and `rootMembers`.

Limitations when filtering dimensional data sources

Avoid combining context filters (slicers) with dimensional constructs that involve members from hierarchies that are used elsewhere in the report. This combination gives results that are often not what you might expect and that may change in a future release.

Dimensional data sources provide implicit rollup at all levels of each dimensional hierarchy. Context filters and slicers with more than one member invalidate any pre-computed rollup of members at hierarchy levels before the level at which the filter applies.

The following types of filtering are safe for dimensional reporting:

- Context filters (slicers) with one or more explicit, non-calculated members per hierarchy, if those hierarchies are not used elsewhere in the report.
- Expressions that use the `filter` function (not in a slicer), comparing measure, tuple, or attribute values.

Nesting Incomplete Sets

When you nest sets (especially sets of explicit members, and sets that result from the functions such as `filter` and `intersect`), there may be members at one nesting level that have no corresponding members that can appear nested after them. In such cases, filtering results may not be what you expect: the higher-level members may or may not appear in the result.

While this is most commonly seen within a single hierarchy, it can also happen across different hierarchies and dimensions.

To avoid this problem, ensure that the sets are constructed to ensure that they are never empty for any of the members in the higher-level set. For example, you could filter only the high level set and nest only the complete set of descendants at the desired levels after that one.

Error Characters (--) When Filtering

When you use slicers or context filters with a calculated fact or measure, you may see two dashes (--) as values for some or all of the cells in the report that represent aggregates that are calculated in the database (aggregation is set to **Automatic**). This means that the data source is unable to compute these values.

You can avoid this error by using an explicit rollup rule or aggregation function such as **Total**. However, do this only if you are familiar with the data and absolutely certain that this is the appropriate answer for that report.

Time Hierarchies

Error characters also appear in summaries if your report includes a time hierarchy and you use two or more members from a different time hierarchy as a context filter. To avoid the error, use only one member as the context filter.

Filters in Queries and Sub-queries

For dimensional data sources, filters in queries and sub-queries are considered equivalent. The same applies to slicers.

Limitations When Specifying the Scope of Summary Filters with Dimensional Data Sources

When you specify the scope for a summary filter, consider the following limitations. The scope of a summary filter

- must refer to a grouped data item for list reports. Otherwise, you encounter the following error:
OP-ERR-0212 The summary filter scope (Scope1) found in the query (Query1) is not valid. It must refer to a grouped query item.
- can refer to multiple data items, but it can refer to only one data item per edge of the crosstab. Otherwise, you encounter the following error:
OP-ERR-0213 The summary filter scope (Scope1) found in the query (Query1) is not valid. Referencing more than one query item from the same edge is not supported.
- must refer to a level and cannot refer to a measure. Otherwise, you encounter the following error:
OP-ERR-0209 The summary filter scope (Scope1) found in the query (Query1) is not valid. It must refer to a level.
- must refer to a data item that is projected on an edge of the crosstab. If the scope of a summary filter refers to a data item that was deleted from the report layout, you may encounter unexpected results. Otherwise, you encounter the following error:
OP-ERR-0213 The summary filter scope (Scope1) found in the query (Query1) is not valid. Referencing more than one query item from the same edge is not supported.
- must refer to unique data items. For example, the summary filter cannot refer to the same data item more than once.

Limitations When Filtering Data Using an SAP BW Data Source

If you are working with an SAP BW data source, you must consider additional exceptions when applying filters.

If you apply a filter and a sort to an item that corresponds to the leaf-level of a recursive hierarchy, siblings may appear in the report even though the aggregated values are correct. Siblings are characteristic values with the same parent as the filtered member.

Each level in an SAP BW hierarchy has an item with the same name as the level and a role of `_businessKey`. Such items are known as level identifiers. The level identifier must be an exact value for the operators `=`, `<`, and `>` to work. For example, for the filter `[Office] > 'Chicago'` to work, the value `'Chicago'` must exist in the data source. If you do not know the exact values, you can apply the filter to one of the attribute items associated with the level, such as `[OfficeLongName] > 'C'`. Filters on non-identifiers are possible, but they are slower because SAP BW data sources are optimized for queries based on level identifiers.

When filtering time-related data, only the level identifier items of the time-related characteristics in SAP BW, such as `OCALDAY` and `OCALMONTH`, should be used for performing anything other than equality filters. All other (attribute) items in these hierarchies are formatted string representations of

the characteristic values with which they are associated. These formatted values sort alphanumerically and not chronologically.

Using Prompt Expressions in Filters

If you create a filter expression using report item attributes, such as the following, no data is returned.

[*report item attribute*] = ?prompt?

To resolve the problem, do one of the following:

- Fully qualify the item by using items from the source tree instead of data items from the report.
- Use prompt controls in the report instead of hand coded prompts.

Considerations when Creating Calculations

Consider the following information and limitations when creating dimensional calculations.

Calculation Solve Order

When calculations in the rows and columns of a report intersect, calculations are performed in the following order: addition or subtraction, multiplication or division, aggregation (rollup), and then the remaining arithmetic functions.

The remaining functions are as follows:

- absolute, round, average, minimum, maximum, medium, count
- percentage, % difference (growth), or % of total
- rank, quartile, quantile, percentile

If both calculations have the same precedence, for example, if they are both business functions, then the row calculation takes precedence.

You can override the order of precedence by changing the solve order property. For more information, see [“Resolve Multiple Calculations for Crosstabs and Charts” on page 491](#).

Length of Expressions

When creating layout calculations that use complex expressions, limit the length of the expression to less than 1,000 tokens. A token is a keyword, identifier, constant, or special character symbol that the server identifies when it parses the SQL. For example, the expression 1+1+1+1+1+1+1+1+1+1 contains approximately 28 tokens, whereas the expression 1+1+1...+1 (400 times) contains more than 1000 tokens.

Tip: The Sales Commissions for Central Europe sample report in the GO Data Warehouse (analysis) package includes expressions.

Quality of Service Indicators

Not all data sources support functions the same way. The data modeler can set a quality of service indicator on functions to give a visual clue about the behavior of the functions. Report authors can use the quality of service indicators to determine which functions to use in a report.

The quality of service indicators are:

- not available (X)

The function is not available for any data source in the package.

- limited availability (!!)

The function is not available for some data sources in the package.

- limited support (!)

The function is available for all data sources in the package but is not naturally supported for that data source. IBM Cognos Analytics with Watson uses a local approximation for that function. Because an approximation is used, performance can be poor and the results may not be what you expect.

- unconstrained (check mark)

The function is available for all data sources.

Using Quotation Marks in Literal Strings

When inserting literal strings in an expression, you must enclose the string in single quotation marks. If the string contains a quotation mark, it must be escaped. For example, if you want to insert the string ab'c, you must type 'ab'c'.


Limitations of calculations in dimensional reporting

You should use only the expressions and functions available in IBM Cognos Analytics - Reporting and follow their syntax.

Minimal checking exists for calculations. If your calculation uses an invalid expression, your report results may contain unexpected values.

In addition, you should define member summaries as follows:

```
summary_function (currentMeasure within set set_reference)
```

where *set_reference* is a level or set inserted from the **Source** tab .

Unless otherwise required, *summary_function* should be the aggregate function. If you use an explicit summary function, you may encounter problems with measures (such as profit margin, distinct count, and so on) that have complex rollup values, and/or scenario or account dimension members that do not roll up.

Know your data, and confirm with the owner of the cube where overriding the automatic aggregation is safe.

Because of these limitations, summaries of calculations may not provide reliable values. For convenience, you may have to build reports where row summaries and calculated member columns intersect. In such reports, these intersections may contain unexpected values. In contrast, row calculations intersecting with column aggregates using the aggregate function are safe because the calculation is performed on the reliably summarized values.

Units of Measure

When creating calculations, you may encounter problems with the units of measure. For example, the calculation Cost * Cost returns the unit of measure * (asterisk) instead of a currency unit of measure. To avoid this problem, change the format of the corresponding column to obtain the desired unit of measure.

