Create apps and visualizations

Qlik Sense®
2.1.2

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1 About this document

Visualizations are used to present the data that is loaded into the app. The selections you make in the app are reflected in all associated visualizations on all sheets.

Read and learn how to create and customize sheets and visualizations in your app. You will also learn about creating reusable master items, and about expressions in visualizations.

This document is derived from the online help for Qlik Sense. It is intended for those who want to read parts of the help offline or print pages easily, and does not include any additional information compared with the online help.

Please use the online help or the other documents to learn more.

You find these documents and much more at help.qlik.com/sense.

2 Starting Qlik Sense

You start Qlik Sense by entering a web address in your browser, such as *https://<server name>/hub*. The exact address you enter depends on how Qlik Sense has been deployed in your organization.

*If you are not using Windows, a login window will open in your browser. Enter your **User name** in the format DOMAIN\user.*

Qlik Sense opens at the hub, which is where you see all the apps you have access to. If there are no apps, you can begin by creating your first app.

See: *Creating an app (page 279)*

2.1 What you can do and see in Qlik Sense

What you can see and do in Qlik Sense depends on what access rights your Qlik Sense system administrator has granted you. The access control includes controlling user authorization, setting up permissions and resources (for apps, sheets, and so on) but does not control what data you have access to.

Qlik Sense has a default behavior, for example:

- Only the owner of an unpublished app can see it.
- An app cannot be modified once it has been published.
- Only users with access to a stream can see the apps in that stream.

This means that you can see some parts of the user interface or perform some actions only when the app is in a specific state or when access has been granted to you.

Your Qlik Sense system administrator controls authorization and access to make Qlik Sense behave in a particular way. This is configured in the Qlik Management Console.

2.2 Opening an app

Opening an app with data

You open an app from the hub by clicking it.

If you want to open an app not already in the hub, you first need to import the app using the Qlik Management Console (QMC). You can then open the imported app from the hub.

Opening an app without data

In some cases, you may want to open an app without loading its data, for example when there are large amounts of data that would take a long time to load.

When you open an app without data, visualizations will not work, as they are not connected to the data source. Additionally, the data model viewer will not be available.

Do the following:

- Long-touch/right-click the app in the hub and select **Open without data** from the shortcut menu. The app opens, and you can access the data load editor to update the load script, and view or work with the layout of sheets and stories.

You can work with the layout of sheets and stories, to reorganize the content, for example, but you will only see representations of the visualizations. You cannot update measures or dimensions. You can make changes to the data load script, if you want to. Once you run the script in the data load editor successfully, the app visualizations will work as intended and will be ready to be used for data analysis.

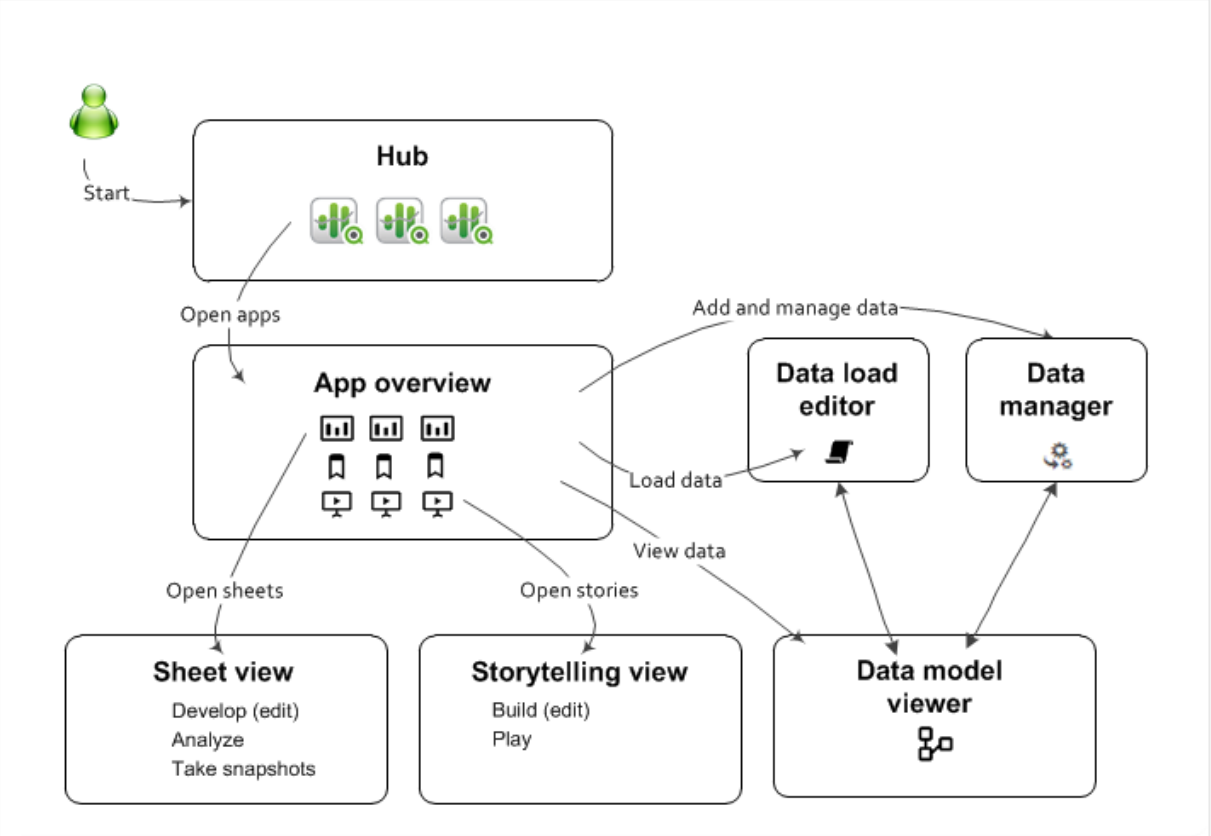
You can only open your own unpublished apps without data.

You can only open apps in qvf format without data; not documents in qvw format.

See: Converting a QlikView document into a Qlik Sense app (page 279)

3 Navigating in the user interface

Qlik Sense is a web-based application with a number of different views to work in. You choose your view depending on whether you are building a data model, exploring and discovering data, or working with data storytelling.

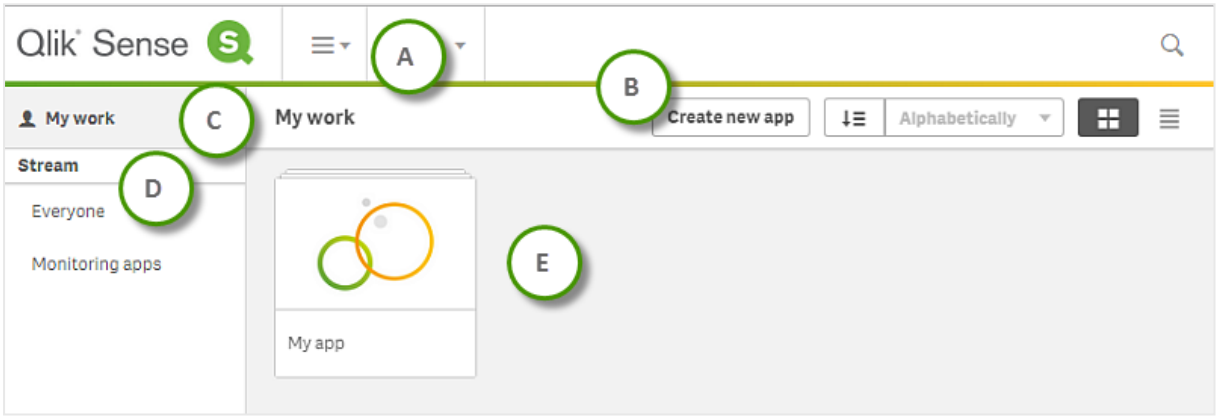


The hub	The hub is your starting point and it is where you find all your apps. You create new apps from here.	*The hub (page 20)*
App overview	When you open an app from the hub, you arrive at the app overview. From here you see and manage all the content the app contains (such as sheets, stories and bookmarks).	
Data manager	You can add data sources without learning script in the data manager.	
Data load editor	You use the data load editor to create, write and run the script that loads data into your app.	*Data load editor (page 123)*
Data model viewer	You use the data model viewer to get an overview of the data you have loaded into your app.	

Sheet view	You arrive at sheet view when you open a sheet in an app. It is here you develop and analyze apps.	
Storytelling view	You arrive at storytelling view when you open a story in an app. It is here you build and play stories based on your data discoveries and insights.	

3.1 The hub

When Qlik Sense starts up, you arrive at the hub. The hub is where you find all the apps you have access rights to use. You find your own apps under **My work**, as well as apps that have been published from the Qlik Management Console organized in streams. Click an app in the hub to open it in a separate tab.



Example of the hub

Publishing is not supported in Qlik Sense Desktop, which means that you only see your private content in the hub when using Qlik Sense Desktop. Also, there is no login section in Qlik Sense Desktop.

A	The toolbar contains the global menu and other useful commands. ☰ Global menu with options **Help** and **About**. **Login** Depending on how the Qlik Sense system has been set up, you may have to log in by clicking the **Login** button. After logging in, your login information is displayed. 🔍 You can search to easily find a specific app.	

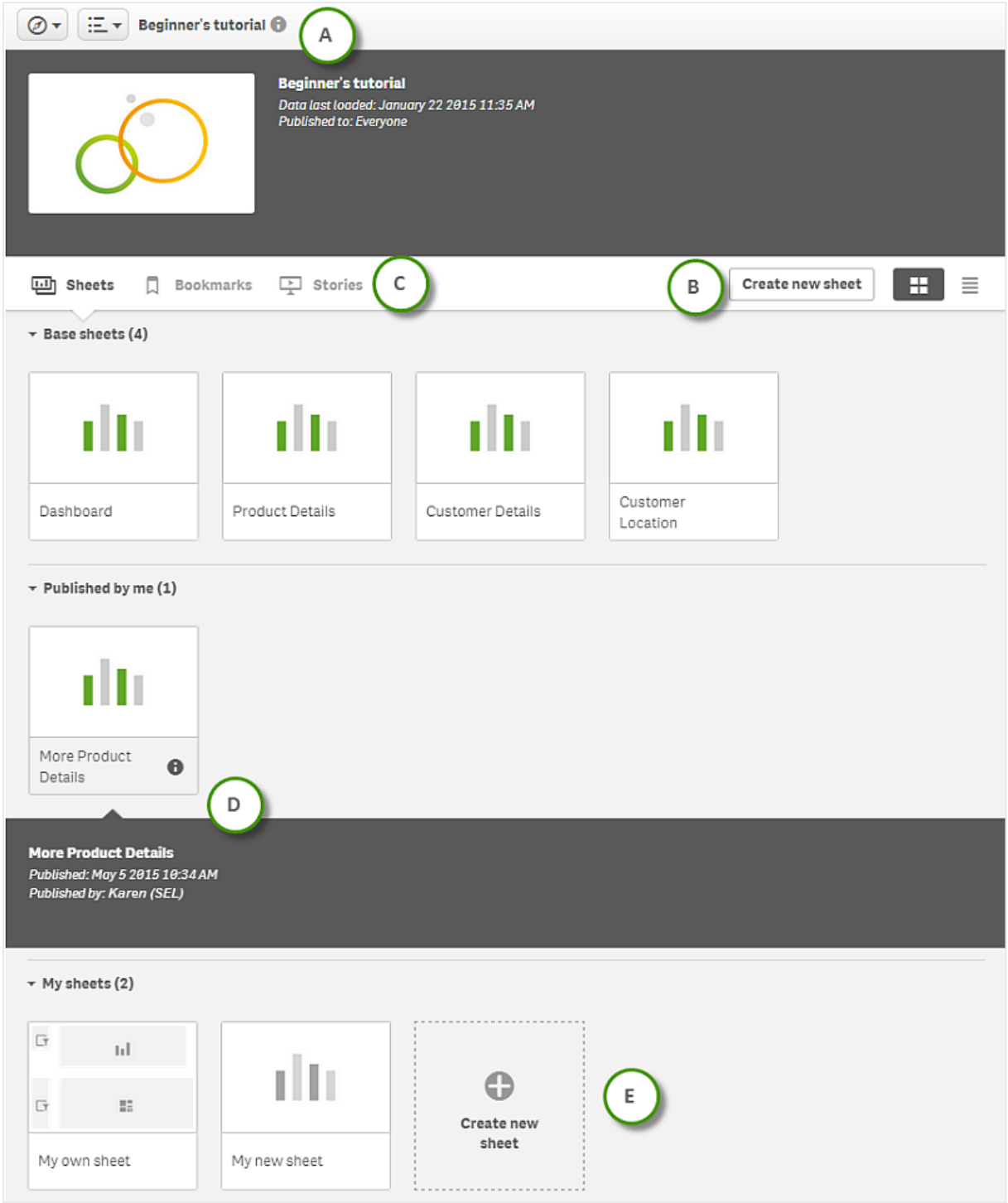
B	**Create new app**	Create a new app. The button is only available if you have permission to create apps.	*Creating an app (page 279)*
	↓≡	You can sort the apps alphabetically or by published date, descending or ascending.	
	■ ≡	Toggle between grid view and list view of the hub, depending on what kind of overview you prefer.	
C	All your own apps.		
D	The published apps are organized in streams.		
E	All of your own apps, or all the apps of the selected stream are displayed in the main area.		

If you are using Microsoft Internet Explorer and the icons in the hub are not displayed correctly, you can modify a setting for the web browser.

3.2 App overview

When you open an app from the hub, you arrive at the app overview. This is where you see and manage all the content within the app. The content of the main area depends on what category you have selected on the left-hand side; sheets, bookmarks or stories.

You find content that is part of the published app in the upper part of the main area. You cannot add any content to the base part of the published app. Your private content is displayed under **My sheets**/**My bookmarks**/**My stories**. Depending on access rights, you may be allowed to publish your private content so that other users of the app can explore it.



Publishing is not supported in Qlik Sense Desktop, which means that you only see your private content in the hub when using Qlik Sense Desktop.

A	The toolbar contains the navigation menu, the global menu and the app name. Navigation menu with options **Data manager**,**Data load editor**, **Data model viewer** and **Open hub**. *Once the app has been published, you cannot navigate to the data manager, the data load editor or the data model viewer.* Global menu with options **Add data**,**Help** and **About**. *Once the app has been published, you cannot add data.* Click the info icon to show or hide the app details.	*Data manager (page 121)* *Data load editor (page 123)* *Data model viewer (page 125)* *The hub (page 20)*
B	**Create new sheet** Create a new sheet. Toggle between grid view and list view of the app overview, depending on what kind of overview you prefer.	*Creating a new sheet (page 144)*
C	Select whether to display sheets, bookmarks or stories in the main area. Access to all sheets in the app and to creating a new sheet. Access to all bookmarks in the app. Access to all stories in the app and to creating a new story.	
D	Clicking the title of a sheet or a story displays its details such as publish information and description.	
E	Reorder and change title and description of private sheets and stories, as well as publish, edit, duplicate and delete them.	*Changing the title and description of a sheet (page 144)* *Duplicating a sheet (page 147)*

Touch gestures in the app overview

The table describes the touch gestures that are used for navigating in the app overview.

Long-touch and drag	Move an item to a new location
Long-touch and release	Open the shortcut menu

3.3 Sheet view

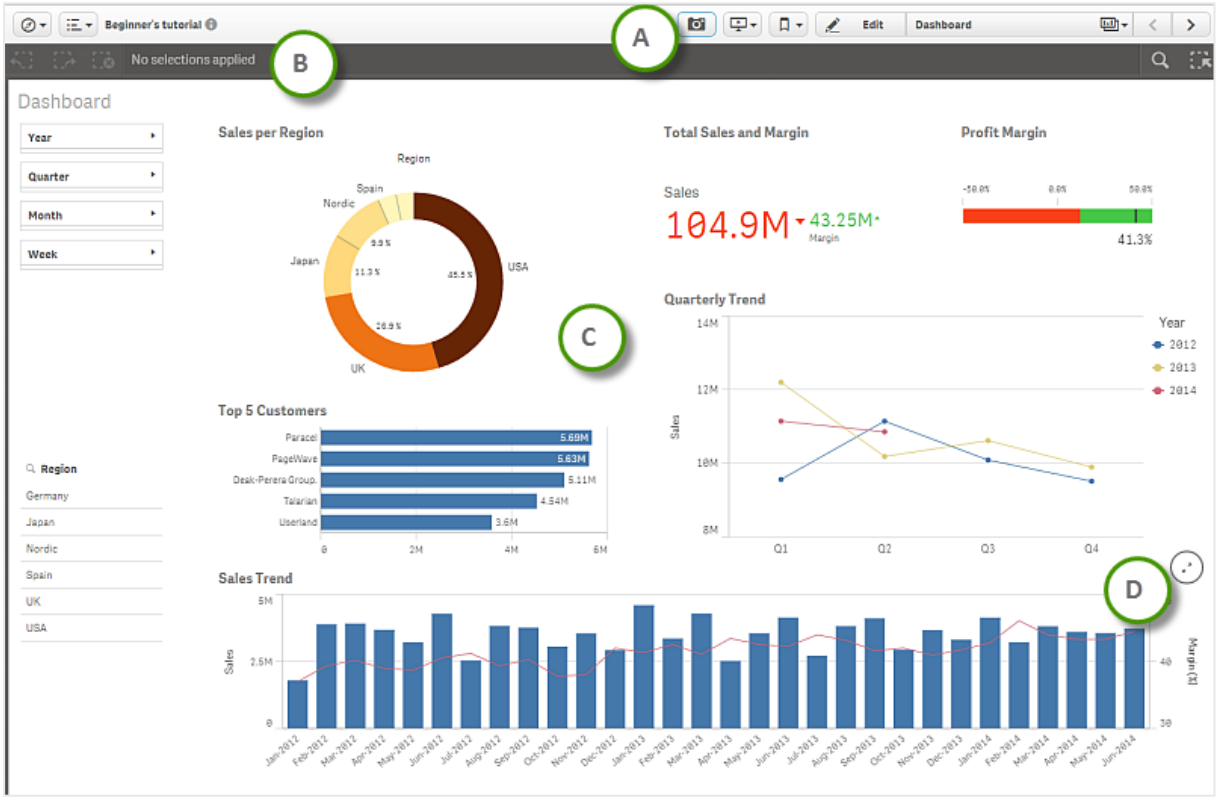
You can open a sheet from the app overview. In sheet view, you can do the following:

- Analyze with the app. You make selections in the visualizations and go into detail in your data to gain insights.
- Take snapshots of visualizations. You use these static snapshots building stories in data storytelling.
- Develop (edit) the app. You create sheets and visualizations to be used for data analysis. You cannot edit sheets of a published app, but if you have the correct permissions, you can create your own private sheets. You can also load another data file into the app.

Depending on if the app you are working with is published or not, you find different options in the menus and different items in the panel on the left when editing.

Analyze

You start analyzing data on a sheet by making selections in the visualizations. You can quickly see and move around among the sheets with the sheet navigator.



Sheet view with filter pane visualizations to the left and chart visualizations to the right

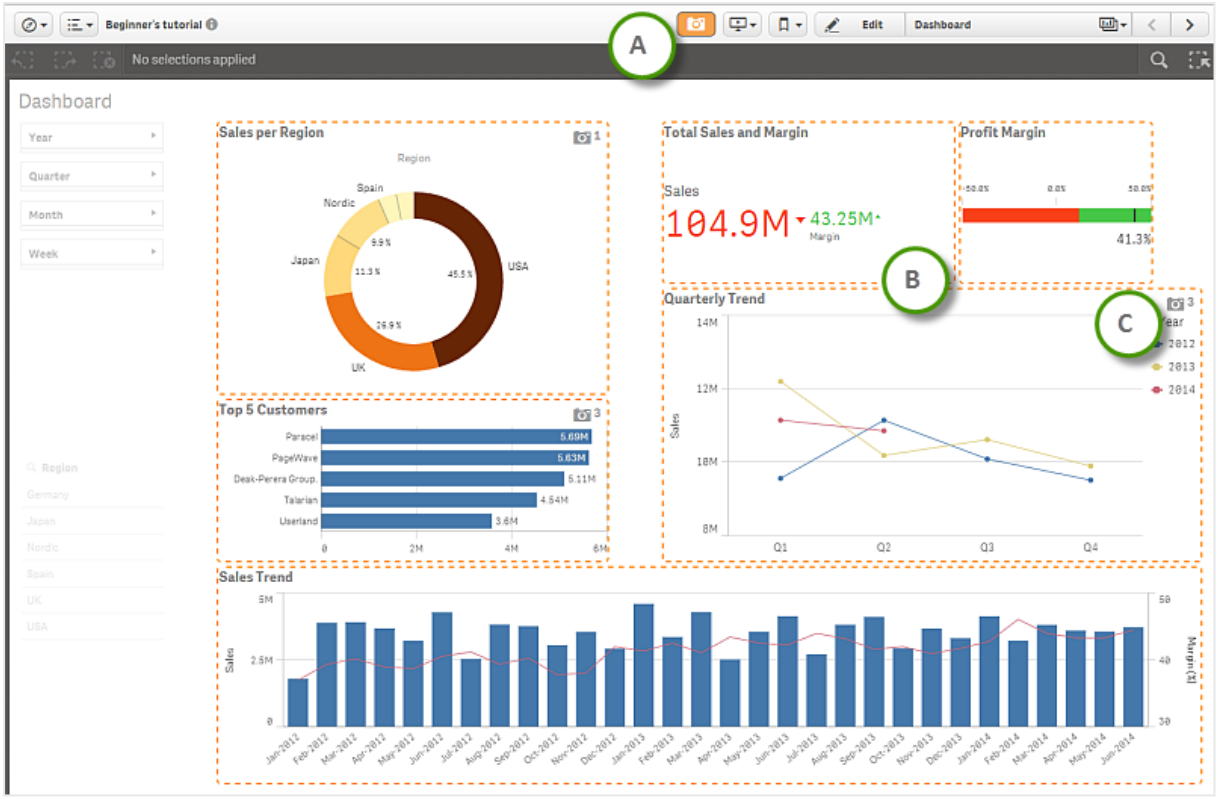
A	The toolbar contains the navigation menu, the global menu and other useful commands. Navigation menu with options **App overview**, **Data manager**, **Data load editor**, **Data model viewer** and **Open hub**. *Once the app has been published, you cannot navigate to the data manager, the data load editor or the data model viewer.* Global menu with options **Add data**, **Export sheet to PDF**, **Publish sheet**, **Duplicate sheet**, **Delete sheet**, **Help** and **About**. *Once the app has been published, you cannot add data.* Click the info icon to show or hide the app details. Start taking snapshots for storytelling. Access to all stories in the app and to creating a new story. Access to all bookmarks in the app and to creating a new bookmark. Enable editing of the sheet. Access to all sheets in the app and to creating a new sheet using the sheet navigator.	*App overview (page 21)* *Data load editor (page 123)* *Data model viewer (page 125)* *The hub (page 20)* *Storytelling view (page 111)* *Navigating between sheets (page 111)*
B	Manage selections by clearing all selections, stepping back or stepping forward in selections.	
C	The sheet with visualizations.	*Sheets (page 143)*
D	To explore data on a detailed level you can expand and work with one visualization at a time on the sheet.	*Showing a visualization in full screen (page 245)*

Take snapshots

When you are in sheet view, you can take snapshots of the visualizations and use them to build a story in data storytelling. You can do this in the following ways:

- Take a single snapshot of a selected visualization.
- Take several snapshots of several visualizations at the same time.

You can take snapshots of all the different visualization types but not the filter panes.



Sheet view with taking snapshots enabled.

A	Enable taking snapshots.	
B	Marked visualizations can be used for snapshots.	
C	A snapshot indicator with the number of taken snapshots. View and manage the snapshots of a visualization.	

Develop (edit)

You enable editing of the sheet and its visualizations by clicking **Edit** in the toolbar. The properties panel opens on the right.

*You can also start editing by long-touching/right-clicking a sheet in the app overview or the sheet navigator, and selecting **Edit** from the shortcut menu.*

In an unpublished app, on the left, you find a panel with assets such as measures, dimensions, fields and charts. You can create measures and dimensions from the assets panel, to use when building visualizations.

In a published app, on the left, you find a panel with pre-made and ready-to-use master items (measures, dimensions and visualizations). You cannot update the existing sheets of a published app, but you can create new sheets to further develop the app.

If the panel on the left is hidden, click ◧ in the lower left-hand corner. If the properties panel is hidden, click ◨ in the lower right-hand corner.

Editing a sheet of an unpublished app, with the assets panel to the left and the properties panel to the right.

A	In the assets panel of an unpublished app you find fields to use when creating dimensions and measures, and charts to use when creating visualizations. You can save dimensions, measures and visualizations as master items for reuse. In the library panel of a published app, you find pre-made and ready-to-use master items (measures, dimensions and visualizations) .You also find charts to use when creating your own visualizations. *Publishing is not supported in Qlik Sense Desktop, which means that you have access to the assets panel (not the library panel) when using Qlik Sense Desktop.*	*Assets panel (page 28)* *Library panel (page 31)*

B	Search all items in the assets or library panel.	
C	A selected visualization with resizing handles.	*Resizing a visualization (page 245)*
D	Properties of the selected visualization or the sheet. The properties for the sheet is shown if you have not selected a visualization.	*Editing a visualization (page 222)*
E	Cut, copy, paste and delete items on the sheet.	*Copying, replacing and moving items on sheets (page 146)* *Deleting a visualization (page 247)*
F	Undo and redo.	*Undo and redo actions (page 138)*
G	Open the variables overview.	*Using variables in expressions (page 256)*

Touch gestures in the sheet view

The table describes the touch gestures that are used in the sheet view.

Long-touch and release	Open the shortcut menu
Long-touch a visualization	Open the options menu
Swipe	Scroll lists and visualizations
Pinch	Zoom in or out on visualizations
Two-finger tap	Select an interval in a list, table or bar chart axis
Two-finger swipe	Pan a scatter plot visualization
Three-finger tap	Reset the zoom level of a scatter plot visualization

See also:

- *Sheets (page 143)*
- *Structuring an app using sheets (page 143)*
- *Visualizations (page 151)*

Assets panel

The assets panel provides a set of items you can use in your visualizations to help you develop an app (which is unpublished). It contains the visualizations and dimensions contained in the app, as well as a list of available charts and any master items. The assets panel is shown on the left-hand side of the sheet you are editing in an unpublished app. If the assets panel is hidden, click ◧ in the lower left-hand corner.

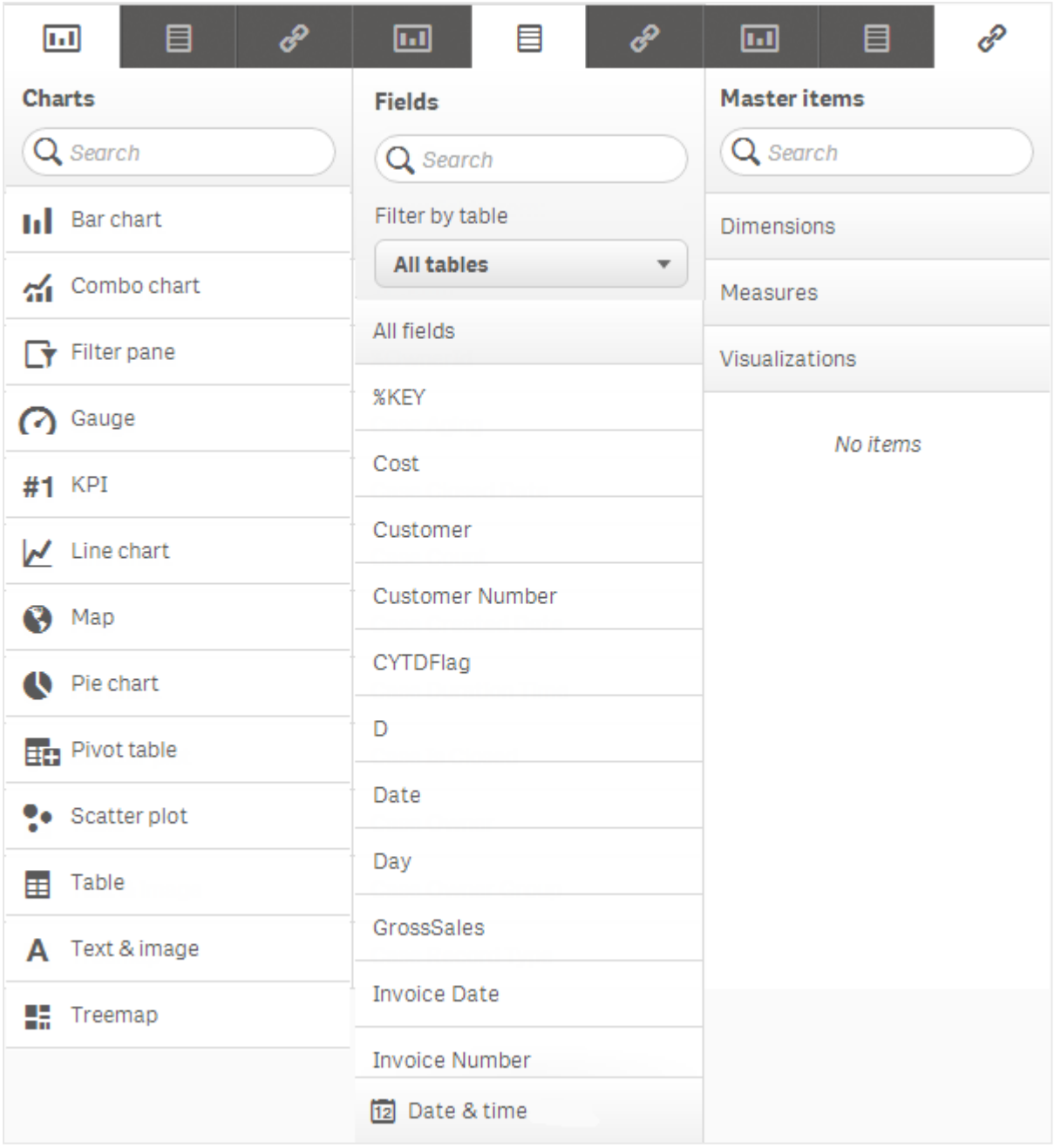
You can save visualizations, dimensions and measures that you want to reuse as master items. These can be edited and updated across all instances in an app.

The assets panel contains the following sections:

	Charts	A list of all the different chart types you can use to build visualizations. These are included in Qlik Sense by default. When you have added a chart to a sheet, you can add dimensions and measures to it to connect it to the data model.
	Fields	All fields in the data model of the app. When the drop-down list displays **All tables**, all fields in the data model of the app are listed in the **All fields** section. You can make a selection in the drop-down list if you want to focus on the fields from a specific table. When you click a field, you can create a measure by clicking fx or create a dimension by clicking . The new measure or dimension is added to the master items. Click to add the field to the selected visualization, or to the sheet if no visualization is selected. The derived date & time fields, from calendar templates, are listed in the **Date & time** section. Use this section if you want to focus on the derived date & time fields. The **All fields** section does not show any derived fields but their source fields are shown here.
	Master items	This is where you create and save reusable dimensions, measures and visualizations as master items.

*In a published app, the content in **Charts** and **Master items** is available in the library panel.*
See Library panel (page 31).

The search field at the top of the assets panel helps you find assets on the different tabs. As you start to type in the search field, all items that have a name or a tag that contains the search string, are presented.



The assets panel with its different set of assets: charts, fields and master items.

See also:

- *Fields (page 209)*
- *Visualizations (page 151)*
- *Dimensions (page 200)*
- *Measures (page 203)*
- *Creating a master visualization (page 270)*

Library panel

When you are using a published app you have a library panel with items to help you create your own visualizations with dimensions and measures to explore and discover beyond what is included in the published app. If the library panel is hidden, click ◧ in the lower left-hand corner.

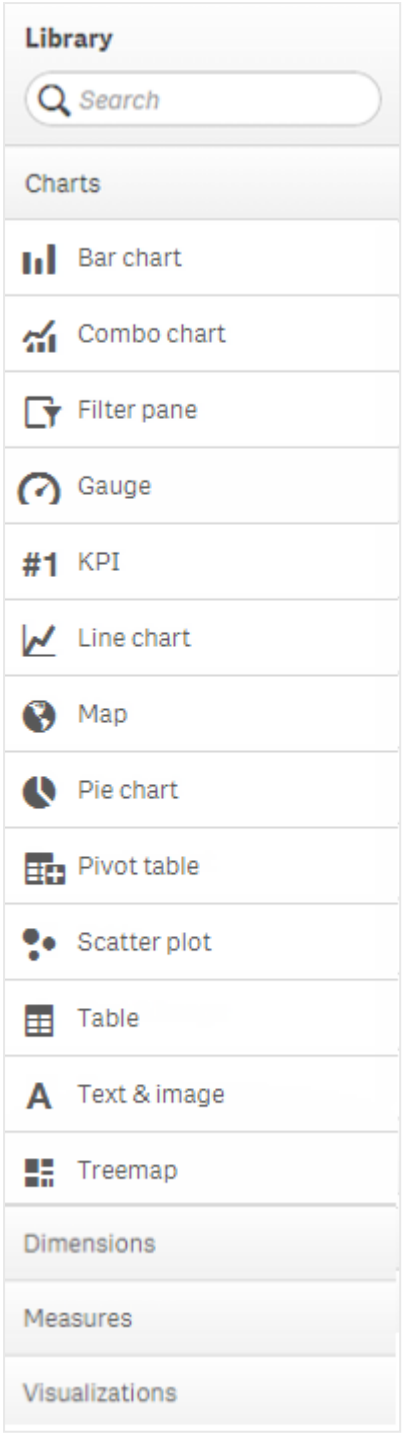
You can find the following items in the library panel:

Charts	A list of all the different chart types you can use to build visualizations. These are included in Qlik Sense by default. When you have added a chart to a sheet, you can add dimensions and measures to it to connect it to the data model.
Dimensions	Pre-made master dimensions ready for you to use when you create visualizations.
Measures	Pre-made master measures ready for you to use when you create visualizations.
Visualizations	Pre-made master visualizations ready for you to use on your own sheets.

It is not possible to make changes to any master dimension, master measure or master visualization in the library of a published app.

The search field at the top of the library helps you find library items. As you start to type in the search field, all items that have a name or a tag that contains the search string, are presented.

The search is not case sensitive.



The library panel with charts, dimensions, measures and visualizations.

See also:

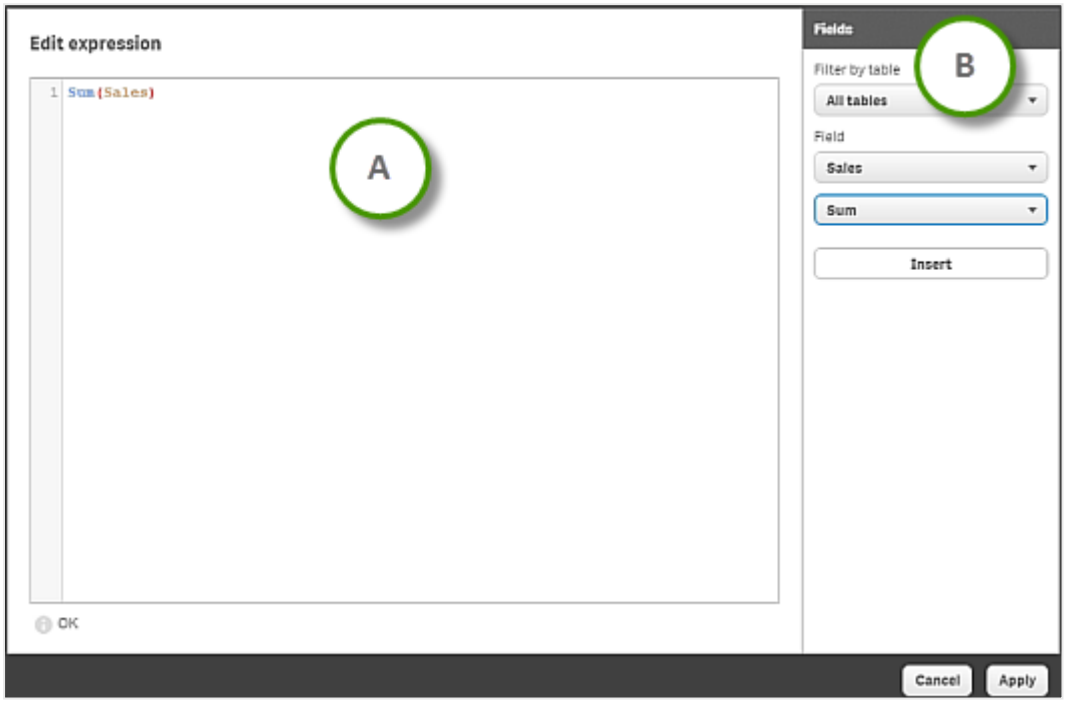
- *Visualizations (page 151)*
- *Dimensions (page 200)*
- *Measures (page 203)*

Create a visualization (page 208)

Expression editor

The expression editor is where you create expressions that are used for making calculations based on the data in the app.

You open the **Add expression** dialog by clicking fx in the properties panel or while creating dimensions or measures.



A	In the expression editor, you enter the expression by typing. When you type the name of a function in the expression, a tooltip appears that provides information to help you enter the function correctly, including argument names and qualifiers. *The tooltip for some chart functions shows the ALL qualifier. It is recommended that you do not use the ALL qualifier. Instead, use the set expression {1}.*	
B	By selecting a field from a specific table and a common aggregation function, you can generate some common expressions to be inserted into the expression editor.	

Direct Discovery fields are listed without special indication in the fields list in the expression editor.

See also:

- *Working with the expression editor (page 250)*
- *Using expressions in visualizations (page 248)*
- *Set analysis and set expressions (page 253)*

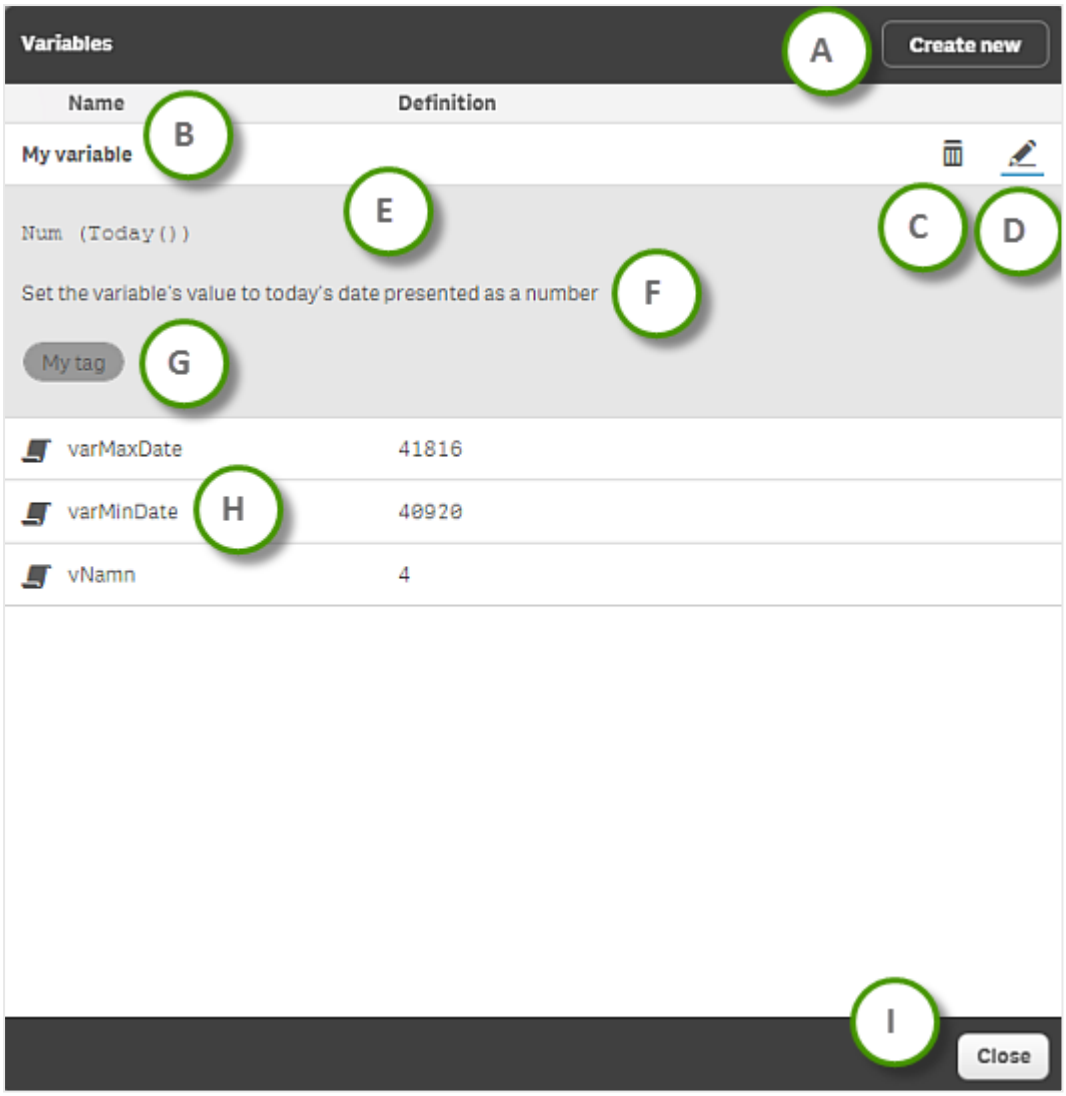
Variables overview

A variable in Qlik Sense is a container storing a static value or a calculation, for example a numeric or alphanumeric value. When you use the variable in the app, any change made to the variable is applied everywhere the variable is used. Variables are defined using the variables overview, or in the script using the data load editor, where the variable acquires its value from a **Let**, **Set** or other control statements in the data load script.

You open the **Variables** overview by clicking in the edit bar when editing a sheet.

The variables overview lists all the variables that you can use in the expressions that are used for making calculations based on the data in the app. When used, the variable is substituted by its value. Variables are case sensitive.

Variables are defined using the variables overview or in the script using the data load editor.



The variables overview with the variable "My variable" selected.

A	Create a new variable.	*Creating a variable (page 257)*
B	Click the name of a variable to display its details and show the delete and edit buttons.	
C	Delete the variable. Only possible for variables not defined in the script.	*Deleting a variable (page 259)*
D	Edit the variable. Only possible for variables not defined in the script.	*Editing a variable (page 258)*
E	Definition of the selected variable. Optional.	
F	Description of the selected variable. Optional.	

G	Tags applied to the selected variable. Optional.	
H	indicates that the variable is defined in the script.	
I	Close the variables overview.	

See also:

- *Using variables in expressions (page 256)*

Properties panel

The properties panel is available on the right-hand side when you are editing a visualization or a sheet. If it is hidden, click in the lower right-hand corner.

Depending on what visualization you are editing, you have different settings options. Typically, you can do the following:

- Edit titles
- Add dimensions and measures and specify how they are displayed
- Set the sorting order and sorting criteria
- Change the way the visualization appears on the sheets

Master visualizations cannot be edited in the properties panel.

See also:

Bar chart properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

Add data	On the **Data** tab, click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add data** or **Dimension** is dimmed, you cannot add more dimensions.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** 🗑 .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click fx to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click fx to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click fx to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click fx to open the expression editor.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

Add data	On the **Data** tab, click **Add data** and select **Measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add data** or **Measure** is dimmed, you cannot add more measures.

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (≡) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	When you have at least two dimensions or two measures, you can present the dimensions or measures grouped together or stacked on top of each other. Select vertical or horizontal orientation of the visualization. **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

By dimension

By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**.

Color scheme: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

- **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.
- **Sequential classes**: The transition between the different color groups is made using distinctly different colors.
- **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.
- **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

Reverse colors: When selected, the color scheme is reversed.

By expression

You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL.

Expression: Enter the expression that you want to use. Click *fx* to open the expression editor.

The expression is a color code: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients.

When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant

	throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

See also:

- *Reference lines (page 199)*
- *Expression editor (page 33)*

Combo chart properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use at least one line or when you have two measures.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

Add data	On the **Data** tab, click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add data** or **Dimension** is dimmed, you cannot add more dimensions.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** 🗑 .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click fx to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click fx to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click fx to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click fx to open the expression editor.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

Add data	On the **Data** tab, click **Add data** and select **Measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add data** or **Measure** is dimmed, you cannot add more measures.

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Bars/Line/Marker	You can choose to add a measure as bars, as a line, or as markers. For lines and markers, you can use the **Primary axis** to the left or the **Secondary axis** to the right. For markers you can choose between several different shapes.
Fill marker	Select to display markers filled.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	When you have at least two measures as bars, you can present the bars grouped together or stacked on top of each other. When you have a least one line, the following options are available: **Missing values** Set how to show missing values. **Show as gaps** The line has a gap, which represents the missing value. **Show as connections** The line connects the values that exist on either side of the missing value. If the missing value is first or last, no line is drawn. **Show as zeros** The line is drawn to zero and from there to the next existing value. If the missing value is first or last, no line is drawn. **Show data points**: Select to display the data points on the line. *The option Show labels on data points is not available for combo charts.*
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto**

	settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: • **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. • **Sequential classes**: The transition between the different color groups is made using distinctly different colors. • **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. • **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

	Reverse colors: When selected, the color scheme is reversed. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click fx to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. **Sequential classes**: The transition between the different color groups is made using distinctly different colors. **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed.

	Show legend: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

Filter pane properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Data

Click **Add dimension** to add a dimension or create a dimension from a field. If the option is dimmed it is not available.

Dimensions

Add dimension	On the **Data** tab, click **Add dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add data** or **Dimension** is dimmed, you cannot add more dimensions.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** 🗑.
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. If you change the field, the dimension name is automatically updated. Click *fx* to open the expression editor.
Title	Enter a title for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Sorting

By default, the dimensions are sorted in the order they were added, with the most recently added dimension last. For filter panes, you change the sorting order of the dimensions under **Dimensions** in the **Data** section. Drag the dimensions to change the order. Under **Sorting** you can change the internal sorting of the dimensions.

Each dimension is sorted internally in the most common way for that type of data. Numbers are sorted numerically, ascending. Text is sorted alphabetically, ascending. If you want to change the internal sorting of a dimension, click the sorting button. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
1. Sort by expression	Enter an expression to sort by. Only available for dimensions.
2. Sort by frequency	Only available for filter panes.
3. Sort numerically	
4. Sort alphabetically	

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.

Gauge properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add measure** and select a measure or create a measure from a field.

Measures

Add measure	On the **Data** tab, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number** and **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.

Add-ons

Reference lines	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.

Presentation	**Range limits** **Min**: Set the minimum value for the gauge. Click fx if you want to create an expression. **Max**: Set the maximum value for the gauge. Click fx if you want to create an expression. **Radial**/**Bar**.Select to display the gauge as a radial or as a bar. Select vertical or horizontal orientation of the visualization. Only available for bar gauges. **Use segments**: When not selected, a single color (by default blue) is used to illustrate the value. When selected, you can divide the gauge into segments with different colors. When segments are used, a pointer marks the value. Click **Add limit** to add a segment to the gauge. Use the slider or type an expression to set the limit. Click fx to create an expression. You can add several segments. Click the segment to change colors. **Remove limit**: Click to remove the selected limit. **Gradient**: Select to use different shades of colors in the transition between the segments.
Measure axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Scale**: Set the spacing of the measure axis scale.

KPI properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add measure** and select a measure or create a measure from a field.