Limitation When Using Dimensional Functions with Running and Moving Summaries

IBM Cognos Analytics with Watson does not currently support queries that contain both dimensional functions and running summaries or moving summaries. For example, when you drill down in a report, the query uses the dimensional function `children`, which is not compatible with running and moving summaries. Running and moving summaries are supported for only the overall level of a dimension.

Creating Expressions Using SAP BW Data Sources

You must consider the following when creating expressions using an SAP BW data source, or you may not get the results you expect.

- The case and if/then/else constructs are not supported in filters.
- The query item identifier of the leaf-level of the OCALDAY characteristic and its presentation hierarchies is of type date. When the values for the query item identifier are presented in IBM Cognos Analytics - Reporting, they are formatted as dates. These formatted values should not be used in filter expressions. The correct date constant format for use in expressions is YYYY-MM-DD.
- You can apply a comparison expression with an operator other than equals to a query item that represents a level identifier. However, level identifiers are more efficient for identifying specific values. Range comparisons must be performed on the IBM Cognos application server, which slows down the performance of the report.

Using Microsoft Excel Functions with SSAS 2005 Data Sources

If you are working with a Microsoft SQL Server 2005 Analysis Services (SSAS) data source and you want to use Microsoft Excel VBA functions such as ROUNDDOWN in MDX queries, the following Microsoft Office features must be installed on the SSAS server:

- Microsoft Office Excel
- Microsoft Visual Basic for Applications

To see a list of Excel VBA functions, see the Microsoft Web site (<http://www.microsoft.com>).

If these Microsoft Office features are not installed on the SSAS 2005 server, and you use Excel VBA functions, you encounter an error such as the following: YK-ERR-0008 The data provider returned an error message: "The '[Excel].[ROUNDDOWN]' function does not exist."

This error occurs because the OLAP server cannot process the function since Excel function libraries are missing.

For more information, see the Microsoft Knowledge Base article 932214 at <http://support.microsoft.com>.

Concatenating Strings

When IBM Cognos Analytics with Watson concatenates strings locally and if any of the involved strings contain null values, the result of the concatenation is an empty cell or a null value. This occurs because IBM Cognos Analytics with Watson requires that an expression that involves a null value returns a null value. Many databases ignore null strings when they perform concatenations. For example, if you concatenate strings A, B, and C, and if string B is a null value, the database may concatenate only strings A and C.

Intersecting Calculations in Crosstabs and Charts

An intersection point in a crosstab or chart can contain a value that is derived from multiple calculations.

If the query expressions for the row and column that intersect in a crosstab both include calculations, the intersecting value is the result of performing both calculations. The second calculation is performed on the result of the first calculation. If you change the order in which the calculations are performed, the resulting value at the intersection point changes.

The solve order is a positive numeric value that you assign to data items. Negative values are not supported. The data item with the lowest value is calculated first, followed by the next higher value, and so on. The data item with the highest solve order is computed last. If you do not specify a solve order, the default value of 0 is used. In crosstabs, if more than one data item has the same solve order, column items are calculated first and row items are calculated second.

For example, a crosstab contains the columns Revenue, Sales target, and a column that calculates the percentage by which actual revenue exceeds target revenue. The crosstab contains a row for each Year

and a summary row that calculates the overall totals for each of the three columns. The cell where the percentage calculation and the overall total calculation intersect contains only one value. By default, IBM Cognos Analytics with Watson calculates the column percentage first and the summary row last. The value that appears at the intersection is therefore a sum of the percentages, which is not a meaningful result. The value is more meaningful if the overall percentage is calculated after the actual and sales target revenues are summed. Specifying a solve order for the percentage calculation that is higher than the overall total calculation gives the following result:

| | Revenue | Sales target | Percentage by which Actual Exceeds Target |
|-------|--------------------|--------------------|---|
| 2010 | \$914,352,803.72 | \$812,885,300.00 | 12% |
| 2011 | \$1,159,195,590.16 | \$1,036,923,300.00 | 12% |
| 2012 | \$1,495,891,100.90 | \$1,332,553,100.00 | 12% |
| 2013 | \$1,117,336,274.07 | \$1,023,006,840.00 | 9% |
| Total | \$4,686,775,768.85 | \$4,205,368,540.00 | 11% |

Figure 49. Crosstab showing a calculation that has a solve order specified

It is not necessary to specify the solve order for the overall total calculation. Because the default solve order is 0, setting the solve order for the percentage calculation to a value higher than 0 is sufficient.

Nested Calculations in Crosstabs

If a crosstab contains nested calculations, the calculations are performed in the following order by default:

1. outermost calculation on the columns
2. innermost calculation on the columns
3. outermost calculation on the rows
4. innermost calculation on the rows

If there are solve order ties, column items are calculated before row items and outer nesting items are calculated before inner nesting items.

Resolve Multiple Calculations for Crosstabs and Charts

If an intersection in a crosstab or chart contains a value that is derived from multiple calculations, you can specify the order in which to perform the calculations. The solve order must be a positive numeric value. The calculations are performed from lowest to highest solve order value.

Setting the **Summary aggregation** property to **Calculated** for a data item assigns a solve order that is higher than any other data item in a query unless a solve order is explicitly specified. If there are multiple data items that have the **Summary aggregation** property set to **Calculated**, the normal rules for solve order apply.

Procedure

1. Click the data item for which to specify the solve order.

A data item can have only one solve order value. Consequently, if a data item is in a query that is used in more than one context and you want the data item to have a different solve order in each context, you must use a separate data item.

2. Click the **Show properties** icon , and in the **Properties** pane, set the **Solve order** property to an integer value.

Resolve Query Calculations that Intersect with Calculated Measures Defined in Microsoft Analysis Services

Microsoft SQL Server Analysis Services (SSAS) data sources may include data source calculations. Because IBM Cognos Analytics with Watson cannot predict the presence of a solve order on such calculations, setting the **Solve order** property may not resolve the solve order correctly. You can suppress potentially meaningless results when querying dimensional data sources that include data source calculations. In the following example, the columns **YTD Change** and **YTD Growth** are data source calculated members and the summary values for these two columns were suppressed.

| Revenue | Prior YTD | YTD | YTD Change | YTD Growth |
|----------------------------|-----------------------|-------------------------|----------------|------------|
| Camping Equipment | 290,355,466.50 | 352,910,329.97 | 62,554,863.47 | 21.54% |
| Personal Accessories | 329,883,402.11 | 443,693,449.85 | 113,810,047.74 | 34.50% |
| Outdoor Protection | 5,942,944.77 | 4,471,025.26 | -1,471,919.51 | -24.77% |
| Golf Equipment | 138,993,560.79 | 174,740,819.29 | 35,747,258.50 | 25.72% |
| Mountaineering Equipment | 93,654,629.48 | 141,520,649.70 | 47,866,020.22 | 51.11% |
| Total(Product line) | 858,830,003.65 | 1,117,336,274.07 | -- | -- |



Figure 50. Crosstab showing revenue by product line with a summary row

When a query-defined calculated member and a data source calculated member intersect, the value is the result of performing both calculations. The second calculation is performed on the result of the first calculation. Whether the final value is meaningful depends on the order in which the calculations are performed. Because IBM Cognos Analytics with Watson cannot determine the presence of these members ahead of time, it cannot automatically determine the correct solve order.

In most cases, SSAS 2005 gives the expected results when no solve order is defined in the cube. Therefore, when using SSAS 2005, you do not need to set either the **Solve order** property in the query or the **Calculation intersection** property.

Note: Dimensionally-modeled relational (DMR) data sources query one or more underlying relational databases, and therefore cannot contain data source calculations. They are not considered dimensional data sources in the context of this topic.

Procedure

1. Click the **Queries** icon , and click the query that contains the data item for which to suppress values.
2. In the **Data Items** pane, click the data item.
3. Click the **Show properties** icon , and in the **Properties** pane, set the **Calculation intersection** property to **Show "Not applicable"**.

Results

When a query-defined calculated member and a data source calculated member intersect, the resulting value is suppressed. If the intersecting members do not contain data source calculations, the value is not suppressed.