Measures

Add measure	On the **Data** tab, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.
Conditional colors	When used, you can add range limits and use different colors and symbols for the different sections. **Add limit**: Use the slider to set the limit. You can add several sections. Click the section to change color. You can use an expression as a limit. Click *fx* if you want to create an expression. **Remove limit**: Click to remove the selected limit. **Gradient**: Select to use different shades of colors in the transition between the sections. **Remove limit** : Click to remove the selected limit. If no limit is selected, the most recently added limit is removed.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Show title**: **On** by default. When selected, the measure title is displayed above the KPI value. **Alignment**: Set the alignment of the KPI value and the title. **Font size**: Set the font size of the measure value. **Link to sheet**: **Off** by default. When selected, you can link from the KPI to any sheet in the app. Select the sheet in the list.

Line chart properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

Add data	On the **Data** tab, click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add data** or **Dimension** is dimmed, you cannot add more dimensions.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** 🗑 .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click *fx* to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).

Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click fx to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click fx to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click fx to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click fx to open the expression editor.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

Add data	On the **Data** tab, click **Add data** and select **Measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add data** or **Measure** is dimmed, you cannot add more measures.

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

You can drag the measures to set the order in which they are displayed in the visualization. Use the drag bars (≡) to rearrange the order.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.

Presentation	**Line**/**Area**: Select to display the chart as a line or as an area. **Stacked area**: When selected, the different areas are displayed on top of each other. Only available with **Area** style. **Stack positive and negative values separately**: Only available with **Area** style. **Missing values** Set how to show missing values. **Show as gaps** The line has a gap, which represents the missing value. **Show as connections** The line connects the values that exist on either side of the missing value. If the missing value is first or last, no line is drawn. **Show as zeros** The line is drawn to zero and from there to the next existing value. If the missing value is first or last, no line is drawn. **Show data points**: When selected, the data points are displayed. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space. **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **Multicolored** Option when more than one measure is used. By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **By dimension**

By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**.

Color scheme: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

- **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.
- **Sequential classes**: The transition between the different color groups is made using distinctly different colors.
- **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.
- **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

Reverse colors: When selected, the color scheme is reversed.

By expression

You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL.

Expression: Enter the expression that you want to use. Click fx to open the expression editor.

The expression is a color code: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients.

When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the

	color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.
X-axis: <Dimension>	**Labels and title**: Select what to display of labels and title. **Label orientation**: Select how to display the labels. **Position**: Select where to display the dimension axis.
Y-axis: <Measure>	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the measure axis. **Scale**: Set the spacing of the measure axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values. **Logarithmic**: When selected, a logarithmic scale is used for the measure values. To be able to use a logarithmic scale, the values must be all positive or all negative.

See also:

- *Reference lines (page 199)*

Map properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add layer** to add an area layer or a point layer. Options that are dimmed are not available.

Layers

<Layer type>	Click the layer name to open the settings. If you want to delete the layer, long-touch/right-click the layer and select **Delete** in the dialog. Alternatively, click the layer and click **Delete** .
Dimension	
Field	Shows the name of the field or dimension that is used for the layer.
Show null values	By default, selected. A null value is displayed as an **x** in the map.
Show excluded	Select **Show excluded** to also display the excluded selections in the map. When left unselected, the map will automatically zoom to show only the included areas of the map. **Show excluded** is only displayed for area layer maps.
Measure	
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Add an expression to the dimension value. You can visualize the differences in value by coloring by measure or selecting the option **Use size**.
Label	Enter a label for the expression. If you have used a field from the assets panel, to create an expression, the expression name is automatically displayed.
Show zero values	When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.
Use expression for bubble size	Select **Use expression for bubble size** to reflect the measure values through the size of the points. (Only available when an expression or measure is used.)
Bubble size	Use the slider to set the size of the bubbles.
Range	By default, **Auto**, which means that the range is set by the measure values. When set to **Custom**, you can set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Opacity	Use the slider to set the opacity of the point or area layer.
Show	Select **Show** to display the area layer or the point layer. By default, it is selected.
Delete	Button for deleting the layer.

Background

Show	Select **Show** to display the background image. By default, it is on.
Map service	By default, **Auto**, which means that a Mapbox background map is automatically added to a point layer. To use other map providers, click the button to switch to **Custom** and enter URL and attribution for the map.
Type	Select the background image type. Currently, slippy map is the only type available.
URL	Enter the URL of the tile server that you want to use. Click the link at the bottom of the section to go to a help page with the available URLs and attributions.
Attribution string	Enter the attribution string that corresponds to the URL. Click the link at the bottom of the section to go to a help page with the available URLs and attributions.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Navigation**: By default, off. When set to **Auto**, the navigation tool is displayed, with options to pan and zoom. **Auto-zoom on selection**: By default, selected. When a selection is confirmed, the map automatically zooms in on the selected area.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. When you add a measure from the assets panel, or an expression to the layer under **Data** in the properties panel, the coloring is automatically set to **By measure**. Coloring by measure reflects the measure value differences, and is normally what you want to use when adding a measure or an expression. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

	Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. **Sequential classes**: The transition between the different color groups is made using distinctly different colors. **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed. **Range**: By default, **Auto**, which means that the range is set by the measure values. When set to **Custom**, you can set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click fx to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option

	The expression is a color code must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

Pie chart properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

Add data	On the **Data** tab, click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. You can also click *fx* to create a dimension in the expression editor. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension. Another way to create a dimension is to type the expression directly in the text box. Expressions added in this way must begin with an equals sign (=). Here is an example with a calculated dimension: *=If (Week < 14, Week, 'Sales')* If **Add data** or **Dimension** is dimmed, you cannot add more dimensions.

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click fx to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click fx to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click fx to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click fx to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click fx to open the expression editor.

Measures

Add data	On the **Data** tab, click **Add data** and select **Measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click fx to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add data** or **Measure** is dimmed, you cannot add more measures.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Sorting

Drag the dimension and measure to set the sorting priority order. The numbers show the order.

The dimension and measure can be sorted internally. Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Pie**/**Donut**: Select to present the chart as a pie or as a donut. **Dimension label**: When set to **Auto**, the label is displayed if there is enough space. **Value labels** **Auto**: The measure values are displayed as a percentage of the whole. **Custom**: Select how to display the measure values. **None**: No measure values are displayed. **Share**: The measure values are displayed as a percentage of the whole (default setting). **Values**: The regular measure values are displayed.
Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color.

Multicolored

Option when more than one measure is used.

By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

By dimension

By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values.

Persistent colors: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**.

Color scheme: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors.

By measure

By default, **Sequential gradient** is selected. The higher the measure value, the darker the color.

Color scheme: You have the following four options:

- **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues.
- **Sequential classes**: The transition between the different color groups is made using distinctly different colors.
- **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light.
- **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors.

Reverse colors: When selected, the color scheme is reversed.

By expression

You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL.

Expression: Enter the expression that you want to use. Click fx to open the expression editor.

The expression is a color code: Selected by default. In most cases, it is

	best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range. **Show legend**: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting. **Legend position**: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

Pivot table properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a row, column, or a measure. When you select **Row** or **Column**, you can only add dimensions. By default, dimensions are added to the rows section and measures to the columns section. But once an item has been added, you can move it.

Dimension settings

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.

Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click fx to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click fx to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click fx to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click fx to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click fx to open the expression editor.
Global grouping	If a limitation is set, you can use global grouping.
Show totals	Adds a top row in the pivot table showing the total value of the underlying rows. **Show totals** is not available for dimensions (except the first one) when **Indent rows** is selected in the **Appearance** property.
Totals	Enter a label for the totals row.

Measure settings

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, click ⊗.

Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are, by default, displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0describes the number as an integer with a thousands separator. ###0describes the number as an integer without a thousands separator. 0000describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000describes the number with three decimals. 0.0##describes the number with at least 1 decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.

Background color expression	Enter an expression for the background color. The text color automatically changes to white when a dark background color is used.
Text color expression	Enter an expression for the text color. If you use the same expression as in the background color, the text will not be visible.

Sorting

The dimensions can be sorted internally:

Click the dimension name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Fully expanded**: When selected, all values in the pivot table are displayed. **Indent rows**: When selected, an indentation is added to the beginning of each row.

Scatter plot properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click ❐ in the lower right-hand corner to open it.

If the visualization has 🔗 in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click to open the expression editor.

Measures

<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** .

Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click fx to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Add-ons

X-axis reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.
Y-axis reference lines	**Add reference line**: Click to add a new reference line. **Show**: When selected, the reference line is displayed. **Label**: Enter a label for the reference line. **Color**: In the color picker, select the color of the reference line and the label. **Reference line expression**: Enter a value or an expression for the reference line. Click *fx* to open the expression editor.
Data handling	**Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation. **Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Navigation**: By default, off. When set to **Auto**, the navigation tool is displayed, with options to pan and zoom. **Bubble size**: Set the size of the data point bubbles. **Labels**: Select what labels to display: • **Auto**: The number of labels displayed varies with the size of the visualization • **All**: All labels are displayed. This option may cause labels to overlap. • **None**: No labels are displayed. .**Compression resolution**: Set the resolution for compressed data. Only available for large data sets (>1000 data points). **Grid line spacing**: Select the spacing of the grid lines. The **Auto** setting is **Medium**.

Colors and legend	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color**: A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **By dimension**: By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. When the coloring is by measure or by expression, you can set the color range (**Min** and **Max** values). By setting the color range, the colors remain constant throughout selections and paging. When using color by expression, the option **The expression is a color code** must be cleared before you can set the color range.
	Show legend: Not available when **Single color** is selected. By default set to **Auto** when there is more than one dimension or measure. The legend is displayed if there is enough space. The placement can be changed in the **Legend position** setting.
	Legend position: Select where to display the legend. **Show legend title**: When selected, the legend title is displayed.

X-axis	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the axis. **Scale**: Set the spacing of the axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.
Y-axis	**Labels and title**: Select what to display of labels and title. **Position**: Select where to display the axis. **Scale**: Set the spacing of the axis scale. **Range**: Select to set the min value, the max value, or both. The min value cannot be larger than the max value. You can use expressions for the values.

Table properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add column** to add a dimension or a measure. Options that are dimmed are not available.

Columns

In the table, the dimensions and measures are presented together under the heading **Columns**.

Dimension settings

Add column	On the **Data** tab, click **Add column** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use. A dimension can either be selected from the list of already existing **Dimensions**, or created from the list of available **Fields**. To edit a dimension that is stored as a master item, you must first unlink the dimension from the master item.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.
Text alignment	When set to **Custom**, you can select how to display the content: **Align left** or **Align right**. If **Text alignment** is set to **Auto**, the alignment is automatically aligned left or right, depending on the content.

Show others	When selected, the last value in the visualization (colored gray), summarizes all the remaining values. When some kind of limitation is set (**Fixed number**, **Exact value**, or **Relative number**), the value counts as 1 in that setting. If, for example, **Exact value** is used and set to 10, the tenth value is **Others**.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label. Click *fx* to open the expression editor.

Measure settings

Add column	On the **Data** tab, click **Add column** and select **Measure** to open a list of available measures. Select the measure that you want to use. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. To edit a measure that is stored as a master item, you must first unlink the measure from the master item.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, click ⊗.
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are, by default, displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0describes the number as an integer with a thousands separator. ###0describes the number as an integer without a thousands separator. 0000describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000describes the number with three decimals. 0.0##describes the number with at least 1 decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.

Background color expression	Enter an expression for the background color. The text color automatically changes to white when a dark background color is used.
Text color expression	Enter an expression for the text color. If you use the same expression as in the background color, the text will not be visible.
Totals function	Select which aggregation function you want to use for the **Totals** row in the table. You set the position of the **Totals** row under **Presentation**.

Sorting

Drag the dimensions and measures to set the sorting priority order. The numbers show the order.

Each of the dimensions and measures can also be sorted internally:

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections. **Show zero values**: When unselected, measures that have the value '0' are not included in the presentation. If there is more than one measure value, all the measure values must have the value '0' to be excluded from the presentation.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	**Totals** **Auto**: The totals (the result of the expression), are automatically included at the top of the table. **Custom**: Select whether to display the totals and where to display them, at the top or bottom. **Totals label**: Set the label for the totals row. You can also use an expression as a label.

Text & image properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click ❐ in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add measure** and select a measure or create a measure from a field.

Measures

Add measure	On the **Data** tab, click **Add measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add measure** is dimmed, you cannot add more measures.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number** and **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.
Format pattern	Set the number format pattern.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click *fx* if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.
Presentation	In the list, set whether text and images should have a responsive behavior. When responsive behavior is selected, the size of text and images are adjusted to the size of the visualization area. However, they do not expand beyond their normal size.
Background image	**Use background image**: **Off** by default. Click the button to enable selection or removal of a background image. You can only have one background image at a time. **Image** Click to open the media library where you can select a background image. To remove the background image, click . **Sizing**: Set the sizing of the image. With the **Auto** setting, the image does not scale when the text & image visualization is resized. **Position**: Select the position of the image.

Treemap properties panel

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Some of the settings in the properties panel are only available under certain circumstances, for example, when you use more than one dimension or measure, or when you select an option that makes other options available.

Data

Click **Add data** to add a dimension or a measure. Options that are dimmed are not available.

Dimensions

Add data	On the **Data** tab, click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. Select the dimension or field that you want to use.
<Dimension name>	Click the dimension name to open the dimension settings. If you want to delete the dimension, long-touch/right-click the dimension and select **Delete** in the dialog. Alternatively, click the dimension and click **Delete** .
Dimension	Only displayed for master items. To be able to edit a dimension that is linked to a master item, you must first unlink the dimension.
Field	If you have added a field from **Fields** in the assets panel, the field name is automatically displayed. Click to open the expression editor.
Label	Enter a label for the dimension. If you have added a field from **Fields** in the assets panel, the field name is automatically displayed.
Show null values	When selected, the measure values of all null dimensions are summarized and presented as one dimension item in a visualization. All null values are displayed as gaps or dashes (-).
Limitation	Limits the number of displayed values. When you set a limitation, the only dimensions displayed are those where the measure value meets the limitation criterion. **No limitation**: The default value. **Fixed number**: Select to display the top or bottom values. Set the number of values. You can also use an expression to set the number. Click to open the expression editor. **Exact value**: Use the operators and set the exact limit value. You can also use an expression to set the number. Click to open the expression editor. **Relative value**: Use the operators and set the relative limit value in percent. You can also use an expression to set the number. Click to open the expression editor. **Calculated on measure:** <measure>: Shown when you make a limitation to the number of displayed dimension values. The dimensions whose measure value meet the criterion are displayed.

Show others	When you have set a limitation for the number of dimension values displayed, you have an option to summarize the measure values for the remaining dimensions by selecting **Show others**. When selected, a gray colored value summarizes all the remaining values.
Others label	Enter a label for the summarized values (when **Show others** is selected). You can also use an expression as a label.

You can drag the dimensions to set the order in which they are displayed in the visualization. Use the drag bars (☰) to rearrange the order.

Measures

Add data	On the **Data** tab, click **Add data** and select **Measure** to open a list of available measures. Select the measure that you want to add to the visualization. If you select a field, you are automatically presented with some common aggregation functions that you can choose between for the measure. If no measure is available, you need to create one. You can enter the expression directly in the text box, or click *fx* to create a measure in the expression editor. To be able to edit a measure that is linked to a master item, you must first unlink the measure. If **Add data** or **Measure** is dimmed, you cannot add more measures.
<Measure name>	Click the measure to open the measure settings. If you want to delete the measure, long-touch/right-click the measure and select **Delete** in the dialog. Alternatively, click the measure and click **Delete** 🗑 .
Measure	Only displayed for master items. To be able to edit a measure that is linked to a master item, you must first unlink the measure.
Expression	Click *fx* to open the expression editor. The existing expression is displayed by default.
Label	Enter a label for the measure. Measures not saved in **Master items** are by default displayed with the expression as label.

Number formatting	Different options for formatting the measure values. If you want to change the number format at app level, and not just for a single measure, it is better to do that in the regional settings, that is, in the **SET** statements at the beginning of the script in the data load editor. **Auto**: Qlik Sense automatically sets a number formatting based on the source data. To represent numeric abbreviations, the international SI units are used, such as k (thousand), M (million), and G (billion). **Number**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Examples:** # ##0 describes the number as an integer with a thousands separator. ###0 describes the number as an integer without a thousands separator. 0000 describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123. 0.000 describes the number with three decimal places. 0.0## describes the number with at least one decimal and at most three decimals. If you add the percent sign (%) to the format pattern, the measure values are automatically multiplied by 100. **Money**: By default, the format pattern used for money is the same as set up in the operating system. Use the **Format pattern** box to change the format pattern. **Date**: By default, the formatting is set to **Simple**, and you can select the formatting from the options in the drop-down list. Click the button to change to **Custom** formatting, and use the **Format pattern** box to change the format pattern. **Duration**: By default, the format pattern used for duration is the same as set up in the operating system. Duration can be formatted as days, or as a combination of days, hours, minutes, seconds and fractions of seconds. **Custom**: By default, the format pattern used for custom is the same as set up in the operating system. Use the **Format pattern** boxes to change the format pattern.
Decimal separator	Set the decimal separator.
Thousands separator	Set the thousands separator.

Format pattern	Set the number format pattern.
Reset pattern	Click to reset to default pattern.

Sorting

The sorting is done automatically by measure size.

Add-ons

Data handling	**Calculation condition**: Specify an expression in this text field to set a condition that needs to be fulfilled (true) for the object to be displayed. If the condition is not fulfilled, the message in the text box **Displayed message** is shown. The value may be entered as a calculated formula. For example: *count(distinct Team)<3* A calculation condition is useful when a chart or table is very big and makes the visualization slow to respond. A calculation condition can then help so that for example an object does not show until the user has filtered the data to a more manageable level by applying selections.

Appearance

General	**Show titles**: **On** by default in all visualizations except filter panes, KPIs, and text & image visualizations. Enter **Title**, **Subtitle**, and **Footnote**. By default, the string is interpreted as a text string. However, you can also use the text field for an expression, or a combination of text and expression. An equals sign *(=)*, at the beginning of a string shows that it contains an expression. Click fx if you want to create an expression by using the expression editor. **Example:** Assume that the following string is used, including quotation marks: *'Sales: ' & Sum(Sales)*. By default, the string is interpreted as a text string and is displayed as presented in the example. But if you begin the string with an equals sign: (*='Sales: ' & Sum(Sales)*), the string is interpreted as an expression instead. The output is then *Sales: <value of expression>*, where *<value of expression>* is the calculated value.

Presentation	**Headers and labels** With the **Auto** setting, the display varies with the size of the treemap. Very small treemaps have no headers or leaf labels. Small treemaps have overlay labels and no leaf labels. Large treemaps have headers and (some) leaf labels. With the **Custom** option you can make settings for headers and leaf labels. **Headers**: When set to **Off**, you can either use **Overlay labels**, or no labels at all, by setting **Overlay labels** to **Off**. **Leaf labels**: With the **Auto** setting the leaf labels are displayed if there is enough space. **Value labels**: By default, **Off**. With the **Auto** setting, the value labels are displayed when there is enough space.

Colors	**Colors** You only need to select **Custom** if you want to change the settings. The **Auto** settings are based on the visualization used and the number of dimensions and measures, that is, the settings are not fixed, but are dependent on the data input. **Single color** A single color (by default blue) is used for all items in the chart. In visualizations that do not benefit from multiple colors (bar charts with one dimension and scatter plots), single color is the default setting. Use the color picker to change the dimension color. **By dimension** By default, 12 colors are used for the dimensions. The colors are reused when there are more than 12 dimension values. **Persistent colors**: When selected, colors are persistent between selection states. Only available when using one dimension and the setting **By dimension** or **Multicolored**. **Color scheme**: Select **12 colors** or **100 colors** to be used for the different values. The 12 colors can all be distinguished by people with color vision deficiency, but not all of the 100 colors. **Dimension**: When set to **By dimension** and you have more than one dimension, you can select which dimension to color by. **By measure** By default, **Sequential gradient** is selected. The higher the measure value, the darker the color. **Color scheme**: You have the following four options: **Sequential gradient**: The transition between the different color groups is made using different shades of colors. High measure values have darker hues. **Sequential classes**: The transition between the different color groups is made using distinctly different colors. **Diverging gradient**: Used when working with data that is ordered from low to high, for instance, to show the relationship between different areas on a map. Low and high values have dark colors, mid-range colors are light. **Diverging classes**: Can be seen as two sequential classes combined, with the mid-range shared. The two extremes, high and low, are emphasized with dark colors with contrasting hues, and the mid-range critical values are emphasized with light colors. **Reverse colors**: When selected, the color scheme is reversed. **By expression** You can use coloring by expression to accentuate certain values. Supported formats: RGB, ARGB, and HSL. **Expression**: Enter the expression that you want to use. Click *fx* to open the expression editor. **The expression is a color code**: Selected by default. In most cases, it is best to keep this setting. When the selection is cleared, the expression

Navigating between sheets

In sheet view you can switch to any sheet you have in the app.

Do the following:

1. Click in the toolbar.

   An overview of your sheets is shown.
2. In the overview, click the sheet you want to switch to.

The chosen sheet is shown.

You can also navigate using the arrows in the toolbar, or with the arrow keys on your keyboard. See Touch gestures and keyboard shortcuts (page 130).

3.4 Storytelling view

You can open a story from the app overview or the sheet view by clicking and then clicking on a story.

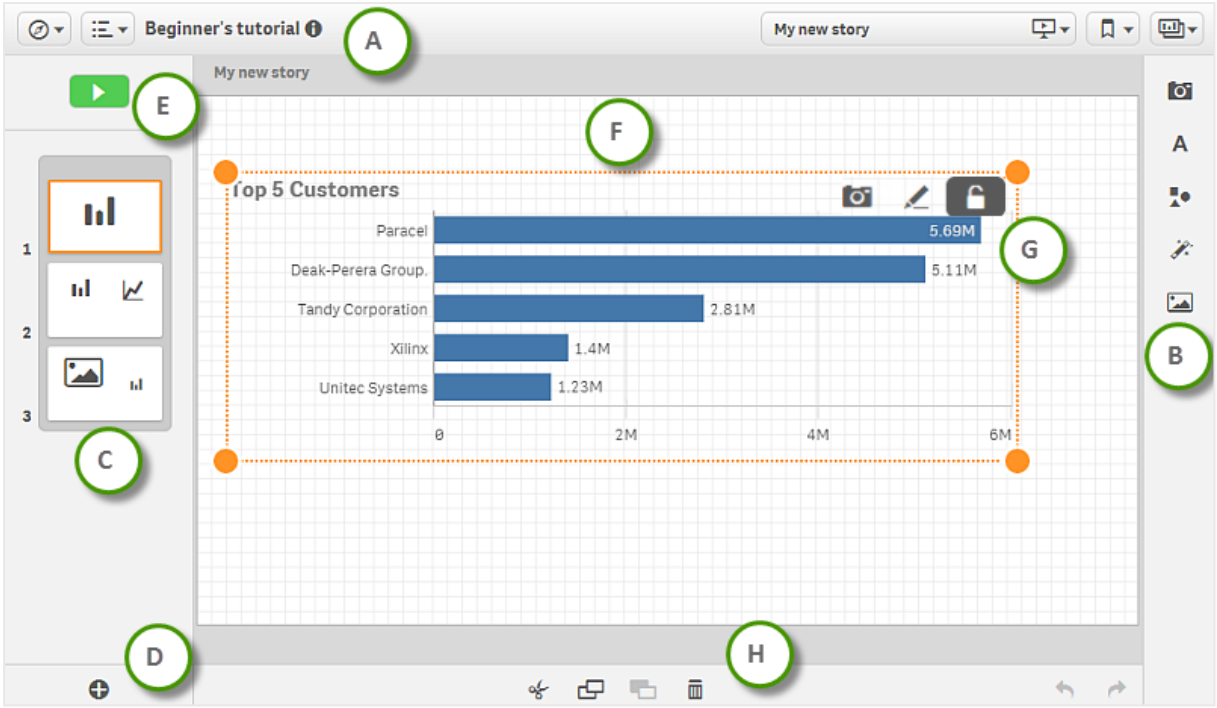
In storytelling view, you can do the following:

- Build stories to present insights and ideas based on your data discoveries.
- Play a story as it would be presented to an audience.
- Publish a story.

Publishing is not supported in Qlik Sense Desktop.

Build (edit)

You build stories by using snapshots of your visualizations. To make the stories look good you can add different kinds of visual effects and content such as text, shapes, images and effects.


Beginner's tutorial
A
My new story
My new story
E
F
Top 5 Customers
Paracel
5.69M
Deak-Perera Group.
5.11M
Tandy Corporation
2.81M
Xilinx
1.4M
Unitec Systems
1.23M
0
2M
4M
6M
G
B
1
2
3
C
D
H

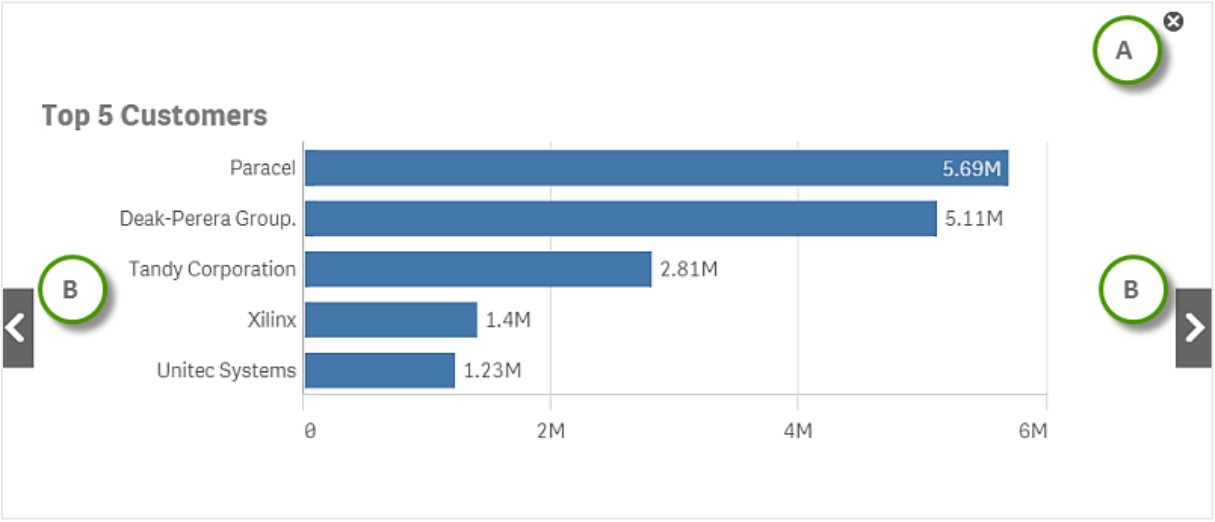
A	The toolbar contains the global menu and useful commands. Navigation menu with options **App overview**, **Data manager**, **Data load editor**, **Data model viewer** and **Open hub**. *Once the app has been published, you cannot navigate to the data manager, the data load editor or the data model viewer.* Global menu with options **Add data**, **Export a story to PowerPoint**, **Publish story**, **Duplicate story**, **Delete story**, **Help** and **About**. *Once the app has been published, you cannot add data.* *The app your story belongs to must be published to enable publishing of the story.* Click the info icon to show or hide the app details. Access to all stories in the app and to creating a new story. Access to all bookmarks in the app. Access to all sheets in the app and to creating a new sheet.	*App overview (page 21)* *Data load editor (page 123)* *Data model viewer (page 125)* *The hub (page 20)* *Navigating between stories (page 121)* *Sheet view (page 24)*
B	A set of tools and libraries to help build and your story and make it look good.	*Story tools (page 116)*
C	The story timeline gives you an overview of and control over the composition of your story. You can navigate inside the story using the slide thumbnails.	*Story timeline (page 115)*
D	Create new slides to add to your story timeline.	
E	Play the story before you make it available for others.	
F	You work with the current slide by inserting snapshots, text, shapes, and visual effects from the story tools.	*Story slide (page 115)*

G	A selected unlocked slide item with resizing handles. Lock the snapshot. Edit the snapshot. Replace the snapshot.	
H	Cut, copy, paste, and delete items on the slide.	

Play

When you play a story, through your snapshots, you can get access to the visualizations from where the snapshots originate. If you have embedded sheets into your story, you can make selections in these embedded sheets, just as you can in a sheet when you are analyzing.

These abilities bring your story to life and you can answer new questions from your audience and steer the story in new directions.



A	Close play and go back to editing the story.	
B	Controls to navigate back and forth in the story.	

Touch gestures in storytelling view

The table describes the touch gestures that are used for navigating in storytelling view.

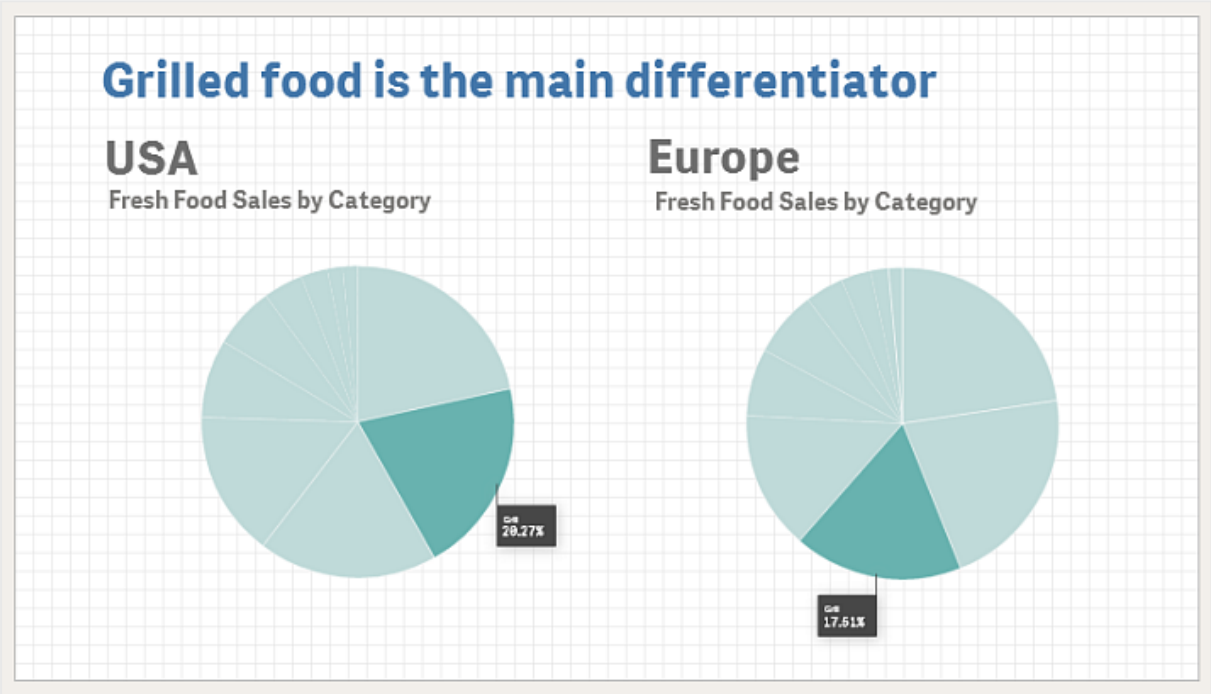
Tap	Highlight a data point in a snapshot by applying an effect.
Double-tap	Edit a text object or an image.
Long-touch and release	Open the shortcut menu.
Long-touch and drag	Move a slide to a new location in the timeline. Move an item on a slide.

Swipe	Scroll the list in the snapshot library. Go to the next or previous slide when playing a story.

Story slide

A story slide is an individual page in a story.

A slide contains different kinds of information you want to show to an audience. This information can be objects such as snapshots (with our without visual effects), textual content and various kinds of other visual content, such as shapes (for example rectangles, circles, lines and arrows).

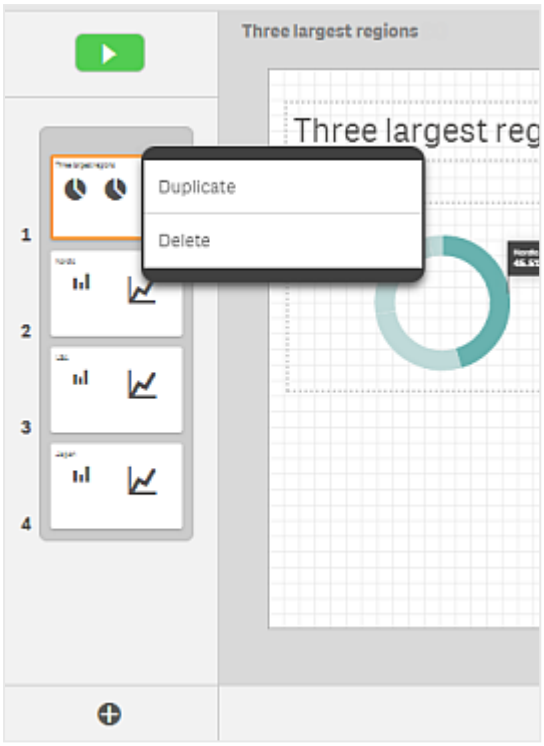


A story slide with text items and snapshots with effects that highlight a value.

Story timeline

The timeline gives you an overview of the structure and content of your story. The timeline contains thumbnails of your slides.

You move between the slides by clicking the thumbnails. A selected thumbnail displays its corresponding slide in the slide view. You can reorder slides by moving them around on the timeline. You can add slides and you can delete slides.



A story timeline with a few slides. The shortcut menu of the selected slide is open.

Timeline controls

⊕	Add a slide right after current slide.

Timeline shortcut menu

Duplicate	Duplicates the current slide.
Delete	Delete a slide from the timeline.

Story tools

When working with a story, you have a set of tools and libraries to help you make your story look good and compelling.

	Snapshot library	All your taken snapshots.
A	Text library	Different text styles (such as title and paragraph).
	Shape library	A variety of shapes (such as rectangles, circles, lines and arrows).
	Effect library	A set of visual effects to apply to your snapshots.
	Media library	Different types of media (such as images).

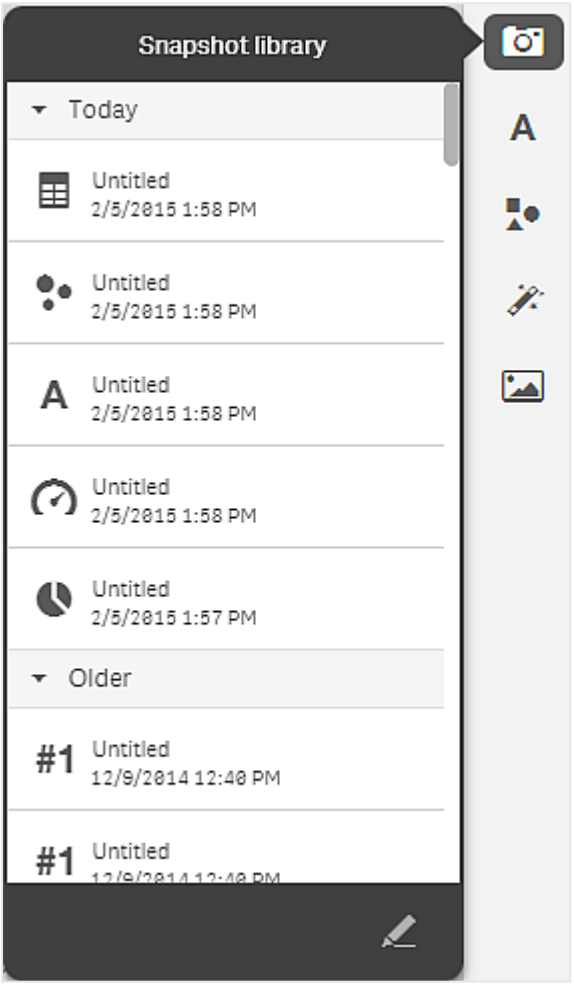
Snapshot library

The **Snapshot library** contains a list of your snapshots sorted by, and grouped by date, with the newest on top. The snapshots are grouped with the following date categories: **Today**, **This week** and **Older**.

*Only categories that contain snapshots are shown, so if there are no snapshots from today, then the **Today** category is not shown.*

You can open the snapshot library from two places: from inside a visualization, and from the story tools panel in storytelling view. The contents of the snapshot library you see depend on where the library was opened from. When the library is opened from a visualization, the snapshots taken for that visualization are displayed. When opened from storytelling view, all the snapshots from all the visualizations are displayed.

You can edit the list of snapshots to delete snapshots and to rename snapshots.



The snapshot library, opened from the storytelling view, with snapshots organized by the date categories.

Text library

The text library contains a set of different text styles. You add text object to a slide by dragging one of the text styles into the slide.

*The text library with the text styles **Title** and **Paragraph**.*

Title

You can change the font size by resizing the text object.

Double-click the text object, or click on the text object and click , to enable:

- Changing the font color
- Changing the font style
- Creating a link to a bookmark or a web address

Paragraph

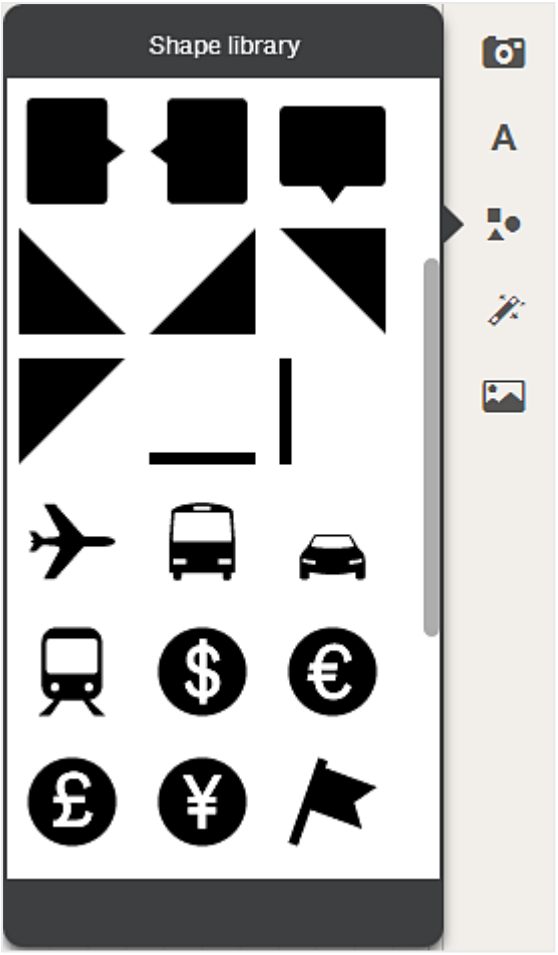
If you type many characters (maximum 12 000) a scroll bar is provided.

Double-click the text object, or click on the text object and click , to enable:

- Changing the color
- Changing the font size
- Changing the font style
- Changing the text alignment
- Creating a link to a bookmark or a web address

Shape library

The shape library contains a number of shapes such as rectangles and circles to use on your story slides. You add a shape to a slide by dragging one of the shapes into a slide.

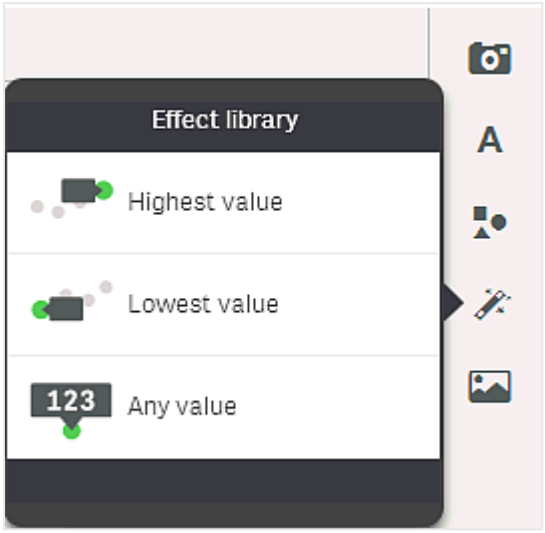


The shape library with some of its shapes.

Effect library

The effect library contains a list of different visual effects to apply to your snapshots. You apply an effect to a snapshot by dragging one of the effects onto a snapshot.

You can only use effects on bar charts, line charts, and pie charts.

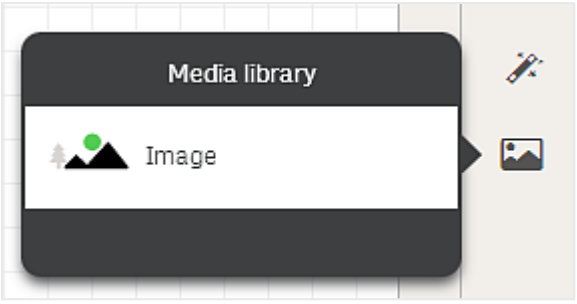


The effect library with different visual effects.

Highest value	For visualizations with a single dimension and measure, this effect will make the highest value stand out by adding a label to the highest value and dimming the other values. For visualizations with grouped values, the highest value in each group will be highlighted.
Lowest value	For visualizations with a single dimension and measure, this effect will make the lowest value stand out by adding a label to the lowest value and dimming the other values. For visualizations with grouped values, the lowest value in each group will be highlighted.
Any value	For visualizations with a single dimension and measure, this effect will make a value, that you select manually, stand out by adding a label to the selected value and dimming the other values. For visualizations with grouped values, you choose to highlight either a measure or a dimension. The selected measure or dimension will be highlighted in all the groups where it occur.

Media library

The media library contains the media type image. You add an image to a slide by dragging the **Image** type into the slide.



*The media library with the media type **Image**.*

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You need to use the Qlik Management Console to upload images to the default folder. You can upload images to the **In app** folder in the media library.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

If you intend to import and publish an app to a Qlik Sense server deployment, you must add the same images used in the app to the media folder in the Qlik Sense server environment.

Navigating between stories

In storytelling view you can switch to any story you have in the app.

Do the following:

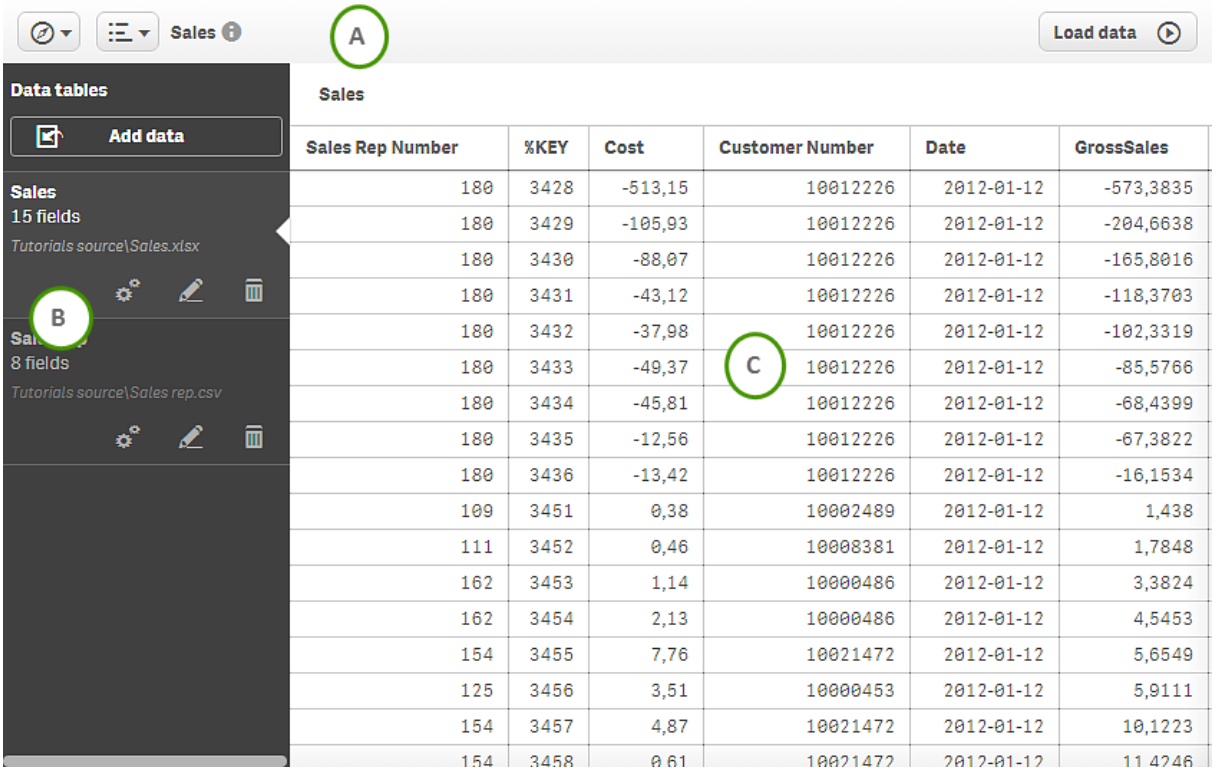
1. Click in the toolbar.
   An overview of your stories is shown.
2. In the overview, click the story you want to switch to.

The chosen story is shown.

You can also navigate between stories in the app overview.

3.5 Data manager

You can add, edit and delete data sources easily in **Data manager**. It is also possible to navigate to the data load editor, where you can edit the data load script, and to the data model viewer, where you can view the data structure.



Sales Rep Number	%KEY	Cost	Customer Number	Date	GrossSales
180	3428	-513,15	10012226	2012-01-12	-573,3835
180	3429	-105,93	10012226	2012-01-12	-204,6638
180	3430	-88,07	10012226	2012-01-12	-165,8016
180	3431	-43,12	10012226	2012-01-12	-118,3703
180	3432	-37,98	10012226	2012-01-12	-102,3319
180	3433	-49,37	10012226	2012-01-12	-85,5766
180	3434	-45,81	10012226	2012-01-12	-68,4399
180	3435	-12,56	10012226	2012-01-12	-67,3822
180	3436	-13,42	10012226	2012-01-12	-16,1534
109	3451	0,38	10002489	2012-01-12	1,438
111	3452	0,46	10008381	2012-01-12	1,7848
162	3453	1,14	10000486	2012-01-12	3,3824
162	3454	2,13	10000486	2012-01-12	4,5453
154	3455	7,76	10021472	2012-01-12	5,6549
125	3456	3,51	10000453	2012-01-12	5,9111
154	3457	4,87	10021472	2012-01-12	10,1223
154	3458	0,61	10021472	2012-01-12	11,4246

*Data tables defined in the load script are not managed in **Data manager**. When you add data sources in **Data manager**, script code will be generated. You can choose to unlock and edit the generated script code, but in that case the data table will not be managed in **Data manager** anymore.*

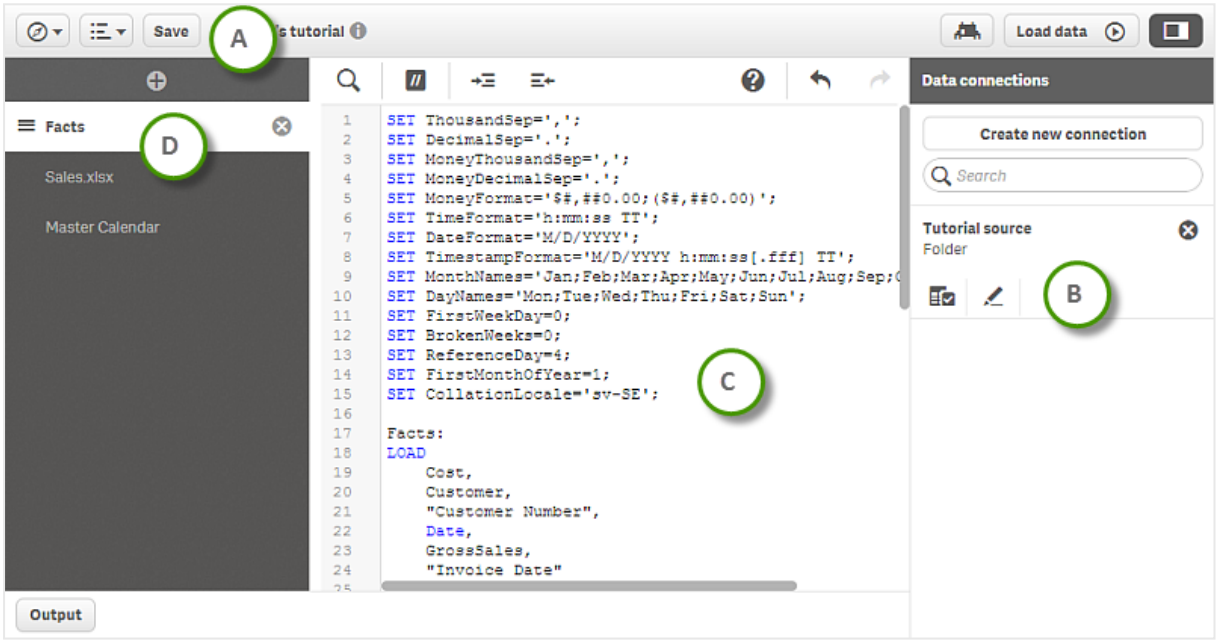
A	The toolbar contains the navigation menu, the global menu and other useful commands. Navigation menu with options **App overview**, **Data load editor**, **Data model viewer** and **Open hub**. Global menu with options **Add data**, **Help** and **About**. **Save** Save the app. Reload all data. The app is automatically saved before loading.	*App overview (page 21)* *The hub (page 20)* *Data load editor (page 123)* *Data model viewer (page 125)*
B	All data tables in the app. You can add data from new or existing data sources, including Qlik DataMarket. You can also edit or remove existing data tables that were added with **Data manager**, and profile data to improve table associations.	