Null (Missing) Values in Calculations and Summaries

The data source that you use determines how null (or missing) values are handled in calculations, summaries, and other expressions.

Null values represent missing data values. For example, a new eyewear product, called Abby, is introduced in 2012. Therefore there are no sales in 2011. If you create a report with the years 2011 and 2012, the values for sales of Abby for the year 2011 are null (missing).

By default, null values appear as blank cells in a crosstab or list report. You can change the default to specify the display of other characters, such as the word null, by changing the data format of the **Missing Value Characters** property for the cells or report. For more information, see [“Set the default data formats”](#) on page 427.

Arithmetic Operations

Null values in arithmetic operations yield different results depending on the type of data source.

In Microsoft SQL Server Analysis Services (SSAS) and Cubing Services data sources, a null value in arithmetic operations is treated as follows:

- In operations such as addition (+), a null value yields the same result as zero ($9 + \text{NULL} = 9$)
- In operations such as multiplication (*), a null value yields a null result ($9 * \text{NULL} = \text{NULL}$)

You can accommodate this behavior by using more complex expressions such as the following:

- `if ([M] is not NULL, then ([M]) else (0)`
- `if ([M] is not NULL, then (<expression involving M> else NULL)`

In relational and other OLAP data sources the result of an operation that includes a null value is always null. For example, $9 + \text{NULL} = \text{NULL}$.

Equality Comparisons

Equality comparisons, such as equal to (=) and not equal to (<>), compare two values and return a Boolean value of true or false.

For all data sources, equality comparisons are treated as tests for missing data. Inequality comparisons are treated as tests for non-missing data.

For example, $\text{NULL} = \text{NULL}$ is true and $\text{NULL} = 0$ is false.

Ordered Comparisons

In ordered comparisons, such as rank and quantile functions, null values are handled as follows.

For relational data sources, the result of the comparison is always false. For example, $\text{NULL} < 1$ is false.

For Microsoft SSAS, Cubing Services, and other OLAP data sources, the null value is treated as zero. For example, $\text{NULL} < 1$ is true.

Boolean Functions

In Boolean operations, such as `or`, null values are handled as follows.

For relational and dimensionally-modeled relational data sources, the result of a Boolean operation is always null. Boolean functions are used in conditions and the null result is treated as a false condition. For example, $\text{NULL OR TRUE} = \text{NULL (FALSE)}$

For Microsoft SSAS, Cubing Services, and other OLAP data sources, the null value is treated as if it is false. For example, $\text{NULL OR TRUE} = \text{TRUE}$.

Summary Functions

All summary functions, such as aggregate, average, and maximum, ignore null values. For all functions except count, if all values in the expression are null, the result is null. For count, if all values in the expression are null, the result is zero.

For example, if the value for Quantity for 2013 is 10 and the values for 2011 and 2012 are null, then the average is as follows:

- `average ([Quantity] within set set([2012], [2013])) = 10`
- `average ([Quantity] within set set([2012], [2011])) = NULL`

The count is as follows:

- `count ([Quantity] within set set([2012], [2013])) = 1`
- `count ([Quantity] within set set([2012], [2011])) = 0`

String Operations

For all data sources, the result of string operations, such as concatenation (`||`), that include a null value is always null.

For example, `'A' || NULL = NULL` and `NULL || NULL = NULL`.

Dimensional coercion rules

IBM Cognos Analytics with Watson uses dimensional coercion rules to automatically convert dimensional types to better match other types. These conversions help you build simpler expressions, making them easier to understand. In addition to the implicit rules that IBM Cognos Analytics with Watson provides, you can make explicit data type conversions using various functions, such as `children`.

IBM Cognos Analytics with Watson supports the following types of coercion:

- coercion of an object of one dimensional type into another, such as a level into a member set
- coercion of a dimensional object into a numeric, date, time, or string value, such as a numeric measure into a numeric value

Coercion rules are applied to expressions and data items. In expressions, an operator or function may require operands to be of a particular dimensional type. When an operand is not of the required type, one or more coercion rules may be applied to coerce the operand to the appropriate type. Coercion rules may also be applied to data items to coerce the data item to a collection of members or values.

Function Operands

The following describes how coercion rules are applied to function operands:

- If the operand is of the required type, no coercion is required.
- If the function operand is supposed to be a numeric value, it is coerced into one.

A coercion rule exists for each type of dimensional object coercion.

- If the function operand is supposed to be a dimensional object and a coercion exists to coerce the operand to the required type, the coercion is applied.
- If no coercion exists, an error message with the code `QE-DEF-0478` appears to indicate that an unsupported conversion of a dimensional object from the source to target type occurred.

Comparison and Other Symmetric Operators

Binary operators that accept operands of more than one type, such as equals (`=`) and `in`, need both operands to be the same dimensional type.

No coercion is possible between value domains (numeric, date, time, and string) or between members and values. Consequently, if either operand is a value type, both must be in the same value domain and converted explicitly using a function. Otherwise, the query fails.

Members and member set operands are valid only with the operators equals (`=`), not equals (`<>`), `in`, and `not in`, where the right side of the expression is a member, member set, or prompt. Only the following are valid:

- `[member / member set] = [member]`
- `[member / member set] <> [member]`
- `[member / member set] = ?p?`
- `[member / member set] <> ?p?`
- `[member / member set] in ([member], ...)[member / member set] not in ([member], ...)`
- `[member / member set] in ([member set])[member / member set] not in ([member set])[member / member set] in ?p?[member / member set] not in ?p?`

Exceptions

For the left operand, member sets are supported in detail and summary filter expressions, but not in expressions that use the `filter` function. Members are not supported in detail and summary filters, but they may be used in expressions that use the `filter` function.

The `in_range` operator is not supported for members and member sets.

Normal coercion rules apply to these operands.

NULL operands are considered values, rather than members.

Examples

The following examples illustrate how coercion is applied to levels in expressions with operators.

```
[Sales].[Products].[].[Product Line] = [Sales].[Products].[].[Product Line]->[Outdoor Equipment]
```

The left operand is coerced to the following member set:

```
members ([Sales].[Products].[].[Product Line])
```

The following expressions are invalid:

- `[Sales].[Products].[].[Product Line] = NULL`
- `[Sales].[Products].[].[Product Line] + 1`
- `[Sales].[Products].[].[Product Line] = 'Canada'`
- `[Sales].[Products].[].[Product Line] > 2000`

The following examples illustrate how coercion is applied to members in expressions with operators. In each example, the left operand is coerced to a value of the current cell at this member:

```
(tuple ([Sales].[Products].[].[Product Line]->[Outdoor Equipment]))
```

- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] = NULL`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] + 1`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] > 2000`
- `[Sales].[Products].[].[Product Line]->[Outdoor Equipment] + 'Canada'`

Coercion Rules for Dimensional Objects

The following table describes coercion rules that are applied when coercing an object of one dimensional type into another.

Note: Measures and Member Unique Names (MUNs) are considered members.

| Source type | Target type | Result |
|-------------------|-------------|--|
| Measure dimension | Hierarchy | A measure dimension can be used without any conversion as a hierarchy. |

| Source type | Target type | Result |
|-------------------|-------------|---|
| Measure dimension | Member set | The member set contains the members of the measure dimension. This coercion is done in two steps. First, measure dimensions are coerced to hierarchies, and then hierarchies are coerced to member sets. |
| Hierarchy | Member set | A set containing the members of the hierarchy. |
| Level | Member set | A set containing the members of the level. The equivalent expression is <code>members (level)</code> . |
| Measure | Member | A measure can be used without any conversion as a member. |
| Measure | Tuple | This coercion is done in two steps. First, measures are coerced to members, and then members are coerced to tuples. |
| Measure | Member set | This coercion is done in two steps. First, measures are coerced to members, and then members are coerced to member sets. |
| Member | Tuple | The tuple consists of the member. The equivalent expression is <code>tuple (member)</code> . |
| Member | Member set | The set consists of the member. This coercion is done in two steps. First, members are coerced to tuples, and then tuples are coerced to member sets. |