C	The data preview area shows an example of the data in the selected table.	

3.6 Data load editor

The data load script connects an app to a data source and loads data from the data source into the app. When you have loaded the data it is available to the app for analysis. When you want to create, edit and run a data load script you use the data load editor.

A script can be typed manually, or generated automatically. Complex script statements must, at least partially, be entered manually.



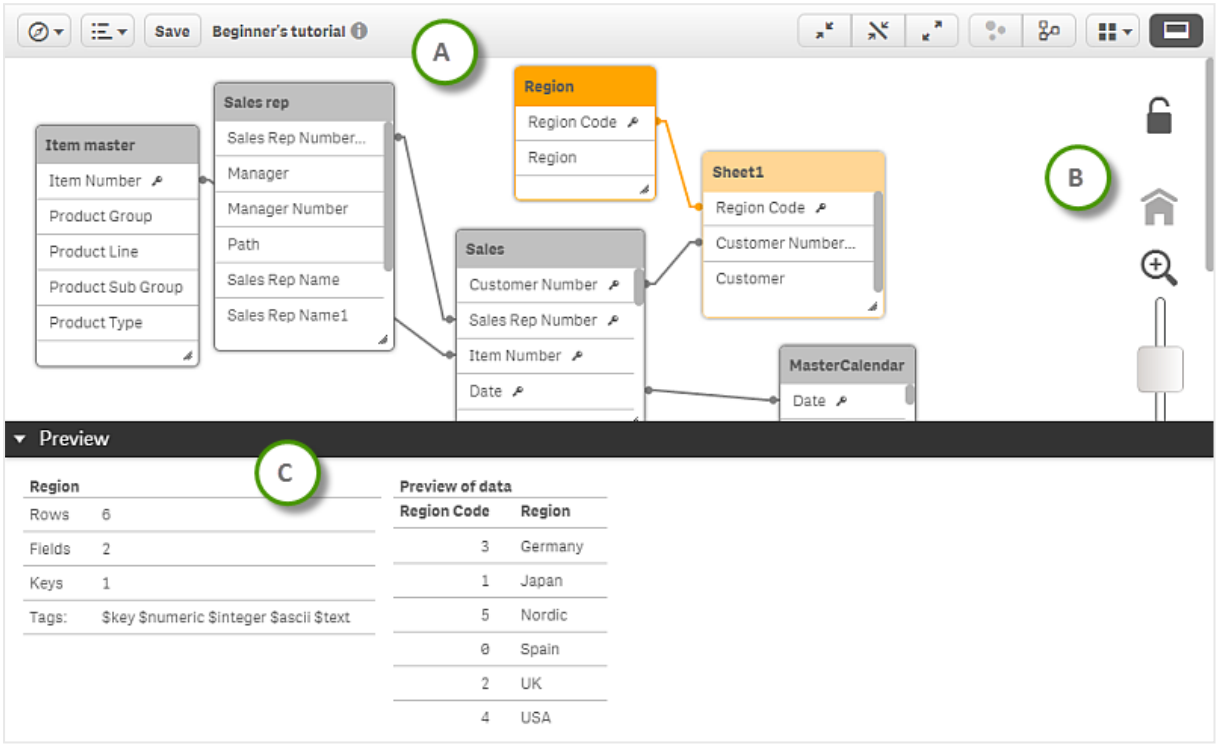
A	The toolbar contains the navigation menu, the global menu and other useful commands. Navigation menu with options **App overview**, **Data manager**, **Data model viewer** and **Open hub**. Global menu with options **Help** and **About**. **Save** Save the script. Click the info icon to show or hide the app details. Debug the script. Run the script to load data. The app is automatically saved before loading. Open and close the **Data connections** panel.	*App overview (page 21)* *Data model viewer (page 125)*
B	In **Data connections** you create and save shortcuts to the data sources (databases or remote files) you commonly use.	

C	The text editor is where you edit the script code. Each script line is numbered and the script is color coded by syntax components. The text editor toolbar contains the following commands: Search and replace text in the script. Comment/uncomment. Indent code. Outdent code. Activate syntax help mode. In help mode you can click on a syntax keyword (marked in blue) in the editor to access detailed syntax help. Undo the latest change (multiple step undo is possible). Redo the latest undo.	
D	You can divide your script into sections to make it easier to read and maintain. The sections are executed from top to bottom. Create a new script section. Delete a section.	
E	**Output** displays all messages that are generated during data load.	

3.7 Data model viewer

The data model viewer provides you with an overview of the data structure of the app. You can view detailed data of the tables and fields as well as you can create dimensions and measures from the data fields.

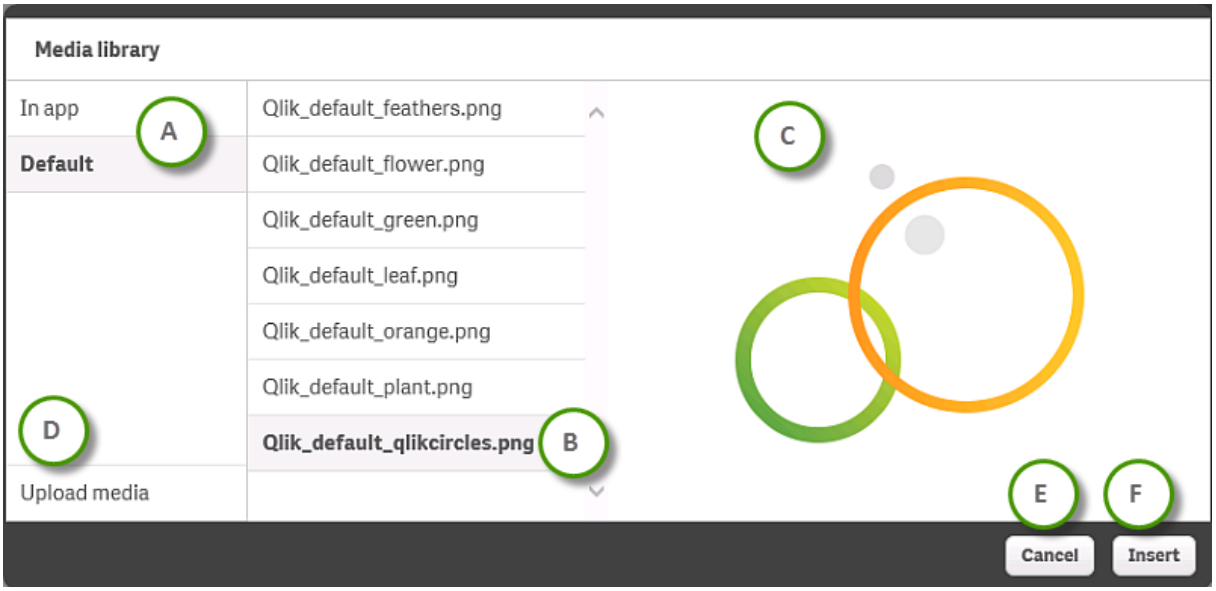
Direct Discovery tables are indicated by .



A	The toolbar contains the navigation menu, the global menu and other useful commands. Navigation menu with options **App overview**, **Data manager**, **Data load editor** and **Open hub**. Global menu with the options **Help** and **About**. **Save** Save changes. Click the info icon to show or hide the app details. Collapse all tables to show the table name only. Reduce the size of all tables to show the table name and all fields with associations to other tables. Expand all tables to show all fields. Internal table view - the Qlik Sense data model including synthetic fields. Source table view - the data model of the source data tables. Layout menu with the options **Grid layout**, **Auto layout** and **Restore layout**. Open and close the preview pane.	*App overview (page 21)* *Data load editor (page 123)* *The hub (page 20)*
B	An overview of all tables and fields in the app, and of the relation between them. You can change the zoom level, by clicking , or using the slider. Click to restore zoom level to 1:1. You can lock the table layout (positions and sizes), by clicking . To unlock the table layout, click .	
C	The preview pane with details about the tables and fields.	

3.8 Media library

The media library contains the images you can use in your app: in text & image visualizations, on story slides, and as thumbnails for apps, sheets, and stories.



The media library in Qlik Sense with the preview of one of the default images.

A	The folders in the media library: **In app**: The images in the app. You can delete images. **Default**: The default images are managed from the Qlik Management Console. If a new content library is shared through security rules defined in the Qlik Management Console, the library and its images becomes a part of the media library.	
B	A list of the images in the selected part of the media library.	
C	A preview of the selected image.	
D	Click **Upload media** to upload a new image.	*Uploading image files to media library (page 282)*
E	Click **Cancel** to close the media library dialog.	
F	Click **Insert** to use the selected image.	

4 Interacting with the user interface

Whether you are using a desktop computer or a mobile device, you need to know how you can interact with the Qlik Sense user interface to get the most of your experience with it and find things easily.

Learn about the following:

- Touch gestures on mobile and hybrid devices
- Keyboard shortcuts and mouse interactions on desktop computers
- How you explore on small screens
- How you change a user interface's language
- Undo and redo actions

4.1 Exploring apps on a small screen

When you are using Qlik Sense on a very small screen (480 pixels wide or smaller), you can make selections and navigate between apps, sheets, visualizations and stories, but you cannot create new content, edit sheets, stories or visualizations, or take snapshots.

This is part of the Qlik Sense responsive experience that also entails that navigation and user interface elements are adapted to work nicely regardless of what device and browser size you are using when working with Qlik Sense.

Qlik Sense on a small screen

When you use Qlik Sense on a small screen, you can explore and make discoveries in the apps.

Navigating

The navigation panel at the top is used to reach the hub, app overview and the help. The navigation panel at the bottom is used to browse between sheets, stories and visualizations. You can hide the navigation panels to make more room for exploring your app. Going from portrait to landscape mode will provide more details in some situations.

The hub

You arrive at the hub with access to different streams, depending on user access rights. You can navigate between the different apps in the streams.

Discovering and analyzing

You can explore the sheets, and also go into detail and view each of the visualizations in full screen. You can navigate between the visualizations one at time and make selections in them. In full screen you also have access to the visual exploration menu at the top.

Using data storytelling

You can play the stories in an app, not edit them. When you are playing a story you must go to sheet view to view the sheet and make selections.

Using bookmarks

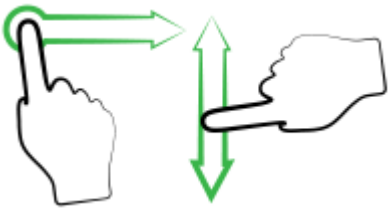
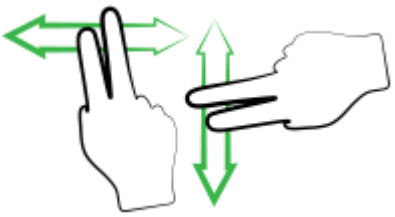
You can use existing bookmarks and create your own bookmarks.

4.2 Touch gestures and keyboard shortcuts

Qlik Sense can be used on computers and touch devices. There are a number of gestures for touch devices and keyboard shortcuts you can use to help you interact more easily with Qlik Sense and aid you in exploring your apps.

Touch gestures

This table describes the various gestures that can be used on touch devices.

Tap		Corresponds to a left-click with a mouse.
Double-tap		Corresponds to a double-click with a mouse.
Swipe		Used for scrolling lists and making selections in visualizations.
Two-finger swipe		Used for scrolling and panning.
Two-finger tap		Used for selecting a range of values in a list.

Pinch		Used for zooming.
Long-touch		Used for opening shortcut menus and selecting an object so it can be moved.
Three-finger tap		Resets the zoom level of a scatter plot visualization
Long-touch and drag		Moves a slide to a new location in storytelling view, moves an item on a slide in storytelling view
Two-finger selection		Used for making a square selection in a visualization.

Keyboard shortcuts

Keyboard shortcuts are expressed assuming that you are working in Windows. For Mac OS use Cmd instead of Ctrl.

Shortcut	Action	Supported in Qlik Sense	Supported in Qlik Sense Desktop
Ctrl+P	Prints the current view or active sheet/story.	Yes	Yes
Ctrl+C	Copies the selected item to the clipboard.	Yes	Yes
Ctrl+X	Cuts the selected item and copies it to the clipboard. When using the Google Chrome browser: if the cursor is put in front of a row in the data load editor or in the expression editor, without selecting anything, the entire row is cut.	Yes	Yes
Ctrl+V	Pastes the most-recently copied item from the clipboard.	Yes	Yes
Ctrl+Z	Undo action. Repeat to undo earlier actions.	Yes	Yes
Ctrl+Y (Cmd+shift+Z for Mac OS)	Redo actions.	Yes	Yes
Ctrl+H	Opens online help in the context of the current function, while in the data load editor or the expression editor.	Yes	Yes
Ctrl+F	Opens smart search.	Yes	Yes
Ctrl+E	In sheet view, opens and closes the editing of the selected sheet.	Yes	Yes
Ctrl+S	Saves changes to the app	No (changes are automatically saved)	Yes
Ctrl+O	Opens an app copied to the clipboard using Ctrl+C.	No	Yes
Ctrl+A	Selects all code in the data load editor.	Yes	Yes
Ctrl+D	Deletes the content of the current line in the data load editor or in the expression editor.	Yes	Yes
Ctrl+K	Comments or uncomments the selected lines in the data load editor.	Yes	Yes

Ctrl+00	Inserts a test script in the data load editor.	Yes	Yes
Tab	Indents code in the data load editor.	Yes	Yes
Shift+Tab	Outdents code in the data load editor.	Yes	Yes
Left arrow	Navigates to the previous slide in storytelling view.	Yes	Yes
Right arrow	Navigates to the next slide in storytelling view.	Yes	Yes
Up arrow	Scrolls up in a table.	Yes	Yes
Down arrow	Scrolls down in a table.	Yes	Yes
Ctrl+left arrow	Navigates to the previous sheet in sheet view.	Yes	Yes
Ctrl+right arrow	Navigates to the next sheet in sheet view.	Yes	Yes
Ctrl+up arrow	Navigates to the first sheet of the app in sheet view.	Yes	Yes
Ctrl+down arrow	Navigates to the last sheet of the app in sheet view.	Yes	Yes
Esc	Exits play mode in storytelling view. Deselects a visualization when editing in sheet view. Deselects an object. Undoes selections in a visualization. Closes a dialog or window.	Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes
Delete	Deletes selected item.	Yes	Yes
Backspace	Deletes selected item.	Yes	Yes
Enter/Return	Performs the action for the active option or button (for example, in dialogs).	Yes	Yes
Ctrl++	Zoom in.	Yes	Yes
Ctrl+-	Zoom out.	Yes	Yes
Ctrl+0	Reset zooming.	Yes	Yes

See also:

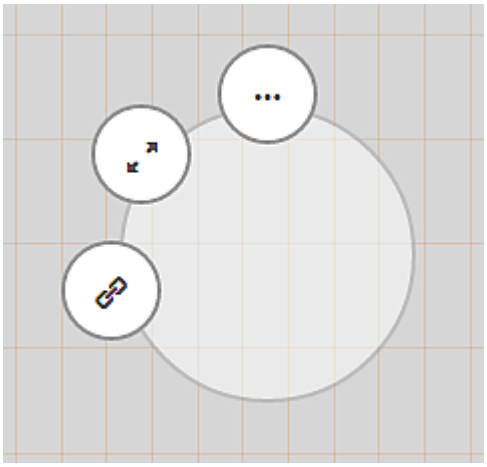
4.3 Long-touch menu (touch devices)

When you work on a touch device, you can long-touch a visualization to open an options menu.

1. Long-touch the visualization.

   The options menu is opened.

2. Tap an option to select it.



When you are editing an app, you have three options displayed, as shown in the screenshot:

- Shortcut menu (•••).
- Full screen ( ).
- Save as a master item or unlink from a master item ( ).

When you are making data analysis in an app, the master item option is replaced by snapshot ( ). You will also get the option to open the visual exploration menu ( ) for visualizations where the menu is available.

4.4 Interaction on hybrid devices

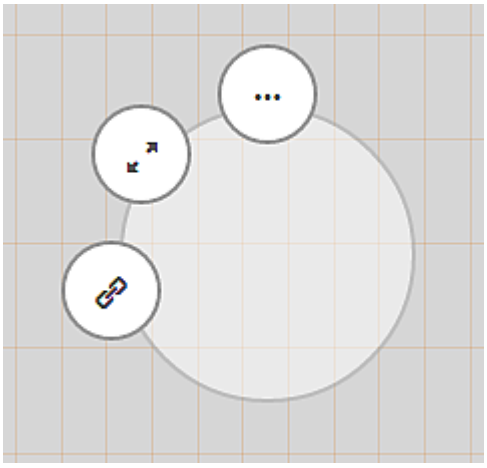
When you are using a hybrid device (a laptop with a touch screen), the mouse-over function is disabled by default. Click on a visualization to see a tooltip, and click again to close it.

You can long-touch on the screen or right-click with the mouse on a visualization to open a touch gesture shortcut menu.

1. Long-touch or right click the visualization.

   The options menu is opened.

2. Long-touch and swipe over the menu items to see tooltips. Tap or click an option to select it.



When you are editing an app, you have three options displayed, as shown in the screenshot:

- Shortcut menu (•••).
- Full screen (⤢).
- Save as a master item or unlink from a master item (🔗).

When you are making data analysis in an app, the master item option is replaced by snapshot (📷). You will also get the option to open the visual exploration menu (🎚) for visualizations where the menu is available.

4.5 Changing language in Qlik Sense

Qlik Sense is available in the following languages:

- English
- German
- Spanish
- French
- Italian
- Japanese
- Dutch
- Brazilian Portuguese
- Russian
- Swedish
- Simplified Chinese

The language you experience Qlik Sense in depends on the web browser it is running in, and how that browser detects the language to display content.

For Qlik Sense Desktop: By default, Qlik Sense Desktop runs in a window of its own, in the display language of the operating system of your computer. In this case, the language cannot be altered unless you change the display language of the operating system. But you can also open Qlik Sense Desktop in a web browser. In that case, the language depends on the web browser it is running in, and how that browser detects the language to display content.

How the language is detected

The following table lists how Qlik Sense detects which language to display content in. Some examples of common and supported web browsers and operating systems are listed.

Web browser	Operating system	Language setting detected
Google Chrome	Windows	Browser user interface language
Safari	Mac OS X	Operating system locale
Safari	iOS	Operating system locale
Mozilla Firefox	Windows	Preferred content language
Internet Explorer 10 or higher	Windows	Operating system locale

The user interface language only influences in which language Qlik Sense is displayed. Changing the language has no effect on the language of the Qlik Sense server.

Changing the language in Qlik Sense

How you set Qlik Sense to display in another language depends on the web browser you are using. For example, for Google Chrome in Windows, and for Mozilla Firefox, the language Qlik Sense displays is the same as the web browser user interface language. Other web browsers, such as Safari in iOS and Internet Explorer 10 use settings other than their user interface language to detect the language to display Qlik Sense in.

Some examples are listed below.

Changing language when using Google Chrome in Windows

Do the following:

1. In the **Customize and control Google Chrome menu**, click **Settings** and expand **Show advanced settings...**.
2. Click **Language and input settings...** under **Languages**.
3. Add the language you want Qlik Sense to run in, or select an existing language from the list.
4. Click **Display Google Chrome in this language**.

5. Click **Done**.
6. Close all Google Chrome sessions and open Qlik Sense again.

Changing language when using Safari in Mac OS X 10.8

Do the following:

1. Click the **Apple** menu and select **System Preferences**.
2. Select **Language & Text** and the **Language** tab.
3. Move the language you want Qlik Sense to run in to the top of the list.

*If the language you want to use is not in the list, click **Edit List...**.*

Changing language when using Safari in iOS 7

Do the following:

1. Tap on the **Settings** icon on your iPad or iPhone. Tap **General**, the option with the gear icon.
2. Tap the **International** option.
3. Tap the **Language** option in the first group, Select your desired language from the list of available languages and tap **Done** on the top-right side of the list screen.

   It will take a few seconds to change the language, and then you will see the interface language has changed to the language you have selected.

Changing language when using Safari in iOS 8

Do the following:

1. Tap on the **Settings** icon on your iPad or iPhone. Tap **General**, the option with the gear icon.
2. Tap **Language & Region**. Select your desired language from the list of available languages

   It will take a few seconds to change the language, and then you will see the interface language has changed to the language you have selected.

Changing language when using Mozilla Firefox in Windows

Do the following:

1. In Mozilla Firefox, click **Tools** > **Options**.
2. Select the **Content** tab and click **Choose** under **Languages**.
3. Add the language you want Qlik Sense to run in, or select an existing language from the list.
4. Move the language you want to use to the top of the list.

Changing language when using Internet Explorer 10 or higher in Windows

Do the following:

1. In Windows, open the **Control Panel** and select **Clock, Language, and Region**.
2. Click **Change the date, time, or number format**.
3. Select the desired language from the **Format** list.

4.6 Undo and redo actions

When you are editing in sheet view or storytelling view, you can undo or redo your actions by clicking ↩ and ↪, or by using the keyboard shortcuts Ctrl + Z and Ctrl + Y.

In sheet view

When working in sheet view, the log of actions is cleared if you:

- Leave the sheet you are working on.
- Make any changes in the assets or library panel.

In storytelling view

When editing in storytelling view, the log of actions is cleared if you:

- Leave storytelling view.
- Enter storytelling play mode.
- Go to sheet view via the shortcut menu choice **Go to source**.

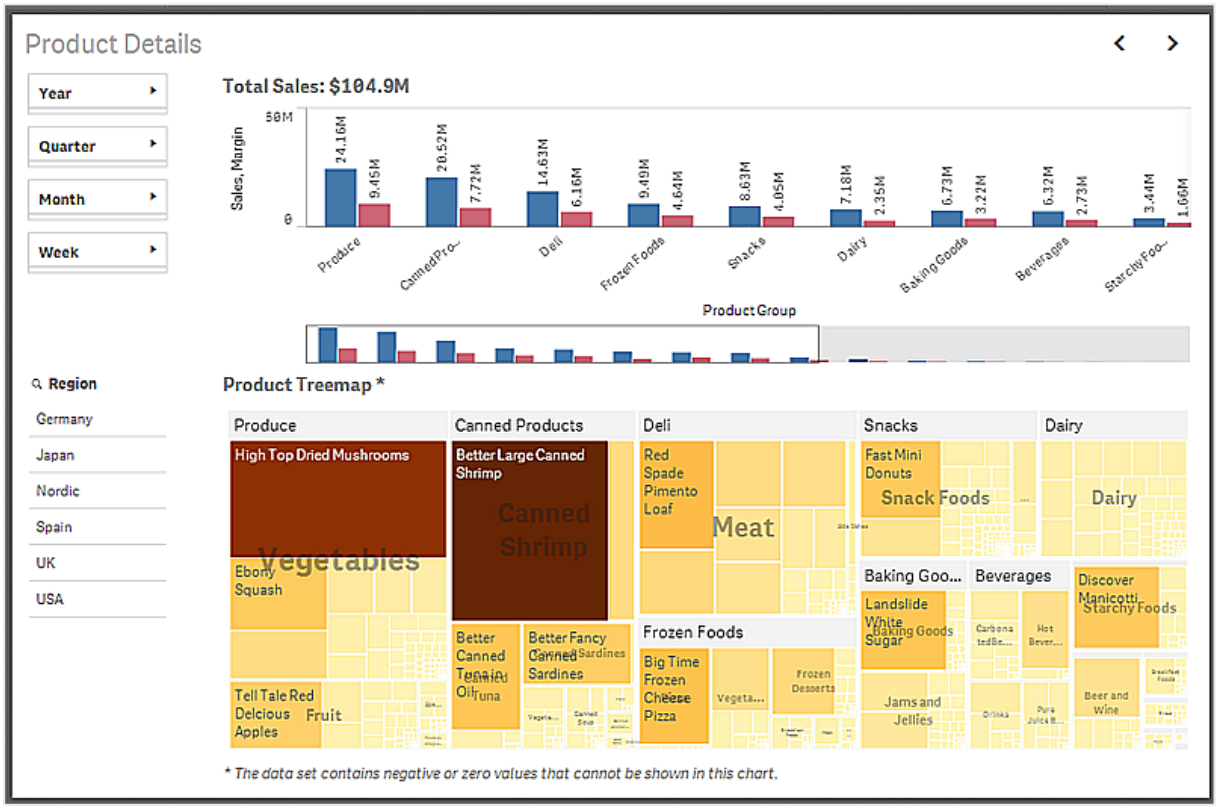
Any action involving effects will not be added to the log of actions. If you have added an effect it will not be deleted if you click ↩ (this is done from the shortcut menu of the snapshot instead).

5 Creating apps and visualizations

Qlik Sense enables you to create and design interactive and clear visualizations, on one or more sheets, using a palette of chart types such as bar charts, pie charts, tables, gauges, and treemaps. The visualizations are simple to add and customize. Interactivity such as drill-down and filtering is built in because Qlik Sense automatically highlights items associated with your selections. You can enhance interactivity further with functionality specific to the different visualizations.

While building visualizations on sheets, consider some rules of thumb:

- Consistency helps the user to navigate and understand the app.
- Keep the sheet tidy and let the data visualization play center stage.
- Focus on a few metrics (KPIs) per sheet and present these in priority order.
- Make sure that the user can drill-down in data. For example, create dimensions for time and date to make it easy to drill down in year, month, week and day.
- Avoid using red and green colors as indicators because these colors can be hard for users with color-vision deficiency to distinguish.



An example of a sheet with four different charts.

You can get a lot of good inspiration by checking out the demo apps:

- Qlik® Sense Demos

5.1 Creating your first app

The app is at the core of Qlik Sense. An app is loaded with data, and the visualizations the app contains allow you and your colleagues to explore the data.

First, you have to create and build your app.

Creating a basic app

This section describes how to build a basic app using some sample data.

Prepare the data

All apps need data. We have supplied some sample data for you to use when following the steps in this section. You can, of course use your own.

If you want to use the sample data, copy the entire table, including the column headings, into an empty Excel file on your computer.

Sample data

Cost	Customer Number	Date	Item Description	Sales	Sales Quantity	Sales Person Number
-147,42	10025049	12/31/2012	Landslide Salt	-124,58	-1	113
-71,78	10025049	12/31/2012	Big Time Home Style French Fries	-98,77	-1	113
-6,95	10017828	12/31/2013	Even Better String Cheese	-8,75	-1	109
0	10005006	12/31/2013	Blue Label Canned Peas	0	1250	167
0	10009633	12/31/2013	Frozen Mushroom Pizza	0	1	127
0	10009633	12/31/2013	Great Pumpernickel Bread	0	2	127
0	10013238	12/31/2013	Blue Label Canned Peas	0	12500	117
0	10021223	12/31/2013	Imagine Ice Cream	0	221	183
0	10022168	01/15/2014	Blue Label Canned Peas	0	2500	154
0	10023447	01/15/2014	Golden Lime Popsicles	0	120	115
0	10025249	01/15/2014	Blue Label Canned Peas	0	1250	162
0,09	10024006	01/15/2014	Blue Label Canned Peas	0	10	157
0,13	10024006	01/15/2014	Blue Label Beef Soup	0	10	157
0,29	10024006	01/15/2014	Club Sour Cream	0	22	157
0,37	10024006	01/15/2014	Tell Tale Red Pepper	0	4	157

2,15	10024006	01/15/2014	Nationeel Apple Fruit Roll	0	10	157
5,14	10023783	02/23/2014	Nationeel Cheese Crackers	0	1	175
5,14	10023783	02/23/2014	Nationeel Graham Crackers	0	1	175
17,5	10021911	02/23/2014	Just Right Canned String Beans	0	10	175
18,69	10009633	03/05/2014	Tell Tale Broccoli	0	1	127
30,34	10009633	03/05/2014	Cutting Edge Turkey Hot Dogs	0	1	127
52,59	10009633	03/05/2014	Ebony Fresh Lima Beans	0	1	127
52,59	10009633	03/05/2014	Ebony Fresh Lima Beans	0	1	127
95,35	10009633	03/05/2014	Tell Tale Limes	0	1	127
112,73	10009633	03/05/2014	Just Right Regular Ramen Soup	0	2	127
206,89	10009633	03/05/2014	Golden Frozen Cheese Pizza	0	1	127
0,22	10011734	03/05/2014	Best Choice Sesame Crackers	0,7	2	155
0,22	10021472	03/05/2014	Best Choice Sesame Crackers	0,71	2	114
0,33	10011734	08/05/2014	Great Pumpernickel Bread	1,48	2	155
0,4	10009606	08/05/2014	Best Oatmeal	1,54	4	118
0,55	10016548	08/05/2014	Best Choice Sesame Crackers	1,75	5	153
0,93	10009606	08/05/2014	Carlson Mild Cheddar Cheese	2,05	1	118
0,4	10023447	08/05/2014	Big Time Fajita French Fries	2,39	2	115
0,84	10016548	08/05/2014	Best Choice Beef Jerky	2,73	2	153
0,99	10009606	08/05/2014	Ebony Plums	2,93	5	118
0,64	10009606	08/05/2014	Club String Cheese	2,99	8	118
1,01	10009606	08/05/2014	Shady Lake Ravioli	3,17	2	118
2,2	10025919	08/05/2014	Golden Chicken TV Dinner	3,21	1	108
1,09	10016548	09/24/2014	Landslide Grape Jam	3,47	1	153

Create the app and add a visualization

1. Start Qlik Sense.
2. Create an empty app.
3. Add data to the app by dragging and dropping your data (Excel) file to the hub or into the empty app.
4. Create a sheet.
5. Add a visualization to the sheet, for example, a bar chart.

Building a more advanced app

If you want to build a more advanced app, there are a number of things you can do.

- You can create structure in your app by adding more sheets, where each sheet has a specific purpose.
- You can create reusable items to make it easy for you and others developing the app to reuse in their own visualizations.
- You can bookmark important findings, and add text descriptions and thumbnails to apps, sheets and stories to help others who use your app understand its purpose and how best to use it.

Please refer to the Qlik Sense online help for further details about structuring sheets.

Discovering with the app

You can now start using the app for data discovery and analysis.

Sharing the app with others

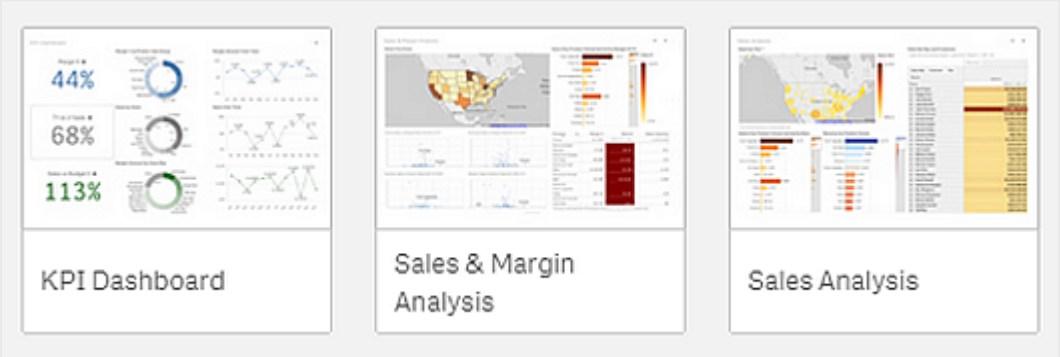
If you want others to use and explore with your app, you must first publish the app.

If you use Qlik Sense Desktop, you can share your app with other people by uploading it to the cloud.

6 Structuring an app using sheets

Sheets provide a way of structuring your ideas and purposes for your app. When you create an empty app, it is good practice to first build a structure of empty sheets, where each sheet represents an idea or a goal. This will give you, and others who you will share your app with, a good overview of the app.

For example, let us say that you want an overview of your business's key metrics, view sales and margins by state, region and product, and also sales by city and salesperson. Instead of having all this information in one place, you could structure it by having one sheet for each of these purposes.

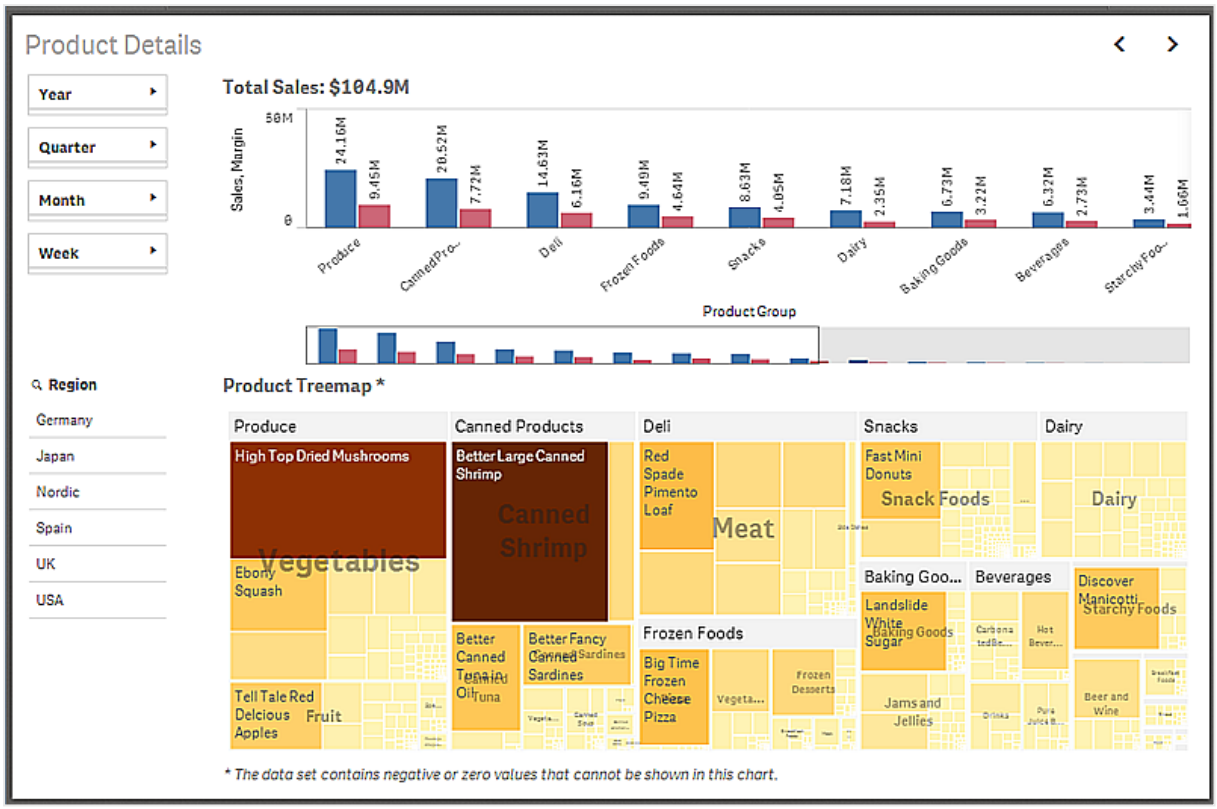


Each sheet has a purpose and an idea of its own

6.1 Sheets

A sheet is where charts and tables for data visualization are placed. An app can include one or several sheets.

The sheets have no connection with the logic – the selections that you make affect visualizations regardless of which sheets they are located on.



An example of a sheet with boxes on the left to select and filter out the data to be presented in the visualizations on the right.

6.2 Creating a new sheet

You can create a new sheet to the app from the app overview or from the sheet navigator.

Do the following:

1. From the app overview, click to view the sheets.
2. Click or **Create new sheet**.
3. Give your sheet a title and add a description.
4. Click outside the text area to save the title and description.

A new sheet is created.

You access the sheet navigator from the sheet view by clicking in the toolbar.

6.3 Changing the title and description of a sheet

You can change the title and description of your sheets.

Do the following:

1. In the app overview, click to view the sheets.
2. Do one of the following:
   - If you are in grid view, , click the sheet title followed by clicking .
   - If you are in list view, , click .
3. Edit **Title** and **Description**.
4. Click outside the text area.

The changes you made are saved.

You can also change a sheet's title and description in the sheet navigator at the top right or in the properties panel.

6.4 Changing the thumbnail of a sheet

You can replace the default thumbnail of a sheet with another thumbnail, to make it easier to distinguish between sheets in the app overview and in the sheet navigator. You can use one of the default images, or an image of your own. If you are using Qlik Sense Desktop, you can also use bundled images saved in the qvf file.

Do the following:

1. In the app overview, click to view the sheets.
2. Do one of the following:
   - If you are in grid view, , click the sheet title followed by clicking .
   - If you are in list view, , click .
3. Click on the default thumbnail.
   The **Media library** opens.
4. Click on a folder in the media library, for example **In app** or **Default**.
5. Select the image you want to use as a thumbnail for the sheet and click **Insert**.
6. Click again.

The image you selected is now used as a thumbnail for the sheet, and is visible in the sheet navigator and in the app overview.

You can also change a sheet's thumbnail in the sheet navigator at the top right or in the properties panel.

The optimal aspect ratio of a thumbnail is 8:5 (width:height).

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You need to use the Qlik Management Console to upload images to the default folder. You can upload images to the **In app** folder in the media library.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

You can only add or change the thumbnail of an unpublished sheet.

6.5 Copying, replacing and moving items on sheets

You can copy, replace and move items on a sheet and between sheets. You can do this in the following ways:

- Using the edit bar on the sheet (, and).
- Using the shortcut menu options **Cut**, **Copy** and **Paste** (or **Paste and replace**).
- With the keyboard shortcuts Ctrl+C, Ctrl+X and Ctrl+V.

Copying items

Follow this procedure when you want to make a copy of an existing item.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. To insert the item on another sheet, navigate to the sheet via the sheet navigator.
4. Click to paste the item.

The copied item is added to the sheet.

If there is no empty space on the sheet, then the largest item will reduce in size by half to make space for the copied item.

Replacing items

Follow this procedure when you want to replace an existing item with the one you have just copied.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. Click on the item you want to replace.
   The item is highlighted.
4. Click to replace the highlighted item with the copied one.

The copied item replaces the highlighted one.

If you want to deselect the visualizations on the sheet, press Esc.

Moving items to another sheet

To move an item between two sheets you first cut it out from one sheet and then paste it onto another sheet.

Do the following:

1. While editing a sheet, click on the item you want to move from one sheet to another.
   The item is highlighted.
2. On the edit bar, click .
   The item is deleted from the sheet.
3. Navigate to the sheet you want to move the item to.
4. Click to paste the item.

The moved item is added to the other sheet.

6.6 Duplicating a sheet

You can duplicate any sheet, regardless of whether it is a sheet that belongs to the app or a sheet you have created yourself. The purpose of duplicating sheets is to save time by reusing content, and to allow you to modify the duplicate so that it fits your needs better.

A duplicated sheet contains the same visualizations as the original sheet, and is linked to the same master items. The duplicated sheet is a standalone sheet with no connection to the original sheet. Duplicated sheets appear under **My sheets** in app overview and in the sheet navigator.

Duplicating a sheet from app overview

Do the following:

1. Click on the left-hand side to show the sheets in the app.
2. Long-touch/right-click a sheet.
   The shortcut menu opens.
3. Click **Duplicate**.

The new sheet is created, and you find it under **My sheets**.

You can also duplicate a sheet from the global menu in app overview or in sheet view, or, when in sheet view, using the sheet navigator.

6.7 Renaming a sheet

You can rename your sheets in the app overview.

Renaming a sheet in grid view

Do the following:

1. Click the title of the sheet you want to edit.
   An area is expanded with detailed information about the item.
2. Click ✎ in the expanded area.
3. Change the title.
4. Click ✎ again.

The new title is saved.

Renaming a sheet in list view

Do the following:

1. Click ✎ for the sheet you want to edit.
2. Change the title.
3. Click ✎ again.

The new title is saved.

6.8 Deleting a sheet

You can delete sheets from the app overview.

Deleting a sheet in grid view

Do the following:

1. Click the title of the sheet you want delete.
2. Click ✎.
3. Click 🗑.
4. In the dialog, click **Delete**.

The sheet is deleted.

Deleting a sheet in list view

Do the following:

1. Click for the sheet you want to edit.
2. Click .
3. In the dialog, click **Delete**.

The sheet is deleted.

In grid view as well as in list view, you can also long-touch/right-click on a sheet and select ***Delete sheet****.*

7 Designing visualizations

7.1 The purpose

The point of a visualization is to communicate its data in a quick and meaningful way while remaining 100 % accurate. A visualization should serve a clear purpose and not overwhelm the users with unnecessary details. If possible, a visualization should be designed to encourage the users to compare its various elements so as to give insight into the meaning behind the data.

So, to design a data visualization to get its message through, you need to first understand the data itself. Then use well-known design patterns and use the type of visualization that reveals the data in the best way.

7.2 Understand the data

To design an effective visualization with a clear purpose, you should thoroughly understand your data. The following points will help you find the information you want to convey with your data:

- What kind of data is it? Nominal, ordinal, interval, or ratio data?
- How different parts of the data relate to each other?
- Can you organize the data in a way that makes it easy for you to create your visualizations?
- What do you want to communicate with your data?

It's easy to start thinking about how the visualization should look, but when you have answered these questions it will be easier to decide what kind of visualization you should use and how it will look and communicate its data.

7.3 Use well-known design patterns

When you have understood the data, how it is organized, and how its parts relate to each other, you should consider using well-known design patterns to communicate your data. For example, if you want to show how a measure behaves over time, you should use a line chart because its strength is that it tells your users a lot without their having to look at the specific details.

7.4 Design individual elements to reveal the data

Apart from the design pattern you choose, an effective visualization is also about how you design and make individual data elements stand out and reveal the data. In other words, the design of the individual elements of a visualization should reveal the data to your users in a quick and intuitive way. An easy way of achieving this is to use a different color on one of the dots in a group of many dots. The different color makes it much easier for you to find the dot and reduces your load of information. Other examples of intuitive design are:

- Position
- Orientation

- Size
- Shape
- Color hue, brightness and saturation

7.5 Avoid the pitfalls of data visualization

To experience the benefits of data visualizations you must avoid the pitfalls. Here are some common pitfalls:

Color abuse

Do not overdo colors. Be aware that the wrong color in the wrong place might cause confusion rather than clarity.

Misuse of pie charts

Avoid having pie charts side by side to compare. Try not to squeeze too much information into them.

Visual clutter

Too much information defeats the purpose of clarity. Use a maximum of nine KPIs and remove all visual clutter.

Poor design

A beautiful visualization is not necessarily the most effective. Use design best practices at all times.

Bad data

Spot and correct issues with your data before you present it. Do not let your visualization take the blame for bad information.

7.6 Visualizations

Visualizations are used to present the data that is loaded into the app. The selections you make in the app are reflected in all associated visualizations on all sheets.

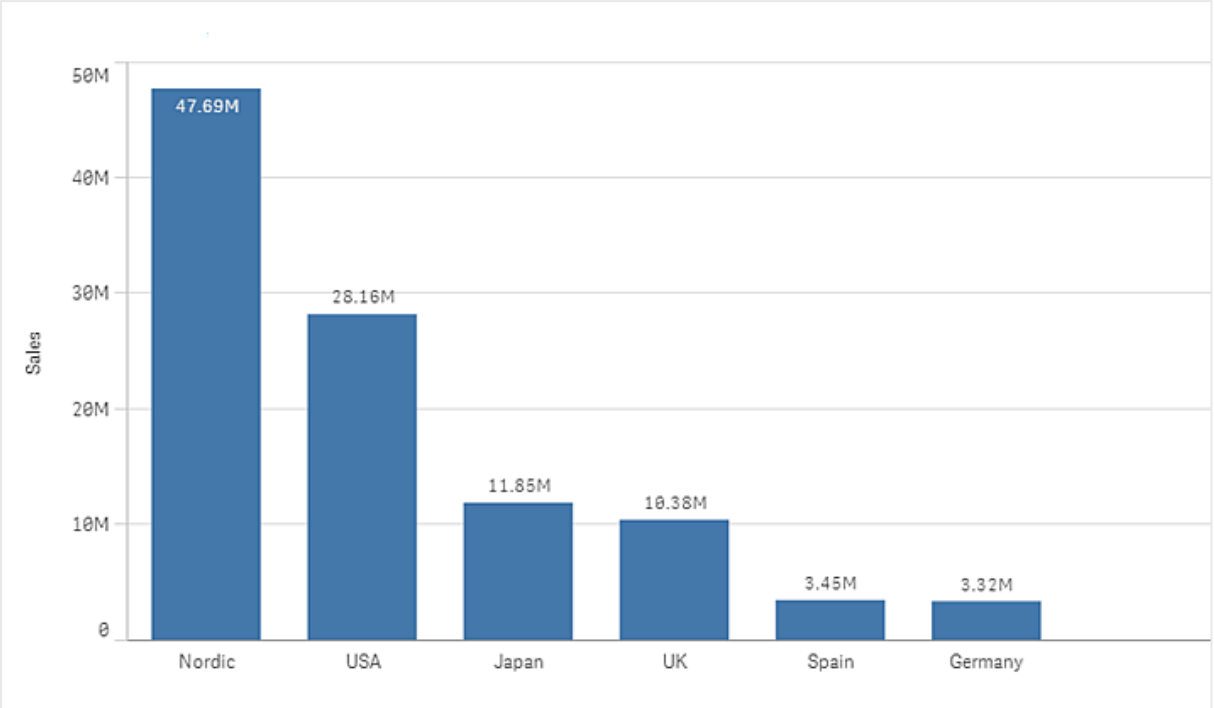
Qlik Sense includes charts that you use to create visualizations. You can convert from one visualization type to another by dragging a new chart to a visualization on a sheet.

	Bar chart	The bar chart displays a bar for each dimension value. The bar length corresponds to its numerical measure value.
	Combo chart	The combo chart combines bars and lines in the same chart. The bars and lines have different axes to enable comparing percentages and sums.
	Filter pane	The filter pane allows you to control what data that is shown in the visualizations on a sheet. A filter pane can filter the data of several dimensions at once.

	Gauge	The gauge is used to display the value of a single measure, lacking dimensions.
#1	**KPI**	The KPI is used to present central performance figures.
	Line chart	The line chart displays data lines between values. Line charts are often used to visualize a trend in data over intervals of time.
	Map	The map is used to combine geospatial data and measure values, such as the sales for a region or a store.
	Pie chart	The pie chart shows the relation between a single dimension and a single measure.
	Pivot table	The pivot table presents dimensions and measures as rows and columns of a table. The pivot table allows you to analyze data in multiple dimensions at a time. The data in a pivot table may be grouped based on a combination of the dimensions, and partial sums can be shown.
	Scatter plot	The scatter plot presents values from two measures. This is useful when you want to show data where each instance has two numbers, for example, country (population and population growth). An optional third measure can be used and is then reflected in the size of the bubbles. When showing large data sets colors will be used instead of bubble size to represent the measure size.
	Table	The table displays values in record form, so that each row of the table contains fields calculated using measures. Typically, a table includes one dimension and multiple measures.
A	**Text & image**	You can use the text & image visualization to add text, images, measures and links to a sheet.
	Treemap	The treemap shows hierarchical data. A treemap can show a large number of values simultaneously within a limited space.

Bar chart

The bar chart is suitable for comparing multiple values. The dimension axis shows the category items that are compared, and the measure axis shows the value for each category item. In the image, the dimension values are different regions: Nordic, USA, Japan, UK, Spain, and Germany. Each region represents a dimension value, and has a corresponding bar. The bar height corresponds to the measure value (sales) for the different regions.



You can make more complex comparisons of data by using grouped or stacked bars. With grouped bars, you can easily compare two or more items in the same categorical group. Stacked bars combine bars of different groups on top of each other and the total height of the resulting bar represents the combined result.

The bar chart can be displayed horizontally or vertically.

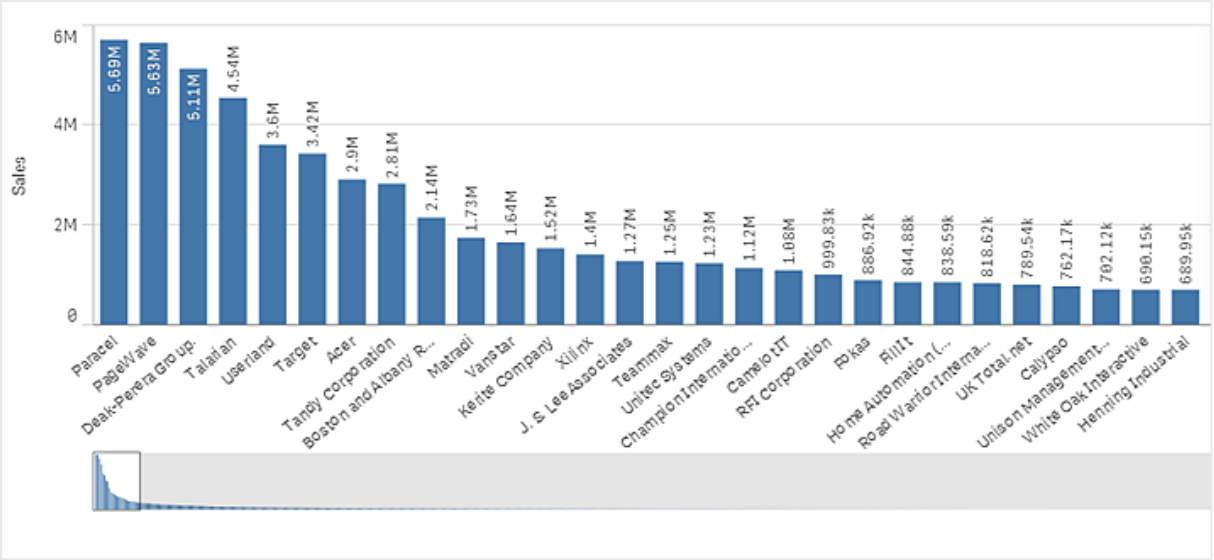
Number of dimensions and measures

In a bar chart you need at least one dimension and one measure. The following table shows the maximum limits.

When using	Max limit
1 dimension	15 measures
2 dimensions	1 measure
1 measure	2 dimensions
2 -15 measures	1 dimension

Scrolling and mini chart

When the number of dimension values exceeds the width of the visualization, a mini chart with a scroll bar is displayed. You can scroll by using the scroll bar in the mini chart, or, depending on your device, by using the scroll wheel or by swiping with two fingers. When a large number of values are used, the mini chart no longer displays all the values. Instead, a condensed version of the mini chart (with the items in gray) displays an overview of the values, but the very low and the very high values are still visible.



Bar chart with mini chart

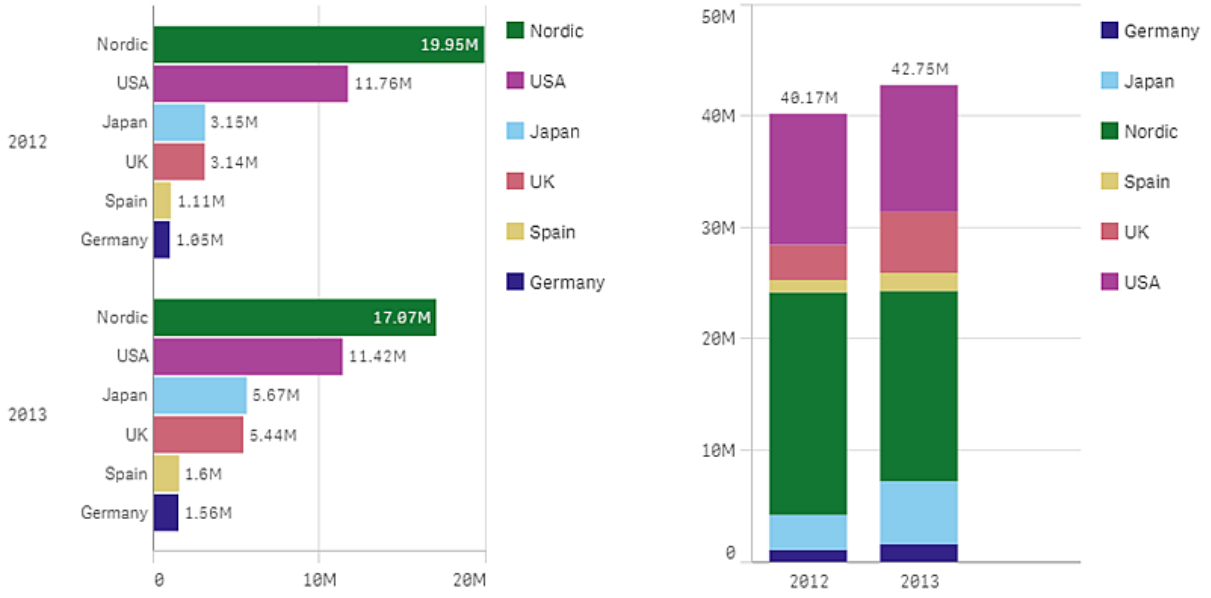
Out of range

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. A bar that exceeds the limit will be cut diagonally to show that it is out of range.

When a bar cannot be displayed, due to the range limits, an arrow indicates the direction of the value.

When a reference line is out of range, an arrow is displayed together with the number of reference lines that are out of range.

When to use a bar chart



Sales per region and year visualized in a bar chart with horizontal, grouped bars and a bar chart with vertical, stacked bars

Description

You can include two dimensions and one measure, or one dimension and multiple measures in a bar chart. Each bar corresponds to a dimension, and the values of the measures determine the height/length of the bars.

When to use it

Grouping and stacking bars makes it easy to visualize grouped data. The bar chart is also useful when you want to compare values side by side, for example sales compared to forecast for different years, and when the measures (in this case sales and forecast) are calculated using the same unit.

Advantages

The bar chart is easy to read and understand. You get a good overview of values when using bar charts.

Disadvantages

The bar chart does not work so well with many dimension values due to the limitation of the axis length. If the dimensions do not fit, you can scroll using the scroll bar, but then you might not get the full picture.

Selections in bar charts

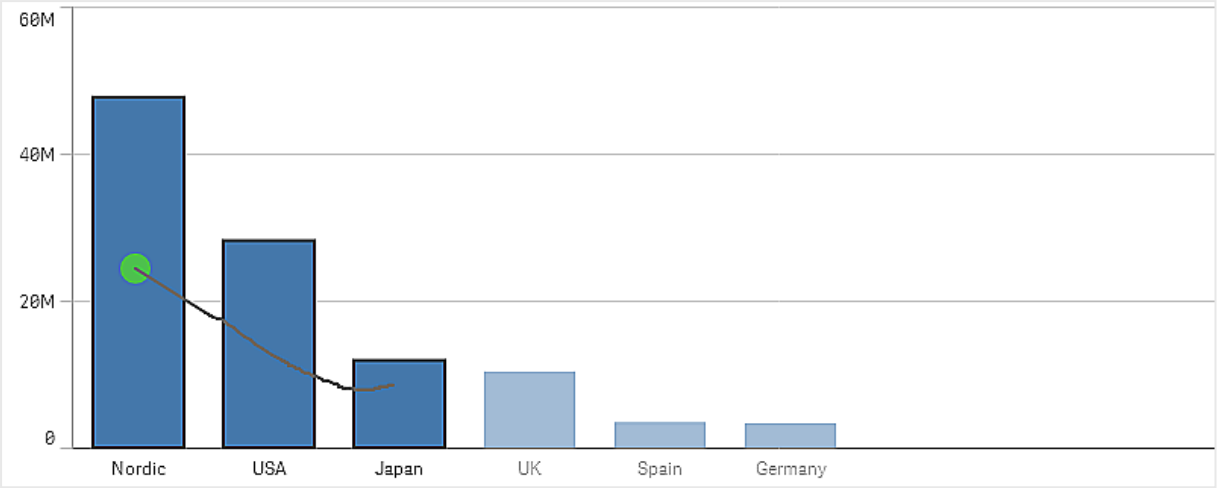
When you analyze your data, you have different ways of making selections. In a bar chart you can either use click selection, draw selection, legend selection, lasso selection, range selection, or label selection. To confirm a selection, click ✓ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Click selection

You can select bars by clicking them, one at a time. To deselect a bar, click it.

Draw selection

You can draw one or more lines in the chart to select bars. All bars that are touched by a line are selected, all other bars are dimmed. To deselect a bar, click it.When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌕ at the top of the visualization. On a computer, you can also press Shift and make the selection.



Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking at the top of the visualization. On a computer, you can also press Shift and make the selection.

Range selection

In range selection, you can make selections either on the x-axis or the y-axis, one at a time. Select a starting point along the axis, just outside the chart area, and drag to make a selection. As soon as you start dragging, a starting point line is displayed, as well as an end point line that shows the selection. You can adjust your selection by dragging the lines, the value boxes, or the green selection area. For an axis showing measure values, you are also able to click on the range bubble to enter a specific numeric value.

Label selection

You can click the dimension labels to make selections. When dimensions are grouped or stacked, the whole group or stack is selected.

Legend selection

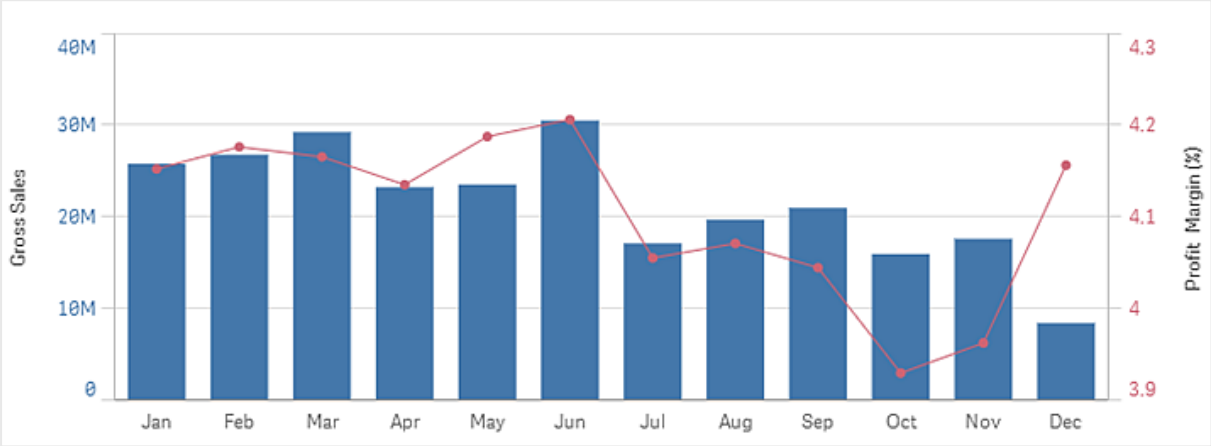
There are two legend types: box legend, with one legend item per dimension value, and range legend, with a gradient scale, where all measure values are represented. In the box legend, you select and deselect the items one at a time by clicking them. In the range legend, you drag from a starting point to an end point to enclose an area. You cannot deselect an item, but you can change the range.

When you have a bar chart with two dimensions and one measure (either grouped or stacked), the selection is by value and not by group or by stack. This means that only parts of a group or stack are selected.

When you have a bar chart with one dimension and two measures (either grouped or stacked), selections cannot be made.

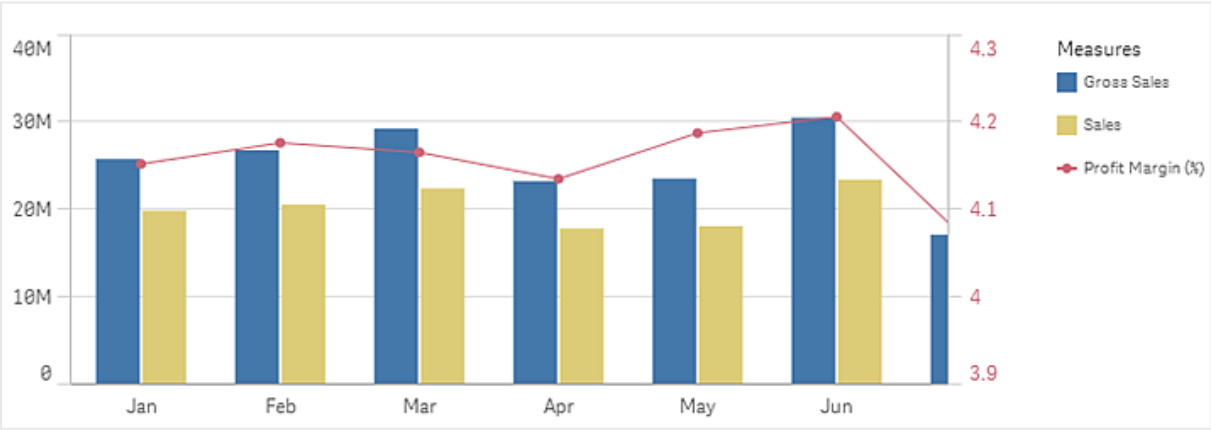
Combo chart

The combo chart is suitable for comparing two sets of measure values that are usually hard to compare because of the differences in scale. A typical example is when you have a bar chart with sales figures and want to combine these figures with the margin values (in percent). In a regular bar chart, the bars for sales would be displayed as usual, but the margin values would be almost invisible because of the very large difference between the numeric values for sales and margin.



With a combo chart you can combine these values by, for example, using bars for the sales values and a line for the margin values. By default, the bars have the measure axis on the left and the margin values have a separate axis to the right. The two measures use the same dimension (month).

If you have yet another measure, for example, gross sales, with values that are roughly in the same range as the sales values, you can add the third measure as bars and either stack or group the new measure values with the sales values. With grouped bars, you can easily compare two or more items in the same categorical group. Stacked bars combine bars of different groups on top of each other and the total height of the resulting bar represents the combined result.



Combo chart with three measures

The combo chart can only be displayed vertically.

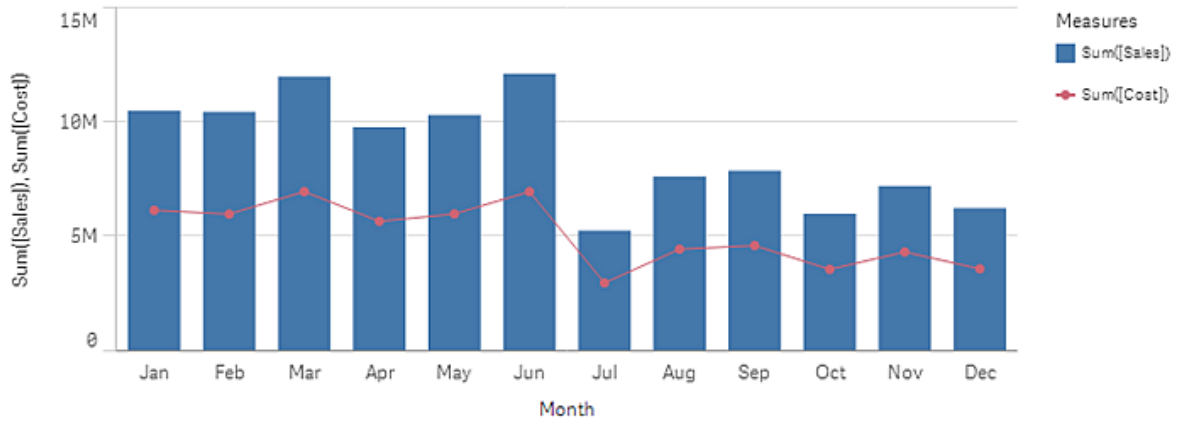
Number of dimensions and measures

In a combo chart, you need at least one dimension and one measure. You can only have one dimension but up to 15 measures.

Out of range

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. A bar that exceeds the limit will be cut diagonally to show that it is out of range. For a line data point value that is out of range, an arrow indicates the direction of the value.

When to use a combo chart



Sales (blue bars) compared to Cost (red line)

Description

The combo chart combines the features of the bar chart and the line chart. You can use bars and lines to represent different categorical groups in the same visualization.

When to use it

With the possibility to have different measure scales, one to the left and one to the right, the combo chart is ideal when you want to present measure values that are normally hard to combine because of the significant difference in value ranges.

But a combo chart can also be quite useful when comparing values of the same value range. In the image above, the combo chart only has one measure axis, but the relationship between the two categories sales and cost is clear.

Advantages

The combo chart is the best choice when combining several measures of different value ranges.

Disadvantages

The combo chart only supports one dimension, and can therefore not be used when you need to include two or more dimensions in the visualization.

Selections in combo charts

When you analyze your data, you have different ways of making selections. In a combo chart, you can use: click selection, draw selection, lasso selection, range selection, label selection, or legend selection. To confirm a selection, click ✓ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Click selection

You can select bars or data points on lines by clicking them, one at a time. To deselect a bar or data point, click it.

Draw selection

You can draw one or more lines in the chart to select bars and data points on lines. All bars and data points that are touched by a line are selected, all other bars and data points are dimmed. To deselect a bar or data point, click it.

When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌕ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.

When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌕ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Range selection

In range selection, you can make selections either on the x-axis or the y-axis, one at a time. Select a starting point along the axis, just outside the chart area, and drag to make a selection. As soon as you start dragging, a starting point line is displayed, as well as an end point line that shows the selection. You can adjust your selection by dragging the lines, the value boxes, or the green selection area. For an axis showing measure values, you are also able to click on the range bubble to enter a specific numeric value.

Label selection

You can click the dimension labels to make selections. When dimensions are grouped or stacked, the whole group or stack is selected.

Legend selection

There are two legend types: box legend, with one legend item per dimension value, and range legend, with a gradient scale, where all measure values are represented. In the box legend, you select and deselect the items one at a time by clicking them. In the range legend, you drag from a starting point to an end point to enclose an area. You cannot deselect an item, but you can change the range.

When you have a combo chart with one dimension and two measures (either grouped or stacked),selections cannot be made.

Filter pane

You can add a filter pane to control what data that is shown in the visualizations on a sheet. A filter pane can filter the data of several dimensions at once. For example, if you have a chart of sales over time, you can use a filter pane to limit the data in the chart to only show sales from a selected time period, from certain product categories, and from a certain region.

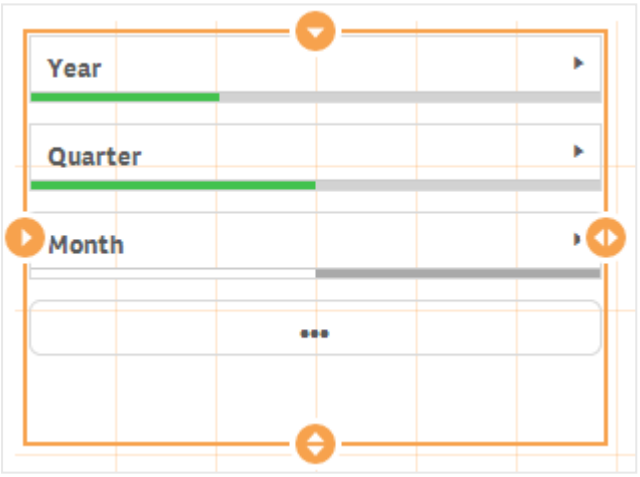
When a dimension is added, it is placed to the right of the previous dimensions, or below, depending on the available space. As long as there is space enough, the dimensions are displayed as expanded lists. If there is not enough space, the dimensions that were added first are turned into filter panes.

Responsive design

The filter pane has a responsive design and renders as many dimensions as possible. When space is limited, this could involve reducing the size of each dimension so that all dimensions are displayed.

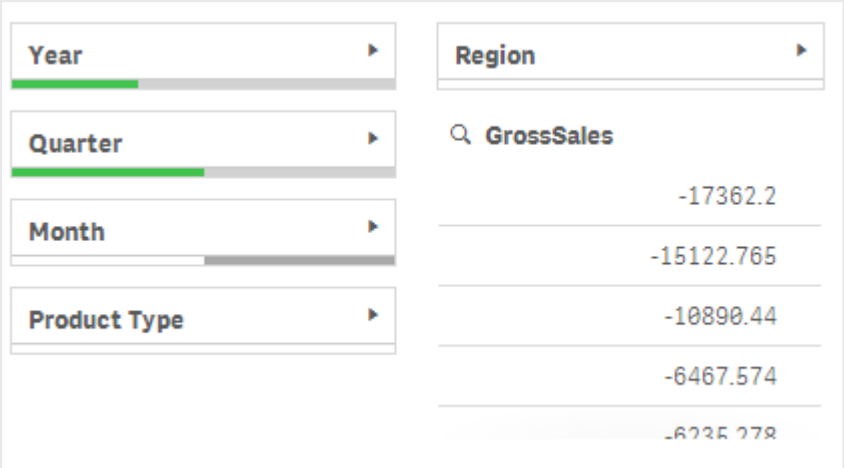
Example:

The following image shows a filter pane while it is being edited. Only three out of five dimensions are displayed. The other dimensions are replaced by a button with an ellipsis (...), indicating that there are more dimensions that are not displayed. You can click the button to open the filter pane in full screen view.



Five dimensions as displayed when editing the filter pane

When you have finished editing the filter pane and enter analysis mode, you will see the filter pane with all the dimensions displayed. If all items cannot be shown due to lack of space, the ellipsis box is displayed to indicate that there are more dimensions.



Five dimensions as displayed when analyzing data

Full screen view

In full screen view, the filter pane is maximized and displays as many dimensions as possible expanded. When not all dimensions can be displayed expanded, the priority order is that the most recently added dimensions are expanded to the right. You can change the priority order in the properties panel, under **Dimensions**. Drag the dimensions to change the order.

Full screen view on a touch device

Do the following:

1. Long-touch the visualization.
   The touch item menu is displayed.
2. Tap .

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

Full screen view on a computer (mouse interaction)

By default the full screen icon is hidden.

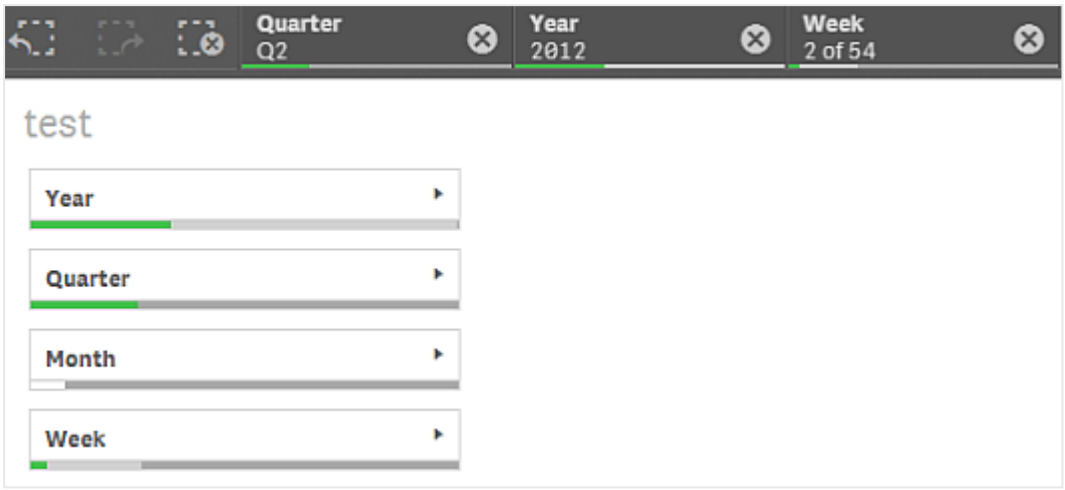
Do the following:

1. Hover over the visualization that you want to expand.
2. Click at the top right of the visualization.

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

When to use a filter pane



Selections have been made in the dimensions Year, Quarter, and Week

Description

The filter pane helps you control what data that is reflected in the visualizations on a sheet.

When to use it

With filter panes, you can easily make several selections to define your data set exactly like you want it. With your well-defined data set, you can explore data of particular interest.

By using the selection menu options in the filter panes (select possible, select alternative, and select excluded), you can make adjustments to the data set and compare the results with the previous selection.

Advantages

Filter panes are good for making selections and defining data sets. But they also show the relationship between different values, the associations. The green, white, and gray colors reflect the data associations that exist - and that do not exist. And by analyzing those associations, you can make new discoveries, for example, that a sales representative has too many customers, or that a region lacks a sales representative.

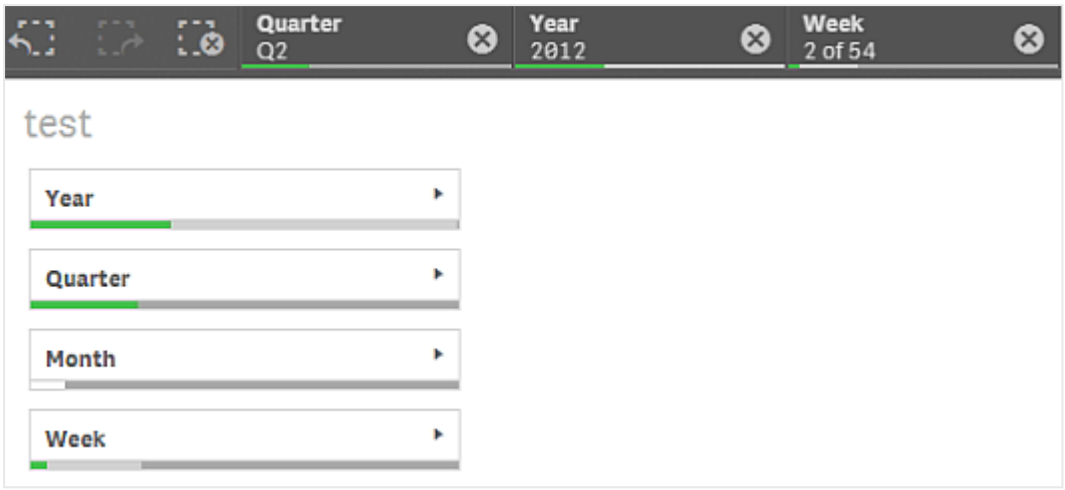
Disadvantages

When the dimensions contain a very large amount of values, it may be harder to manage the data.

Selections in filter panes

During analysis you click a compressed filter pane dimension to open a selection list.

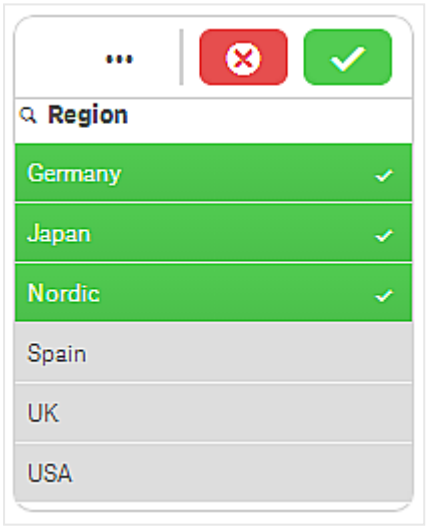
When you make a selection, it is reflected in the small bars at the bottom of each filter pane dimension. Four states can be displayed in the bars: selected (green), possible (white), alternative (light gray), and excluded (dark gray). Locked values are indicated by a lock icon. The details of the selections are displayed in the selections bar, above the sheet. You can click an item to see the details and change your selection.



Fields are filtered out from each dimension to be shown in the visualizations on the sheet.

Making selections in filter pane lists

When there is space enough in a filter pane, the dimension values are displayed in a list. In lists, you can click to select a single value or draw to select several values. On a touch device, you can two-finger-tap in the list to select a range of values.



Filter pane with expanded list

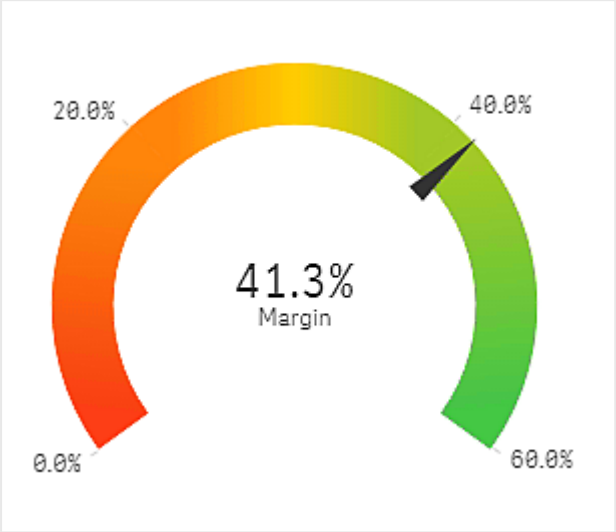
The selections tool

The selections tool offers an option to get an overview of the fields and dimensions in an app. In the selections tool you can make selections in all the fields and dimensions in the app, regardless of whether they are used in the app or not.

During analysis, the selections tool is available to the right in the selections bar. Click to open the selections tool.

Gauge

The gauge is designed to show a single measure value and visualize how to interpret that value.



Default settings for a gauge

The following settings are used by default in a gauge:

- A radial gauge.
- A single (blue) color.
- Range limits: min (0), max (100).
- No segments.
- Label and title are displayed.

You can change the radial gauge to a bar.

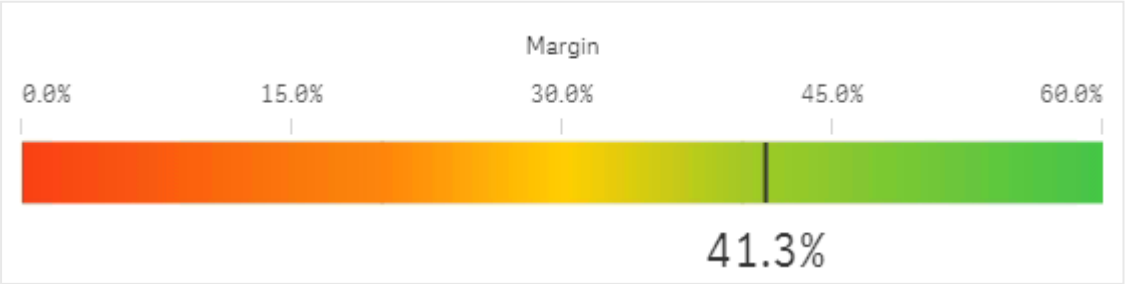
With segments, another color is introduced. You can set the color for each segment.

You can use expressions for the range limits. When a measure value is outside the range limits, an arrow indicates whether the measure value is higher or lower than the range values.

Number of dimensions and measures

In a gauge you can only have one measure and no dimensions.

When to use a gauge



Description

The gauge displays the value of a single measure.

When to use it

The gauge is often used to present KPIs, for example, on an executive dashboard, and together with segmenting and color coding, it is an effective way of illustrating a performance result.

It is important to set relevant max and min values to support the interpretation of the value. You can use a reference line to provide additional context.

Advantages

A gauge is easy to read and understand and gives an instant indication of the performance within an area.

Disadvantages

The gauge is quite space-demanding in relation to the single value it visualizes.

Although visually compelling, the gauge is not always the best choice for presenting a single measure value. Problems when deciding the max and min values can indicate that some other visualization should be used.

If you only want to show a performance value, without a gauge, consider using a KPI instead.

KPI

The KPI visualization can show one or two measure values, and is used to track performance.

A KPI visualization with two measure values, using conditional colors and symbols

Default settings for a KPI visualization

The following settings are used by default in a KPI visualization:

- Centered alignment.
- Black text color.
- Medium font size.
- No titles.
- Measure label displayed.
- Conditional colors and symbols are turned off.
- No link to sheet.

Conditional colors and symbols

When you use conditional colors for your KPI visualization, you have the option to use symbols to be displayed next to your measure value. Additionally, you can use the following options:

- Set range limits.
- Add limits to create subsections with different colors to indicate performance, for example, good (green), below expectations (yellow), or critical (red).
- Add symbols to the values.
- Use gradient coloring between color sections.

You can use expressions to set the limits. All these settings are done in the properties panel that is displayed on the right-hand side of the window when editing a sheet.

Measures and dimensions

In a KPI visualization, you can have one or two measures and no dimensions.

You can add a second measure value either by dragging it from **Fields** or **Master items** in the assets panel, or by clicking **Add measure** in the properties panel. With two measures, the second value automatically becomes a complementary value and is shown with a smaller font size. You can easily switch their order by dragging the measures in the properties panel under **Measures**.

Link to sheet

You can link from the KPI visualization to a sheet in the app. When making data analysis and clicking the visualization, you can click a second time to go to a predefined sheet. The sheet is opened in a new tab.

When hovering over ⓘ, the name of the sheet is displayed. The icon is only displayed when **Show title** is selected, under **Presentation**.

When to use a KPI

Description

Key performance indicators (KPIs) are used to evaluate the performance in a company or an organization. The KPIs show to what extent a number of goals have been reached. Different organizations have different goals, and it is important that the goals are well defined so that they are valid and reliable.

When to use it

Use KPIs to get an overview of performance values that are central to an organization. Use color coding and symbols to indicate how the figures relate to the expected results.

Advantages

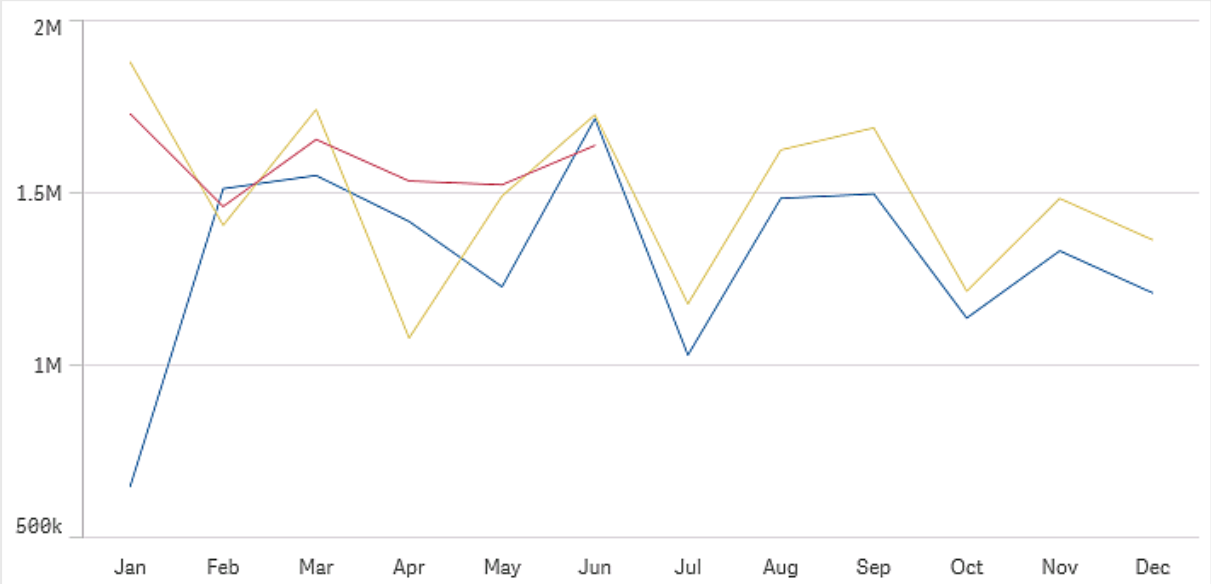
KPIs give a quick understanding of the performance within an area.

Disadvantages

The KPI is somewhat limited when it comes to graphical components. You can use symbols to help illustrate the performance, but if you want a more conspicuous component, consider using a gauge.

Line chart

The line chart is used to show trends over time. The dimension is always on the x-axis, and the measures are always on the y-axis. The orientation cannot be changed to vertical.



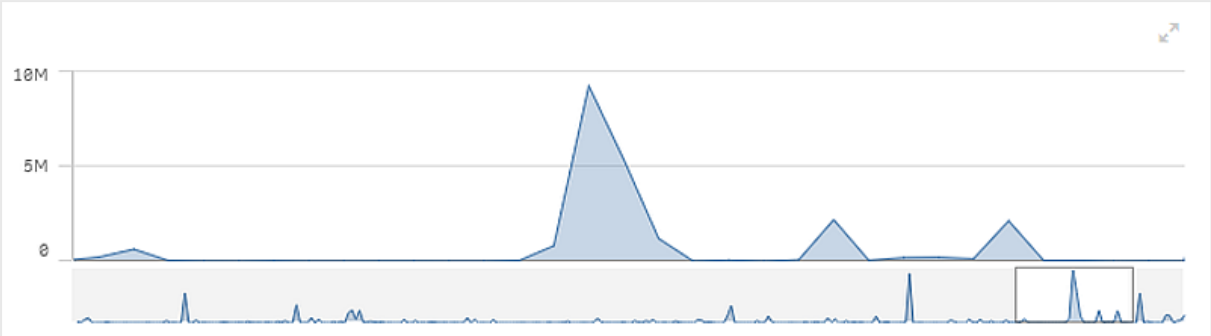
Number of measures and dimensions

In a line chart you need at least one dimension and one measure. The following table shows the maximum limits. When using more than three measures the chart may be difficult to interpret.

When using	Max limit
1 dimension	15 measures
2 dimensions	1 measure
1 measure	2 dimensions
2 -15 measures	1 dimension

Scrolling and mini chart

When the number of dimension values exceeds the width of the visualization, a mini chart with a scroll bar is displayed. You can scroll by using the scroll bar in the mini chart, or, depending on your device, by using the scroll wheel or by swiping with two fingers. When a large number of values are used, the mini chart no longer displays all the values. Instead, a condensed version of the mini chart (with the items in gray) displays an overview of the values, but the very low and the very high values are still visible.



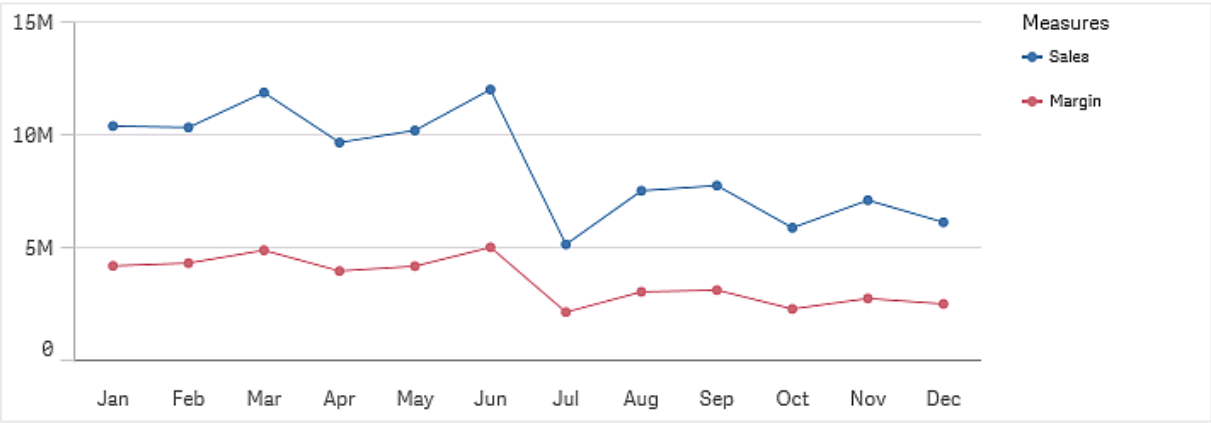
Line chart with mini chart

Out of range

In the properties panel, under **Appearance**, you can set a limit for the measure axis range. Without a limit, the range is automatically set to include the highest positive and lowest negative value, but if you set a limit you may have values that exceed that limit. When a data point value cannot be displayed, due to the range limits, an arrow indicates the direction of the value.

When a reference line is out of range, an arrow is displayed together with the number of reference lines that are out of range.

When to use a line chart



Line chart that shows trends for the measures sales and margin on a monthly basis

Description

You can include one dimension and several measures in a line chart.

Data can be presented in different ways in a line chart: as lines, as an area, or as a stacked area, when you have more than one measure.

When to use it

The line chart is primarily suitable when you want to visualize trends and movements over time, where the dimension values are evenly spaced, such as months, quarters, or fiscal years.

Your data set must consist of at least two data points to draw a line. A data set with a single value is displayed as a point.

If, you have a data set where data is missing for a certain month, you have the following options for showing the missing values:

- As gaps
- As connections
- As zeros

When a month is not present at all in the data source, it is also excluded from the presentation.

Advantages

The line chart is easy to understand and gives an instant perception of trends.

Disadvantages

Using more than a few lines in a line chart makes the line chart cluttered and hard to interpret. For this reason, avoid using more than two or three measures.

Selections in line charts

When you analyze your data, you have different ways of making selections. In a line chart you can either use range selection, lasso selection, draw selection, click selection, legend selection, label selection, or indirect selection. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Range selection

In range selection, you can make selections either on the x-axis or the y-axis, one at a time. Select a starting point along the axis, just outside the chart area, and drag to make a selection. As soon as you start dragging, a starting point line is displayed, as well as an end point line that shows the selection. You can adjust your selection by dragging the lines, the value boxes, or the green selection area. For an axis showing measure values, you are also able to click on the range bubble to enter a specific numeric value.

Range selection on the y-axis is not supported for visualizations with two dimensions.

Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌾ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Draw selection

In draw selection, you can make a selection by drawing one or more lines in the chart. All data points that are touched by a line are selected. To deselect a data point, click it. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌾ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Click selection

In click selection, you can make a selection by clicking the data points, one at a time. To deselect a data point, click it.

Legend selection

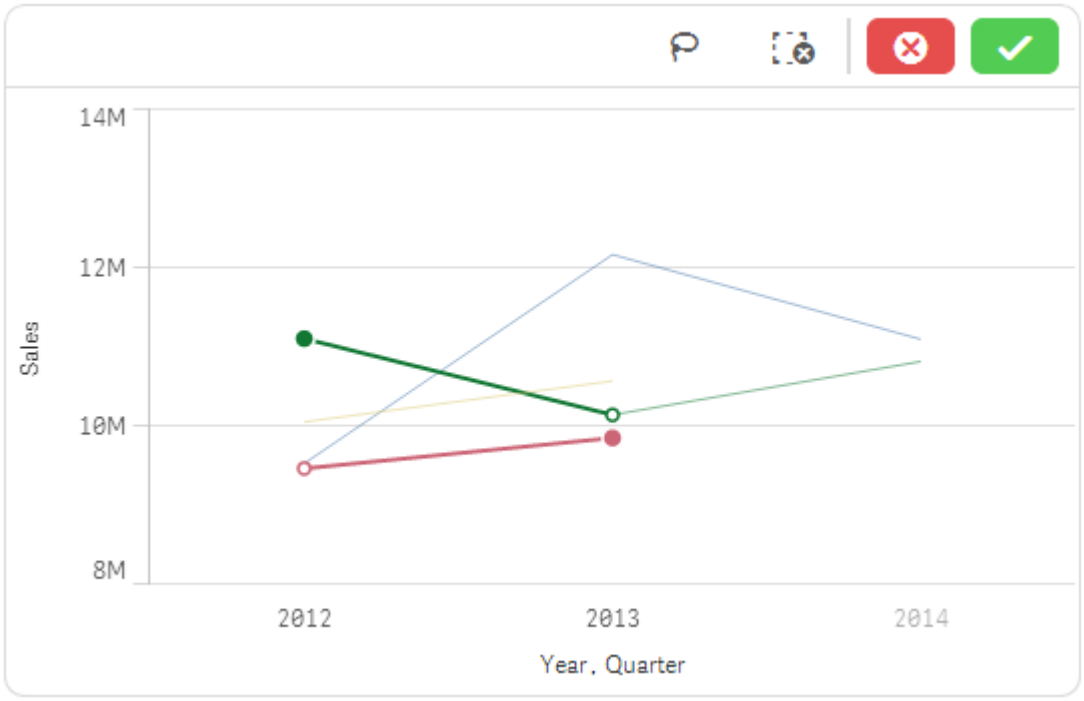
In the box legend, you select and deselect the items one at a time by clicking them.

Label selection

You can click the dimension labels to make selections. When dimensions are grouped or stacked, the whole group or stack is selected.