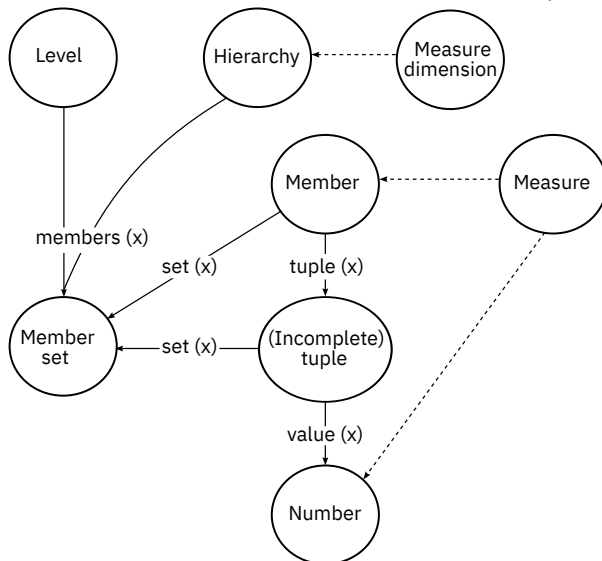
Coercion Rules for Numeric and String Values

The following table describes the coercion rules for expressions or prompts that return a numeric or string value. These rules apply to functions and operators that require an operand of a particular data type, as well as to binary operators that require operands of the same type.

| Source type | Target type | Result |
|-------------|------------------------------|--|
| Measure | Number, Date/Time, or String | The result is the value of the measure at the current cube intersection. |
| Member | Number | The result is the value of the cell at the cube intersection specified by the member. This coercion is done in two steps. First, members are coerced to tuples, and then tuples are coerced to the target type. |
| Tuple | Number | The value of the cell at the cube intersection specified by the tuple. The equivalent expression is <i>value (operand or parameter)</i> . |

Coercion Paths

The following diagram shows how coercion rules are connected. The expression that coerces a source node type to a target node type is built by following the path that connects them. A dotted line indicates a coercion that does not require an explicit conversion function. This occurs whenever the source type is a specialization of the target type. For example, every measure is a member so you can use measures without conversion wherever a member is required.




Recommendation - Use Member Unique Name (MUN) Aliases

If you are working with a dimensional data source, use MUN aliases to simplify building reports and expressions. In addition, you can tie the MUN back to the member in the package.

When working with dimensional data sources, IBM Cognos Analytics with Watson uses MUNs to uniquely identify members. MUNs are very complex. For example, the MUN for the member 2012 might appear as `[great_outdoors_company].[Years].[Years].[Year]-> : [PC] . [@MEMBER] . [20120101-20121231]`.

When you build expressions that involve members, the use of MUNs makes these expressions difficult to read and maintain.

IBM Cognos Analytics - Reporting has an option that automatically generates an alias for MUNs (**More** icon , **Options, Report** tab, **Alias member unique names**). The MUN alias is a data item that has the MUN as its definition. For the previous example, you would see 2012 as the MUN alias in the **Expression** property for the data item. If the MUN alias is not enabled, in the **Expression** property, you would see the complex MUN for 2012.

Important: Do not modify or rename MUN aliases, because they will lose their connection to their respective members in the package.

Running a Report That Contains Members

If you are using members in a report and your modeler has updated the data source in a way that changes member unique names, the following problems may arise when you run the report.

- If the report queries an OLAP data source, you receive an error message explaining that some specific members cannot be found.
- If the report queries a dimensionally modeled relational (DMR) data source, data items whose member unique names have changed do not appear in the report. Calculations that refer to members that have changed no longer contain values from the members.

To resolve these problems, you must update the member unique names in the report. Open the query that contains the members that you need to update in Query Explorer. Delete the member from the pane in which it appears and reinsert it from the **Source** tab. For example, if you inserted the member as a detail filter, delete it from the **Detail Filters** pane and reinsert it.

Limitations When Formatting Empty Cells in SAP BW Data Sources

When working with SAP BW data sources, if the SAP BW server administrator configured custom formatting for empty cells on the SAP BW server, this custom format does not appear in IBM Cognos Analytics with Watson reports. Ask your administrator to configure the formatting of empty cells in IBM Cognos Analytics with Watson.

Related tasks

[Suppress empty cells](#)

Appendix B. Limitations When Producing Reports in Microsoft Excel Format

There are limitations when producing reports in Microsoft Excel format.

Unable to Load Images from the IBM Cognos Analytics with Watson Content Store in a Report

If a report contains an image whose URL points to the IBM Cognos Analytics with Watson content store, the Microsoft Excel spreadsheet software generates an access violation error and shuts down.

This problem is a known issue in the Microsoft knowledge base, and Microsoft is currently investigating the problem. This problem occurs only in Excel 2002.

Blank Worksheet Appears

If the Microsoft Excel spreadsheet software cannot download a worksheet within a timeout period, Excel may instead open a blank worksheet.

Warning Message Appears When Excel Opens an IBM Cognos Analytics with Watson Report

Each time the Microsoft Excel spreadsheet software opens an IBM Cognos Analytics with Watson report, a warning message appears.

The warning message is as follows:

Some of the files in this Web page are not in the expected location. Do you want to download them anyway? If you are sure the Web page is from a trusted source, click Yes.

The Excel workbook in HTML/XML format requires the presence of the file filelist.xml. IBM Cognos Analytics with Watson does not allow the creation of local files on the client side. In addition, a local file that contains URLs introduces a security issue. Consequently, this message will appear whenever you open an IBM Cognos Analytics with Watson report in Excel. If you see this error message, click **Yes** to open the report.

Spreadsheet Content Not Saved for Reports Saved in XLS Format

If you open a report that was saved in XLS format or run a report in XLS format, and security settings in your Web browser are set so that you are prompted to open or save the report, do not click **Save**. If you save the report, the spreadsheet content will not be saved. This is because Microsoft Excel reports in Microsoft Office 2000 HTML format use relative paths to the spreadsheets. The relative URL paths are no longer available when you open a saved XLS report.

Instead, click **Open** first and then choose to save the report.

Unable to Nest Labels in Charts

Currently, it is not possible to specify nested labels for the category axis via XML.

Data Series Are Truncated

The Microsoft Excel spreadsheet software may group data series or categories differently when compared to a chart produced by IBM Cognos Analytics with Watson.

A 1 KB buffer limit in Excel limits the maximum number of data series per chart to 120. Data series over 120 are truncated.

Colors Different From Those in HTML or PDF

If an IBM Cognos Analytics with Watson report contains a chart that uses custom colors, the Microsoft Excel spreadsheet software may not be able to add the custom color to the Excel color palette. Excel will attempt to match the custom color to one of its available standard colors. As a result, colors in Excel may vary from those seen in HTML or PDF.

We recommend that you use standard colors in charts.

Repeating Pie Charts

If you have a report that has repeating pie charts and you define a chart title, the Microsoft Excel spreadsheet software will show each pie with a title that is a concatenation of the chart title and the data series. For example, if the chart title is Quantity Sold by Order Method and Product Line and the data series is Order method, the title of each pie in Excel will be Quantity Sold by Order Method and Product Line, *order method*.

Unable to Skip Discrete Axis Labels

In IBM Cognos Analytics with Watson charts, you can control the skipping of discrete axis labels. This feature is not supported in Microsoft Excel charts.

Unsupported IBM Cognos Analytics with Watson Formatting

About 30% of the formatting functions available in IBM Cognos Analytics with Watson are not supported in the Microsoft Excel spreadsheet software.

In particular, Excel does not allow changing locale-dependent formatting attributes, such as the following:

- Decimal Separator
- Exponential Symbol
- Group Separator
- Monetary Decimal Separator
- AM String
- Day Name
- Day Short Name
- Decimal Delimiter Symbol
- Month Name
- Month Short Name
- PM String
- YYYY date format pattern

Excel does not provide an equivalent capability to the Y formatting character. As a result, Cognos Analytics cannot preserve this capability when creating XLSX files.