Indirect selection

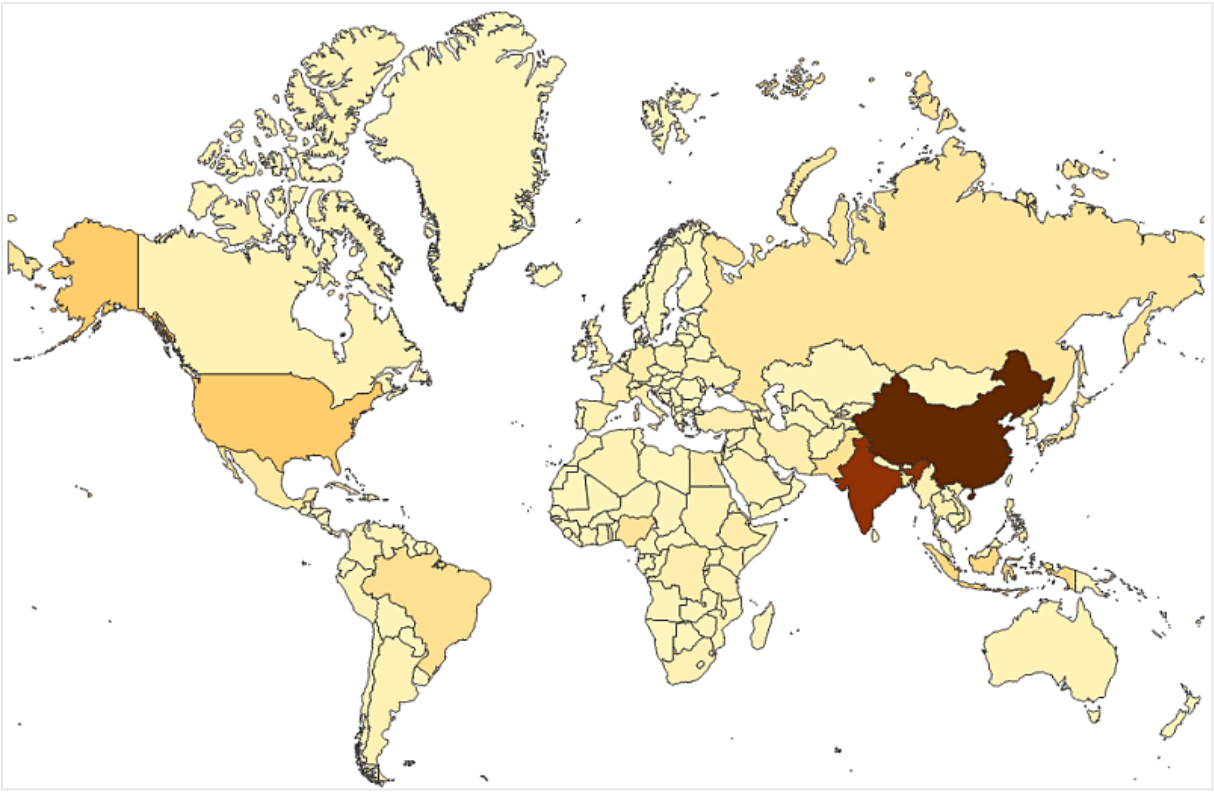
When you have a line chart with two dimensions and make a selection of two measure values for two different dimension values, as illustrated in the image, Qlik Sense makes indirect selections of the corresponding dimension values, so that the selection becomes the same as you would achieve when using range selection for the area. The data values selected by Qlik Sense are unfilled.



Indirect selection of the values that are unfilled

Map

Maps can be used for a wide variety of purposes. A common use in business intelligence is to plot sales data per region or per store.



You can create a map by using either a point layer or an area layer. A point layer map is typically used to mark places of interest, such as airports or office locations, using longitude and latitude coordinates, while an area map can be used to display geographical areas, such as countries. If you use a point layer, you also need a background map to provide the context for the points, otherwise you will only have a collection of points on an empty background. By default, a Mapbox background map is added to a point layer. If you want to, you can use a map from a different provider.

You can add a measure value or an expression to the dimension values, and use the size of the points or color by measure to reflect the size of the measure. If you use an area layer, you often do not need a background map, but there is support for complementing an area layer with a background.

The background map is of the type “slippy map” in which you can zoom, pan around, and make selections.

- http://wiki.openstreetmap.org/wiki/Slippy_Map

Number of dimensions and measures

You can only use a single dimension type: point or area. You can create an expression in the dimension. If you add a measure from the master items to the map, the measure is added in the expression box under **Data** > **Layers** > **<layer type>** in the properties panel.

Zooming and panning

A map has options for zooming and panning, which work differently depending on the type of device you are using. The interaction differs depending on what device you are using.

When you re-size your browser window, the map scales accordingly.

Touch device interaction

On a touch device, you pinch apart to zoom and swipe to pan.

You can reset the zoom by tapping , which appears in the top-right corner when you start zooming.

Computer (mouse) interaction

With a computer, you use the mouse to zoom and pan in the visualization. Use the scroll wheel to zoom in and out. You pan by dragging.

You can also use the navigation tool for zooming and panning. Right-click in the map and select **Navigation** to open the tool.

You reset the zoom by clicking the scroll wheel or by clicking in the navigation tool.

When to use a map

Description

You can use an area layer or a point layer when you create a map. Each point or sub-area corresponds to a dimension value.

When to use it

You can use a map to show the geographical distribution of offices, stores, and other sites of business interest. You can visualize not only locations but also sales values and other measures and display the value differences by bubble size or color.

With a point layer

In a simple implementation of a map with a point layer, all bubbles look the same. But by using an expression or a measure, you can let the bubble size reflect the value. In the properties panel, add an expression to the point layer, or drag a measure from **Master items** in the assets panel to the visualization.

You can also use coloring by measure or by expression to show differences in values.

With an area layer

With an area layer, each subarea is a dimension value. By using colors, you can differentiate between measure values. In the properties panel, under **Appearance** > **Colors and legend**, switch **Colors** to **Custom** where the options **By measure**and **By expression** are available.

Advantages

The map is a versatile visualization that efficiently presents the geographical distribution of key values related to location or area.

Disadvantages

With a large number of values, it may be hard to get a good overview. Values may be placed on top of each other and not visible until zoomed in.

Selections in maps

When you analyze your data, you have different ways of making selections. In a map, you can either use lasso selection, draw selection, click selection, or legend selection. To confirm a selection, click ✓ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.

When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌕ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Draw selection

In draw selection, you can make a selection by drawing one or more lines in the visualization. All data points that are touched by a line are selected, and all other data points are dimmed. To deselect a data point, click it. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌕ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Click selection

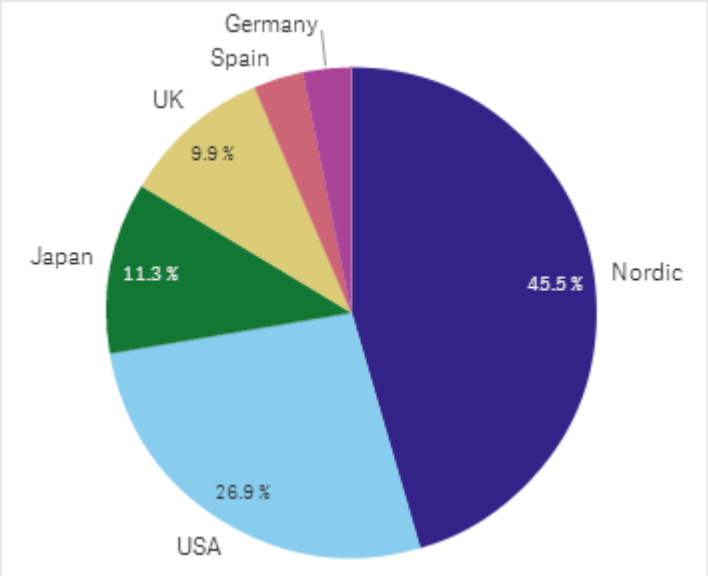
In click selection, you can make a selection by clicking data points, one at a time. To deselect a data point, click it.

Legend selection

You can make selections in the legend. There are two legend types: box legend, with one legend item per dimension value, and range legend, with a gradient scale, where all measure values are represented. In the box legend, you select and deselect the items one at a time by clicking them. In the range legend, you drag from a starting point to an end point to enclose an area. You cannot deselect an item, but you can change the range.

Pie chart

The pie chart displays the relation between values as well as the relation of a single value to the total. You can use a pie chart when you have a single data series with only positive values.



Sales per region in a pie chart

Default settings for a pie chart

The following settings are used by default in a pie chart:

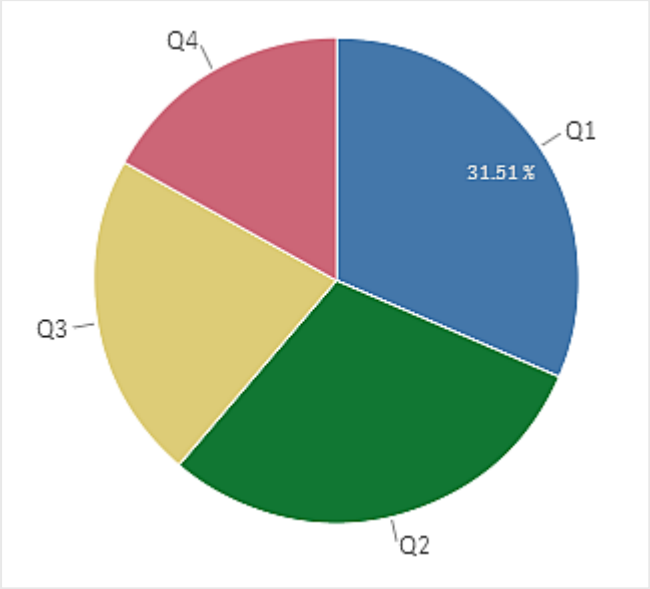
- The top 10 sectors are presented in descending size order, clockwise.
- Colors are presented by dimension.
- Value labels are presented in percent.

All these settings can be changed in the properties panel.

Number of dimensions and measures

A pie chart is built from one dimension and one measure only.

When to use a pie chart



Description

In the pie chart, the dimensions form sectors of the measure value.

You can include one measure and one dimension in a pie chart.

When to use it

The primary use of a pie chart is to compare a certain sector to the total. The pie chart is particularly useful when there are only two sectors, for example yes/no or queued/finished.

Advantages

The pie chart provides an instant understanding of proportions when few sectors are used as dimensions. When you use 10 sectors, or less, the pie chart keeps its visual efficiency.

Disadvantages

It is often hard to compare the results of two pie charts with each other, and therefore you should not do it.

It may be difficult to compare different sectors of a pie chart, especially a chart with many sectors.

The pie chart takes up a lot of space in relation to the values it visualizes.

Selections in pie charts

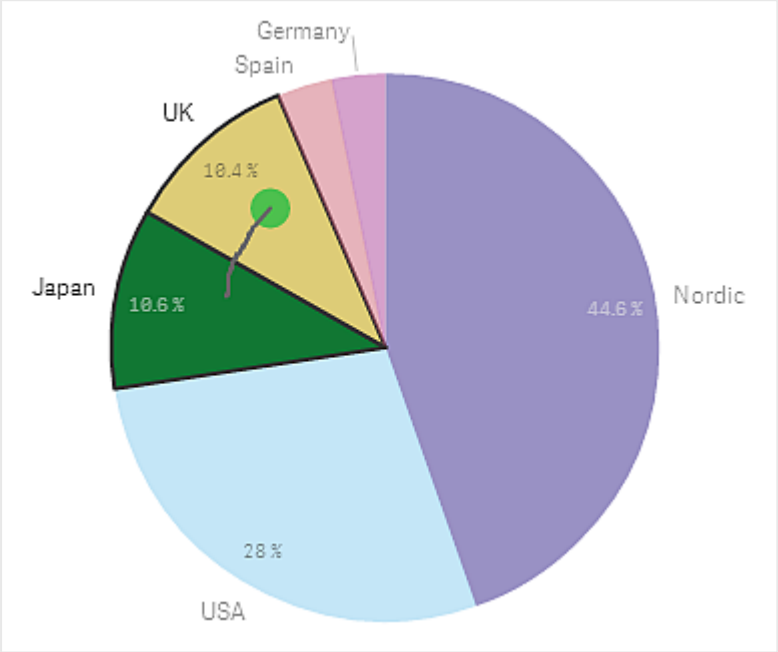
When you analyze your data, you have different ways of making selections. In a pie chart you can either use click selection, draw selection, legend selection, lasso selection, or label selection. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Click selection

In click selection you can make a selection by clicking sectors, one at a time. To deselect a sector, click it.

Draw selection

In draw selection you can make a selection by drawing one or more lines in the chart. All sectors that are touched by a line are selected, all other sectors are dimmed. To deselect a sector, click it. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking at the top of the visualization. On a computer, you can also press Shift and make the selection.



Legend selection

There are two legend types: box legend, with one legend item per dimension value, and range legend, with a gradient scale, where all measure values are represented. In the box legend, you select and deselect the items one at a time by clicking them. In the range legend, you drag from a starting point to an end point to enclose an area. You cannot deselect an item, but you can change the range.

Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking at the top of the visualization. On a computer, you can also press Shift and make the selection.

Label selection

You can click the dimension labels to make selections.

Pivot table

The pivot table presents dimensions and measures as rows and columns in a table. In a pivot table you can analyze data by multiple measures and in multiple dimensions at the same time. You can rearrange the measures and dimensions to get different views of the data. The activity of moving measures and dimensions interchangeably between rows and columns is known as “pivoting”.

Example:

The efficiency of a pivot table can be illustrated by comparing a regular table with a pivot table that has the same data. In the following table, you have three dimensions: Customer, Product Group, and Item, and two measures: Quantity and Sales. The table shows the sales of some food products. If you want to rearrange the data to simplify analysis, the options are somewhat limited. You can change the order of the columns, but that does not improve the overview. You can also set the sorting order, either in the sorting section in the properties panel, or by clicking the dimension columns. However, the problem persists. The customers, product groups, and items are all presented more than once, and it is not possible to get a good summary of the data.

Customer	Product Group	Item	Quantity	Sales
Totals			**1,818,294**	**$104,852,674.81**
A-2-Z Solutions	Alcoholic Beverages	Good Light Wine	2	$337.58
A-2-Z Solutions	Alcoholic Beverages	Pearl Chardonnay	8	$513.89
A-2-Z Solutions	Alcoholic Beverages	Pearl Light Beer	1	$60.10
A-2-Z Solutions	Alcoholic Beverages	Walrus Light Wine	7	$34.69
A-2-Z Solutions	Baked Goods	Colony Pumpernickel Bread	2	$9.54
A-2-Z Solutions	Baked Goods	Colony Wheat Bread	1	$74.73
A-2-Z Solutions	Baked Goods	Great Blueberry Muffins	3	$149.02
A-2-Z Solutions	Baking Goods	BBB Best Apple Butter	6	$211.35
A-2-Z Solutions	Baking Goods	BBB Best Apple Preserves	2	$276.20
A-2-Z Solutions	Baking Goods	BBB Best Extra Chunky Peanut Butter	1	$617.40
A-2-Z Solutions	Baking Goods	BBB Best Grape Jam	1	$33.75
A-2-Z Solutions	Baking Goods	BBB Best Pepper	4	$328.97

Here is the same data in a pivot table.

Customer / Product Group / Item	Measures: Quantity	Measures: Sales
Totals	1,818,294	$105,134,346.96
⊕ A-2-Z Solutions	1,418	$196,298.49
⊕ A-ARVIN Laser Resources	25	$4,053.05
⊕ A Superior System	868	$103,728.12
⊕ A&B	891	$92,120.60
⊕ A&G	133	$12,502.61
⊕ A&R Partners	156	$30,392.45
⊕ A1 Datacom Supply	5,830	$259,599.52
⊕ a2i	14	$451.64
⊕ A2Z Solutions	454	$69,977.36
⊕ AA-Wizard	917	$94,209.44
⊕ Aadast	881	$351,243.31
⊕ Aaron D. Meyer & Associates	1,869	$90,017.11
⊕ Aaron Products	25	$4,901.96
⊕ Abacus Niagara	263	$48,161.07

As you can see, the pivot table presents the data in a much more condensed way, which simplifies analysis and comparison. Compared to the regular table, the number or rows has been halved in the pivot table and the number of columns is three instead of five.

One of the advantages of a pivot table is the interchangeability, that is, the ability to move row items to columns and column items to rows. This flexibility is very powerful and enables you to rearrange the data and have several different views of the same data set. Depending on what you want to focus on, you move the dimensions and measures to bring forward data of interest and hide data that is either too detailed, or irrelevant for the analysis.

The pivot table shows the dimensions *Customer*, *Product Group*, and *Item*, and the measures *Quantity* and *Sales*. In this view, you have a summary of quantity and sales for each customer. If you want to know which items and product groups that the customers bought, you need to expand the customer fields by clicking ⊕. A ⊕ icon indicates that a field can be further expanded and present more details, while a ⊖ icon indicates that the field can be collapsed, to reduce the number of fields and details.

Pivoting

When you want to rearrange your data to get a new view, you drag the items to the new place, either to a column or a row. In the following pivot table, the dimension *Customer* has been dragged to the position after *Product Group* and the dimension *Item* to the position before *Product Group*. As a consequence, the dimensions are now sorted by *Item*, primarily. Focus has shifted from *Customer* to *Item*. By expanding the dimensions you can find out the quantities and sales for each customer, but there is another way to achieve that goal.

Item / Product Group / Customer	Measures: Quantity	Measures: Sales
American Beef Bologna	166	$4,346.12
American Chicken Hot Dogs	173	$15,115.88
American Cole Slaw	156	$3,979.37
American Corned Beef	1,771	$211,676.74
American Foot-Long Hot Dogs	52	$2,267.24

By moving the dimension *Customer* from rows to columns, you retain focus on the dimension *Item*, but you also get the distribution of items per customer. The move has made the pivot table more information dense.

Item / Product Group	Totals: Quantity	Totals: Sales	A-2-Z Solutions: Quantity	A-2-Z Solutions: Sales	A-ARVIN Laser Resources: Quantity	A-ARVIN Laser Resources: Sales
Even Better Large Curd Cottage Cheese	195	$6,450.72	-	-	-	-
Even Better Low Fat Cottage Cheese	161	$18,115.97	2	$240.82	-	-
Even Better Low Fat Sour Cream	38	$3,435.48	-	-	-	-
Even Better Low Fat String Cheese	208	$48,298.08	-	-	3	$20.22
Even Better Mild Cheddar Cheese	145	$59,564.85	2	$1,105.01	4	$2,560.05
Even Better Muenster Cheese	21	$16,589.88	-	-	-	-
Even Better Sharp Cheddar Cheese	6,079	$431,143.00	-	-	1	$640.01
Even Better Sour Cream	19	$472.97	-	-	-	-

Measure grouping

As you may have noticed, *Quantity* and *Sales* are not presented as separate measures in the top column row. Next to the dimension *Customer*, you find an item called *Measures*. When you use more than one measure, the measures are automatically grouped together forming a measure group, *Measures*, which as a whole can be added to the rows section or the columns section. The measure group is not editable in the table. You cannot split the measure item and use one measure as a row and another as a column, nor can you change the order in which the measures are presented. Changes to the *Measures* item are made in the properties panel.

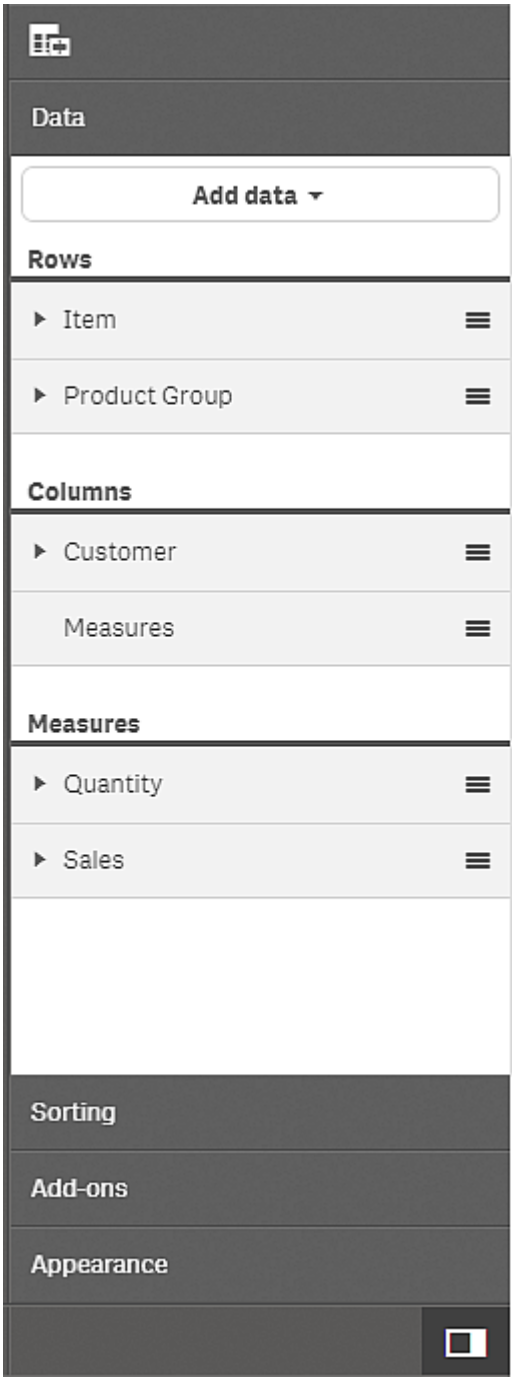
Different ways of pivoting

Essentially, pivoting involves dragging the dimensions and measures from rows to columns and columns to rows, but you have two options for performing the pivoting.

- In the pivot table (both when editing and when analyzing).
- In the properties panel (only when editing).

Pivoting using the properties panel

In the properties panel, you can add measures and dimensions to the pivot table, and also move the dimensions and measures to rows or columns. When you use more than one measure, the measures are grouped and a *Measures* item is created. You can change the internal order of the dimensions and measures, but when you have more than one measure, it is always the whole measure group that you move.



When to use a pivot table

Description

The pivot table presents dimensions and measures as rows and columns of a table. The pivot table allows you to analyze data by multiple measures and in multiple dimensions at the same time. The data in a pivot table may be grouped based on a combination of the dimensions. You can pivot by dragging and dropping dimensions in the table.

When to use it

The pivot table is particularly useful when you want to include several dimensions or measures in a single table, and then want to reorganize them to see different subtotals.

Advantages

The pivot table is very powerful when you want to analyze multiple dimensions and measures at once, and then reorganize them to get a different perspective on your data. Another advantage is that you can expand the rows you are interested in while keeping the rows in the rest of the table collapsed.

Disadvantages

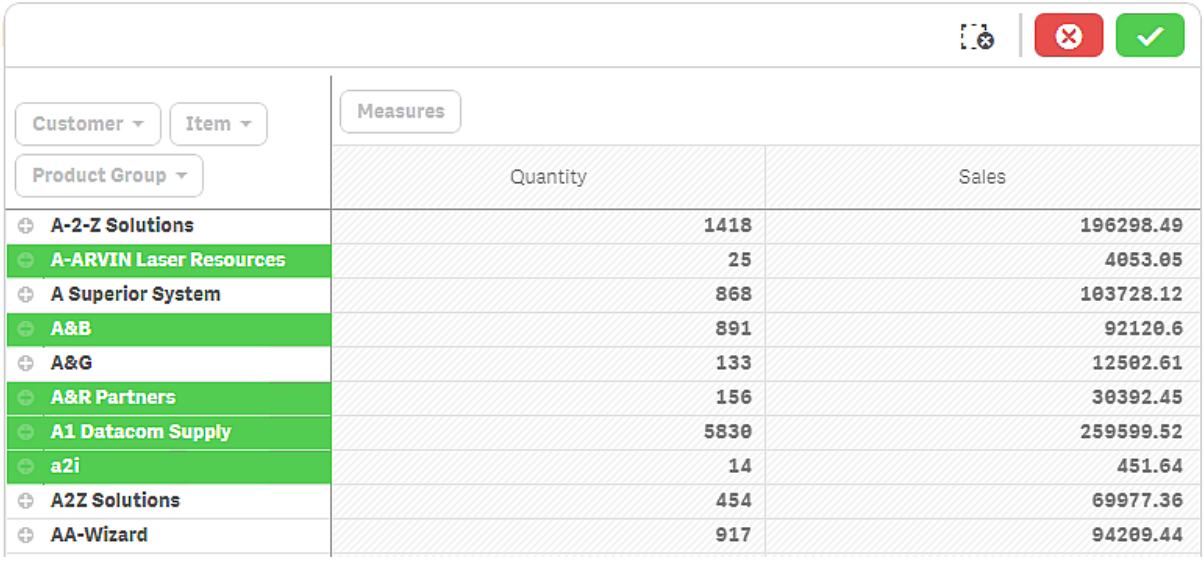
The pivot table may seem a bit complicated, and does not give insights at a glance.

Selections in pivot tables

In a pivot table, you can make selections either by clicking on dimensions in the table, or by making a selection in the list that appears when you click a dimension item.

You cannot make selections in measures.

Selecting dimension fields in the table



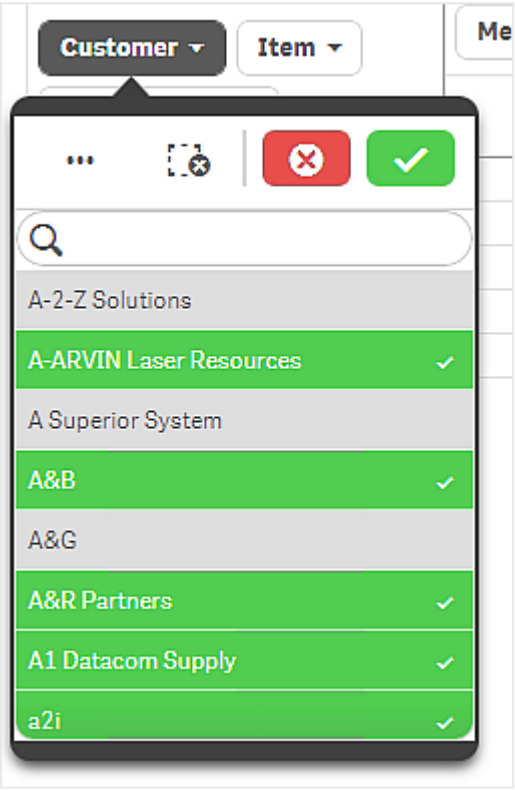
Pivot table with selected dimension fields in green

You can make selections in a pivot table by clicking or drawing in the dimension fields. Measure values cannot be selected. When you make a selection, it is always the dimension values that you select. You can only make selections for one dimension at a time.

To deselect a row, click it. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc. If you confirm, the selection is reflected in all visualizations associated with the pivot table.

You cannot select dimension values that are NULL. Null values in a table are presented as dashes (-).

Selecting dimension list items



Dimension list during selection

The list displays the values from the chosen dimension. You can select fields by clicking or by drawing. All selected fields are marked green. To deselect a field, click it. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc. If you confirm, the selection is reflected in all objects related to the pivot table.

You cannot select dimension values that are null. Null values in a pivot table are presented as dashes (-). Rows without valid dimension values will not be included in the selection.

Global grouping

With global grouping you use a limited data set, and in that data set, you single out values that you want to focus on, for example, the best quarters, the top sales persons, or the worst selling products.

You can regard global grouping as a two-step procedure. First you apply a limitation to a data set, and then, in the resulting list, you apply the same limitation again to the inner dimension (that is, the dimension that is second in the sorting hierarchy), to only show results for the singled out inner dimension values.

Example:

In the following pivot table, no limitation is applied. The values are sorted on *Sales*, descending. The list is long, the values for 2013 are not shown.

Year / Sales Rep Name	sum(Sales)
2014	**$41,006,958.72**
Judy Thurman	$6,037,992.86
Stewart Wind	$4,717,671.77
Lee Chin	$3,535,768.74
Cheryle Sincock	$1,791,498.68
Brenda Gibson	$1,750,292.96
John Greg	$1,443,128.30
Martha Richard	$1,388,402.75
Amalia Craig	$1,200,853.57
David Laychak	$1,170,791.14
Karl Anderson	$957,467.35
Max Blagburn	$940,446.81
David Howard	$850,575.53
Angelen Carter	$810,618.88
Amanda Honda	$704,245.66
Amelia Fields	$635,124.63
Donna Brown	$603,055.39
Peggie Hurt	$525,843.84
Craig Amundson	$495,495.93
Micheal Williams	$469,046.29

In the following pivot table, a limitation has been applied to the (inner) dimension *Sales Rep Name*, so that only the top five sales representatives for the years 2013 and 2014 are shown.

Year / Sales Rep Name	Sum(Sales)
2014	**$41,006,959.00**
Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
Cheryle Sincock	$1,791,499.00
Brenda Gibson	$1,750,293.00
2013	**$38,657,267.00**
Stewart Wind	$5,669,097.00
Judy Thurman	$4,951,304.00
Lee Chin	$3,685,579.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,353,069.00

The next step is to select global grouping in the properties panel. The option **Global grouping** is only available when you have applied a limitation on the dimension.

When global grouping is selected, the limitation of the top five sales representatives is applied again, but this time regardless of the dimension *Year*. The five sales representatives with the highest sales (either in 2013 or 2014) are the only ones that will be presented in the final pivot table. The following image shows the six highest results for 2014 and 2013. The top four results are from 2014, but the fifth (John Greg) is from 2013. Because five other sales representatives have higher sales than *Brenda Gibson* (who was number five in 2014), she is knocked out of the list.

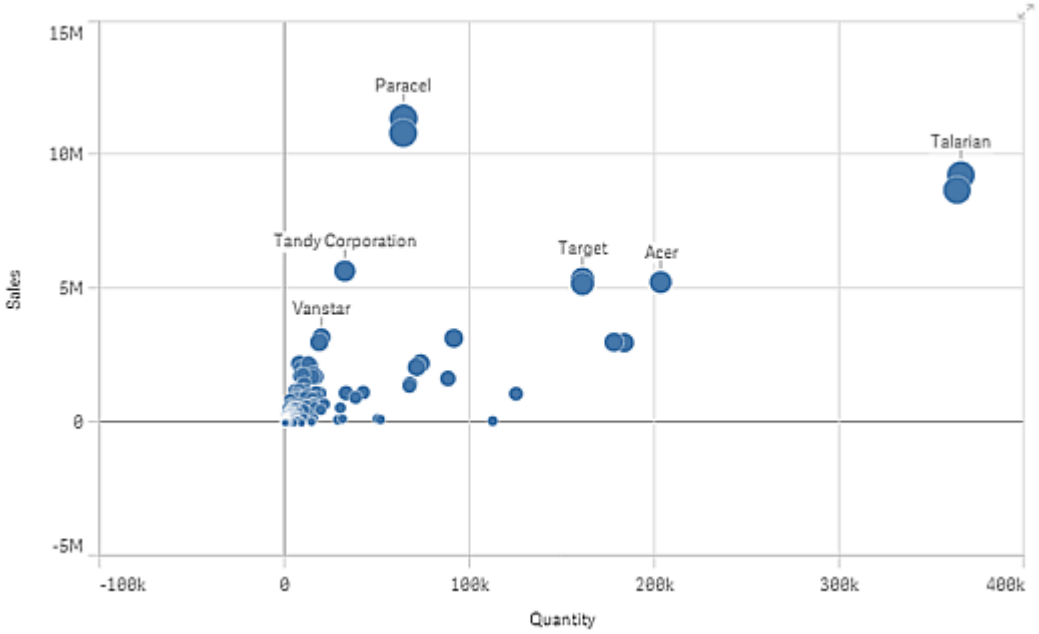
Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,791,499.00
Brenda Gibson	$1,750,293.00

The following image shows the pivot table with global grouping applied. The pivot table only contains the sales results for the top five sales representatives. Even though *Brenda Gibson* had a better result in 2014 than John Greg, his result for 2013 qualified him for the top five list.

Year / Sales Rep Name	Sum(Sales)
2014	**$41,006,959.00**
Judy Thurman	$6,037,993.00
Stewart Wind	$4,717,672.00
Lee Chin	$3,535,769.00
John Greg	$1,443,128.00
Cheryle Sincock	$1,791,499.00
2013	**$38,657,267.00**
Judy Thurman	$4,951,304.00
Stewart Wind	$5,669,097.00
Lee Chin	$3,685,579.00
John Greg	$2,104,622.00
Cheryle Sincock	$1,353,069.00

Scatter plot

The scatter plot presents pairs of values from two or three measures. This is useful when you want to show data where each instance has two numbers, for example, the relationship between Sales and Quantity per Customer. In the scatter plot below, a third measure (Cost) is used to generate the bubble size.



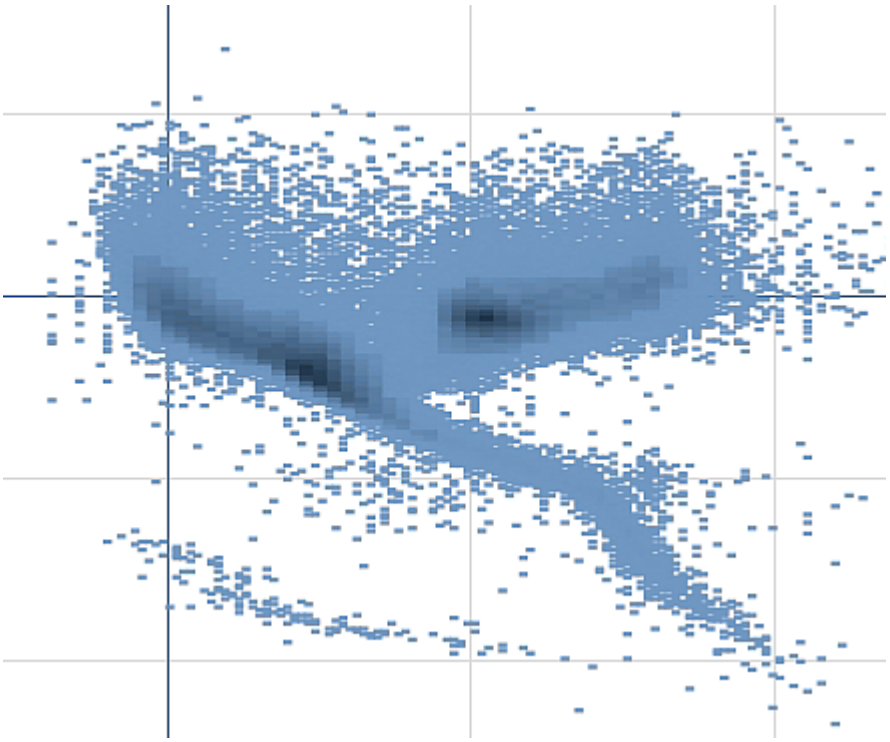
Example of a scatter plot

Number of dimensions and measures

In a scatter plot you need one dimension and at least two measures. You can have maximum one dimension and three measures, where the third measure is visualized as colors or bubble size.

Large data sets in scatter plots

If you have a scatter plot with large amounts of data (more than 1000 data points) Qlik Sense uses an algorithm to create an overview of the data, as shown in the scatter plot below. However, if you zoom or make selections so that the number of displayed data points is reduced to less than 1000 data points, the data will be shown as individual bubbles. This switch between compressed view and bubble view is done automatically. The density of the data points is reflected by color.

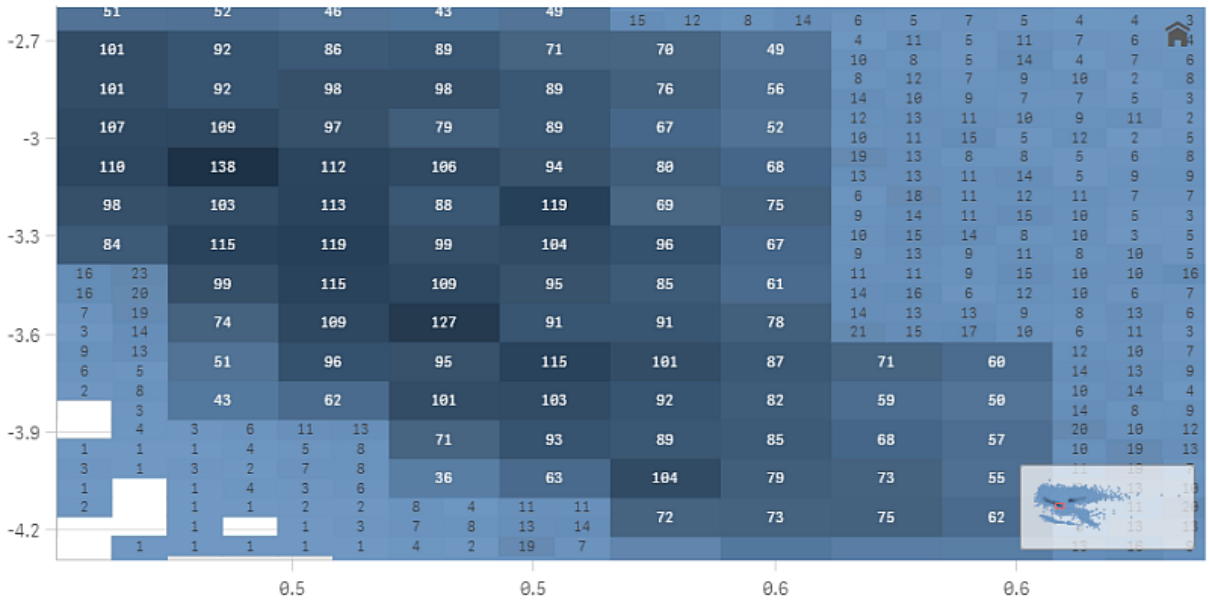


Example of a scatter plot with compressed data

Zooming and panning

In a scatter plot, you can zoom and pan around in your data. The interaction differs depending on what device you are using. If you are zooming in you can see where in the data set you are located by looking at the mini chart in the bottom right corner. If you zoom in on large data sets you will be able to see the data shown as boxes with values inside. The values represent the number of points in each box. If you zoom in so that there are <1000 data points, you will instead see the data points represented by bubbles.

You can change the compression resolution in the visual exploration menu or in the properties panel.



Example of a scatter plot with compressed data

Touch device interaction

On a touch device you pinch to zoom and swipe to pan. Points that are outside the visible range are visualized as small dots along the axis lines or shown as being outside the selected area in a mini chart.

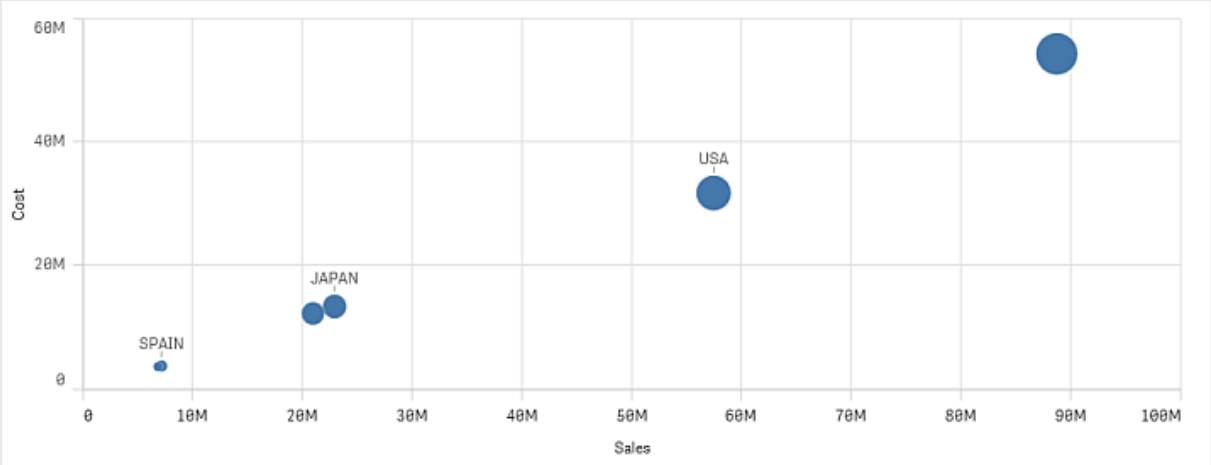
With a three-finger tap you reset the zoom. You can also reset the zoom by tapping , which appears in the top right corner when you start zooming.

Computer (mouse) interaction

With a computer you use the mouse to zoom and pan in the visualization. Use the scroll wheel to zoom in and out. The zooming is made on the area where the pointer is. Points that are outside the visible range are visualized as small dots along the axis lines.

You reset the zoom by clicking the scroll wheel or by clicking , which appears in the top right corner when you start zooming. You pan around in the chart by dragging. You also have the option of using the navigation tool that is available in the visual exploration menu. Right-click in the scatter plot and select **Open exploration menu**. Under **Presentation** you can turn on **Navigation** to open the tool.

When to use a scatter plot



Scatter plot showing cost and sales per region. The third measure (generating the bubble size) is gross sales.

Description

The scatter plot presents values from different measures over one dimension as a collection of points. In most charts, you find your dimension on one of the axes, but for a scatter plot, the dimension is represented by the points in the chart, and the measures are found on each of the two axes. When a third, optional, measure is used, its value is reflected in the bubble size. If you are analyzing large data sets and view compressed data, the density of the data points is reflected by color.

When to use it

The scatter plot helps you find potential relationships between values, and to find outliers in data sets. The scatter plot is useful when you want to show data where each instance has at least two metrics, for example, average life expectancy and average gross domestic product per capita in different countries.

Advantages

The scatter plot is a great way to visualize the correlation of two or more measures at the same time. The third measure is an efficient way of differentiating between values and simplifying the identification of, for example, large countries, large customers, large quantities, and so on.

Disadvantages

The scatter plot may be difficult to understand for an inexperienced user, because it has measure value on both axes, and the third, optional, measure adds complexity to the interpretation. Make sure a novice can interpret the scatter plot correctly. Using descriptive labels is a good way to make the visualization easier to interpret.

Values may be placed on top of each other and are then not visible until you zoom in.

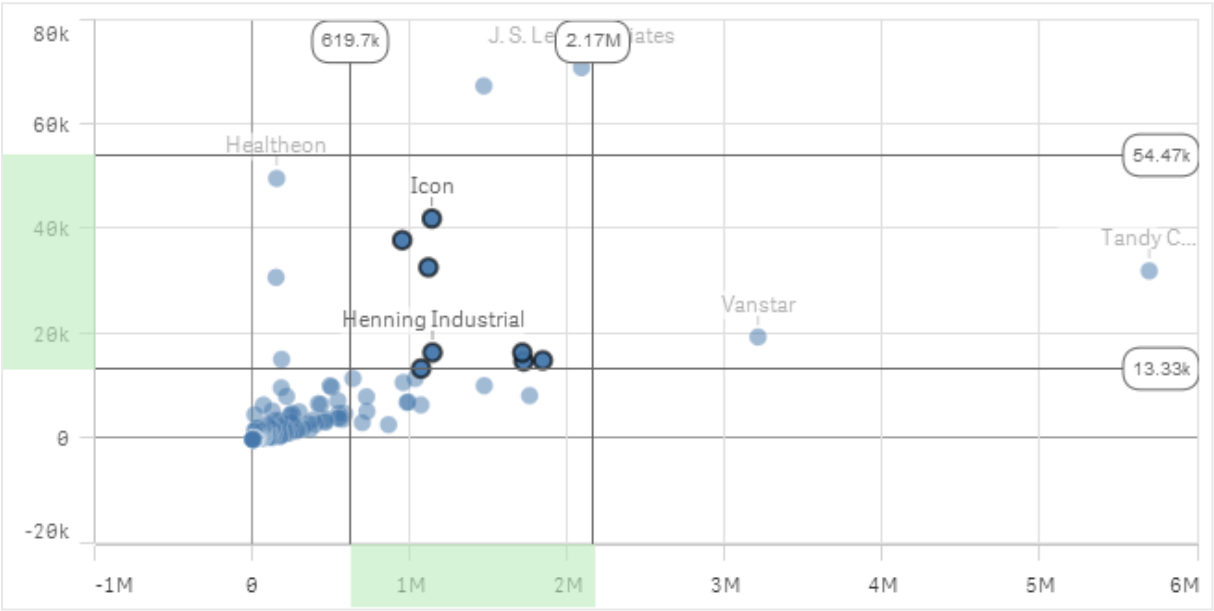
Selections in scatter plots

When you analyze your data, you have different ways of making selections. In a scatter plot you can either use lasso selection, range selection, draw selection, click selection, or label selection.

When you are analyzing large data sets and see the compressed data view, you can only select data using range selections.

To confirm a selection, click ✓ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Range selection



In range selection, you can make selections on the x-axis or the y-axis, or both together. Select a starting point along the axis, just outside the chart area, and drag to make a selection. As soon as you start dragging, a starting point line is displayed as well as an end point line that shows the selection. You can adjust your selection by dragging the lines, the value boxes, or the green selection area.

For an axis showing measure values, you are also able to click on the range bubble to enter a specific numeric value.

Lasso selection

In lasso selection, you can draw a freehand shape to enclose an area. You must close the area by returning to the starting point of your selection.When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌾ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Draw selection

In draw selection, you can make a selection by drawing one or more lines in the chart. All data points that are touched by a line are selected, and all other data points are dimmed. To deselect a data point, click it. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking ⌾ at the top of the visualization. On a computer, you can also press Shift and make the selection.

Click selection

In click selection, you can make a selection by clicking data points, one at a time. To deselect a data point, click it.

Legend selection

There are two legend types: box legend, with one legend item per dimension value, and range legend, with a gradient scale, where all measure values are represented. In the box legend, you select and deselect the items one at a time by clicking them. In the range legend, you drag from a starting point to an end point to enclose an area. You cannot deselect an item, but you can change the range.

Table

The table shows several fields simultaneously, where the content of each row is logically connected. Typically, a table consists of one dimension and several measures.

Customer	Sales	Quantity	Margin (%)	# of Invoices	Average Sales per Invoice
Totals	**$104,852,674.81**	**1,816,372**	**4127.8%**	**38,314**	**$2,736.67**
A-2-Z Solutions	$196,298.49	1,418	3841.7%	58	$3,384.46
A-ARVIN Laser Resources	$4,053.05	25	3792.6%	13	$311.77
A Superior System	$103,728.12	868	4074.5%	167	$621.13
A&B	$92,120.60	891	4202.9%	18	$5,117.81
A&G	$12,502.61	133	4708.0%	12	$1,041.88
A&R Partners	$30,392.45	156	3409.9%	6	$5,065.41
A1 Datacom Supply	$259,599.52	5,830	4025.7%	111	$2,338.73
a2i	$451.64	14	5983.7%	9	$50.18
A2Z Solutions	$69,977.36	454	4121.1%	94	$744.44
AA-Wizard	$94,209.44	917	4660.6%	41	$2,297.79

You can use a table when you want to view precise values rather than visualizations of values, and when you want to compare individual values. A table is particularly useful when drill-down groups are used as a dimension.

You only make selections in the dimension columns. All dimension columns have a search icon ( ) in the header.

Number of rows and columns

In a table, you can have millions of rows and virtually any number of columns with dimensions and measures. But because huge tables are impractical and hard to manage, the limit for what is practical is far less than the theoretical maximum. In most cases, it is desirable to see all the columns without scrolling horizontally.

Data alignment

If **Text alignment** is set to **Auto**, column data is aligned according to data type: text values are left-aligned and number values, including date related values, are right-aligned. If you set it to **Custom**, you can select to align the data to the left or to the right.

Sorting

You can adjust both the order of the dimensions and measures from left to right (column sorting), and the sorting priority order of the rows (row sorting). In addition, you also have an internal sorting option.

During analysis, you can also use interactive sorting to change the row sorting.

Column sorting

By default, the order in which columns are sorted is set by the order in which dimensions and measures are added to the table. If you add the measure *Sales* first, it is presented first (leftmost) in the table. The next dimension or measure that is added is presented in the second column, and so on. The column sorting order can be changed in the properties panel, under **Columns**.

Row sorting

By default, rows are sorted by the first added dimension or measure, numeric values descending, text values ascending. A small arrow under the column header shows by which column the table is sorted.

You can change the row sorting in the properties panel, under **Sorting**. Drag the dimensions and measures to change the sorting priority order. In many cases, sorting is not only affected by the first dimension or measure in **Sorting**, but also the following ones.

Example:

In the following screenshot, the rows are first sorted by *Customer*, then by *Month*, and then by *Product Type*. As you can see, the columns *Customer* and *Month* have several rows with the same values (*A-2-Z Solutions* and *Month*). The rows in *Product Type* are ordered alphabetically, but only those that were sold in January to the customer *A-2-Z Solutions* are displayed.