In addition, Excel does not support the following:

- Format Width
- International Currency Symbol

- List Separator
- Percent Symbol (Excel does not support percent symbols for charts)
- Multiplier
- Overline Text Format
- PerMill Symbol
- Plus Sign
- Scale (Excel has a different scaling formula than IBM Cognos Analytics with Watson)
- Calendar (Excel does not allow changing the calendar)
- Era Name
- First Day Of Week
- Show Era

Cells Contain Series of

Cells in the Microsoft Excel spreadsheet software have a limit of 255 characters. If your report contains text strings that are longer than 255 characters, they will be formatted as text and appear as #####.

To resolve this problem, use fewer characters.

Table and Column Widths

The Microsoft Excel spreadsheet software does not support using percentages to determine the width of tables.

If the report contains only one table, the value of the width attribute for the Table element in the report specification determines the width of the table in the Excel worksheet. If the report contains more than one table, Excel determines the width of all the tables in the worksheet. If the tables are nested, the width specified for the outer table is used and, if necessary, the width is adjusted to accommodate data in the nested tables. The columns and rows around the table are merged to preserve the appearance of the nested table. When you save the workbook, only a single table is saved per worksheet.

Secure Socket Layer (SSL) Is Not Supported in Some Excel Formats and Versions

SSL is supported for only the Microsoft Excel 2002 format in Microsoft Excel 2002 and Microsoft Excel 2003.

Number Formats Become Currency Formats in Japanese Excel

A report uses the Number data format and you save it as Microsoft Excel output. When you open the report in the Japanese version of Microsoft Excel, the data format is listed as Currency rather than Number. This occurs because Japanese Excel interprets the standard Number data format slightly differently than other versions of Excel.

The value appears correctly in Number format. For example, if you specified five digits as your number format, five digits still appear. In Excel, click the **Custom** number format to see the exact format string being used.

Reports Show Data in Wrong Columns

A report contains a large amount of data that is presented using a large number of nested report objects, such as tables and blocks. When the report is produced in Microsoft Excel format, some of the data appears in the wrong columns. This occurs because Excel has a 64K limit on how many nested cell objects can appear in a single spreadsheet.

To solve this problem, you can redesign the report to present the data using non-nested structures.

Unable to Access Reports on Remote Servers

You cannot access a report in Microsoft Excel format on a remote server.

To resolve this problem, you must change the hostname portion of the gateway URI from localhost to either the IP address of the computer or the computer name. You do this using IBM Cognos Configuration.

Drill-through Reports Are Not Supported in Excel

IBM Cognos Analytics with Watson does not support drill-through for reports in Microsoft Excel format.

Map Reports Are Not Supported in Excel

IBM Cognos Analytics with Watson does not support map reports in Microsoft Excel format.

Unsupported Excel Formatting

IBM Cognos Analytics with Watson does not support some formatting.

The following formatting functions that are available in the Microsoft Excel spreadsheet software are not supported by IBM Cognos Analytics with Watson:

- background images in table cells
- Excel-specific headers and footers
- text flow and justification
- floating text objects
- white space, normal, and wrap text formatting
- maximum characters

Some layouts do not show exactly in HTML and PDF due to Excel limitations.

Hyperlink Buttons Are Not Supported in Excel

The Microsoft Excel spreadsheet software does not support hyperlink buttons.

Unable to View Reports in Excel Format Sent as Email Attachments

IBM Cognos Analytics with Watson can send Microsoft Excel reports in HTML and XML format by email. However, you cannot open them directly from the email message.

Save the Excel email attachments to your computer and view them from there.

Many items on axis produces empty chart in Excel

If a chart contains many items on the x-axis, an empty chart is generated when the report output format is Microsoft Excel 2002.

This problem is caused by a limitation in Excel 2002 for chart data strings. To work around the problem, produce the report in Excel 2007 format. Excel 2007 does not have this limitation.

Chart legend titles are not supported in Excel

The Microsoft Excel spreadsheet software does not support chart legend titles.

Unsupported Chart Properties in Excel

The following IBM Cognos Analytics with Watson chart properties are not supported in the Microsoft Excel spreadsheet software:

- tool tips
- conditional text
- depth
- visual angle
- show values
- marker text location
- show baseline
- new note
- new marker
- truncation text and allow n-degrees rotation category labels
- border
- margin
- box type
- font and font alignment
- footer
- subtitle
- regression line
- baseline
- Include Zero For Auto Scale
- Summarize Small Slices
- Summarize Small Items

In addition, IBM Cognos Analytics with Watson makes sure that Excel reuses the same color palette that is defined in IBM Cognos Analytics with Watson. However, Excel can only use the first 16 colors from the IBM Cognos Analytics with Watson palette. If the number of categories in a chart exceeds 16, the rest of the colors are taken from the default Excel palette.

Unsupported chart types in Excel

About 30% of the chart types available in IBM Cognos Analytics with Watson are not matched in the Microsoft Excel spreadsheet software.

The following chart types appear differently or are not supported. Charts that are not supported appear as a default column chart in Excel.

- Bipolar charts
- Bubble charts

Excel does not support regression lines.

- Bullet charts

Excel does not support certain fills. As a result, the colored regions in bullet charts do not appear in Excel output.

- Combination charts

In Excel, combination charts appear as two-dimensional. If a three-dimensional or two-dimensional combination chart includes only an area, column, or line chart, only the one chart appears.

- Gauge charts
- Donut charts

Excel may fill in the donut hole to accommodate extra measures. Excel shows donut three-dimensional charts as donut charts.

- Maps

In Excel, no chart appears.

- Matrix charts
- Metrics range charts

In Excel, they appear as combination charts with two line charts for the tolerance bars.

- Pareto charts

In Excel, the cumulative line is not displayed.

- Pie charts

Excel shows only one type of pie chart and may show it at a different angle.

- Progressive column charts
- Polar charts

In Excel, a scatter chart appears instead.

- Quadrant charts
- Radar charts

Excel does not support stacked area radar charts. Excel names area radar charts as filled radar charts. Excel shows radar charts as radar with markers.

- Scatter charts

In Excel, three-dimensional scatter charts appear as two-dimensional scatter charts. The z-axis is dropped.

- 100% stacked bar and column charts

Clustered (side-by-side) stacked column charts are not supported in Excel. Only one column is rendered in the Excel output. For example, you have a 100% stacked column chart with Product line and Order method as columns. In the Excel output, columns for only Product line appear in the chart, but both Product line and Order method appear in the legend.

Cell Height and Width Are Incorrect

The width and height of cells that contain data with curly brackets {} or parentheses () may appear incorrectly.

This is because the Microsoft Excel spreadsheet software uses different word wrapping algorithms than IBM Cognos Analytics with Watson.

Appendix C. Prompt API for IBM Cognos Analytics with Watson

The JavaScript Prompt API provides report authors with a method of customizing prompt interaction in the reports they author.

With the prompt API, JavaScript applications can interact with IBM Cognos Analytics with Watson report prompts for the purposes of validation or custom interaction. The prompt API can query and set user selections, validate typed-in values using patterns, set default values using expressions or query data, and more. Examples are provided to show various usage scenarios of the prompt API.

Note: The prompt API does not support tree and search prompt controls. Additionally, date and date & time prompt controls do not support the `setValidator` method.

`cognos.Prompt` object

Defines the class that contains a prompt object from a report.

This object should only be accessed through an instance of `cognos.Report`.

`cognos.Prompt.getControlByName` method

Returns the control object associated with a name.

Syntax

```
(cognos.Prompt.Control) getControlByName(String sName)
```

Parameters

{String} sName

Specifies the prompt name property set for the control in IBM Cognos Analytics - Reporting.

Returns

{cognos.Prompt.Control}

Object associated to the specified `sName` control. Returns `null` if the control does not exist.

Example

The following is an example of the `clearMyPrompt()` function.

```
<script type="text/javascript">
  function clearMyPrompt() {
    var oCR = cognos.Report.getReport("_THIS_");
    var myPrompt = oCR.prompt.getControlByName("myPrompt");
    myPrompt.clearValues();
  }
</script>
```

cognos.Prompt.getControls method

Returns an array of all controls associated with the report.

Syntax

```
(cognos.Prompt.Control[]) getControls()
```

Parameters

None.

Returns

{cognos.Prompt.Control[]}

An array of controls associated with the report.

Example

This example implements a function, `clearAllValues()`, that resets (clears the selection of) all prompt controls for a page.

```
<script type="text/javascript">
  function clearAllValues() {
    var oCR = cognos.Report.getReport("_THIS_");
    var aControls = oCR.prompt.getControls();
    for (var i = 0; i < aControls.length; i++) {
      aControls[i].clearValues();
    }
  }
</script>
```

cognos.Prompt.Control object

A control is a visual element in the prompt page, such as a text prompt or a value prompt.

cognos.Prompt.Control.addValue method

Add an array of values to a control.

If the control does not support multiple values, only the first one provided is used.

Syntax

```
{void} addValues(aValues)
```

Parameters

{cognos.Value[]} aValues

The new values to use for this control.

Returns

{void}

Example

This example adds an array of two values (use and display) to a prompt.

```
var oCR = cognos.Report.getReport("_THIS_");
function setPromptValue( promptName, useValue, displayValue ) {
    var oP = oCR.prompt. getControlByName( promptName );
    var oValue = { 'use': useValue, 'display': displayValue };
    oP.addValue( [oValue] );
}
setPromptValue ( 'country', 'ca', 'Canada');
```

cognos.Prompt.Control.clearValues method

Clear (or deselect) all values for this control.

Syntax

For a text prompt, the text is set to empty. For a value prompt, all the selections are removed.

```
{void} clearValues()
```

Parameters

None.

Returns

```
{void}
```

Example

This example resets all the controls of a page.

```
function clearAllValues() {
    var oCR = cognos.Report.getReport("_THIS_");
    var aControls = oCR.prompt.getControls();
    for (var i = 0; i < aControls.length; i++) {
        aControls[i].clearValues();
    }
}
```

cognos.Prompt.Control.getName method

Returns the name of the control.

The name is set in IBM Cognos Analytics - Reporting in the name property set for the control.

Syntax

```
{String} getName()
```

Parameters

None.

Returns

```
{String}
```

The value specified by the name property set for the control.

cognos.Prompt.Control.getValues method

Returns the current value for the control.

This method always returns an array, even if there is only one value selected.

- The following is an example for a text box prompt (single):

```
[ {use: "Smith", display: "Smith"} ]
```

- The following is an example for a select prompt (multiple):

```
[ {use: "CAN", display: "Canada"}, {use: "JPN", display: "Japan"} ]
```

- The following are examples of range prompts:

A range is an array of two elements, with the mandatory names start and end. The value of each element is a regular array as in earlier examples. When the range values are equal, this method returns a normal value instead of a range:

```
[ {use: useValue, display:displayValue} ]
```

When the range values are different, this method returns a range:

```
[ start:{use: useValue, display:displayValue}, end:{use: useValue, display:displayValue} ]
```

Syntax

```
{cognos.Value[]} getValues(boolean v_allOptions)
```

Parameters

{Boolean} v_allOptions

This optional parameter is applicable only to value prompts. The parameter specifies whether to retrieve all values or only selected values.

If the parameter is true, then all options are returned. If the parameter is false or missing, then only the selected options are returned.

The default value of this parameter is false.

Returns

{cognos.Value[]}

An array of values for the control.

Example

This example demonstrates how to adjust your code based on whether the result is a single value or a range.

```
function isRangeOutOfLimits(datePrompt, rangeLimit) {
    var result = false;
    var v = datePrompt.getValues();
    var rangeValue = v[0];
    var rangeDaysDiff = 0;
    if (rangeValue.start) {
        rangeDaysDiff = 0;
        var startDate = rangeValue.start.use;
        var endDate = rangeValue.end.use;
        rangeDaysDiff = dateUtils.substractDate(endDate,startDate);
    }
    if (rangeDaysDiff > 0 && rangeDaysDiff <= rangeLimit) {
        result = true;
    }
}
```



```
    }
    return result;
}
```

This example demonstrates the use of the parameter `v_allOptions`.

```
var allValues = valueControl.getValues(true);
var selectedValues = valueControl.getValues();
```

cognos.Prompt.Control.setValidator method

Changes the default validation function for a control to one defined by the user.

When the specified function returns `false`, the UI element associated with the control indicates that a validation error occurred. When used in a multi-select control, the **Insert** button is disabled.

Note: Date and date & time prompt controls do not support this method.

Syntax

```
{void} setValidator(oFct)
```

Parameters

{function} oFct

A user-defined function that takes the user input as a parameter and returns a Boolean value.

Returns

```
{void}
```

Example

This example demonstrates how to ensure that a valid postal code is provided in the form A1A 1A1.

```
textBox.setValidator(
    function (values) {
        var result = false;
        if (values && values.length > 0) {
            var sValue = values[0]['use'];
            var rePostalCodeFormat = new RegExp( "[a-z][0-9][a-z] ?[0-9][a-z][0-9]", "gi" );
            if ( rePostalCodeFormat.test(sValue) ) {
                result=true;
            }
        }
        return result;
    }
);
```

cognos.Prompt.Control.setValues method

Resets the control and adds an array of values to a control.

If the control doesn't support multiple values, only the first value provided is used. This is a convenience method that issues consecutive calls to `clearValues()` and `addValues()`.

Syntax

```
{cognos.Value[]} aValues
```

Parameters

{cognos.Value[]} aValues

New values to use for this control.

Returns

{void}

Example

```
function setPromptValue( promptName, value ) {
    var oCR = cognos.Report.getReport("_THIS_");
    var oP = oCR.prompt.getControlByName( promptName );
    oP.setValues( oValues );
}
oValues = [{ 'use': 'ca', 'display': 'Canada' },
           { 'use': 'us', 'display': 'USA' }];
setPromptValue( 'countries', oValues );
```

cognos.Report object

Represents a report object in the content store.

Properties

prompt

References a cognos.Prompt object for this instance.

Example

This example creates a new cognos.Report object from the current instance.

```
var oCr= cognos.Report.getReport("_THIS_");
```

The new oCr object is specific to the cognos.Report namespace and avoids collisions with other objects in your scripts. The keyword `_THIS_` should always be used. The Report Server will replace it with a unique namespace during report execution.

cognos.Report.getReport method

Getter method for a cognos.Report object.

Namespaces are used to support HTML fragments. Always use a proper namespace when using this method to retrieve a cognos.Report object.

Syntax

```
<static> {cognos.Report} cognos.Report.getReport(sNamespace)
```

Parameters

{String} sNamespace *Optional*

Returns

{cognos.Report}

The cognos.Report instance for this namespace.

Example

```
var oCR = cognos.Report.getReport( "_THIS_" );
```

cognos.Report.sendRequest method

Sends a requests with the current parameters and values.

Syntax

```
{void} sendRequest(eAction)
```

Parameters

{cognos.Report.Action} eAction

Specifies one of the cognos.Report.Action enumeration values. No other values are allowed.

Returns

```
{void}
```

Example

```
function customButton( eAction )  
{  
    var oCR = cognos.Report.getReport("_THIS_");  
    oCR.sendRequest( eAction );  
}
```

cognos.Report.Action object

Defines constants for report navigation.

cognos.Report.Action.BACK

Go back one prompt page.

Syntax

```
<static> <constant> cognos.Report.Action.BACK
```

cognos.Report.Action.CANCEL

Cancel report execution and navigate to the previous page.

Syntax

```
<static> <constant> cognos.Report.Action.CANCEL
```

cognos.Report.Action.FINISH

Submit parameter values and skip all remaining optional prompts and prompt pages.

Syntax

```
<static> <constant> cognos.Report.Action.FINISH
```

cognos.Report.Action.NEXT

Submit parameter values and go to the next prompt page.

Syntax

```
<static> <constant> cognos.Report.Action.NEXT
```

cognos.Report.Action.REPROMPT

If the report contains prompt pages, the first prompt page is displayed. Otherwise, if the report doesn't contain prompt pages, this constant will re-prompt for values.