Customer	Month	Product Type	Sales
Totals			**$104,852,674.81**
A-2-Z Solutions	Jan	Baking Goods	$248.83
A-2-Z Solutions	Jan	Beer and Wine	$129.25
A-2-Z Solutions	Jan	Breakfast Foods	$68.29
A-2-Z Solutions	Jan	Canned Soup	$45.24
A-2-Z Solutions	Jan	Carbonated Beverages	$187.42
A-2-Z Solutions	Jan	Dairy	$8,262.54
A-2-Z Solutions	Jan	Specialty	$686.59
A-2-Z Solutions	Feb	Beer and Wine	$24.60
A-2-Z Solutions	Feb	Breakfast Foods	$270.72
A-2-Z Solutions	Feb	Canned Soup	$91.80

By changing the sorting order, so that secondary sorting is by *Product Type*, followed by *Month*, all *Product Type* items sold to the customer *A-2-Z Solutions* are presented in alphabetical order, whereas only the months when they were sold are displayed under *Month*.

Customer	Product Type	Month	Sales
Totals			**$104,852,674.81**
A-2-Z Solutions	Baking Goods	Jan	$248.83
A-2-Z Solutions	Baking Goods	Jul	$1,318.04
A-2-Z Solutions	Baking Goods	Nov	$396.00
A-2-Z Solutions	Beer and Wine	Jan	$129.25
A-2-Z Solutions	Beer and Wine	Feb	$24.60
A-2-Z Solutions	Beer and Wine	Apr	$129.25
A-2-Z Solutions	Beer and Wine	Jun	$60.10
A-2-Z Solutions	Beer and Wine	Jul	$129.25
A-2-Z Solutions	Beer and Wine	Oct	$400.65
A-2-Z Solutions	Beer and Wine	Nov	$10.09
A-2-Z Solutions	Beer and Wine	Dec	$63.07
A-2-Z Solutions	Bread	Jul	$158.56
A-2-Z Solutions	Bread	Oct	$74.73

Internal sorting

Each dimension and measure has a default (**Auto**) internal sorting order, which can be changed. Under **Sorting**, click the item you want to change and click the button to switch to **Custom** sorting. Changes made to the internal sorting of an item may not have any effect if the sorting is in conflict with an item with higher priority.

Interactive sorting

During analysis, you can set which column to sort on by clicking the column header. The first click sorts the table according to the default sorting of the selected item. A second click reverses the sorting order. Interactive sorting is session based and is not saved. If you want your changes to the sorting to be persistent, you need to make the changes in the properties panel.

Column picker

When space is limited and not all dimensions and measures can be displayed in a table, the column picker appears on the right in the table. When you click the column picker, a list is displayed with all dimensions and measures in the table. You can temporarily change the order of the columns by dragging them in the list, and you can make selections in all displayed dimensions, as usual.

The order changes that you make in the column picker are not permanent and do not the affect the column order or the sorting order set in the properties panel.

Totals

By default, the totals of numeric values are displayed under the column names. In the properties panel, you can change this to display the totals at the bottom of a column, or not at all.

Search

The usual search options are available when you want to perform a search in a table.

You can use the following options:

- Text search
- Numeric search
- Expression search
- Fuzzy search

When to use a table

Description

The table displays values in record form, so that each row of the table contains fields calculated using measures. Often a table consists of a single dimension, for example, customers, and multiple measures, such as sales, quantity, margin, and invoice figures.

When to use it

Use a table, when you want to view detailed data and precise values rather than visualizations of values. Tables are good when you want to compare individual values. Drill-down group dimensions are very efficient in tables. Within a limited space, you can drill down to the next level of detail and analyze the updated measure values.

Advantages

You can filter and sort the table in different ways. Many values can be included in a table, and when you drill down in a table, you make good use of a limited space of the sheet. A table is excellent when you want to see exact values rather than trends or patterns.

Disadvantages

If the table contains many values, it is difficult to get an overview of how values are related. It is also hard to identify an irregularity within the table.

Searching in tables

In a table, you can search the dimension columns, and make selections in the resulting list.

Do the following:

1. Click in the dimension column that you want to search in.
   A selection popup is displayed.
2. Type your search string.
   While you type, the list is filtered to only display matching items.

3. Make a selection by clicking or drawing.
4. Confirm your selection.

> *You can confirm the selection of all matching items by pressing Enter.*

The new selection is active and reflected in all associated visualizations.

> *You can remove the search string by clicking ⊗ or pressing Esc. The search string is always removed when you press return/Enter.*

Selections in tables

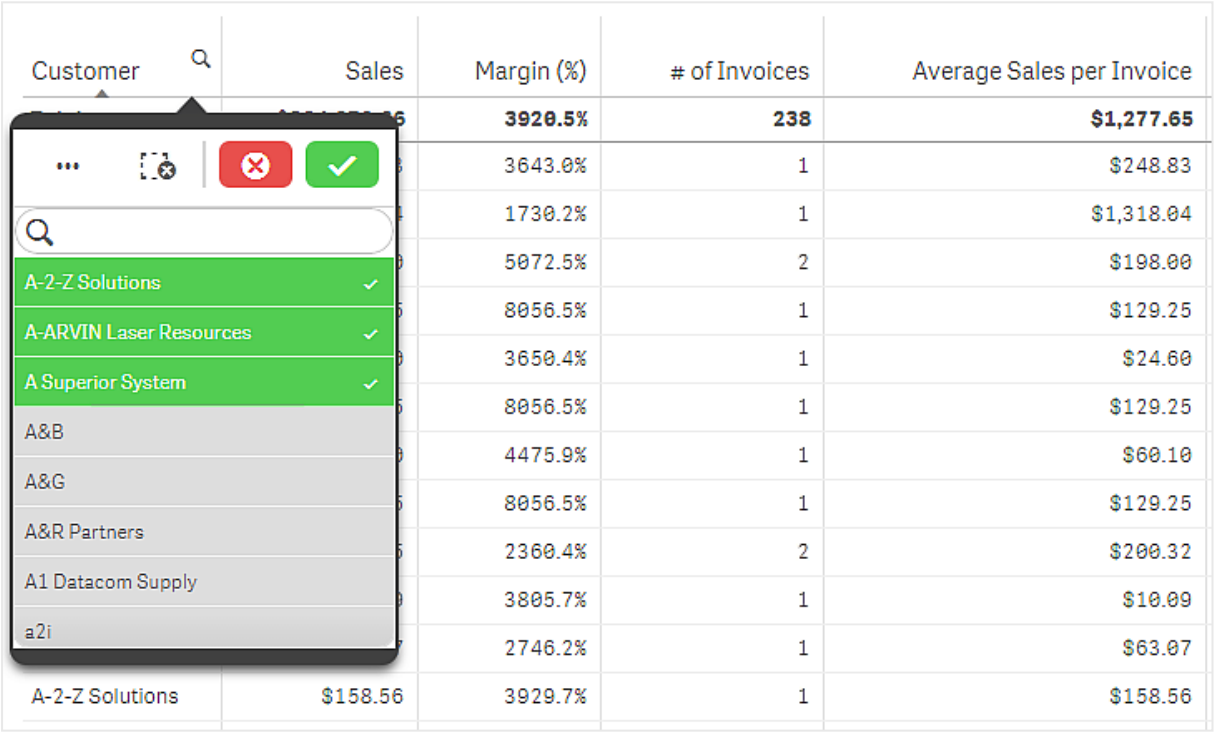


Table with selected fields in green

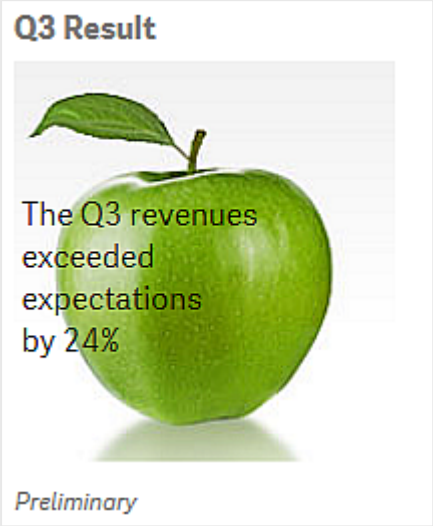
You can make selections in a table by clicking or drawing in the dimension columns. Measure values cannot be selected. When you make a selection, it is always the dimension values that you select. You can only make selections in one column at a time.

To deselect a row, click it. To confirm a selection, click ✔ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc. If you confirm, the selection is reflected in all visualizations associated with the table.

You cannot select dimension values that are null. Null values in a table are presented as dashes (-). Rows without valid dimension values will not be included in the selection.

Text & image

The text & image visualization complements other visualizations by offering options to add text, images, hyperlinks, and measures.



You can format and color the text and align the paragraphs. The background image has sizing and positioning options. You can also set the responsive behavior for text and images.

When to use a text & image

Description

The text & image visualization is intended for presentation purposes, and does not support selections. However, the measures in the text & image visualization are updated when selections are made.

When to use it

Use on the first sheet of an app for essential information.

Display a company image, or use a background image together with formatted text and measure values to present figures in a compelling way.

Link to sites with additional information.

Use the responsive behavior to ensure that the visualization renders well on all devices.

Advantages

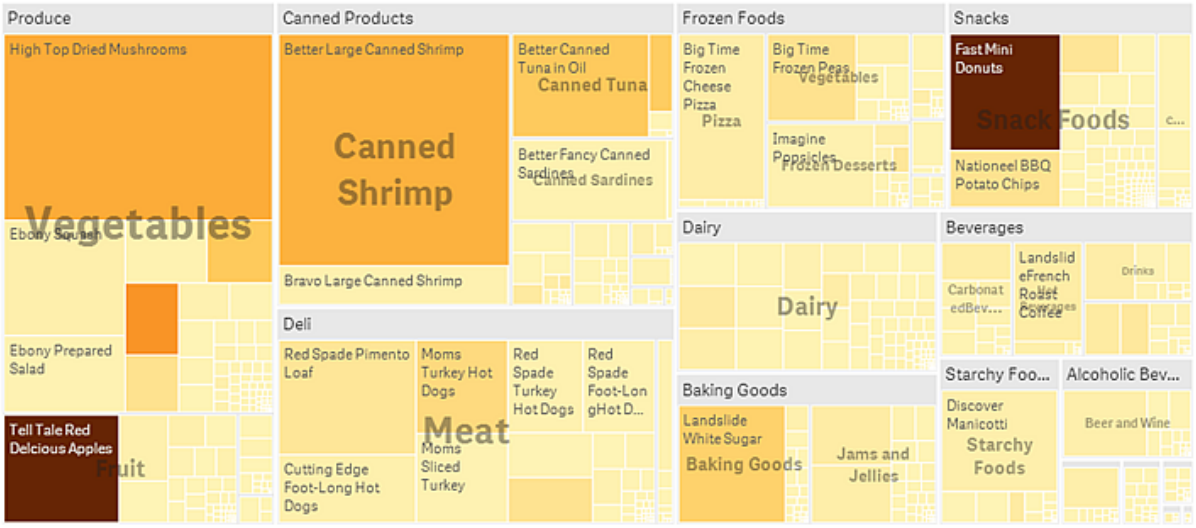
The text & image visualization contrasts with the other visualizations. You have many options for making the text & image visualization stand out next to more regular charts.

Disadvantages

You are limited to a few measure values and rather short texts, otherwise the text & image visualization will be cluttered.

Treemap

Treemaps display hierarchical data by using nested rectangles, that is, smaller rectangles within a larger rectangle.



In this image you have several product groups, such as Produce, Canned Products, and Frozen Foods. Each product group consists of a large rectangle. You can regard the product groups as branches of the tree. When you select a product group, you drill down to the next level, the product type, for example, Vegetables, Meat, and Dairy. You can regard the product types as sub-branches of the tree. The branches have leaves. A leaf node's rectangle has an area proportional to a specified dimension of the data. In this example, the items Ebony Squash, Bravo Large Canned Shrimp, Red Spade Pimento Loaf, and so on, are the leaves. The leaf nodes are colored to show a separate dimension of the data.

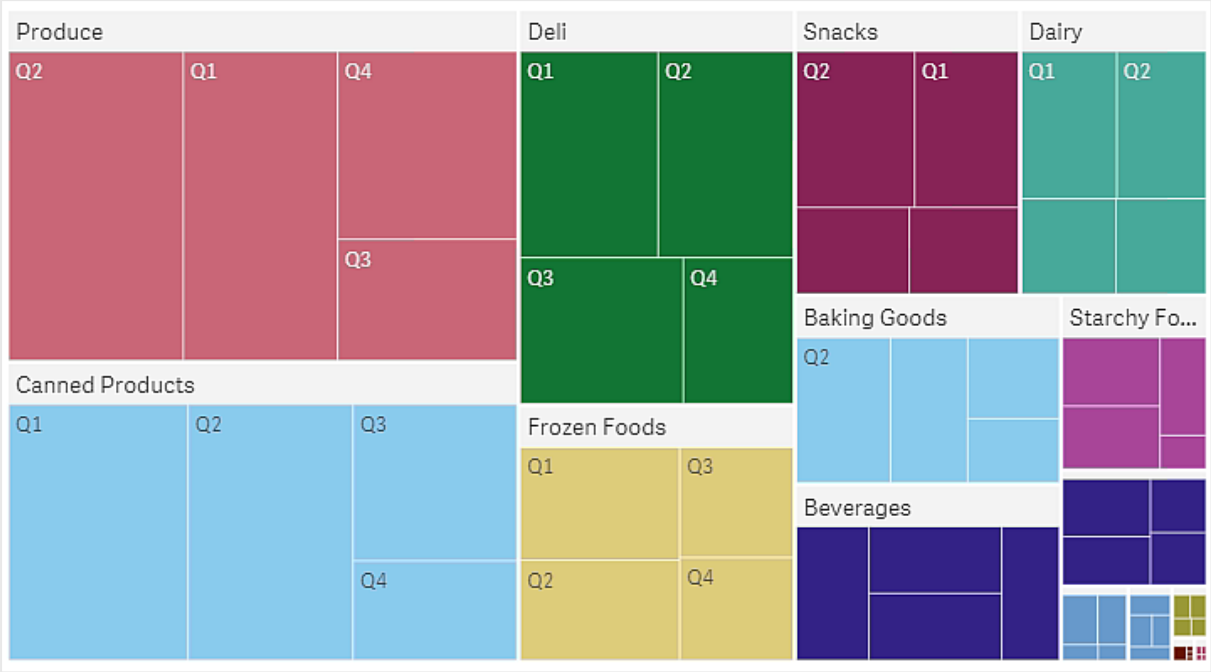
Sorting is automatic according to size. By default, the coloring is by dimension, with 12 colors, but that can be changed in the properties panel. When you have more than one dimension, you can decide which dimension to color by. In this example, the coloring is not by dimension, but by expression (*Avg(Margin)*), a calculated measure, and by using this expression, you can see which items have the highest average margin. The darker the color, the higher the average margin.

If the data set contains negative values, a text message is shown stating that the negative values cannot be displayed.

Number of dimensions and measures

In a treemap you need at least one dimension and one measure, but to make full use of the treemap it is preferable to have two or three dimensions. You can only have one measure, but up to 15 dimensions. However, using more than two or three dimensions is not recommended because the treemap may become unmanageable.

When to use a treemap



Description

Treemaps are used to display hierarchical data. You can drill down in the data, and the theoretical number of levels is almost limitless. You reach the practical limit before you reach the theoretical limit.

When to use it

Use a treemap when space is constrained and you have a large amount of hierarchical data that you need to get an overview of. Treemaps should primarily be used with values that can be aggregated.

Advantages

Treemaps are economical in that they can be used within a limited space and yet display a large number of items simultaneously.

When there is a correlation between color and size in the tree structure, you are able to see patterns that would be difficult to spot in other ways, for example, when a certain color is particularly relevant.

Disadvantages

Treemaps are not good when there is a big difference in the magnitude of the measure values. Nor is a treemap the right choice when mixing absolute and relative values.

Negative values cannot be displayed in treemaps.

Selections in treemaps

When you analyze your data, you have different ways of making selections. In a treemap you can either use click selection, draw selection, or lasso selection. To confirm a selection, click ✓ or click outside the visualization. You can also press Enter. To cancel, click ⊗ or press Esc.

Click selection

You can select treemap branches by clicking them, one at a time. To deselect a branch, click it.

Draw selection

You can draw one or more lines in the treemap to select branches. All branches that are touched by a line are selected, all others are dimmed. To deselect a branch, click it. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking at the top of the visualization. On a computer, you can also press Shift and make the selection.

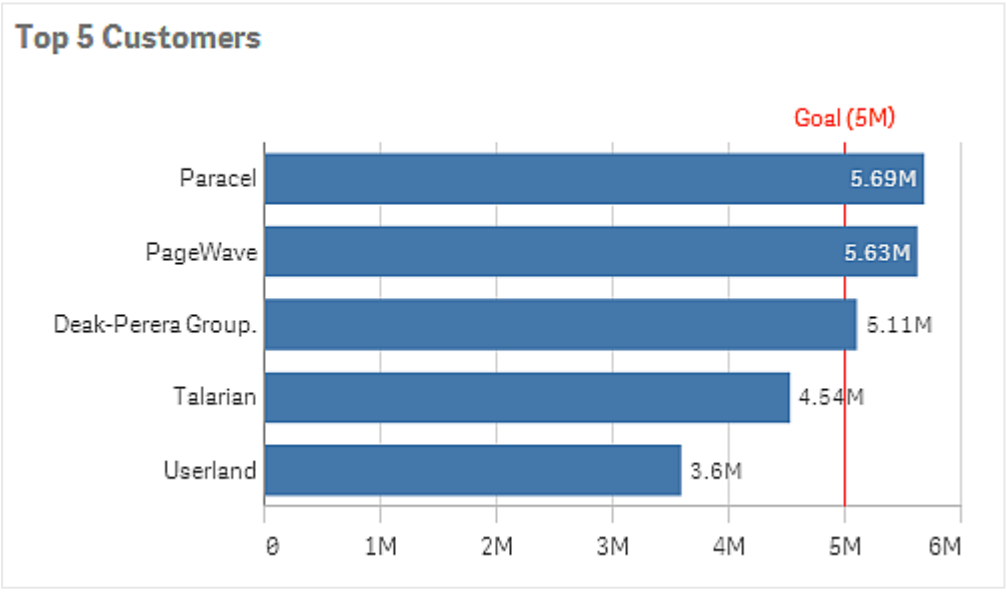
Lasso selection

In lasso selection, you can draw a lasso freehand to enclose an area. In a treemap you can make lasso selections, but in most cases it is easier to use draw selections to select more than one branch. When you want to make a draw selection, you must first click inside the visualization and turn on lasso selection by clicking at the top of the visualization. On a computer, you can also press Shift and make the selection.

Reference lines

A reference line is a line intersecting the chart area from a given point on the measure axis. You can use a reference line to indicate a certain level of chart data. The reference line is only drawn if it falls within the current range of the measure axis. You can have several reference lines in the same chart.

Reference lines are available in bar charts, gauges, line charts, and scatter plots.



Bar chart with a reference line at 5M

Reference line expression

You can either set the reference line expression to an absolute numeric value, or enter an arbitrary numeric expression.

Null values in visualizations

Data is sometimes missing or cannot be calculated, because the fields contain values that are null or not a number (NaN). In the visualizations, null and NaN values are displayed in different ways, according to the following table.

	Null values in dimensions	**NaN values in measures**
Bar chart	–	– (when labels are enabled in the properties panel, otherwise empty)
Combo chart	–	A combination of the NaN value for the bar and the line.
Filter pane	No representation	N/A
Gauge	N/A	–
KPI	N/A	–
Line chart	–	Empty
Map	No representation	gray
Pie chart	–	Empty
Scatter plot	–	Empty
Table	–	–
Text & image	N/A	–
Treemap	–	Empty

7.7 Dimensions

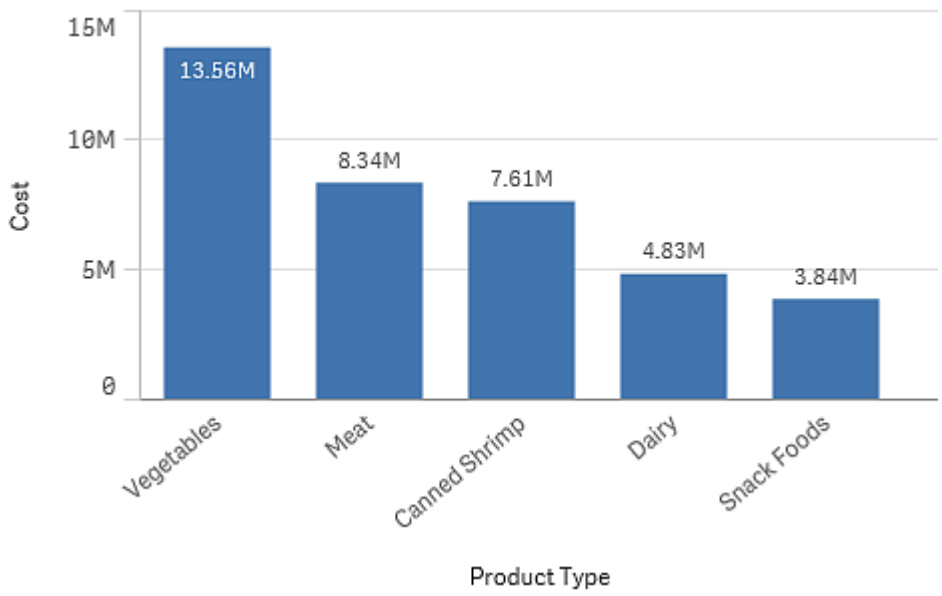
Dimensions determine how the data in a visualization is grouped - for example total sales per country or number of products per supplier. You typically find a dimension as the slices in a pie chart or on the x-axis of a bar chart with vertical bars.

Dimensions are created from fields in the data model tables.

Example:

Product Type is a field in the *Product* table that is loaded into the app. The values of this field are the different types that products are grouped into.

You can, for example, create a bar chart to visualize the cost of each type, by adding the *Product Type* dimension to the chart. To complete the visualization, you must add a measure (in this case Cost), which is grouped by the *Product Type* dimension.



Field groups as dimensions

One main difference between Qlik Sense and many other database viewers and online analytical processing tools (OLAP systems), is that in Qlik Sense, you do not need to predefine any hierarchies in the input data. The unique internal logic of Qlik Sense gives you the complete freedom to access any field as a full dimension in any order you like.

For most purposes, the built-in functionality is fully satisfactory, but in some situations, a predefined hierarchy can help you to display data more efficiently. In Qlik Sense, you can achieve this by defining hierarchic groups of fields as drill-down dimensions.

Any fields or calculated dimensions can be grouped together.

Drill-down groups

When several fields form a natural hierarchy, it can make sense to create a drill-down group.

Example 1:

Organization: Company, Department, Employee

Example 2:

Geography: Continent, Country, State, City

When you use a drill-down group as a dimension in a chart, the chart uses the first field in the group's list of fields that has more than one possible value. If the currently made selections cause the field to have only one possible value, the next field in the list is used instead, provided that it has more than one possible value. If no field in the list has more than one possible value, the last field is used anyway.

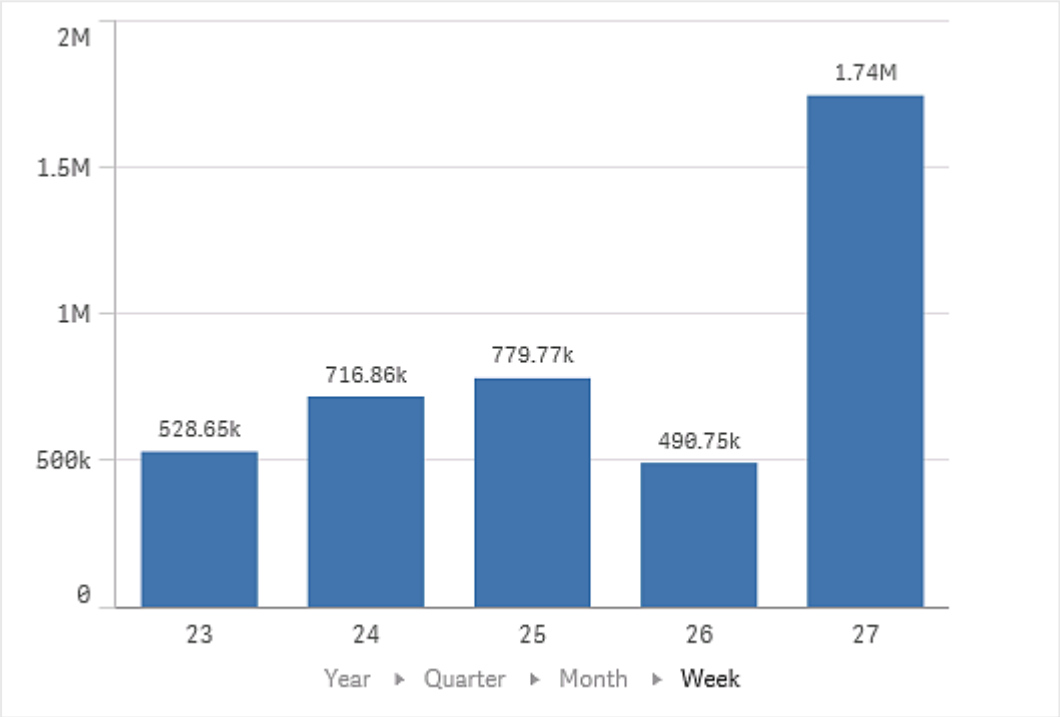
In the first example above, *Company* will be used as chart dimension until a single company is selected. The chart will then show *Department*. If a single department is selected, the chart will switch to *Employee*.

As selections are reverted, so that more than one value becomes possible in the upper fields of the group's field list, the chart is automatically drilled back up.

Drill-up

The drill-up function is available in bar charts, pie charts, and line charts. Other visualizations reflect the changes made in the charts, but cannot themselves be used to drill up through the different dimensions. When you drill down in a dimension group, breadcrumbs provide links back to the previous dimensions. Click the dimension that you want to drill up to.

In the following bar chart, the breadcrumbs *Year* > *Quarter* > *Month* enable drilling up.



Calculated dimensions

You can use expressions to create calculated dimensions. A calculated dimension consists of an expression involving one or more fields. All standard functions may be used.

For performance reasons, it is recommended to perform all calculations in the data load editor. When dimensions are calculated in the chart, Qlik Sense first calculates the dimension values, and then aggregates the measures for these calculated values, which affects the performance more than calculations in the load script.

There are cases when calculated dimensions are powerful in data analysis, for example, if you want to generate the dimensions values during analysis, when dimension values are dependent on the selections.

Calculated dimensions are also useful if you want to modify a field.

Once you have created a calculated dimension, you can use it as any other dimension.

Example:

You have a field called Calendar Month that includes each of the months of the year. In your app, you want include a table that shows the sales for each of the first 6 months of the year. For the rest of the months, you want to see a total. You can use an expression to create this calculated dimension.

Syntax:

```
If ([Calendar Month] <7, [Calendar Month], 'Rest')
```

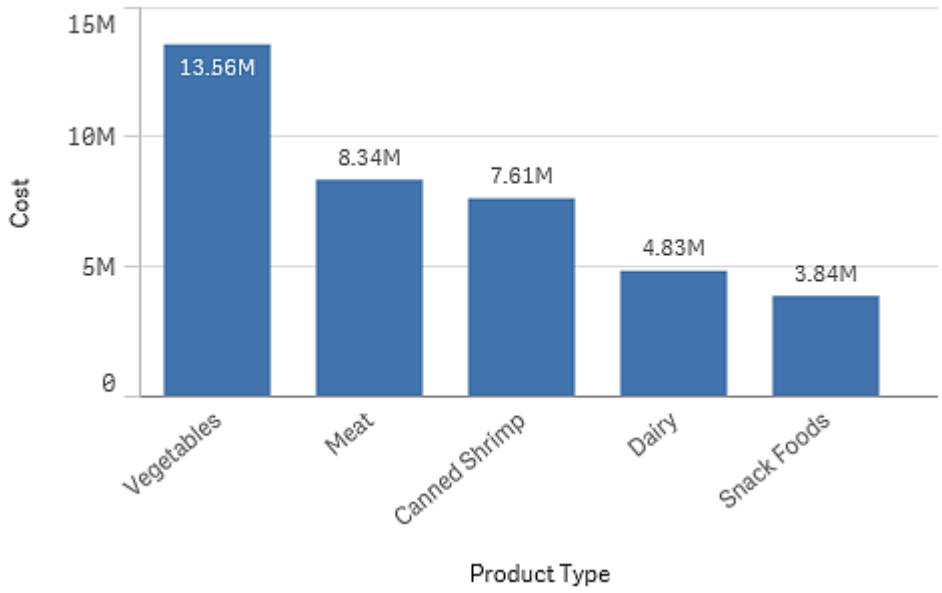
7.8 Measures

Measures are calculations used in visualizations, typically represented on the y-axis of a bar chart or a column in a table. Measures are created from an expression composed of aggregation functions, such as **Sum** or **Max**, combined with one or several fields.

A measure must have a name, and may also be supplied with descriptive data such as description and tags.

Example:

You can, for example, create a bar chart to visualize the cost of each type, by adding the *Product Type* dimension to the chart, and the measure *Cost*, which is made from the expression **Sum(Cost)**, that is the result of the calculation of the aggregation function **Sum** over the field **Cost**. The results are grouped by the *Product Type* dimension.



7.9 When to use what type of visualization

You use different charts and tables to present the data in a quick, understandable and meaningful way.

Charts present relationships among many values efficiently, and provide you with a way to analyze data at a glance. The best choice of chart type depends on the purpose of the visualization. For instance, tables are useful when you need to view precise values, and when you want to compare individual values to each other.

Here you find which visualizations that are suitable for different purposes.

Purpose	Recommended visualization type
Compare data side by side	Bar chart
Combine absolute and relative values	Combo chart
Make selections to reduce data set	Filter pane
Indicate ratio	Gauge
Display a performance value	KPI
Display trends over time	Line chart
Display point and area data	Map
Display ratio to total	Pie chart
Create a cross table view of data and to summarize data	Pivot table
Display correlation of measures	Scatter plot
Display numbers and values	Table
Display text, images, links, and measures	Text & image
Display hierarchical data	Treemap

7.10 Guidelines for visualizations, fields, and naming

There are certain conventions and limitations you need to be aware of when working with Qlik Sense. For example: the maximum number of characters to use in names, descriptions, and expressions, as well as characters reserved for use by Qlik Sense only.

Max number of visualizations

The maximum number of visualizations there can be on a sheet is limited to the number of cells on a sheet, that is, 288 (24x12). The maximum practical number will be less than this because of the limited use for visualizations that are made up of only 1 cell.

Upper limits on name lengths

The following limits apply to the number of characters that can be used in various situations in Qlik Sense:

Names (title, dimension, footnote...)	Max. 255 characters
Descriptions	Max. 512 characters
Expressions	Max. 8,192 characters

Tags	Max 31 characters per tag and max 30 tags per master item
Text & image chart	Max 12,000 characters

Naming dimensions and measures

If you use long names for your dimensions and measures they will be truncated and not the whole name will be shown in the label properties panel, instead "..." will be shown at the end. It is also recommended to avoid using some characters reserved for system purposes, as unpredictable results and errors could occur.

Avoid using he following characters in dimension and measure names:

Colon	:
Equals sign	=
Left bracket	[
Right bracket	]
Left brace	{
Right brace	}
Dollar sign	$

Conventions for number and time formats

In many interpretation and formatting functions it is possible to set the format for numbers and dates by using a format code. This topic describes the conventions used to format a number, date, time or time stamp. These conventions apply both to script and chart functions.

Number formats

- To denote a specific number of digits, use the symbol "0" for each digit.
- To denote a possible digit, use the symbol "**#**". If the format contains only # symbols to the left of the decimal point, numbers less than 1 begin with a decimal point.
- To mark the position of the thousands separator or the decimal separator, use the applicable thousands separator and the decimal separator.

The format code is used for defining the positions of the separators. It is not possible to set the separator in the format code. Use the **DecimalSep** and **ThousandSep** variables for this in the script.
It is possible to use the thousand separator to group digits by any number of positions, for example, a format string of "0000-0000-0000" (thousand separator="-") could be used to display a twelve-digit part number as "0012-4567-8912".

Examples:

# ##0	describes the number as an integer with a thousands separator.

###0	describes the number as an integer without a thousands separator.
0000	describes the number as an integer with at least four digits. For example, the number 123 will be shown as 0123.
0.000	describes the number with three decimals.
0.0##	describes the number with at least 1 decimal and at most three decimals.

Special number formats

Qlik Sense can interpret and format numbers in any radix between 2 and 36 including binary, octal and hexadecimal. It can also handle roman formats.

Binary format	To indicate binary format the format code should start with (bin) or (BIN).
Octal format	To indicate octal format the format code should start with (oct) or (OCT).
Hexadecimal format	To indicate hexadecimal format the format code should start with (hex) or (HEX). If the capitalized version is used A-F will be used for formatting (for example 14FA). The non-capitalized version will result in formatting with a-f (for example 14fa). Interpretation will work for both variants regardless of the capitalization of the format code.
Decimal format	The use of (dec) or (DEC) to indicate decimal format is permitted but unnecessary.
Custom radix format	To indicate a format in any radix between 2 and 36 the format code should start with (rxx) or (Rxx) where xx is the two-digit number denoting the radix to be used. If the capitalized R is used letters in radices above 10 will be capitalized when Qlik Sense is formatting (for example 14FA). The non-capitalized r will result in formatting with non-capital letters (for example 14fa). Interpretation will work for both variants regardless of the capitalization of the format code. Note that (r02) is the equivalent of (bin), (R16) is the equivalent of (HEX), and so on.
Roman format	To indicate roman numbers the format code should start with (rom) or (ROM). If the capitalized version is used capital letters will be used for formatting (for example MMXVI). The non-capitalized version will result in formatting with lower cap letters (mmxvi). Interpretation will work for both variants regardless of the capitalization of the format code. Roman numbers are generalized with minus sign for negative numbers and 0 for zero. Decimals are ignored with roman formatting.

Examples:

num(199, '(bin)')	returns	11000111
num(199, '(oct)')	returns	307
num(199, '(hex)')	returns	c7
num(199, '(HEX)')	returns	C7

num(199, '(r02)')	returns	11000111
num(199, '(r16)')	returns	c7
num(199, '(R16)')	returns	C7
num(199, '(R36)')	returns	5J
num(199, '(rom)')	returns	cxcix
num(199, '(ROM)')	returns	CXCIX

Dates

You can use the following symbols to format a date. Arbitrary separators can be used.

D	To describe the day, use the symbol "D" for each digit.
M	To describe the month number, use the symbol "M". • Use "M" or "MM" for one or two digits. • "MMM" denotes short month name in letters as defined by the operating system or by the override system variable **MonthNames** in the script. • "MMMM" denotes long month name in letters as defined by the operating system or by the override system variable **LongMonthNames** in the script.
Y	To describe the year, use the symbol "Y" for each digit.
W	To describe the weekday, use the symbol "W". • "W" will return the number of the day (for example 0 for Monday) as a single digit. • "WW" will return the number with two digits (e.g. 02 for Wednesday). • "WWW" will show the short version of the weekday name (for example Mon) as defined by the operating system or by the override system variable **DayNames** in the script. • "WWWW" will show the long version of the weekday name (for example Monday) as defined by the operating system or by the override system variable **LongDayNames** in the script.

Examples: (with 31st March 2013 as example date)

YY-MM-DD	describes the date as 13-03-31.
YYYY-MM-DD	describes the date as 2013-03-31.
YYYY-MMM-DD	describes the date as 2013-Mar-31.
DD MMMM YYYY	describes the date as 31 March 2013.
M/D/YY	describes the date as 3/31/13.

W YY-MM-DD	describes the date as 6 13-03-31.
WWW YY-MM-DD	describes the date as Sat 13-03-31.
WWWW YY-MM-DD	describes the date as Saturday 13-03-31.

Times

You can use the following symbols to format a time. Arbitrary separators can be used.

h	To describe the hours, use the symbol "h" for each digit.
m	To describe the minutes, use the symbol "m" for each digit.
s	To describe the seconds, use the symbol "s" for each digit.
f	To describe the fractions of a second, use the symbol "f" for each digit.
tt	To describe the time in AM/PM format, use the symbol "tt" after the time.

Examples: (with 18.30 as example time):

hh:mm	describes the time as 18:30
hh.mm.ss.ff	describes the time as 18.30.00.00
hh:mm:tt	describes the time as 06:30:pm

Time stamps

The same notation as that of dates and times above is used in time stamps.

Examples: (with 31th March 2013 18.30 as example time stamp):

YY-MM-DD hh:mm	describes the time stamp as 13-03-31 18:30
M/D/Y hh.mm.ss.ffff	describes the time stamp as 3/31/13 18.30.00.0000

7.11 Create a visualization

You use visualizations to present the data that is loaded into an app. You create visualizations, on sheets, from pre-defined charts and add dimensions and measures to make the visualizations complete.

There are various ways to create new visualizations, according to your preferences and depending on if the app is published or not.

When you have added the visualization to the sheet, you may want to adjust its appearance using the properties panel.

Fields

Fields hold the data that is used in Qlik Sense. Fields can be thought of as the data loaded from the load script. Fields contain one or more values, called field values, and at the basic level, correspond to columns in a database table, but can also exist in more than one table. Field values consists of numeric or alphanumeric data. When loaded from the load script, fields can be represented as a table visualization.

Example of data in a load script:

```
Temp:
LOAD * inline [
Customer Product UnitSales UnitPrice
Imagine Film 4 16
Imagine Film 10 15
Imagine Shutter 9 9
PhotoInc Shutter 5 10
PhotoInc Lens 2 20
PhotoInc Magnifier 4 25
Gallery Film 8 15
Gallery Lens 7 19
] (delimiter is ' ');
```

The fields represented in a data model table after having loaded the data:

The same fields as columns in a table visualization on a sheet:

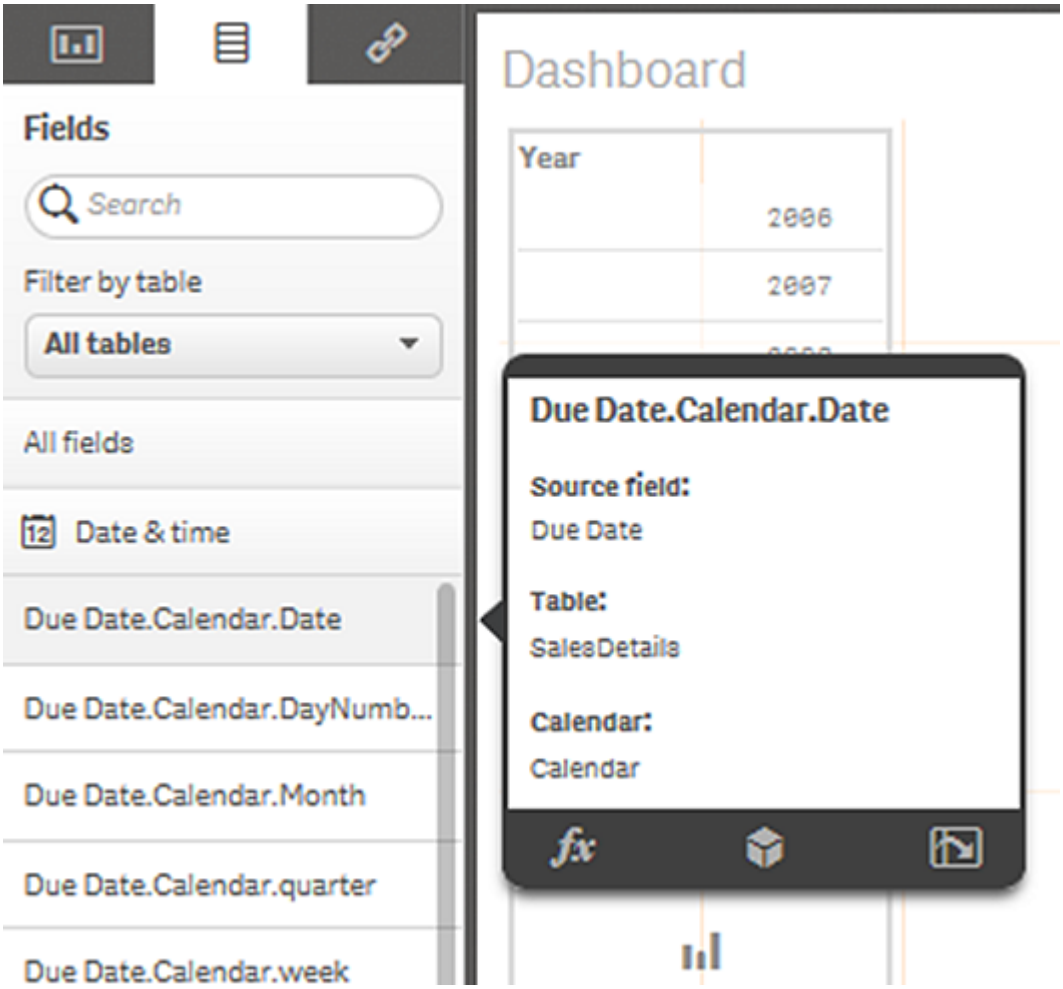
Customer ▲	Product	UnitPrice	UnitSales
Gallery	Film	15	8
Gallery	Lens	19	7
Imagine	Film	15	10
Imagine	Film	16	4
Imagine	Shutter	9	9
PhotoInc	Lens	20	2
PhotoInc	Magnifier	25	4
PhotoInc	Shutter	10	5

Date & time fields

If you are working with fields containing date or timestamp information in your app, you can define a number of related attributes of a date, for example, year or hour, as derived fields and use them in your visualization.

You need to create a calendar template where you define which fields to derive in the data load script. The derived date & time fields will be generated when the script is run and data is reloaded.

The date & time fields that have been generated appear in the assets panel. You can use them in visualizations, just like any other data field.



Creating a bar chart

You can create a bar chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty bar chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add dimensions and measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

If you double-click or drag a measure from the assets panel, a bar chart is added on the sheet using the measure. You only need to add a dimension to make the bar chart complete.

When you have created the bar chart, you may want to adjust its appearance and other settings in the properties panel.

Creating a combo chart

You can create a combo chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty combo chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add a dimension and one or more measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the combo chart, you may want to adjust its appearance and other settings in the properties panel.

Creating a filter pane

You can create a filter pane on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty filter pane to the sheet.
2. Click **Add dimension** and select a dimension or a field.

You can add dimensions to the filter pane in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

If you double-click or drag a field or a dimension from the assets panel, a filter pane is added to the sheet using the dimension. If you then double-click more dimensions, they are automatically added to the new filter pane.

When you have created the filter pane, you may want to adjust its appearance and other settings in the properties panel.

Creating a gauge

You can create a gauge on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty gauge to the sheet.
2. Click **Add measure** and select a measure or create a measure from a field.

You can add a measure to the gauge in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the gauge, you may want to adjust its appearance and other settings in the properties panel.

Creating a KPI

You can create a KPI visualization on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty KPI chart to the sheet.
2. Click **Add measure** and select a measure or create a measure from a field.

You can add up to two measures to the KPI in the following ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the KPI visualization, you may want to adjust its appearance and other settings in the properties panel.

Creating a line chart

You can create a line chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty line chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add dimensions and measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the line chart, you may want to adjust its appearance and other settings in the properties panel.

Creating a map

To be able to create a map, you first need to load point data or area data as described in the topic Loading map data in the Concepts in Qlik Sense guide.

You can add a map to the sheet you are editing.

You can create several map visualizations based on different point data or area data, but which use the same dimension data.

Do the following:

1. From the assets panel, drag an empty map to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Add a measure to the map (optional).

You can add a dimension to the chart in different ways:

From a data field. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the map, you may want to adjust its appearance and other settings in the properties panel.

Adding a background map

You can add a background map to both point maps and area maps. However, if you have added a point layer to your map, a Mapbox background map is automatically added. You can use maps from other providers.

Do the following:

1. In the toolbar, click **Edit**.
2. In the properties panel to the right, click **Background**.
3. Switch **Show** to **On**.
4. Switch **Map service** to **Custom**.
5. From the list of slippy map servers below, copy a URL and paste it into the **URL** text field.
6. From the same list, copy the attribution string for the chosen URL and paste the string into the **Attribution** text field.

Slippy map servers

These are the available URLs and attribution strings for the background map.

OpenStreetMap

URL	http://tile.openstreetmap.org/${z}/${x}/${y}.png
Attribution string	© OpenStreetMap contributors

OpenCycleMap

URL	http://a.tile.opencyclemap.org/cycle/${z}/${x}/${y}.png http://b.tile.opencyclemap.org/cycle/${z}/${x}/${y}.png http://c.tile.opencyclemap.org/cycle/${z}/${x}/${y}.png
Attribution string	© OpenCycleMap. Map data © OpenStreetMap contributors

MapQuest OSM

URL	http://otile1.mqcdn.com/tiles/1.0.0/map/${z}/${x}/${y}.png http://otile2.mqcdn.com/tiles/1.0.0/map/${z}/${x}/${y}.png http://otile3.mqcdn.com/tiles/1.0.0/map/${z}/${x}/${y}.png http://otile4.mqcdn.com/tiles/1.0.0/map/${z}/${x}/${y}.png
Attribution string	Data, imagery and map information provided by MapQuest, OpenStreetMap and contributors, CC-BY-SA <img src='http://developer.mapquest.com/content/osm/mq_logo.png' border='0'>

MapQuest Open Aerial

URL	http://otile1.mqcdn.com/tiles/1.0.0/sat/${z}/${x}/${y}.png http://otile2.mqcdn.com/tiles/1.0.0/sat/${z}/${x}/${y}.png http://otile3.mqcdn.com/tiles/1.0.0/sat/${z}/${x}/${y}.png http://otile4.mqcdn.com/tiles/1.0.0/sat/${z}/${x}/${y}.png
Attribution string	Tiles Courtesy of MapQuest. Portions Courtesy NASA/JPL-Caltech and U.S. Depart. of Agriculture, Farm Service Agency. <img src='http://developer.mapquest.com/content/osm/mq_logo.png' border='0'>

MapBox Natural Earth (only supports the first five zoom levels)

URL	http://a.tiles.mapbox.com/v3/mapbox.natural-earth-hypso-bathy/${z}/${x}/${y}.png http://b.tiles.mapbox.com/v3/mapbox.natural-earth-hypso-bathy/${z}/${x}/${y}.png http://c.tiles.mapbox.com/v3/mapbox.natural-earth-hypso-bathy/${z}/${x}/${y}.png http://d.tiles.mapbox.com/v3/mapbox.natural-earth-hypso-bathy/${z}/${x}/${y}.png
Attribution string	Tiles © MapBox

Creating a pie chart

You can create a pie chart on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty pie chart to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add a dimension and a measure to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the pie chart, you may want to adjust its appearance and other settings in the properties panel.

Creating a pivot table

You can create a new pivot table on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty pivot table to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add dimensions and measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the pivot table, you may want to adjust its appearance and other settings in the properties panel.

Creating a scatter plot

You can create a scatter plot on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty scatter plot to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.
4. Click **Add measure** and select a measure or create a measure from a field.

You can add a dimension and measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the scatter plot, you may want to adjust its appearance and other settings in the properties panel.

Creating a table

You can create a new table on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty table to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add dimensions and measures to the chart in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the table, you may want to adjust its appearance and other settings in the properties panel.

Creating a text & image

You can create a text & image visualization on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty text & image chart to the sheet.
2. Click the text & image chart to open the editing toolbar.
3. Add and format text, images, hyperlinks or measures to the text & image chart.

If you double-click a text & image chart in the assets panel, it is added to the sheet immediately.

Creating a treemap

You can create a treemap on the sheet you are editing.