Syntax

```
<static> <constant> cognos.Report.Action.REPROMPT
```

cognos.Value class

JSON structure to represent parameter values.

This object includes the following valid attributes:

- display
- end
- start
- use

Simple values

```
{ 'use': '[a].[b].[c]', 'display': 'Canada' }
```

Range values

```
{  
  'start': { 'use': '2007-01-01', 'display': 'January 1, 2007' },  
  'end': { 'use': '2007-12-31', 'display': 'December 31, 2007' }  
}
```

Multiple values

```
[  
  { 'use': '12', 'display': 'Canada' },  
  { 'use': '41', 'display': 'Germany' },  
  { 'use': '76', 'display': 'Japan' }  
]
```

Appendix D. Legacy Map Manager maps

This appendix describes the Map Manager maps functionality that has been replaced by new maps functionality as described in other areas of this document.

IBM Cognos Analytics - Reporting provides a set of maps that you can use to represent tabular data in a spatial context. For example, on a map of the world, countries and regions can be colored to represent the level of revenue.

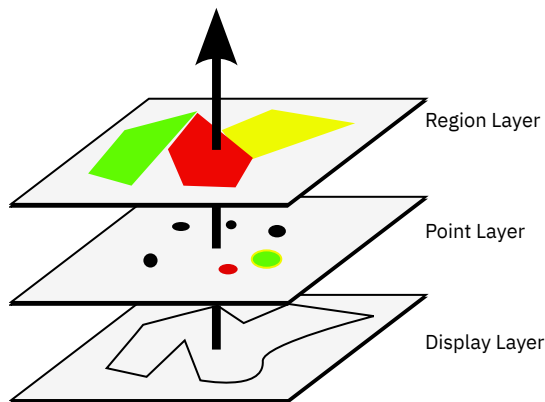
Maps are not supported for reports run in Microsoft Excel format.

The Reporting map object

Maps are most often used to show geographical areas, but they can be used to show other spatial information, such as a floor plan in a building, seats in an airplane, or parts of the human body.

Maps are similar to crosstabs in the way their data is organized. The display is different, but maps show the intersection of data the same ways as crosstabs; for example, you can see the revenue for golf equipment in Canada.

A map in IBM Cognos Analytics with Watson consists of a collection of layers. Each layer contains different information and acts like a transparency that is placed over the map. Each layer adds more information to the map. For example a map of the world may contain information related to countries or regions on one layer and information related to cities on another level.



IBM Cognos Analytics - Reporting maps provide the following three types of layers:

- Region layer

Specifies the regions on a map to be differentiated according to values in the data source. For example, to show the revenue level for each country and region on a map of the world, choose Country and Region as the region layer and then specify that the color of each country and region is based on the revenue value for that country and region. Areas can be set up for drilling through to other reports.

- Point layer

Specifies the points to be placed on a map. The color and size of the points is based on the data that you select. For example, you choose to show cities as points on a map and set the color of each point by revenue and the size of each point by profit. Points can be set up for drilling through to other reports.

- Display layer


You can show or hide items such as grid lines or capital cities. This layer is determined in the map file and not in the data source.

Note: If you intend to create CSV or XML output from your map, use only a point layer or a region layer. CSV and XML do not support the simultaneous use of both layers in the same map. Only one layer will be rendered in the output.

Creating a map report

To show how revenue for the company is distributed throughout the world, you can create a report that contains a map that shows the distribution of revenue by country and region.

Procedure

1. To start IBM Cognos Analytics - Reporting click **New** and then click **Report**.
2. In the **Templates and themes** window, click **Blank** and then click **OK**.
3. Click the **Data** icon, click the **Add report data** icon , find the package and click **Open**.
4. Click the **Toolbox** icon, double-click **Map**.
5. In the **Choose map** dialog box, in the **Maps** pane, expand the **World** folder and click **World**.
6. In the **Region layers** box, click **Countries and Regions + Territories**.
7. In the **Point layers** box, click **None**.
8. In the **Display layers** box, click **Oceans** and then click **OK**.

Tip: You can select or deselect multiple display layers by Ctrl+clicking.

Tip: You can return to the **Choose Map** dialog box at any time by double-clicking the map background.

9. Drag data items to the map and run the report.

Set Map Properties

When you select an element in a map, you can view its properties in the **Properties** pane. Some properties are dependent on the existence of other properties.

If you are familiar with using conditional variables, you can customize the map to change appearance or provide information in response to expressions or conditions.

When you change a map property, you usually do not see the change until you run the report. Changes to the properties of labels and titles are reflected immediately.

These are some of the properties you can change in maps. These properties are available when you select the map object, unless specified otherwise in the **Action to perform in the Properties pane** column.

| Goal | Action to perform in the Properties pane |
|--|--|
| Hide or show the title, subtitle, footer, or axis title | Under Chart Titles , set the Title , Subtitle , Footer , or Axis Title property. |
| Hide or show the legend | Under Chart Annotations , set the Legend property. |
| Hide or show region and point layer values and labels on the map | Select the region or point layer. Under Chart Labels , double-click the Show Values property and select the options that you want. To hide overlapping labels, select the Hide overlapping labels check box. |
| Hide or show display layer labels on the map | Select the display layer. Under Chart Labels , double-click the Show Labels property and select the option that you want. To hide overlapping labels, select the Hide overlapping labels check box. |

| Goal | Action to perform in the Properties pane |
|--|--|
| Hide or show the border around the legend | Select the legend icon. Under Box , set the Borders property. |
| Change the border around the map object | Under Box , set the Border property. |
| Hide or show the tooltips Note: Some versions of Acrobat Reader do not support tooltips. | Under Chart Labels , set the Tooltips property. |
| Change the amount of white space around the map | Under Box , set the Padding or Margin property. |
| Change the default colors for all map elements | Under Color & Background , set the Background Color , Foreground Color , or Fill Effects property. |
| Change the font and the alignment of text | Under Font & Text , set the Font or Relative Alignment property. Tip: The 2011 Quarterly Sales Forecast sample report in the GO Sales (analysis) package includes text alignment. |
| Resize the map | Under Positioning , set the Size & Overflow property. |
| Change the font for the legend | Select the legend icon. Under Font & Text , set the Font property. |
| Change the format of values in the legend | Select the value in the region or point layer. Under Data , set the Data Format property. |
| Ignore data with no features | Under Data , set the Ignore Data with No Features property. |
| Specify the size of points | In the point layer, click the measure in the Size drop zone and set the Minimum Size and Maximum Size properties. |
| Add titles, subtitles, footers, or axis titles | Set the Title , Subtitle , Footer , or Axis Title property. |

Procedure

1. Select the map object or map element to change:

- To change general properties, such as size and color, click the map object.
- To change specific map elements, such as a layer or title, click the element itself.

Tip: To cancel a selection, press the Esc key.

2. In the **Properties** pane, set the property value.


An ellipsis button indicates that a dialog box provides further options.

Note: You may have to scroll to see all the properties.

Defining Data Values for the Region Layer

The map that you created in the previous topic is not yet linked to a data source. You will now specify the data values from your data source that will determine the color of each region.

Procedure

1. From the **Source** tab , expand your data.
2. Drag your measure to the **Color** drop zone.
3. Drag your country or region items to the **Location** drop zone.
4. Run the report.


Match Data Values to Names in the Map File

If the **Ignore Data with No Features** property is set to **No**, then each object that is called from the data source must have a matching label in the specified layer of the map file. For example, if your data source has a country and region named United States and the layer in the map file labels the same country and region USA, then there is a mismatch that must be corrected. IBM Cognos Analytics - Reporting only makes you aware of a mismatch if each object in your data source does not have a corresponding label in the map file. If there are extra labels in the map file that do not have a match in the data source, the report will run without an error message.

A mismatch between your data and the map file must be corrected by the report author. It can not be corrected by a consumer of the map report at run time. There are two ways to correct a mismatch between your data and the labels in the map files. You can use IBM Cognos Map Manager to edit the labels in the layers of the map file, or you can use the dictionary property to create an alias for each mismatched object. When you use the dictionary property, it resolves the mismatch only for a single report, and is not shared with other reports. If you intend to continue using a map with the same data source, it is best to edit the map in Map Manager so that the labels match the objects in your data source.

For information about using Map Manager, see the Map Manager *Installation and User Guide*.

Procedure

1. Select the map object.
The title bar of the **Properties** pane now shows the word **Map**.
2. In the **General** section of the **Properties** pane, double-click the **Dictionary** property.
3. Click the new button .
4. In the **Dictionary Entry** dialog box, click **Search**.
5. In the **Search string** box, type a word or part of a word for which to search.

For example, if you are searching for United States, type in part or all of the name.

6. In the **Search map layer** box, click the layer to search and click **Search**.
7. In the **Matching features** box, click the label to which to match your data source and click **OK**.
8. In the **Alias** box, type the name as it appears in the data source and click **OK**.


For example, if the country and region in your data source is named USA, type USA as the alias.

Note: To find out the name for the objects in your data source, run a list report. For example, you can run a list report to show the names of all the countries and regions in your data source. For more information see [Chapter 3, “Lists,” on page 61](#).

Define Data Values for the Point Layer

The Point layer in a map is used to visually represent data for point locations, such as cities or sales outlets. Both the color and size of points can be based on data from your data source.


Procedure

1. Open the **Choose Map** dialog box:
 - When you create a new map report, this dialog box appears automatically.
 - If you are already in a map report, double-click the map background.
2. In the **Point Layers** box, select the layer containing the points to show on the map.
For example, on a map of the world, you may want the points to represent cities.
3. From the **Source** tab , drag a data item to the **Color** drop zone in the **Point Layer**.
For example, to have the color of the point based on revenue, drag **Revenue** from the **Source** tab to the **Color** drop zone.
4. From the **Source** tab, drag a data item to the **Size** drop zone in the **Point Layer**.
5. From the **Source** tab, drag a data item to the **Location** drop zone in the **Point Layer**.
The object must be supported in the map file as a point location. For example, in the World sample map, city is supported as a point location but country or region is not.
6. If you need to refine the location, drag an object to the **Refine Location** drop zone.
Use this drop zone when there is more than one location with the same name. For example, if you try to run a report with cities in the point layer, and there is more than one city in your data source with the same name, the report does not run. An error message indicates that there are cities in your data source with duplicate names. You can differentiate the cities by using the data object **Region** to refine the location.

Add Colors to the Region or Point Layer

You can add colors for regions or points and specify values to determine when those colors are shown.


Procedure


1. In the report, click the **Region Layer** or **Point Layer**.
2. In the **Color & Background** section of the **Properties** pane, double-click the **Palette** property.
3. Click the new button  and click **Color**.
A new color is added to the list of colors.
4. To view the palette colors as a continuous spectrum in which colors blend into one another, click **Continuous Colors**.
5. With the new color selected, click **Color** in the right pane of the dialog box and select a color.
6. Change the percentage boundaries for the colors.
Tip: To specify absolute values rather than percentages, clear the **Percentage** check box.

Add a Legend Title to a Map

There are legend titles for the entire legend, for the color of the regions, for the color of the points, and for the size of the points.

Procedure


1. If the legend title is not showing, click the legend icon .
2. In the **General** section of the **Properties** pane, set the **Legend Title** to **Show**.
3. In the report, double-click the legend title and type the title.
4. By default, the legend titles are taken from the object you have selected from the data source. To change the legend title for the region color, point color, or point size, do one of the following:

- Click the **Toolbox** icon , drag a text or calculation object to the **Color Legend Title** drop zone in the Region Layer or Point Layer, or the **Size Legend Title** drop zone in the Point Layer.
- Double-click the **Color Legend Title** or **Size Legend Title** drop zone, to change from the default legend title, then double-click the drop zone again. In the **Text** dialog box, type text for the legend title.


Add a Note to a Map

You can add one or more notes, determine their position in the map report, and specify borders around notes.

Procedure

1. Select the map object.
2. In the **Chart Annotations** section of the **Properties** pane, double-click the **Notes** property.
3. Click the new button , and click **OK** twice.

A note icon with the words **New Note** appears in the report.

4. Click **New Note** next to the note icon .
5. In the **Text Source** section of the **Properties** pane, double-click the **Text** property.
6. Type the text to appear in the note and click **OK**.
7. In the report, click the note icon.
8. In the **Positioning** section of the **Properties** pane, type values to specify the bottom position, left position, height, and width for the note.

The location of the note is defined by the number of pixels.


9. Set the **Note Border** property to specify a border around the note.
10. Run the report to view the note.

If necessary, change the position again.

Drill Through to Another Report From a Map

You can link regions or points on a map to another report. For example, on a map of the world, you can specify that when you click on China, a map of China opens.

Procedure

1. Open the target report.
2. From the report object toolbar, click **Filters**.
3. On the **Detail Filters** tab, click the add button .
4. In the **Available Components** box, click the **Source** or **Data Items** tab to select the data item to use.


For example, to open the target report when Canada is clicked in the source report, expand **Countries and Regions** and double-click **Country and Region**.

5. In the **Expression Definition** box, type an operator after the data item or select an operator from the **Functions** tab and then enter a value.

For example, to open the report when Canada is clicked in the source report, the expression would be as follows:

[Country and Region]='Canada', where [Country and Region] is the name of the data item in the package.

6. Save the target report.
7. Open the source report.
8. Select the region layer or the point layer.
9. In the **Data** section of the **Properties** pane, double-click the **Map Drills** property.

10. In the **Map Drills** dialog box, click the new button .

11. In the **Search string** box, type the name of the feature to use for the drill-through link.

For example, to open a report when you click on Canada in the map, search on all or part of the word **Canada**.

12. Click **Starts with** to search for features that start with the search string or click **Contains** to search for feature names that include the search string.
13. To include a parent layer's name in the results of your search, select a layer in the **Include parent layer** list.

For example, if you searched for **Oslo** and you included the parent layer of **Countries and Regions + Territories**, the search result would be **Oslo (Norway)**.

14. Click **Search**.
15. Select a feature from **Matching features** box and click **OK**.
16. In the **Drill-Through Definitions** dialog box, click the new button.
17. Click the ellipsis button beside the **Report** box, and select the target report.
18. Run the report.

Results

When you click the selected feature in the source report, the target report will open.

Edit a Map

With IBM Cognos Map Manager you can edit the labels in maps to be consistent with the object names in your database.

Administrators and modelers use a Microsoft Windows operating system utility named Map Manager to import maps and update labels for maps in IBM Cognos Analytics - Reporting. For map features such as country or region and city names, administrators and modelers can define alternative names to provide multilingual versions of text that appears on the map.

For instructions, see the Map Manager *Installation and User Guide*.

Additional Maps

IBM Cognos supplies a set of standard maps that can be used directly with IBM Cognos Analytics - Reporting as well as IBM Cognos Map Manager.

If you already have proprietary geographic data, you can also convert them to .TAB and .XML files that can be imported into Map Manager. Map Manager uses the files to generate .CMF map files, which you can use in Reporting. For more information about the required .TAB and .XML files format and how to generate .CMF map files with Map Manager, see the Map Manager *Installation and User Guide*.

Location intelligence

Sophisticated mapping functionality, known as location intelligence, can be used for a broad range of business applications that extend the mapping capability of IBM Cognos Analytics with Watson. These include the ability to dynamically create geographic filters and custom areas for aggregating data for ad-hoc analysis. Examples of business applications of location intelligence are listed in the following table.

| Business application | Benefits |
|---|--|
| Target marketing | Learn who your best clients are and find more like them. |
| Network optimization and site location analysis | Put stores near your customers and look for gaps in geographical coverage. |
| Routing and work force optimization | Reduce the number of trucks you need and make your drivers more efficient. |
| e-government | Provide citizens with self-service opportunities. |
| Sales territory creation | Create balanced sales territories. |
| Economic development | Plan the development of your community. |
| Communications network planning | Avoid costly mistakes by putting cell towers in the correct locations. Identify the locations of clients in your service area. |

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