Do the following:

1. From the assets panel, drag an empty treemap to the sheet.
2. Click **Add dimension** and select a dimension or a field.
3. Click **Add measure** and select a measure or create a measure from a field.

You can add dimensions and a measure to the treemap in different ways:

From one or more data fields. (The **Fields** section is not available in a published app.)	*Creating a visualization from fields (page 219)*
From master items.	*Creating a visualization using master items (page 218)*
From the properties panel.	*Adding a dimension (page 234)*

When you have created the treemap, you may want to adjust its appearance and other settings in the properties panel.

Creating a visualization using master items

When you are working with an unpublished app, you can create and use master dimensions and measures.

When you are working with a published app, you cannot create master items, but you have access to any master dimensions and measures that were included in the app when it was published.

Adding a chart to a sheet

You start creating a visualization by dragging a chart onto a sheet.

Do the following:

1. Click **Edit** in the toolbar.
   You find charts in the panel that opens on the left-hand side.
2. Drag a chart onto a sheet.

You can drop it in an empty location on the sheet, split the area of an existing visualization into two, or replace an existing visualization. You can also convert an existing visualization to another kind of visualization.

If you double-click a chart, it is added to the sheet immediately.

Adding a master dimension

You find the master dimensions in the left-hand panel when you are editing a sheet.

Do the following:

- Drag a dimension from the **Dimensions** category and drop it on the visualization.

The dimension is added to the visualization.

Adding a master measure

You find the master measures in the left-hand panel when you are editing a sheet.

Do the following:

- Drag a measure from the **Measures** category and drop it on the visualization.

The measure is added to the visualization.

You now have a complete visualization that you can start using while exploring the data in the app.

Adding a master measure to a combo chart

The procedure is slightly different when creating a combo chart.

Do the following:

1. Drag a measure from the **Measures** category and drop it onto the visualization.
2. Click **Add "<measure name>"**.
3. Select how to visualize the measure by clicking one of the following: **As bar**, **As line** or **As marker**.

The measure is added to the visualization.

Creating a visualization from fields

When you are editing a sheet in an unpublished app, you find charts and fields in the assets panel on the left-hand side. You can use fields to quickly add dimensions and measures to a visualization.

Adding a chart to a sheet

You start creating a visualization by dragging a chart onto a sheet.

Do the following:

1. Click **Edit** in the toolbar.
   You find charts in the panel that opens on the left-hand side.
2. Drag a chart onto a sheet.
   You can drop it in an empty location on the sheet, split the area of an existing visualization into two, or replace an existing visualization. You can also convert an existing visualization to another kind of visualization.

If you double-click a chart, it is added to the sheet immediately.

Adding a dimension from a field

You find all the fields in the data model on the **Fields** tab of the assets panel.

Do the following:

1. Click in the assets panel to open the **Fields** tab.
2. Drag a field onto the visualization.
3. Select to use the field as a dimension.

The field is added to the visualization as a dimension.

Adding a measure from a field

You can use fields to quickly add measures based on some common aggregation functions.

Do the following:

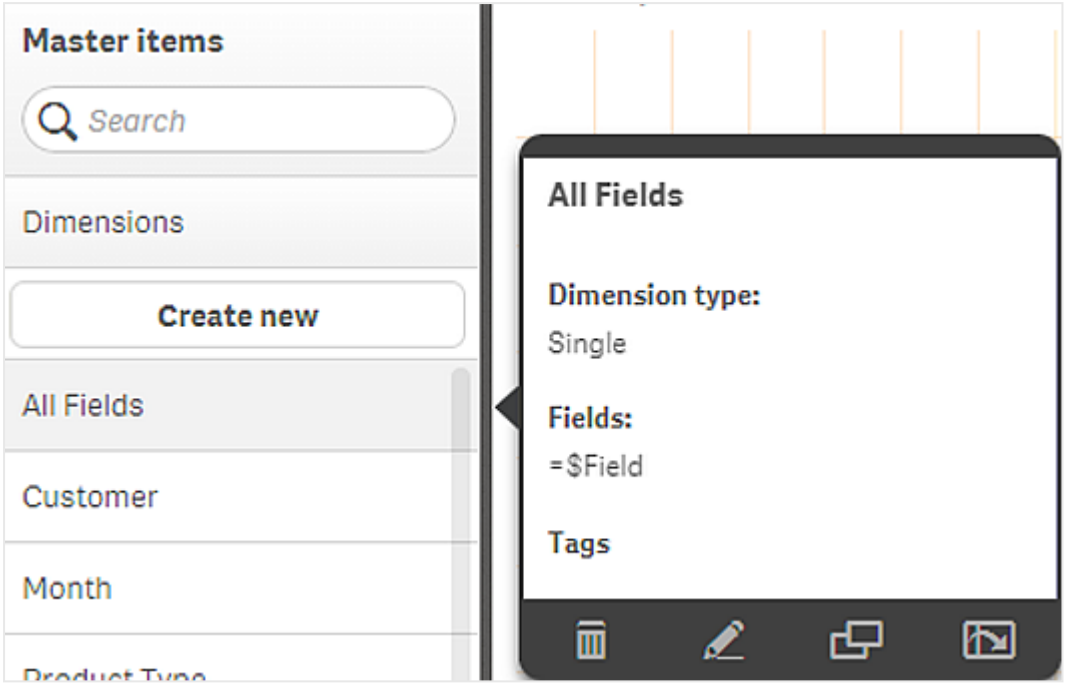
1. Click in the assets panel to open the **Fields** tab.
2. Drag a field onto the visualization.
3. Select to use the field as a measure.
4. Select one of the common aggregation functions to use in combination with the field to create an expression.

The expression is added to the visualization as a measure.

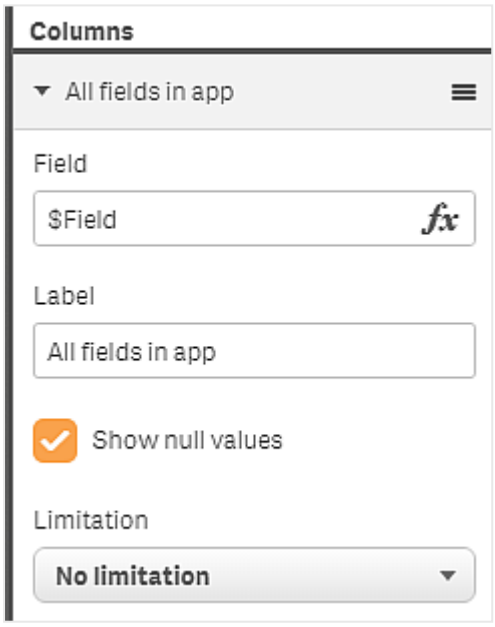
You now have a complete visualization that you can start using while exploring the data in the app.

Using system fields in a visualization

You can use system fields in a visualization. System fields are created by Qlik Sense when the data load script is generated, and include information about the fields and tables in the loaded data. A system field begins with "$", and you need to reference it by typing the field name including the "$" manually. You can use a system field to create a dimension either as a master item or from the properties panel.



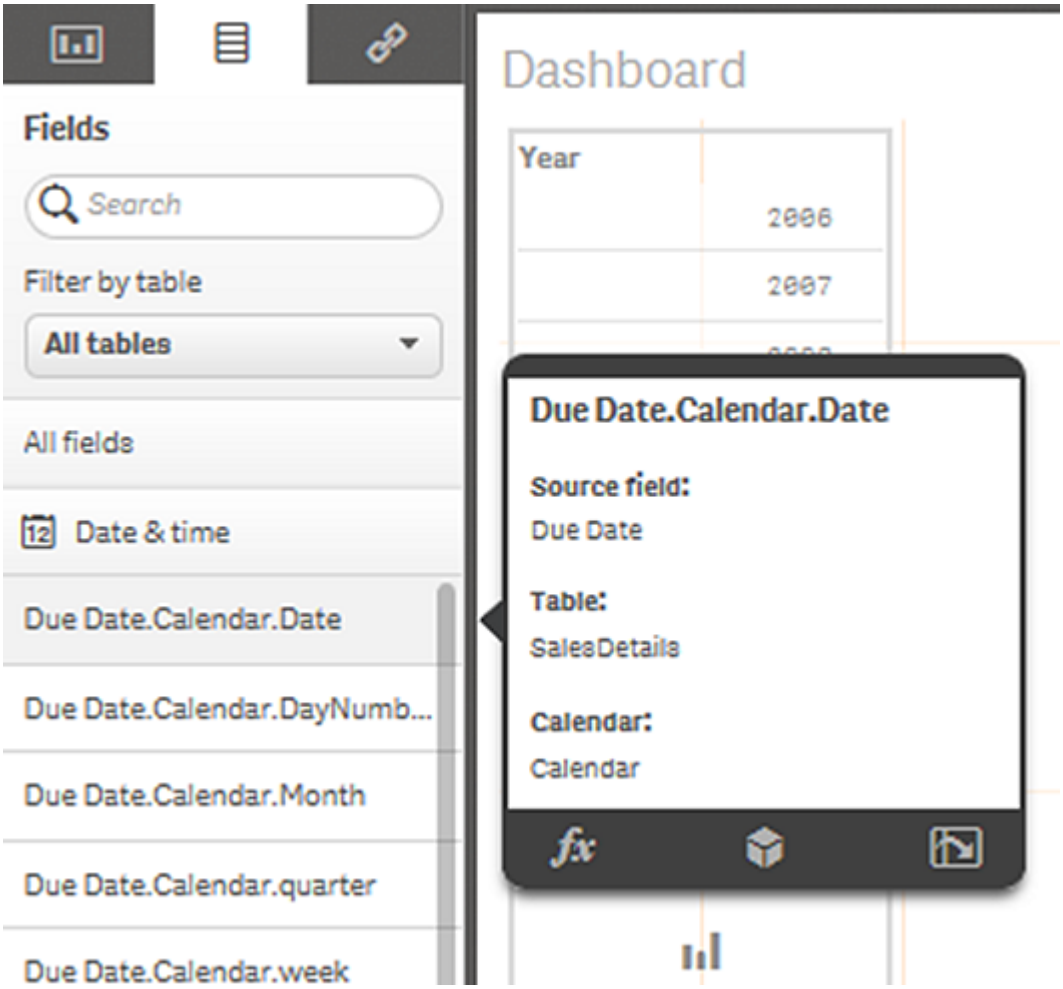
Preview of a dimension based on a system field



A system field added as dimension in the properties panel

Using date & time fields in a visualization

You can use date & time fields in visualizations. These fields are derived fields, which are defined by a calendar template in the data load script, and generated when the script is run. The date & time fields appear in the assets panel in the **Fields** tab in the **Date & time fields** section.



Preview of a derived date & time field

7.12 Editing a visualization

To make a visualization look its best and show the data in a way that is easy to understand, you can edit its properties in the properties panel. This could, for instance, be titles, descriptions, vertical or horizontal presentation and colors. It could also be how to sort the data (by measure, by dimension), which labels to show, and so on.

Do the following:

1. Click **Edit** in the toolbar.
   The properties panel for the sheet opens to the right. (If it is hidden, click in the lower right-hand corner.)
2. Click the visualization that you want to edit.
   The properties panel now shows the properties of the visualization.
3. Make your changes in the properties panel.
4. Click **Done** in the toolbar.

Change the appearance of a visualization

The **Appearance** section in the properties panel offers several options to set and modify the appearance of a visualization. Many of the settings have **Auto** options that support an optimal presentation of the visualization, taking into account the number of dimensions and measures and the type of data used. Normally, you do not need to change these settings, unless you have a special reason for doing so, for example, when space is very limited.

Appearance can be affected by the sorting of the dimensions and measures.

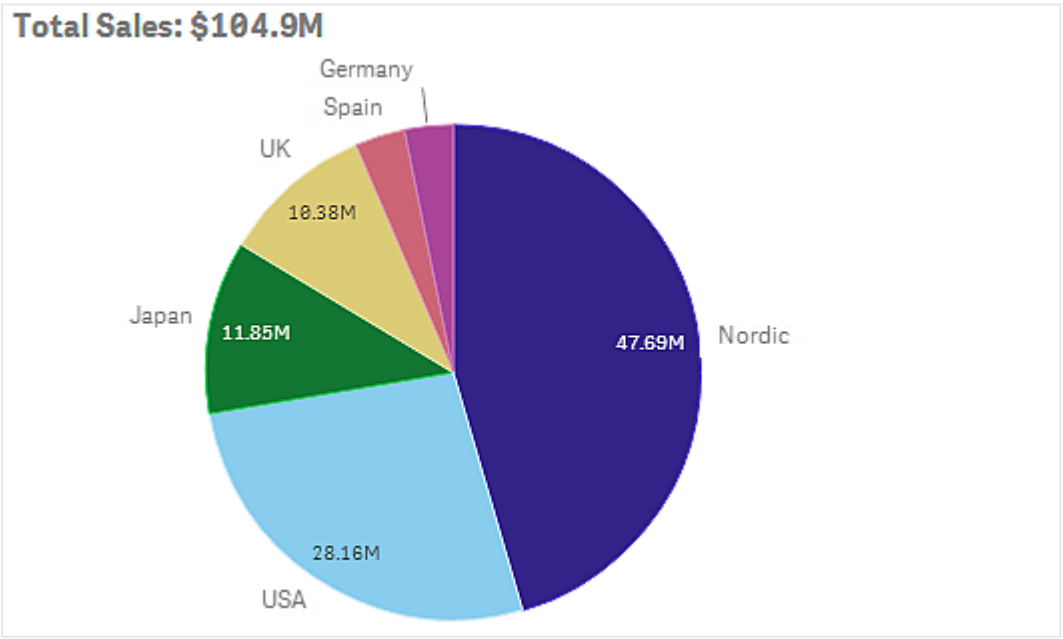
General

Show titles: **On** by default in all visualizations except filter panes and text & image visualizations. Filter panes have the name of each dimension, and in most cases do not need any additional title. The text & image visualization includes an editing toolbar with many options to format the text, and therefore the title field can be used for other purposes.

Title, **Subtitle**, and **Footnote**: Apart from the obvious use of title, subtitle, and footnote as text fields, you can use these fields to also display an expression, which provides additional information that complements the measure in the visualization. You could, for example, show the totals in the title field, so that the totals of the selected values are always available.

Example:

In the following image, the total sales are calculated and used in the title. When a selection is made, the total sales are updated accordingly.



The following string was used to add the *Total Sales* expression to the field **Title**:

='Total Sales: $'& Round(Sum(Sales)/1000000, 0.1) & 'M'.

Because the title field is primarily a text field, it is necessary to start the string with an equals sign (=), to signify that the strings contains an expression.

Because *'Total Sales: $'* is a text string when it is used in an expression, the string must be surrounded by single quotation marks.

& is used to concatenate the string and the expression.

Round(Sum(Sales)/1000000, 0.1) is the expression. The aggregation *Sum(Sales)* is divided by 1000000 and the function *Round (x,0.1)* reduces the number of decimals to one.

& 'M', finally, concatenates the expression with the unit *M* for million.

For the title there are three options for adding an expression:

- Directly in the title field of a visualization. Start the string with an equals sign (=).
- Directly in the box **Title** under **Appearance** in the properties panel. Start the string with an equals sign (=).
- Through the expression editor in the box **Title**. Click fx to open the expression editor. No equals sign is needed.

For the subtitle and footnote only the last two options are available.

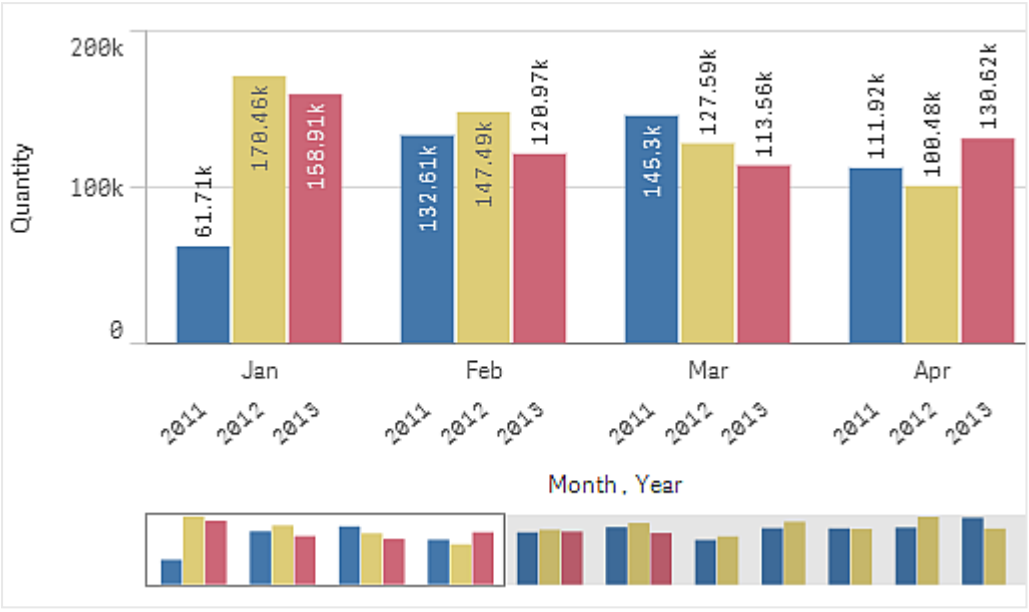
Presentation

Many of the presentation settings only apply to a certain visualization.

Bar chart	Set the bars to be displayed grouped or stacked, vertically or horizontally.
Gauge	Set the gauge to be displayed as a radial or a bar. You can set range limits and use segments with limits.
Line chart	Set the line chart to be displayed as a line or an area.
Pie chart	Set the pie chart to be displayed as a pie or a donut.
Scatter plot	Turn on/off navigation. Set the size of the bubbles in a scatter plot. Set the compression resolution for large data sets in scatter plot.
Table	Set the totals to be displayed at the top, bottom, or not at all.
Treemap	Set the headers, labels, overlay labels, and leaf values. Select to show the data values.

Example:

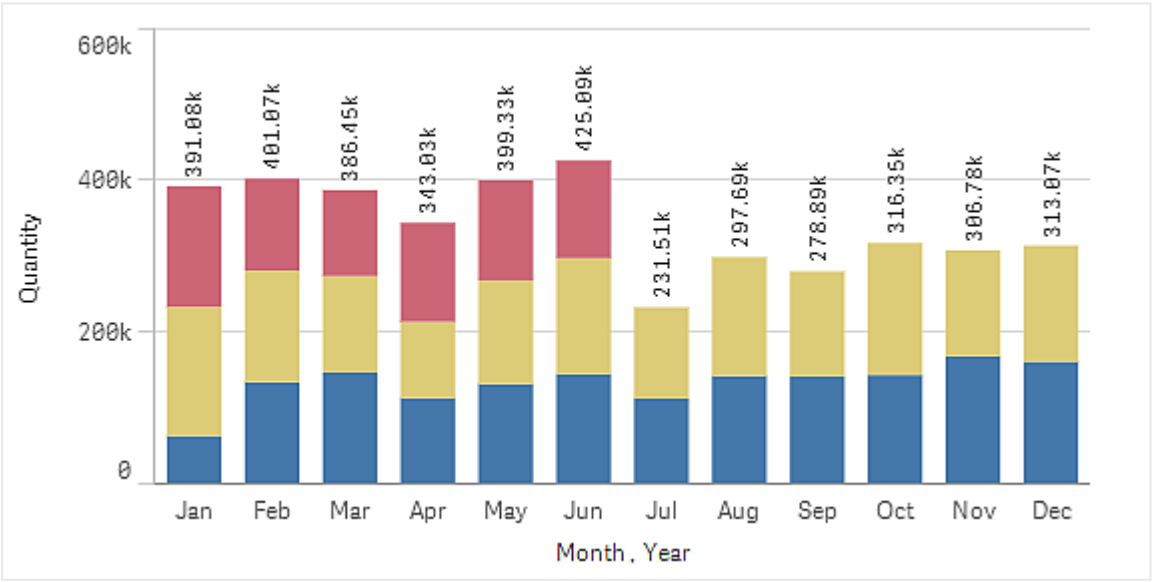
A bar chart with two dimensions is by default presented with the bars grouped.



Let us assume that you want to compare the total monthly quantity for these years. Then it would be a good idea to switch to a stacked bar chart.

In the properties panel, under **Appearance** > **Presentation** there is an option **Stacked**.

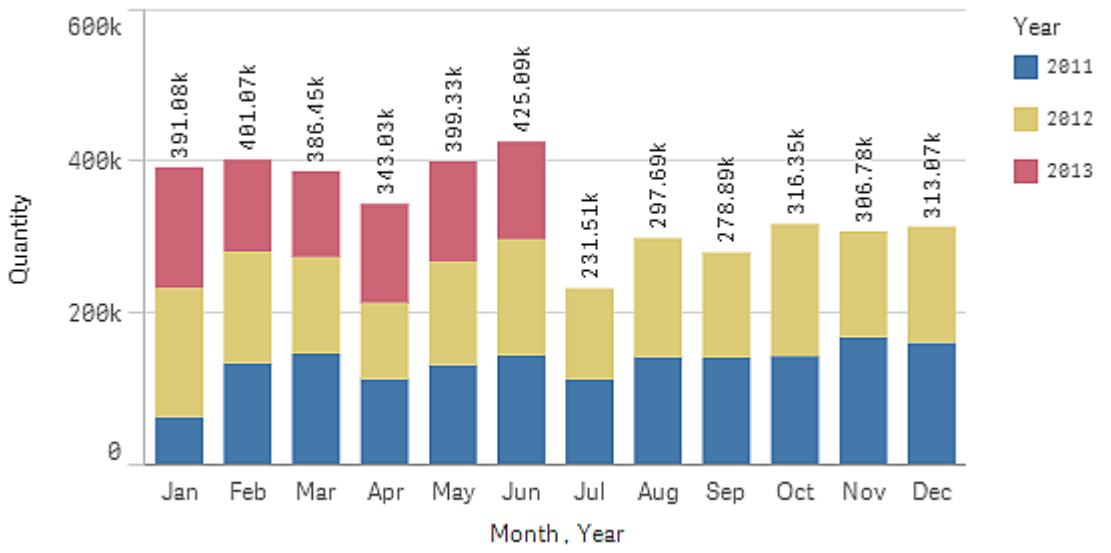
With stacked bars it is easier to compare the quantity between different months.



Now it is quite easy to compare the quantities per month, but the years are no longer visible. You can add a legend to display the years.

In the properties panel, under **Colors and legend** there is a **Show legend** button.

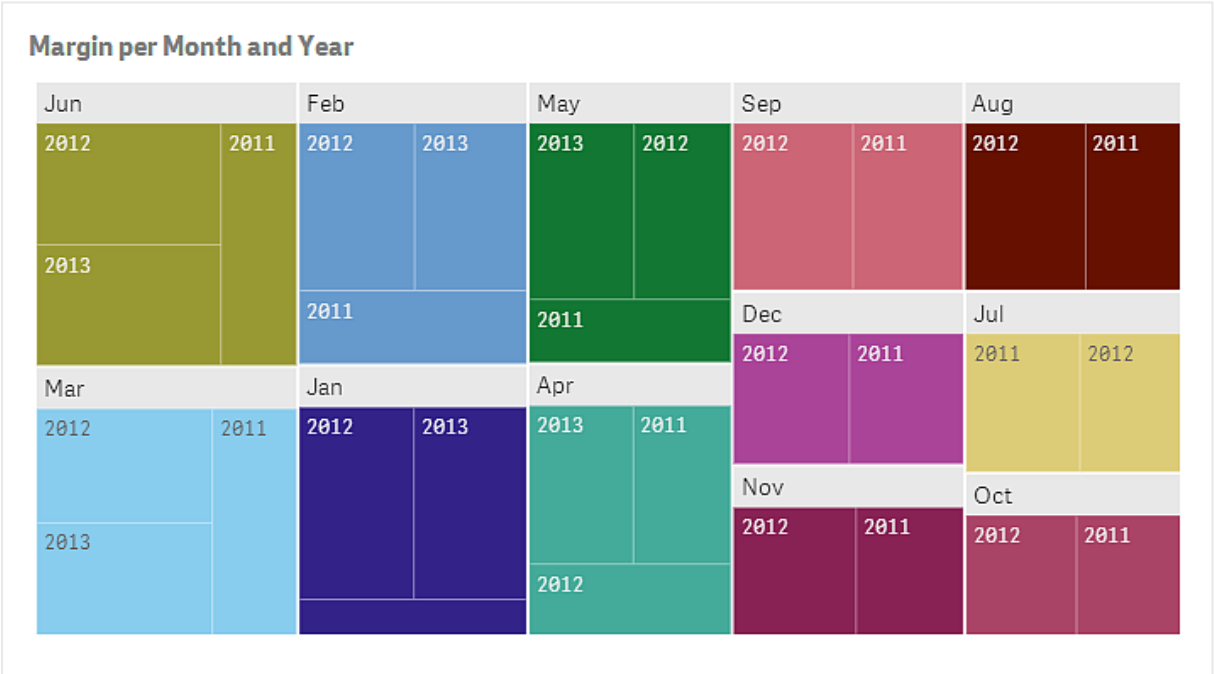
Show legend is set to **Auto**, which means that the legend is displayed when there is enough space. In the properties panel, you can also set where to display the legend and whether to display the legend title.



There is only data for the first half of 2013 (red bars).

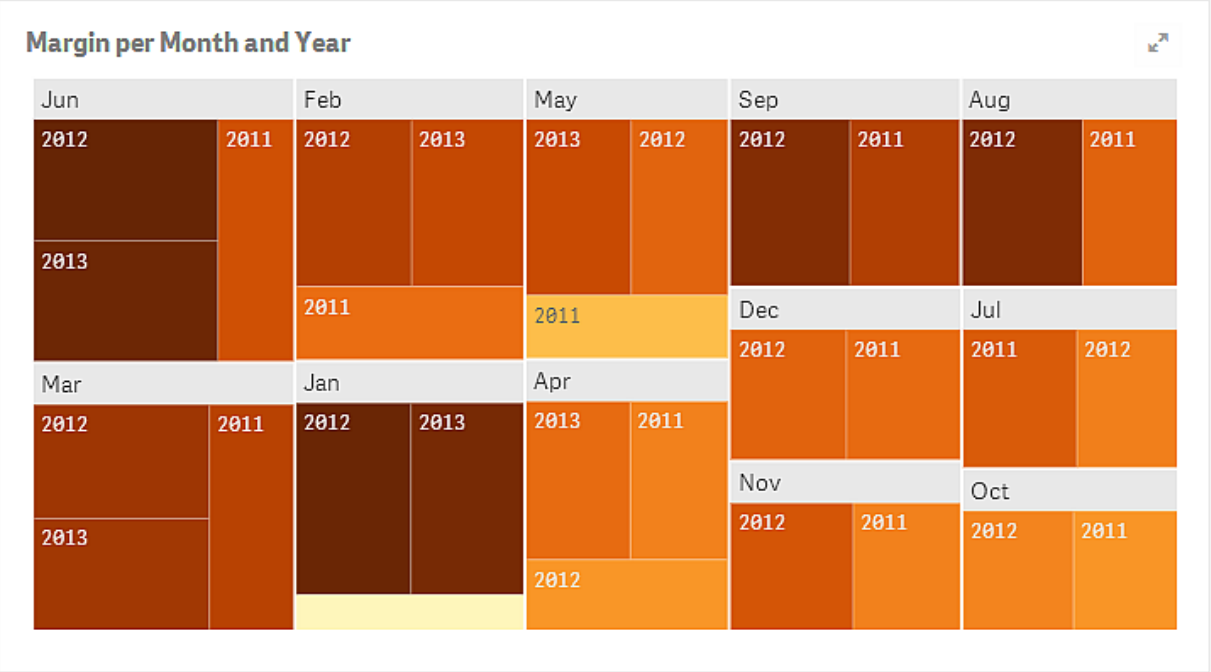
Colors and legend

In the following treemap, the margin values are presented per month and year. The months are sorted by margin value, descending, top down, left to right. By default, the coloring is by dimension with 12 colors, one for each month. The **Auto** option sets a sensible coloring for the visualization given the input data. In most cases the automatic setting does not need to be changed. However tempting it may be to "add some color" to a visualization, it is important remember that different colors should only be used when they serve a purpose.



Let us assume that you still want to change coloring to display the differences in the margin values. In that case you need to change from the automatic coloring to coloring by measure.

In the properties panel, under **Appearance** > **Colors**, there is a **Colors** button. After clicking that button you can select the option **By measure**.



The margin values are now colored by size, the darker the color, the higher the value. If you also want to differentiate between values with the same color, you can display each margin value. Under **Presentation**, there is an option **Show values** to show each margin value.

X-axis and Y-axis

For both the y-axis and the y-axis, you have options for deciding what combination of labels and title to display, as well as their orientation and position. Sometimes it may feel unnecessary to have labels and/or title, because the visualization is self-explanatory and then it would be good to be able to hide them. Furthermore, when you create a visualization that is very small, for example, three by three squares, the labels are automatically hidden.

Range: The measure axis (usually the y-axis) has an option to set the range of the axis. By default, the range is adjusted according to the highest positive or the lowest negative measure value, but if, for example, a single measure value is much larger than all the other values, you may want to set a range that is suitable for the lower values. In the properties panel, under **Appearance** > **Y-axis <measure name>**, there is a button for **Range**, which is set to **Auto**. Click the button to switch to **Custom**. Now you can set the range for **Max**, **Min**, or both. In a bar chart, the bars that are out of the range are cut diagonally to indicate that they are out range. In a line chart, only the parts that are within the range are visible.

Coloring by expression

In the properties panel, you have options for changing the color settings of a visualization. The option **By expression** gives you great freedom to decide how to color the measure values in a visualization. In the expression you can define what colors to use and have different colors for different value ranges. In a table you can define both the background color and the text color, and color different measure columns individually. Other charts receive a single color across all measures (if multiple measures exist).

Correctly used, coloring by expression is a very efficient way of accentuating values of particular interest, or differentiating between values that do and do not meet a limit value.

The expression is a color code: Selected by default, because, normally, you want to use the expression as a color code. When this option is cleared, the expression evaluates to a number, which in turn is plotted against one of the chart gradients. If you use the same expression as the measure in the visualization, you will have the same coloring as **By measure**.

Visualizations that support color by expression

The following visualizations support color by expression:

- Bar chart
- Combo chart
- Line chart
- Map
- Pie chart
- Scatter plot
- Table
- Treemap

Legend selection is not available in a visualization when coloring by expression.

Supported expression formats

The following formats are supported when you create your expressions.

RGB

With RGB colors you enter an integer value between 0 and 255 (or an expression that evaluates to such a value) for each of the colors red, green, and blue. The resulting color is produced by adding the three colors together.

Example:

rgb(0,0,255)

This example generates the color blue. Many of the RGB colors have a corresponding keyword in plain text that can be used instead of the RGB code. If you use *'blue'* as expression, you would get exactly the same color. Hexadecimal numbers are also supported, and the color blue has the string *'#0000ff'*.

ARGB

The ARGB color model has the same support as the RGB color model, but extends it with an additional alpha value to set the opacity of a color.

Example:

argb(125,0,0,255)

The first value (125), sets the alpha value. The value 0 generates full transparency and the value 255 full opacity.

HSL

In HSL, the color is defined by a hue value, a saturation value, and a luminosity value. You use values between 0 and 1. Hue is represented as an angle of the color circle (that is, the rainbow represented in a circle). Saturation is full with the value 1 and a shade of gray with the value 0. Lightness with the value 1 is white, and black with the value 0. The value 0.5 is commonly used.

Example:

hsl(0,0.5,0.5)

This example generates a red color with medium saturation and lightness.

Qlik Sense color functions

The following color functions can be used in the expressions.

- black()
- darkgray()
- lightgray()
- white()
- blue()
- lightblue()
- green()
- lightgreen()
- cyan()
- lightcyan()
- red()
- lightred()
- magenta()

- lightmagenta()
- brown()
- yellow()

Creating an expression

You create expressions for colors in the properties panel.

Do the following:

1. In the properties panel, open **Appearance** > **Colors and legend**.
2. Click the **Colors** button to switch to **Custom**.
3. In the drop-down list, select the option **By expression**.
   An expression text box is opened.
4. Enter your expression in the text box, or click fx to open the expression editor.

If the expression is valid, the visualization is updated.

Examples

Here are a few examples to show what you can do with expressions by color.

Example 1:

if(sum([Budget Amount]) > 1000000, 'cornflowerblue', magenta())

In this example there is a condition. If *sum([Budget Amount])* is greater than 1 million, the corresponding measure values will be colored 'cornflowerblue', otherwise they will be colored magenta.

'cornflowerblue' is the keyword for the color rgb(100, 149, 227).

magenta() is the function that generates a magenta color.

Example 2:

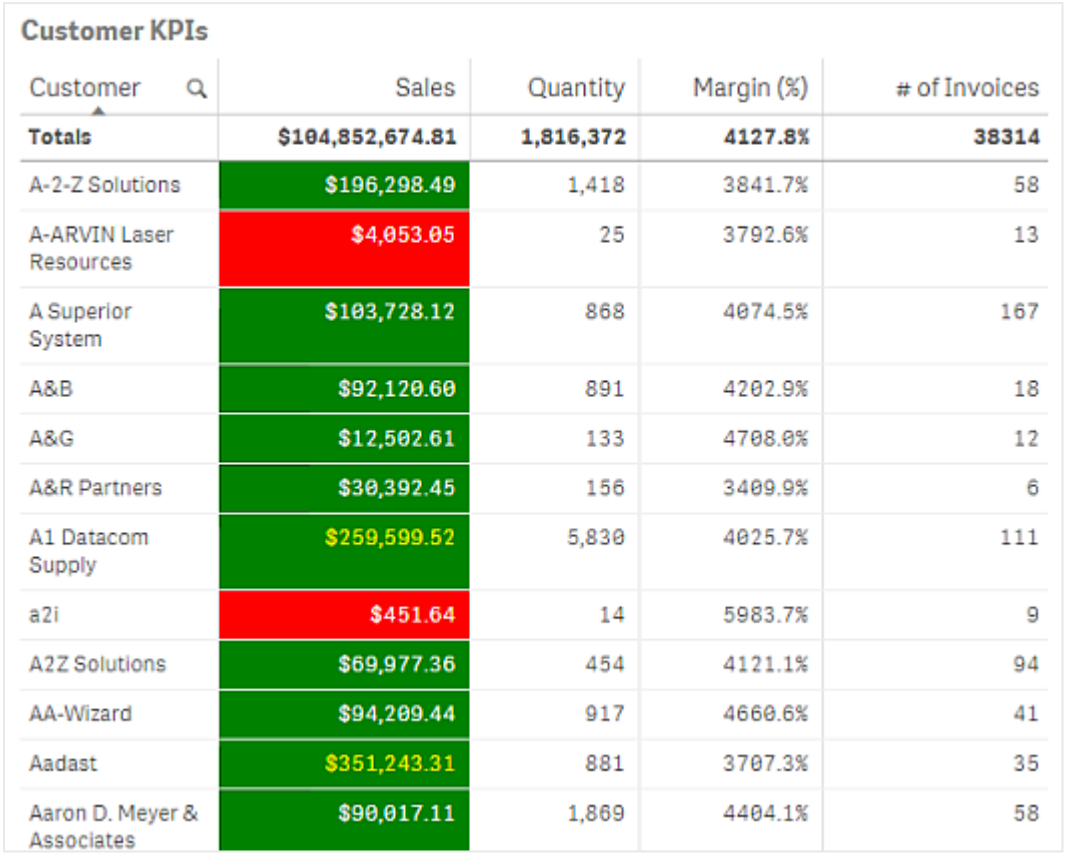
*argb(255,rand()*255,rand()*255,rand()*255)*

This example starts with alpha value for full opacity, and then uses the rand() function to generate random values for the red, green, and blue colors.

Example 3:

In the properties panel for a table, under **Columns** > **<Measure name>**, you have color expression options both for the background color and the text color. If you set a background color that is dark, the text color will automatically become white instead of black to improve readability.

The following screenshot shows the use of expressions for background color and text color. Measure values in *Sales* that are lower than $10000 have a red background color, all other values have a green background. In addition, the values that are higher than $200000 have the text color 'gold'.



Customer KPIs

Customer	Sales	Quantity	Margin (%)	# of Invoices
Totals	**$104,852,674.81**	**1,816,372**	**4127.8%**	**38314**
A-2-Z Solutions	$196,298.49	1,418	3841.7%	58
A-ARVIN Laser Resources	$4,053.05	25	3792.6%	13
A Superior System	$103,728.12	868	4074.5%	167
A&B	$92,120.60	891	4202.9%	18
A&G	$12,502.61	133	4708.0%	12
A&R Partners	$30,392.45	156	3409.9%	6
A1 Datacom Supply	$259,599.52	5,830	4025.7%	111
a2i	$451.64	14	5983.7%	9
A2Z Solutions	$69,977.36	454	4121.1%	94
AA-Wizard	$94,209.44	917	4660.6%	41
Aadast	$351,243.31	881	3707.3%	35
Aaron D. Meyer & Associates	$90,017.11	1,869	4404.1%	58

Use the following links to find out more about CSS colors:

- http://www.w3.org/TR/CSS21/syndata.html#value-def-color
- https://developer.mozilla.org/en-US/docs/Web/CSS/color_value

Change the data of a visualization

In most visualizations, dimensions and measures are essential parts. The dimensions and measures define what the visualizations display, and by adding more than one dimension or measure you can compare or group data in different ways.

Adding dimensions

In the properties panel, under **Data**, you can add a dimension. Click **Add data** and select **Dimension** to open a list of available **Dimensions** and **Fields**. The dimensions are those that exist as master items and the fields are those that have been loaded into the app.

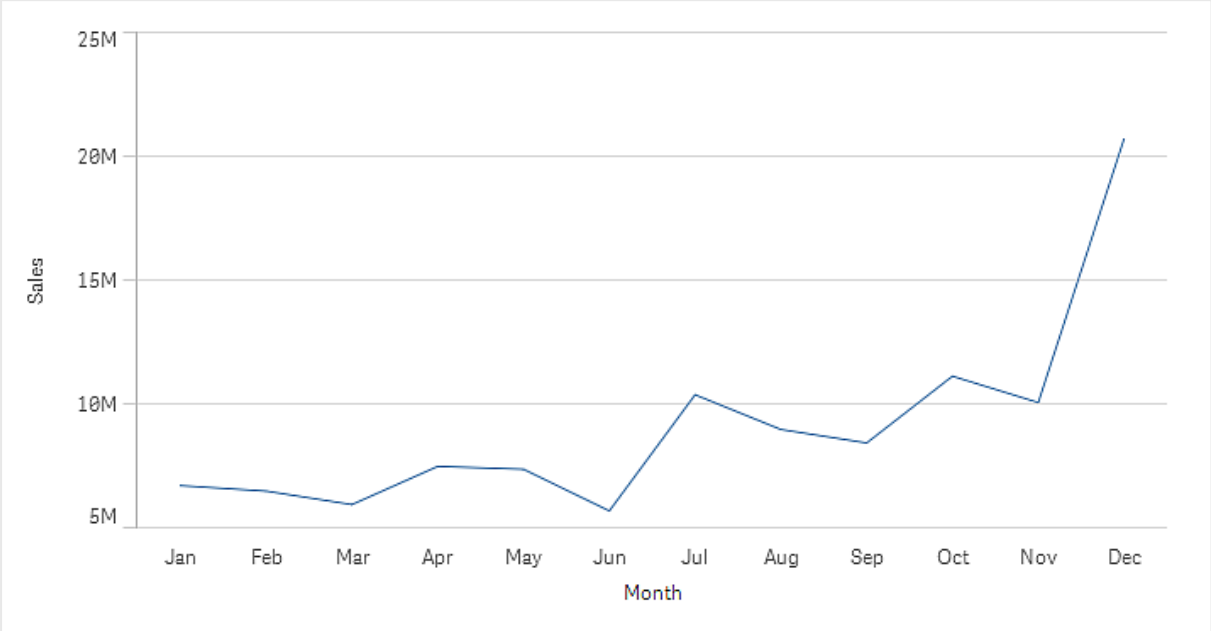
Let us assume that you create a dimension by clicking **Add data**, selecting **Dimension** and typing *Month*. You select the field *Month* from the list to create a new dimension. You can edit the dimension after it has been created.

Adding measures

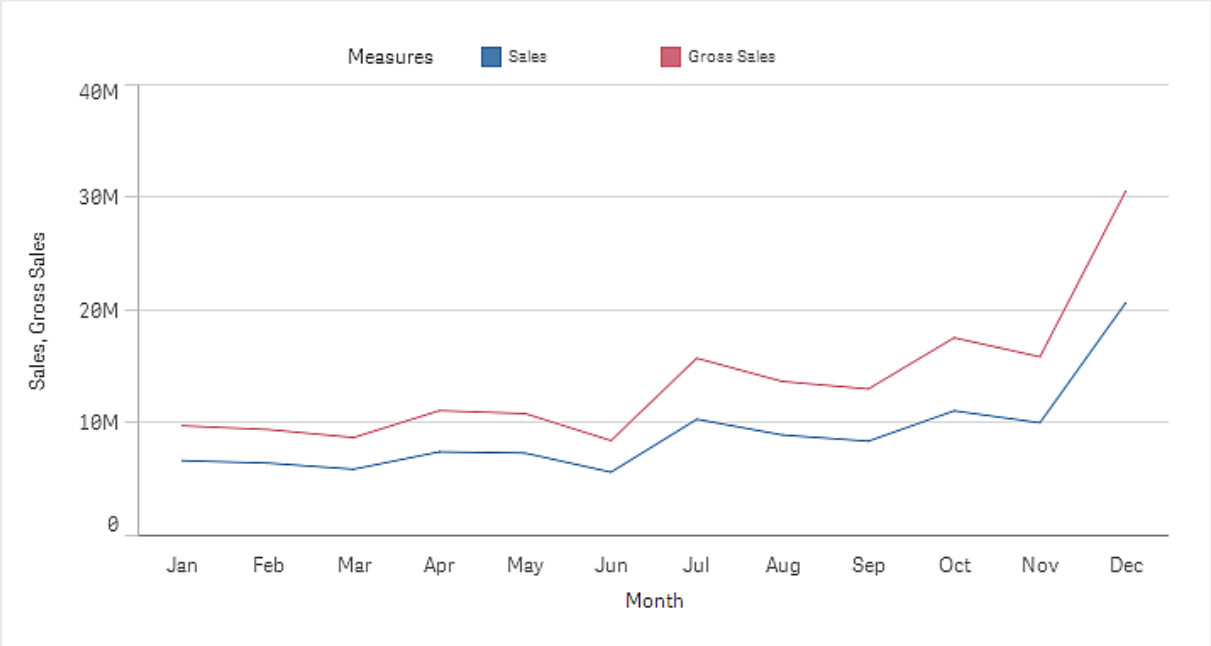
In the properties panel, under **Data**, you can add a measure. Click **Add data** and select **Measure** to open a list of available **Measures** (if any).

Let us assume that you create a measure by clicking **Add data**, selecting **Measure** and typing *Sum(Sales)* to create a new measure that calculates the sum of sales. You can edit the measure after it has been created.

In the following line chart, a measure *Sales* and a dimension *Month* have been added.



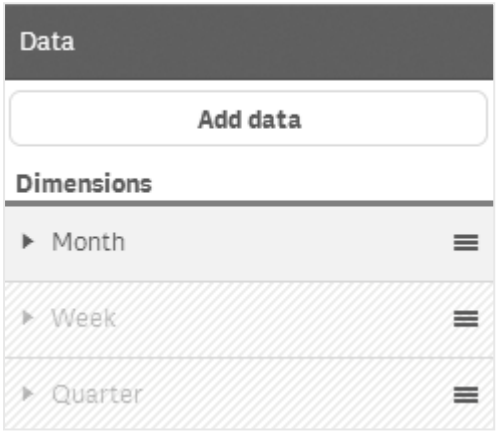
You can add a second measure, *Gross Sales*, to compare with *Sales*.



Line chart with the measures Sales and Gross Sales

Many visualizations have limitations on how many dimensions and measures that can be displayed at the same time. A line chart with two or more measures can only have one dimension, and a line chart with two dimensions can only have one measure. However, even if there are limitations on a visualization, you may sometimes have more dimensions or measures than those that are used in the visualization. This can happen when you have converted from one visualization to another, and some of the dimensions and measures are not used in the new visualization.The unused dimensions and measures are not displayed in the visualization, but they are visible in the properties panel under **Dimensions** and **Measures**, respectively.

In the following screenshot from the properties panel, there are three dimensions: *Month*, *Week*, and *Quarter*. The screenshot shows that the dimension *Month* is in use, but by dragging *Quarter* or *Week* to the top, that dimension will be used instead.



Properties panel for a chart with two unused (dimmed) dimensions: Week and Quarter

Master items

Dimensions and measures that are linked to a master item are displayed with a in the properties panel. If you want to edit a linked dimension or measure, you have two options: either updating the master item in the assets panel, or unlinking the item and making the changes in the properties panel. An update of the master item is reflected in all linked items.

Even if linked items cannot be edited in the properties panel, you still have a few settings that can be edited. These are related to the presentation of the items.

A visualization that is linked to a master item is displayed with a on the sheet. You can edit a linked visualization, either by editing the master item or by unlinking the visualization. The unlinked visualization is independent of the master item and can be edited, but it can still contain dimensions or measures that are linked to master items.

Editing a dimension

You can edit dimensions in the properties panel. If you want to edit a master item, you must first unlink the dimension from the master item. In the properties panel, click the dimension that you want to edit. If the dimension is dimmed, it is not part of the current visualization and must be moved (temporarily) to the top in **Dimensions** to be editable.

Field: Start typing the field name to display a list of matching fields to choose from. You can also click *fx* to open the expression editor, where you can create a calculated dimension.

Label: Enter a name for the dimension.

Show null values: If, for example, you have sales figures but do not have any information about what company the figures belong to, the figures will be added to the measure value for the null value dimension. The null value dimension is presented as a gap or a dash, depending on the visualization that is used.

Limitation: You can limit the number of dimension values that are displayed.

Show others: When you have set a limitation for the number of dimension values displayed, you have an option to summarize the measure values for the remaining dimensions by selecting **Show others**.

Editing a measure

You can edit measures in the properties panel. If you want to edit a master item, you must first unlink the measure from the master item. In the properties panel, click the measure that you want to edit. If the measure is dimmed, it is not part of the current visualization and must be moved (temporarily) to the top in **Measures** to be editable.

Expression: Enter the expression. You can also click *fx* to open and use the expression editor.

Label: Enter a name for the measure. The label is not automatically updated when you make changes in **Expression**.

Number formatting: Set the number formatting for the measure values. The options **Number** and **Date** offer custom formatting options for defining your own format pattern.

Invalid dimensions and measures

If you create an invalid dimension or edit an existing one so that it becomes invalid, the dimension is presented in the properties panel as dimmed with a red hue to indicate that the dimension is invalid. If you use an invalid dimension in a visualization, the visualization cannot be displayed.

If you create an invalid measure or edit an existing one so that it becomes invalid, the **Expression** text box under **Measures** in the properties panel is presented with a red border to indicate that the measure is invalid.

Deleting dimensions and measures

In the properties panel, you can delete a dimension or measure. Long-touch/right-click the dimension or measure and select **Delete** in the dialog. Alternatively, click the dimension or measure and click **Delete** 🗑 . If you delete an instance of a master item, the master item is still available in the assets panel.

Adding a dimension

Adding dimensions to a visualization can be done from the properties panel.

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click ❐ in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Adding a dimension from master items or fields

Do the following:

1. In the properties panel, click the **Data** tab.
   The **Data** tab is expanded.
2. Click **Add data** and select **Dimension**.
   A dialog with a text box opens. Below the text box all available dimensions are listed, grouped into **Dimensions** (that is master items) and **Fields**.
3. Start typing in the text box.
   A list of matching fields and dimensions is displayed.

   You can also create a dimension by entering an expression directly in the text box, or by clicking to create a dimension in the expression editor.
4. Select the field or dimension that you want to use.

The dimension is added to the visualization and the new dimension's settings are shown in the properties panel.

Adding a measure

Adding measures to a visualization can be done from the properties panel.

You open the properties panel for a visualization by clicking **Edit** in the toolbar and clicking the visualization that you want to edit.

If the properties panel is hidden, click in the lower right-hand corner to open it.

If the visualization has in the upper right-hand corner, the visualization is linked to a master item. You cannot edit a linked visualization, but you can edit the master item. You can also unlink the visualization to make it editable.

Do the following:

1. In the properties panel, click the **Data** tab.
   The **Data** tab is expanded.
2. Click **Add data** and select **Measure**.
   A dialog with a text box opens. Below the text box all available measures are listed, grouped into **Measures** (that is master items) and **From a field**.

3. Start typing in the text box.
   A list of matching measures is displayed.

   > *If no measure is displayed, you need to create one. You can enter an expression directly in the text box, or you can click fx to create a measure in the expression editor.*

4. Select the measure that you want to use.

The measure is added to the visualization and the new measure's settings are shown in the properties panel.

Editing a measure from the properties panel

In the properties panel, you can modify a measure that is used in a visualization. A measure is either a library measure, or a standalone measure that is used only by an individual visualization. A library measure is indicated by the symbol in the properties panel.

Making a standalone measure from a library measure

Do the following:

1. When editing a sheet, click the visualization that you want to edit.
   The properties panel for that visualization is displayed on the right-hand side.
2. Under **Data**, locate and click the measure.
3. Click to unlink the measure.
4. Click **OK** to confirm.
   The measure is no longer linked to the master item.
5. In the expression box, click fx.
   The **Edit expression** dialog opens.
6. Make your changes and save the expression.

The measure is updated.

Editing a standalone measure

Do the following:

1. When editing a sheet, click the visualization that you want to edit.
   The properties panel for that visualization is displayed on the right-hand side.
2. Under **Data**, locate and click the measure.
3. In the expression box, click fx.
   The **Edit expression** dialog opens.
4. Make your changes and save the expression.

The measure is updated.

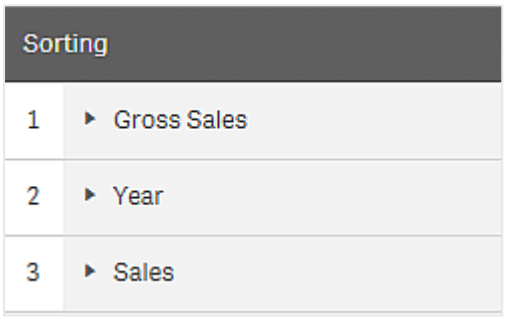
See also:

- *Create master measures (page 267)*

Change the sorting of a visualization

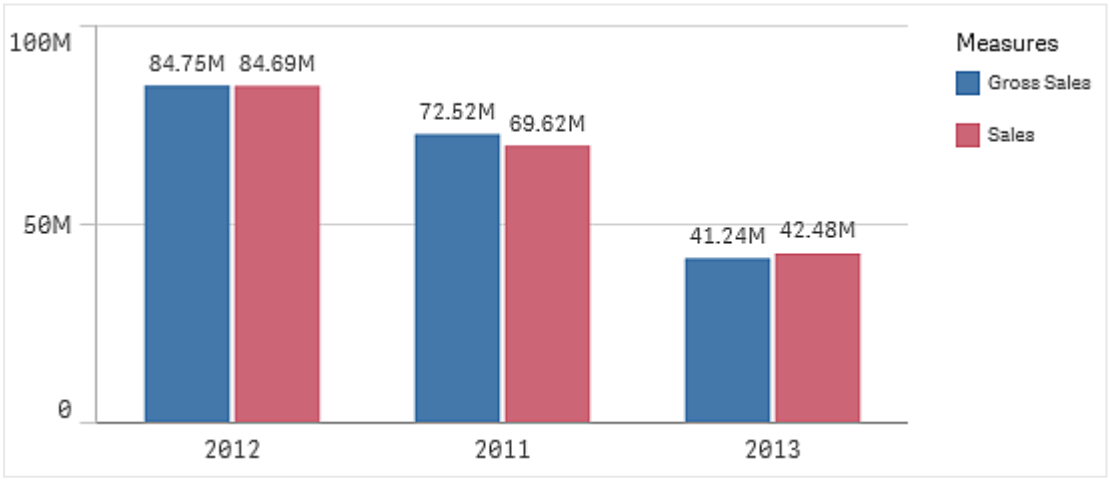
When you are working with a visualization, you will occasionally want to change the sorting order of the dimensions and measures so that your data is presented in the way you intend. Most visualizations have a **Sorting** section in the properties panel where you can put the cursor on the ≡ drag bars and drag the dimension or measure to rearrange the sorting order. In visualizations without a sorting section, you can still adjust the sorting to some extent.

In the following screenshot, the primary sorting is on the measure *Gross Sales*.



Sorting section in the properties panel

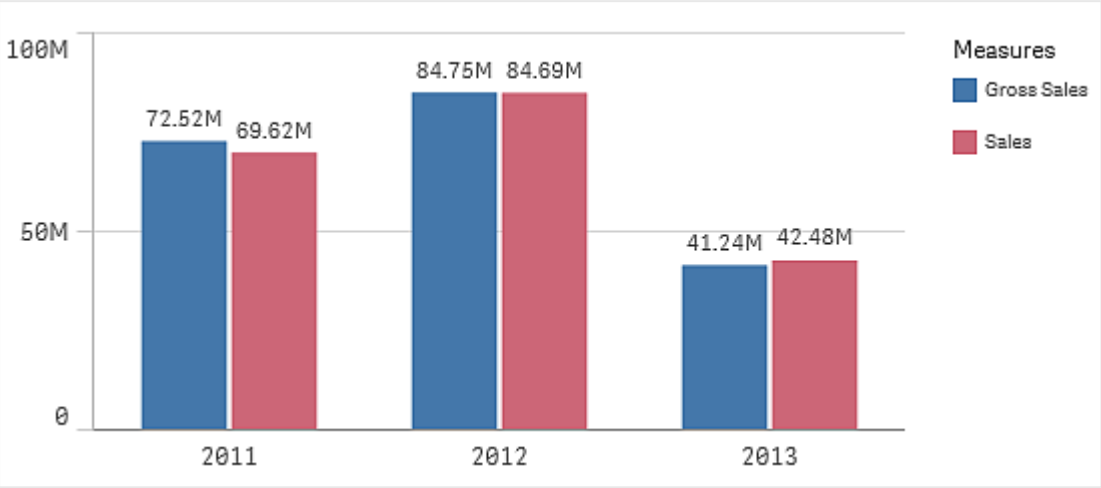
A bar chart with that sorting order will look as follows.



Bar chart sorted by Gross Sales

Since there are two measures, *Gross Sales* and *Sales*, the bars are by default grouped. *Gross Sales* is presented first, because it has sorting priority 1. If you were to drag *Sales* to the top of **Sorting**, the first bar would be *Sales* and the second bar *Gross Sales*.

To sort by *Year*, instead, you need to drag *Year* to the top in **Sorting**. The bar chart is then updated and sorted by *Year*.



Bar chart sorted by Year

> *In bar charts with multiple dimensions, sorting is locked to the first dimension. This dimension is what groups and stacks are based on, and sorting on a different dimension or a measure would break up these groups in an undesirable way. If you still want to sort by the measure value, try using the option **Sort by expression** on the first dimension under **Sorting**.*

Sorting in the dimensions and measures sections

Although it is primarily under **Sorting** that you set the sorting order, you can also adjust the order in the properties panel section **Data** under **Dimensions** and **Measures**. In **Dimensions** you can change the priority order between the different dimensions by dragging them, and, likewise, in **Measures**, you can drag the measures to change the sorting order. Put the cursor on the ≡ drag bars and drag the dimension or measure to rearrange the order. Changes are reflected in the visualization.

Internal sorting

Apart from setting the sorting order between dimensions and measures, you can also set the internal sorting order, under **Sorting**.

Click the dimension or measure name to open the settings and click the sorting button to switch to **Custom** sorting. The following table shows the internal sorting priority order and sorting options. The sorting is either **Ascending** or **Descending**.

Sorting options	Comment
Sort by expression	Enter an expression to sort by. Only available for dimensions.
Sort numerically	
Sort alphabetically	

Default sorting

By default, the dimensions and measures are sorted in the order they were added, with the most recently added item last. Each dimension is sorted internally in the most common way for that type of data. Numbers are sorted numerically, ascending. Text is sorted alphabetically, ascending.

Bar chart	By default, a bar chart with one measure and one dimension is presented with vertical bars sorted descending on the measure. When a dimension has less than 10 values, the sorting is by dimension, alphabetically.
Combo chart	Sorted by the first item added, either the dimension or the measure.
Filter pane	By default, data in filter panes is presented ascending.
Gauge	A gauge only uses a single measure value, the first one under **Measures**.
KPI	By default, the first added measure becomes the main value.
Line chart	By default, a line chart is sorted by the dimension.
Map	A map can only have one dimension and one measure.
Pie chart	A pie chart uses one measure and one dimension. By default, a pie chart is sorted by the measure in descending order.
Scatter plot	The scatter plot does not have any sorting section, but the order of the measures decides where they are used. The first measure is used on the x-axis, the second measure is used on the y-axis, and the third (optional) measure is used for the bubble size (it is used to set the color on large data sets) in the scatter plot. You can only have one dimension in a scatter plot.
Table	By default, the column presents the dimensions and measures in the order they were added. Sorting order of rows: By default, the table is sorted in ascending order by the first dimension or measure under **Sorting**. You can temporarily change the sorting by clicking the header of the row you want to sort on. One click - ascending order, two clicks - descending order.
Text & image	The text & image visualization does not have any sorting section, but you can drag the measure tokens in the visualization to change the order.
Treemap	The treemap does not have any sorting section. The sorting is automatically by measure size.

Unlinking from a master dimension

If you want to make changes to a dimension that is linked to a master dimension, you must first unlink it from the master dimension. The dimension in your visualization is then independent with no connection to the master dimension in the assets panel.

Unlinking from the properties panel

A linked dimension that is used in a visualization can be unlinked from the properties panel.

Do the following:

1. Click **Edit**.
   The properties panel opens on the right-hand side.
2. Select the visualization on the sheet.
   The properties for the selected visualization are displayed in the properties panel.
3. Click the **Dimensions** heading in the properties panel to expand the category, and click the dimension.
4. Click next to the dimension.
   A dialog is displayed that you are about to unlink from a master dimension.
5. Click **OK**.

The dimension used in the visualization can now be edited and the changes will not affect any other dimensions.

You can only unlink from a single dimension, not to a drill-down dimension.

Unlinking from a master measure

If you want to make changes to a measure that is linked to a master measure, you must first unlink it from the master measure. The measure in your visualization is then independent with no connection to the master measure in the assets panel.

Unlinking from the properties panel

A linked measure that is used in a visualization can be unlinked from the properties panel.

Do the following:

1. Click **Edit**.
   The properties panel opens on the right-hand side.
2. Select the visualization on the sheet.
   The properties for the selected visualization are displayed in the properties panel.
3. Click the **Measures** heading in the properties panel to expand the category, and click the measure.
4. Click next to the measure.
   A dialog is displayed that you are about to unlink from a master measure.
5. Click **OK**.

The measure used in the visualization can now be edited and the changes will not affect any other measures.

Changing the title of a visualization

You can change the title of a visualization by editing it directly on the sheet. You change the title by clicking it and making your changes.

You need to be in sheet view to edit the title.

Do the following:

1. Click **Edit** in the toolbar.
2. Click the title that you want to edit.
   The cursor appears.
3. Enter a title.
4. Click outside the title area.

The title is changed.

> *The text **Click to add title** is only visible in while editing the sheet. By default, the visualizations do not have a title.*

Editing a text & image

In the text & image visualization you can add and format text, images, measures, and links in various ways.

When you are editing a sheet and the text & image visualization does not have focus, you need to click twice to open the editing toolbar. In the editing toolbar, you can format text properties such as color, size, and style, and also align the text. Additionally, you have options for adding links and images.

Editing toolbar

Creating a link

You can mark a text section and use it for a link.

If you do not add a prefix, *http://* is added automatically, assuming that you are adding a web address.

Do the following:

1. Select the text section that you want to use for the link.
2. Click in the editing toolbar to open the link dialog.
3. Enter the web address that you want to link to.
4. Click .

The link is created.

Removing a link

You can remove a link from a text section.

Do the following:

1. Click the link so that the cursor is somewhere inside it.
2. Click in the editing toolbar to open the link dialog.
3. Click .

The link is removed, but not the text.

Adding an image

You can add an image through the editing toolbar. You can use one of the default images, or an image of your own. If you are using Qlik Sense Desktop, you can also use bundled images saved in the qvf file.

Do the following:

1. Click in the editing toolbar.
   The **Media library** opens.

   The following formats are supported: .png, .jpg, .jpeg, and .gif.
   *For Qlik Sense: You need to use the Qlik Management Console to upload images to the default folder. You can upload images to the **In app** folder in the media library.*
   *For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

2. Click on a folder in the media library, for example **In app** or **Default**.
3. Select the image that you want to add.
4. Click **Insert**.

The image is added.

In the properties panel, you can add a background image, which, for example, can be used when you want to insert text in the image. The images added through the editing toolbar are not background images.

Adding a measure

You can add a measure in the following ways:

- By dragging a field from the assets panel and adding it as a measure.
- By dragging a measure from **Master items**.
- By adding a measure (existing or new) from the properties panel.

When you are editing the measure, it is displayed as a token, which can be styled and moved around in the visualization. You can also apply number formatting to it. When you leave the editor, the measure value is displayed . Values that cannot be aggregated are shown as a hyphen (-).

Deleting a measure

You can delete a measure in the following ways:

- Place the cursor before the token and press Delete.
- Place the cursor after the token and press Backspace.
- In the properties panel, long-touch/right-click the measure and select **Delete** in the dialog.
- In the properties panel, click the measure and click **Delete** 🗑 .

7.13 Converting a visualization

You can convert from one visualization type to another by dragging a chart from the assets panel on the left-hand side onto the visualization that you want to convert. All properties that the original visualization has are transferred to the new type. The new visualization uses the dimensions, measures, and settings that are applicable to that visualization type, but all properties from the original visualization are saved, even if they are not available or visible in the new visualization. This means that properties can become available again if you decide to convert to yet another visualization type where those properties are used.

Do the following:

1. While editing a sheet, drag a new chart from the assets panel onto the visualization that you want to convert.
   The shortcut menu opens.
2. Select the conversion option.

The new visualization is displayed, using the data from the original visualization.

When you convert to a new visualization type, some of the settings from the original visualization may not be optimal for the new visualization, for example, the sorting order. Therefore, you may need to make some changes in the properties panel, so that the new visualization is displayed as you want.

You cannot convert to or from a map or a text & image visualization, nor can you convert a master visualization.

7.14 Copying a visualization

You can copy a visualization:

- Within the same sheet
- Between sheets in the same app
- Between sheets belonging to different apps.

For a copied visualization to work in a different app, the same dimensions and measures have to be a part of the target app as well.

Do the following:

1. While editing a sheet, click on the item you want to copy.
   The item is highlighted.
2. On the edit bar, click .
3. To insert the item on another sheet, navigate to the sheet via the sheet navigator.
4. Click to paste the item.

The copied item is added to the sheet.

Depending on what situation you are in, different things will happen when you paste the copied visualization on a sheet:

- *If a visualization is selected, then the selected visualization will be replaced.*
- *If no visualization is selected, then the pasted visualization will be placed in the largest empty space.*
- *If there is no empty space, then the largest visualization on the sheet will be split in half to make space for the pasted visualization.*

7.15 Moving a visualization

You can move a visualization on a sheet.

Do the following:

1. Click **Edit** in the toolbar.
2. Drag the visualization to where you want to move it.

If you drag a visualization to the center of another visualization, they will swap places. If you drag a visualization towards one of the sides of another visualization, they will resize and share the existing space.

7.16 Replacing a visualization

You can copy a visualization on a sheet and then replace a different visualization with the copied visualization. You can replace a visualization that is located on any sheet in any app.

Do the following:

1. Click **Edit**.
2. Long-touch/right-click the visualization you want to copy and select **Copy**.
3. Long-touch/right-click on the visualization you want to replace an select **Paste and replace**.

The visualization is replaced.

If you select a visualization, you can replace that visualization with a copied visualization by pressing Ctrl+V.

7.17 Resizing a visualization

You can resize a visualization on a sheet. You can only use the available space when resizing. Other visualizations are not moved or resized when you resize a visualization.

Do the following:

1. Click **Edit** in the toolbar.
2. Click the visualization that you want to resize.
3. Use the handles on the edges to resize the visualization.

The resize causes the visualization to use progressive disclosure.

When you increase the size of a visualization, its information is disclosed progressively. If you reduce the size, the visualization's information is reduced, which allows you to focus on the essential information and avoid cluttering the visualization with too much information in too little space.

7.18 Showing a visualization in full screen

You can expand a visualization on a sheet to see the details.

Touch device interaction

Do the following:

1. Long-touch the visualization.
   The touch item menu is displayed.

2. Tap .

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

Computer (mouse) interaction

By default the full screen icon is hidden.

Do the following:

1. Hover over the visualization that you want to expand.
2. Click at the top right of the visualization.

The visualization is displayed in full screen.

Close the full screen view and return to the sheet view by clicking .

7.19 Unlinking from a master visualization

If you want to make changes to a visualization that is linked to a master visualization, you must first unlink it from the master visualization. The visualization on your sheet is then independent with no connection to the master visualization in the assets panel.

Unlinking using

A linked visualization can be unlinked using that is located in the top right corner of a linked visualization.

Do the following:

1. Click **Edit**.
2. Click in the top right corner of a linked visualization on the sheet.
   A dialog is displayed that you are about to unlink from a master visualization.
3. Click **OK**.

The visualization on the sheet can now be edited and the changes will not affect any other visualizations.

Unlinking from the shortcut menu

A linked visualization can be unlinked from the shortcut menu.

Do the following:

1. Click **Edit**.
2. Long-touch/right-click a linked visualization on the sheet.
   The shortcut menu opens.
3. Select **Unlink visualization**.

A dialog is displayed that you are about to unlink from a master visualization.

4. Click **OK**.

The visualization on the sheet can now be edited and the changes will not affect any other visualizations.

7.20 Deleting a visualization

You can delete a visualization from a sheet.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
2. Long-touch/right-click the visualization.
   The shortcut menu opens.
3. Click **Delete**.

You can also delete a visualization by selecting it, and then clicking the wastebasket that is available when you are editing a sheet.

8 Using expressions in visualizations

Visualizations in Qlik Sense are built from charts, which in turn, are built from dimensions and measures, depending on the type of chart. Visualizations can have titles, subtitles, footnotes, and other elements to help convey information. All of the elements that make up a visualization can be simple: a dimension consisting of a field representing data, a title consisting of text, for example.

For visualizations that contain measures, the measures are calculations based on fields, for example **Sum (Cost)**, which means all the values of the field **Cost** are aggregated using the function **Sum**. In other words, **Sum(Cost)** is an expression.

An expression is a combination of functions, fields, and mathematical operators (+ * / =). Expressions are used to process data in the app in order to produce a result that can be seen in a visualization. They are not limited to use in measures. You can build visualizations that are more dynamic and powerful by using expressions for titles, subtitles, footnotes, and even dimensions.

This means, for example, that instead of the title of a visualization being static text, it can be made from an expression whose result changes depending on the selections made.

Expressions can be used in a visualization wherever the symbol fx is seen in the properties panel while editing a visualization. The fx symbol indicates an expression field. By clicking fx, you enter the expression editor, which is designed to help you build and edit expressions. Expressions can also be entered directly into the expression field, without using the expression editor.

An expression cannot be saved directly as a master item, but if an expression is used in a measure or dimension, which is then saved as a master item, with its descriptive data, such as name, description, and tags, the expression in the measure or dimension is preserved.

For detailed reference regarding script functions and chart functions, see the Script syntax and chart functions.

8.1 Expressions

An expression is a combination of fields, variables, operators, functions, numbers, and mathematical symbols put together according to a special syntax in order to calculate a value. Expressions are used both in scripts and in chart visualizations. They can be simple, involving only basic calculations, or complex, involving functions fields and operators.

In a script, an expression is evaluated as the script execution passes it by. In visualizations (including charts and tables), expressions are evaluated automatically whenever any of the fields, variables or functions that the expression contains change value or logical status.

Expressions can be used in several different situations. The difference between measures and expressions is that expressions have no name or descriptive data.

A few differences exist between script expressions and chart expressions in terms of syntax and available functions.

For detailed reference regarding script functions and chart functions, see the Script syntax and chart functions.

8.2 Functions

A function is a type of procedure or routine that performs a specific task on data in apps. Qlik Sense provides several hundred functions that can be used for various purposes, such as: to perform calculations, interpret data or system information, determine conditions, and so on.

Many functions can be used both in the data load editor and in visualizations. Some functions are specific to visualizations (chart functions), and others are specific to the data load editor (script functions).

Functions are often, but not always, used in expressions.

The following list shows some examples of functions:

- **Max**: an aggregation function that can be used in scripts and charts.
  For example: **Max(Sales)** calculates the highest value in the field Sales.
- **IF**: a conditional function that can be used in scripts and charts.
  For example: **IF(Amount>0, 'OK','Alarm')** determines if the condition 'is the value of Amount greater than zero?' is met. If it is, OK is written, otherwise Alarm is written.
- **Date#**: an interpretation function that can be used in scripts and charts.
  For example: **Date#(A)** takes the input value **A** and evaluates it as a date.

For detailed reference regarding script functions and chart functions, see the Script syntax and chart functions.

8.3 Variables

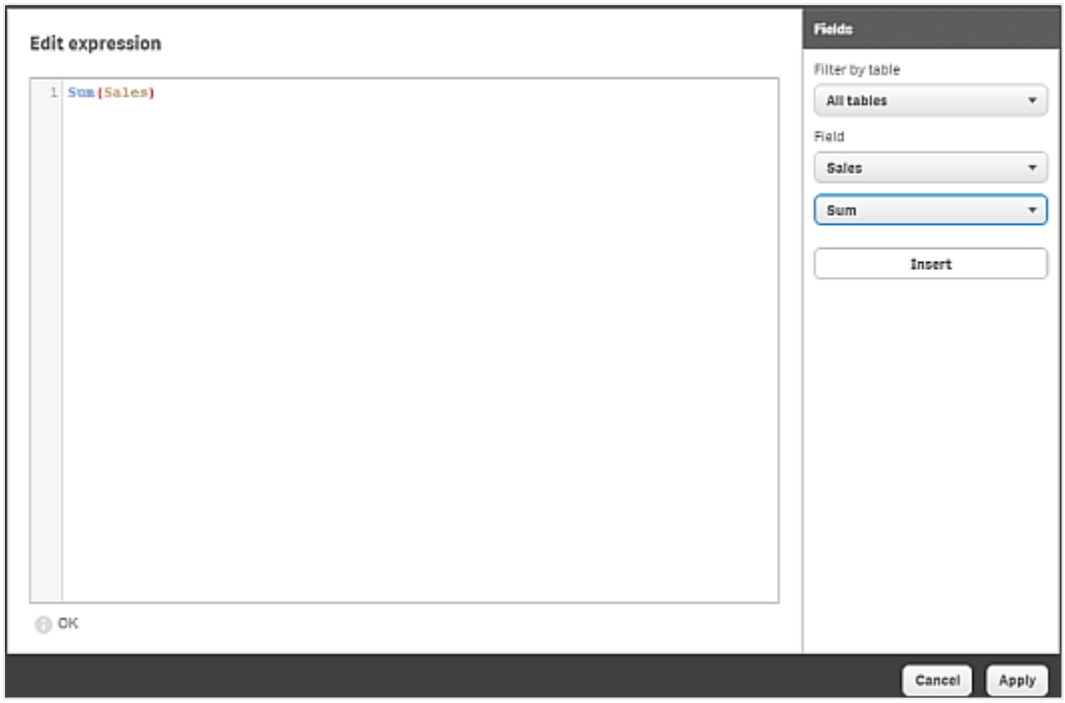
A variable in Qlik Sense is a container storing a static value or a calculation, for example a numeric or alphanumeric value. When you use the variable in the app, any change made to the variable is applied everywhere the variable is used. Variables are defined using the variables overview, or in the script using the data load editor, where the variable acquires its value from a **Let**, **Set** or other control statements in the data load script.

When using variables in expressions, you can change the expression used in a range of charts simultaneously simply by editing the variable.

8.4 Working with the expression editor

You can enter the expression editor to add or edit an expression wherever you see the symbol fx in the properties panel while editing a visualization. The fx symbol indicates an expression field. Click fx to enter the expression editor.

You can add expressions in two ways. Simple expressions can be inserted directly from the **Fields** panel by making selections from the available fields and functions. You can add more complex expressions by typing directly into the expression field.



Inserting an expression by selecting from the Fields panel

You can insert an expression by making selections from the **Fields** panel at the right-hand side of the expression editor dialog.

Do the following:

1. If you want to limit the available fields to those from a particular table in your data model, select a table from the drop-down list marked **Show fields from**.
2. Select a field from the **Field** drop-down list.
3. Select the aggregation function you want to use. The functions available are from the group of basic aggregation functions.
4. Click **Insert** to insert the field and the function into the expression editor.

> *If you do not select an aggregation function, only the field will be inserted into the expression.*

5. Click **Apply** to close the **Add expression** dialog.
   For a dimension or measure, you continue by adding descriptive data for the dimension or measure.

Adding or editing an expression by typing

Do the following:

1. Type the expression directly in the expression editor.
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   As you type in the expression editor, the expression is validated. If there is an error, you see a hint about what is incorrect. Additional error information may be available by clicking the icon next to the hint.

   When you type the name of a function in the expression, a tooltip appears that provides information to help you enter the function correctly, including argument names and qualifiers.

   The tooltip for some chart functions shows the ALL qualifier. It is recommended that you do not use the ALL qualifier. Instead, use the set expression {1}.

   Each line in the expression editor is numbered and syntax highlighting is used.
2. Click **Apply** to close the **Add expression** dialog.
   For a dimension or measure, you continue by adding descriptive data for the dimension or measure.

Auto-complete and color coding

When typing in the expression editor, you get an auto-complete list of matching fields, variables and functions to select from. The list is narrowed down as you continue to type. The color coding helps you to see where fields, variables and functions are used in the expression.

The color coding applies both in the auto-complete list and in the expression itself.

How names are interpreted

It is not recommended to name a variable identically to a field or a function in Qlik Sense. But if you do, you must know how to use them in an expression.

Example:

XXX is a field, a variable and a function. XXX will be interpreted as one of them depending on how you create the expression.

Expression	XXX interpreted as
`$(XXX)`	variable
`Count(XXX)`	field
`XXX()`	function

Rules for expressions

The following rules apply for chart expressions:

- All expressions return a number and/or a string, whichever is appropriate.
- Logical functions and operators return 0 for False, -1 for True. Number-to-string conversions and string-to-number conversions are implicit.
- Logical operators and functions interpret 0 as False and all else as True.
- Expressions that cannot be correctly evaluated, for example as a result of incorrect parameters or functions, return NULL.

Detailed syntax help

You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name.

This feature is supported only when using a computer with a keyboard.

8.5 Using functions in charts

Qlik Sense contains several hundred ready-made functions that can be used in charts when creating visualizations. Functions can be, for example, mathematical, logical, can operate on financial or date and time information, can be used to manipulate strings, and other situations.

Functions can be grouped into the types:

- Aggregation functions, which use several records as input and produce a single value result.
- Scalar functions, which take a single input and produce a single output.
- Range functions, which produce a single value based on a range of input values.
- Range-producing functions, which are like range functions, but produce a range of values as output.

Many of the functions can be used in both chart expressions and scripts, but some are specific for chart expressions.

A few differences exist between script expressions and chart expressions in terms of syntax and available functions. The most important difference is the role of the aggregation functions and the use of field references. The basic rule is that any field name in a chart expression must be enclosed by exactly one aggregation function. An aggregation function can never have another expression containing an aggregation function as argument.

8.6 Set analysis and set expressions

Set analysis offers a way of defining a set (or group) of data values that is different from the normal set defined by the current selections.

Normally, when you make a selection, aggregation functions, such as **Sum**, **Max**, **Min**, **Avg**, and **Count** aggregate over the selections that you have made: the current selections. Your selections automatically define the data set to aggregate over. With set analysis you can define a group that is independent of the current selections. This can be useful if you want to show a particular value, for example, the market share of a product across all regions, irrespective of the current selections.

Set analysis is also powerful when making different sorts of comparisons, such as what are the best-selling products compared with poorly-selling products, or this year against last year.

Let us imagine an example in which you start working in an app by selecting the year 2010 in a filter pane. The aggregations are then based on that selection, and the visualizations only show values for that year. When you make new selections, the visualizations are updated accordingly. The aggregations are made over the set of possible records defined by the current selections. With set analysis, you can define a set that is of interest to you and does not depend on the selections.

Creating set expressions

Before looking at the different parts of a set analysis example, there is a distinction that should be made between a set expression and set analysis:

Defining a set of field values is referred to as defining a set expression, whereas using set expressions to analyze data is referred to as set analysis. Consequently, the rest of this section focuses on the set expression and its components.

Here is a set analysis example: `sum( {$<Year={2009}>} Sales )`, in which `{$<Year={2009}>}` is a set expression.

There are two general syntax rules for a set expression:

- A set expression must be used in an aggregation function. In this example, the aggregation function is `sum(Sales)`.
- A set expression must be enclosed by braces, {}. In the example, the set expression is: `{$<Year={2009}>}`.

A set expression consists of a combination the following parts:

- **Identifiers**. One or more identifiers define the relationship between the set expression and what is being evaluated in the rest of the expression. A simple set expression consists of a single identifier, such as the dollar sign, `{$}`, which means all records in the current selection.
- **Operators**. If there is more than one identifier, an operator or operators are used to refine the set of data by specifying how the sets of data represented by the identifiers are combined to create a subset or superset, for example.
- **Modifiers**. A modifier or modifiers can be added to the set expression to change the selection. A modifier can be used on its own or to modify an identifier to filter the data set.

In our example set expression `{$<Year={2009}>}` contains an identifier `$`, and the modifier `<Year={2009}>`. This example does not include an operator. The set expression is interpreted as: "All records in the current selection that belong to the year 2009".

Set expressions can only be used in expressions for visualizations, not in script expressions.

Identifiers, operators and modifiers are described in more detail with in the following subsections.

Identifiers

Identifiers define the relationship between the set expression and the field values or expression being evaluated.

In our example `sum( {$<Year={2009}>} Sales )`, the identifier is the dollar sign, $, and means that the set of records to be evaluated consists of the all the records of the current selection. This set is then further filtered by the modifier part of the set expression. In a more complex set expression, two identifiers can be combined using an operator.

This table shows some common identifiers.

Identifier	Description
1	Represents the full set of all the records in the application, irrespective of any selections made.
$	Represents the records of the current selection. The set expression **{$}** is thus the equivalent to not stating a set expression.
$1	Represents the previous selection. $2 represents the previous selection-but-one, and so on.
$_1	Represents the next (forward) selection. $_2 represents the next selection-but-one, and so on.
BM01	You can use any bookmark ID or bookmark name.

This table shows some examples with different identifiers.

Example	Result
sum ({1} Sales)	Returns total sales for the app, disregarding selections but not the dimension.
sum ({$} Sales)	Returns the sales for the current selection, that is, the same as sum(Sales).
sum ({$1} Sales)	Returns the sales for the previous selection.
sum ({BM01} Sales)	Returns the sales for the bookmark named *BM01*.

Operators

Operators are used to include, exclude, or intersect parts of or whole data sets. All operators use sets as operands and return a set as result. Our example `sum( {$<Year={2009}>} Sales )`, does not contain any operator.

This table shows operators that can be used in set expressions.

Operator	Description
+	Union. This binary operation returns a set consisting of the records that belong to any of the two set operands.
-	Exclusion. This binary operation returns a set of the records that belong to the first but not the other of the two set operands. Also, when used as a unary operator, it returns the complement set.
*	Intersection. This binary operation returns a set consisting of the records that belong to both of the two set operands.
/	Symmetric difference (XOR). This binary operation returns a set consisting of the records that belong to either, but not both of the two set operands.

This table shows some examples with operators.

Examples	Results
`sum( {1-$} Sales )`	Returns sales for everything excluded by the selection.
`sum( {$*BM01} Sales )`	Returns sales for the intersection between the selection and bookmark BM01.
`sum( {-($+BM01)} Sales )`	Returns sales excluded by the selection and bookmark BM01.

Modifiers

Modifiers are used to make additions or changes to a selection. Such modifications can be written in the set expression. A modifier consists of one or several field names, each followed by one or several selections that can be made in the field. Modifiers begin and end with angle brackets, <>.

A set modifier can be used on a set identifier or on its own. It cannot be used on a set expression. When used on a set identifier, the modifier must be written immediately after the set identifier. In our example `sum( {$<Year={2009}>} Sales )`, the modifier is `<Year={2009}>`. Modifiers are optional in set analysis.

This table shows some examples with modifiers.

Example	Result
sum({$<OrderDate = DeliveryDate>} Sales)	Returns the sales for the current selection where OrderDate = DeliveryDate.
sum({1<Region = {US}>} Sales)	Returns the sales for region US, disregarding the current selection.

sum({$<Region = >} Sales)	Returns the sales for the selection, but with the selection in *Region* removed.
sum({<Region = >} Sales)	Returns the same as the example above. When the set to modify is omitted, $ is assumed.
sum({$<Year={2000}, Region={"U*"}>} Sales)	Returns the sales for the current selection, but with new selections both in *Year* and in *Region*.

8.7 Using variables in expressions

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition.Variables are defined using the variables overview or in the script using the data load editor.

You open the **Variables** overview by clicking in the edit bar when editing a sheet.

The following actions are available in the variables overview:

- Create a new variable.
- Edit the selected variable.
- Delete the selected variable.

If you want to edit or delete a variable that is defined in the script, you must edit the script.

Getting an overview of all variables in an app

You can get an overview of all variables in an unpublished app.

Do the following:

1. When editing a sheet, click in the edit bar on the sheet to open the variables overview.
   The variables overview opens and displays a list of all variables in the app and their definitions (if any).
2. Select a variable in the list that you want to view details of.
   The variable expands and displays detailed information about the variable, if any: definition, description and tags.

   When a variable is created or edited, all fields except the name field can be left empty.

See also:

- *Variables overview (page 34)*

Working with the expression editor (page 250)

Creating a variable

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition. Variables are defined using the variables overview or in the script using the data load editor.

You can create a new variable from the variables overview, when editing a sheet in an unpublished app.

Do the following:

1. When editing a sheet, click in the edit bar on the sheet to open the variables overview.
   The variables overview opens.
2. Click **Create new**.
   The following input fields for the variable are displayed:
   - **Name** (mandatory)
   - **Definition**
   - **Description**
   - **Tags**

   Press Esc or click if you want to cancel creating the new variable. If all input fields are empty, you can also cancel by clicking outside the new variable section in the variables overview or by clicking outside the variables overview window.
3. Type a name for the variable (mandatory). Use the following guidelines when choosing a name:
   - You cannot change the name once you have created the variable.
   - Use a letter as the first character, do not use a number or a symbol.
   - It is not recommended to name a variable identically to a field or a function in Qlik Sense.
     See: *How names are interpreted (page 260)*
   - Some characters have specific uses in Qlik Sense expressions, therefore do not use the following characters when naming a variable: `$ ( ) [ ] "`
   - The name must be unique. You are not allowed to name a variable identically to a reserved variable or a system variable. These variables are not listed in the variables overview, but if you are not allowed to use a certain name, even though you cannot find a duplicate in the variables overview, a reserved variable or a system variable already has this name.
   - A long name is not recommended. If a variable's name is too long, the name cannot be fully displayed in the variables overview.
4. Create a definition for the variable (optional). You can enter the expression editor by clicking .
   See: *Working with the expression editor (page 250)*

   Example:

   Set the variable's value to today's date, presented as a number:
   Num(Today())

5. Type a description for the variable (optional).
6. Add tags by typing and click ⊕ or press Enter (optional).
7. Save the variable by clicking ✎. You can also save by clicking outside the new variable's section in the variables overview or by clicking outside the variables overview window.
   The variable is added to the top of the list and marked with **New**.

The new variable is created.

See also:

- *Working with the expression editor (page 250)*

Editing a variable

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition.Variables are defined using the variables overview or in the script using the data load editor.

You can choose to edit a variable from the variables overview, when editing a sheet in an unpublished app.

Do the following:

1. When editing a sheet, click x= in the edit bar on the sheet to open the variables overview.
   The variables overview opens.

   > *If you want to edit a variable that is defined in the script, you can either edit in the script, using the data load editor, or delete it from the script and then edit it in the variables overview.*

2. From the list, select a variable that you want to edit and click ✎.
   The variable expands and displays the following:
   - **Definition** (if any)
   - **Description** (if any)
   - **Tags** (if any)
3. Edit the variable as desired:
   - You can open the expression editor and create the definition by clicking *fx*.
     See: *Working with the expression editor (page 250)*.
   - Cancel editing the variable, by pressing Esc.

     > *If you click 🗑 the variable is deleted.*

   - Add new tags by typing and and click ⊕ or press Enter. Remove tags by clicking ⊗.

4. Save the changes by clicking . You can also save by clicking outside the variable's section in the variables overview or by clicking outside the variables overview window.

The variable is updated.

See also:

- *Working with the expression editor (page 250)*

Deleting a variable

You can delete variables, from an unpublished app, by deleting them from the variables overview.

Do the following:

1. When editing a sheet, click in the edit bar on the sheet to open the variables overview.
   The variables overview opens.
2. Select the variable you want to delete.

   > *If you want to delete a variable that is defined in the script, you must edit the script. If you remove a variable from the script and reload the data, the variable stays in the app. If you want to fully remove the variable from the app, you must also delete the variable from the variables overview.*

   The details of the variable are displayed.

   > *Deleting a variable cannot be undone.*

3. Click .
   A confirmation message is displayed, asking if you are sure you want to delete the variable.
4. Click **OK**.

The variable is deleted.

Examples of using a variable in an expression

A variable in Qlik Sense is a named entity, containing a data value. When a variable is used in an expression, it is substituted by its value or the variable's definition.

Example:

The variable *x* contains the text string *Sum(Sales)*.

In a chart, you define the expression *$(x)/12*. The effect is exactly the same as having the chart expression *Sum(Sales)/12*.

However, if you change the value of the variable *x* to for example *Sum(Budget)*, the data in the chart are immediately recalculated with the expression interpreted as *Sum(Budget)/12*.

When using variables in expressions, you can change the expression used in a range of charts simultaneously simply by editing the variable.

How names are interpreted

It is not recommended to name a variable identically to a field or a function in Qlik Sense. But if you do, you must know how to use them in an expression.

Example:

XXX is a field, a variable and a function. XXX will be interpreted as one of them depending on how you create the expression.

Expression	XXX interpreted as
`$(XXX)`	variable
`Count(XXX)`	field
`XXX()`	function

Variable calculation

There are several ways to use variables with calculated values in Qlik Sense, and the result depends on how you define it and how you call it in an expression.

This example requires the following data is loaded in the data load editor:

```
LOAD * INLINE [
    Dim, Sales
    A, 150
    A, 200
    B, 240
    B, 230
    C, 410
    C, 330
];
```

Let's define two variables, from the variables overview:

- **Name** *vSales* **Definition***'Sum(Sales)'*
- **Name** *vSales2* **Definition***'=Sum(Sales)'*

In the second variable, we add an equal sign before the expression. This will cause the variable to be calculated before it is expanded and the expression is evaluated.

If you use the vSales variable as it is, for example in a measure, the result will be the string Sum(Sales), that is, no calculation is performed.

If you add a dollar-sign expansion and call $(vSales) in the expression, the variable is expanded, and the sum of Sales is displayed.

Finally, if you call $(vSales2), the variable will be calculated before it is expanded. This means that the result displayed is the total sum of Sales. The difference between using =$(vSales) and =$(vSales2) as measure expressions is seen in this chart showing the results:

Dim	$(vSales)	$(vSales2)
A	350	1560
B	470	1560
C	740	1560

As you can see, $(vSales) results in the partial sum for a dimension value, while $(vSales2) results in the total sum.

See also:

- *Working with the expression editor (page 250)*

9 Working with master items

When you create and build your visualizations you will come to the point when you realize you have items worth saving to reuse in other visualizations and on other sheets, for your own sake as well as for others using your app. You can save these items as master items in the assets panel. When your app gets published these master items will be available to others in a library panel as ready-to-use visualizations, dimensions and measures.

One of the purposes with creating and maintaining master items is for other users to explore their own ways and directions in the data, on top of what you have provided in the app as pre-made sheets with visualizations. The users will be able to create their own visualizations with your pre-made master dimensions and master measures, for example.

9.1 Master items

Master items are reusable assets such as visualizations, dimensions and measures that you can use throughout your app. You create and use master items to apply global changes to your visualizations, dimensions and measures.

Master items are very useful, you can use, for example, a master dimension in as many of your visualizations as you like and maintain it in just one place. Any updates you make to the master item will be applied everywhere the master item is used.

9.2 Create master dimensions

When you are working with an unpublished app, you can create master dimensions so that they can be reused. Users of a published app will have access to the master dimensions in their library, but will not be able to modify them.

You can create a master dimensions in different ways.

In addition to creating master dimensions from the assets panel when working with a sheet, you can also create master dimensions from the data model viewer.

Creating a master dimension from a field

When you are working with an unpublished app, you can create master dimensions so that they can be reused. You can create a master dimension from the **Fields** section of the assets panel.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the fields tab.
3. Click the field you want to use to create a dimension.

The preview opens.

4. Click at the bottom of the preview.
   The **Create new dimensions** dialog opens with the field you selected. The field name is also used as the name of the dimension.
5. Select if the dimension is to be single or drill-down.
6. Edit the name if you want to.
7. Type a description for the dimension (optional).
8. Add tags (optional).
9. Click **Add dimension**.
10. Click **Done** to close the dialog.

The dimension is now saved in the **Dimensions** category in the master items, and you can use it in visualizations.

*You can quickly add several dimensions as master items by clicking **Add dimension** after adding each dimension. Click **Done** when you have finished.*

*Direct Discovery fields are indicated by in the **Fields** section of the assets panel.*

Creating a master dimension from the assets panel

When you are working with an unpublished app, you can create master dimensions so that they can be reused. Users of a published app will have access to the master dimensions in their library, but will not be able to modify them.

You can only create master dimensions when you are working with an unpublished app.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Dimensions** heading to expand the category.
4. Click **Create new**.
   The **Create new dimensions** dialog opens.
5. Select if the dimension is to be single or drill-down.
6. Click a field on the left-hand side to select it.
   The name of the field is automatically added as the name of the dimension.
7. Change the name if you want to.

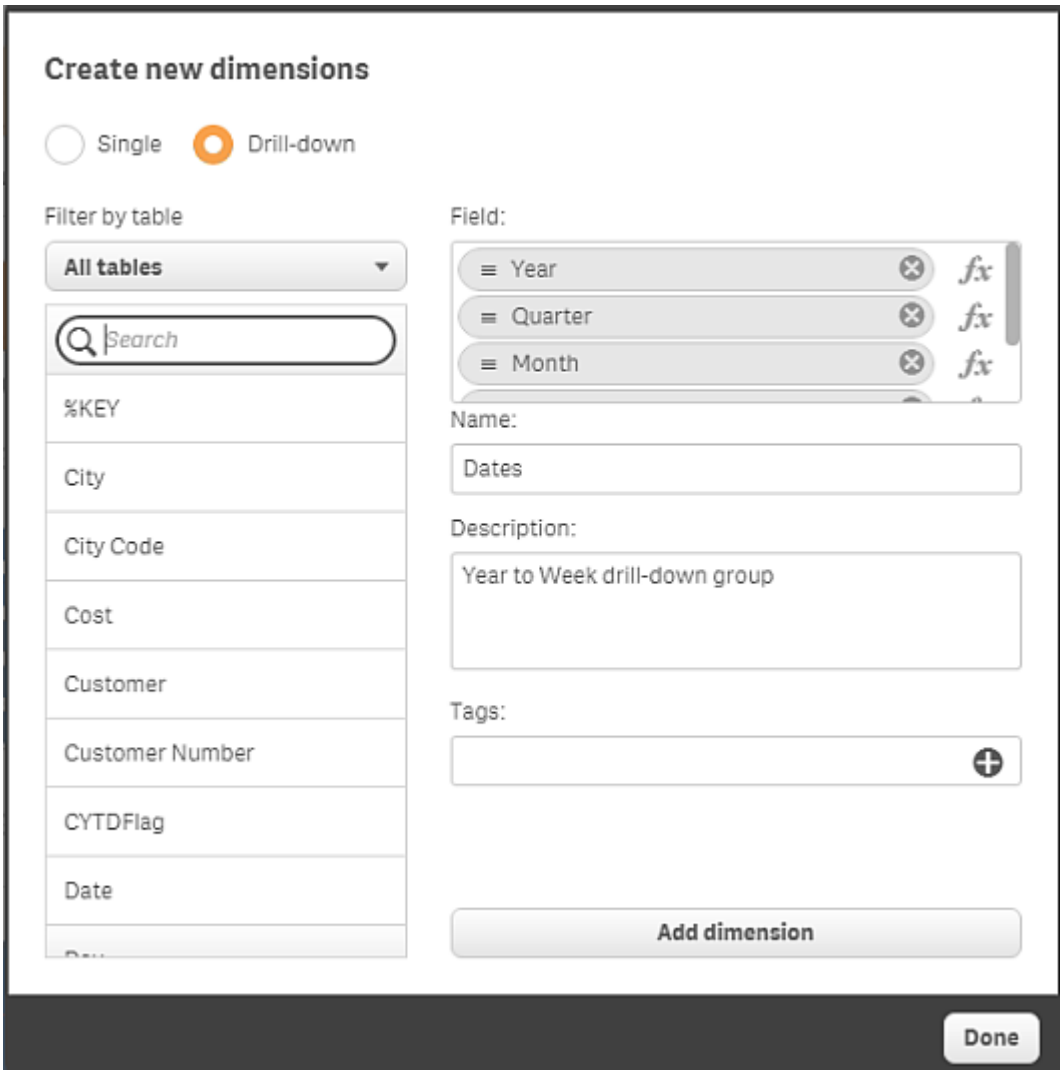
8. Type a description for the dimension (optional).
9. Add tags (optional).
10. Click **Add dimension**.
11. Click **Done** to close the dialog.

The dimension is now saved in the **Dimensions** category in the master items, and you can use it in visualizations.

*You can quickly add several dimensions as master items by clicking **Add dimension** after adding each dimension. Click **Done** when you have finished.*

Creating a drill-down dimension

When adding a dimension, you can select between creating a single or a drill-down dimension. The following description explains how to create a drill-down group from the **Create new dimensions** dialog.



Do the following:

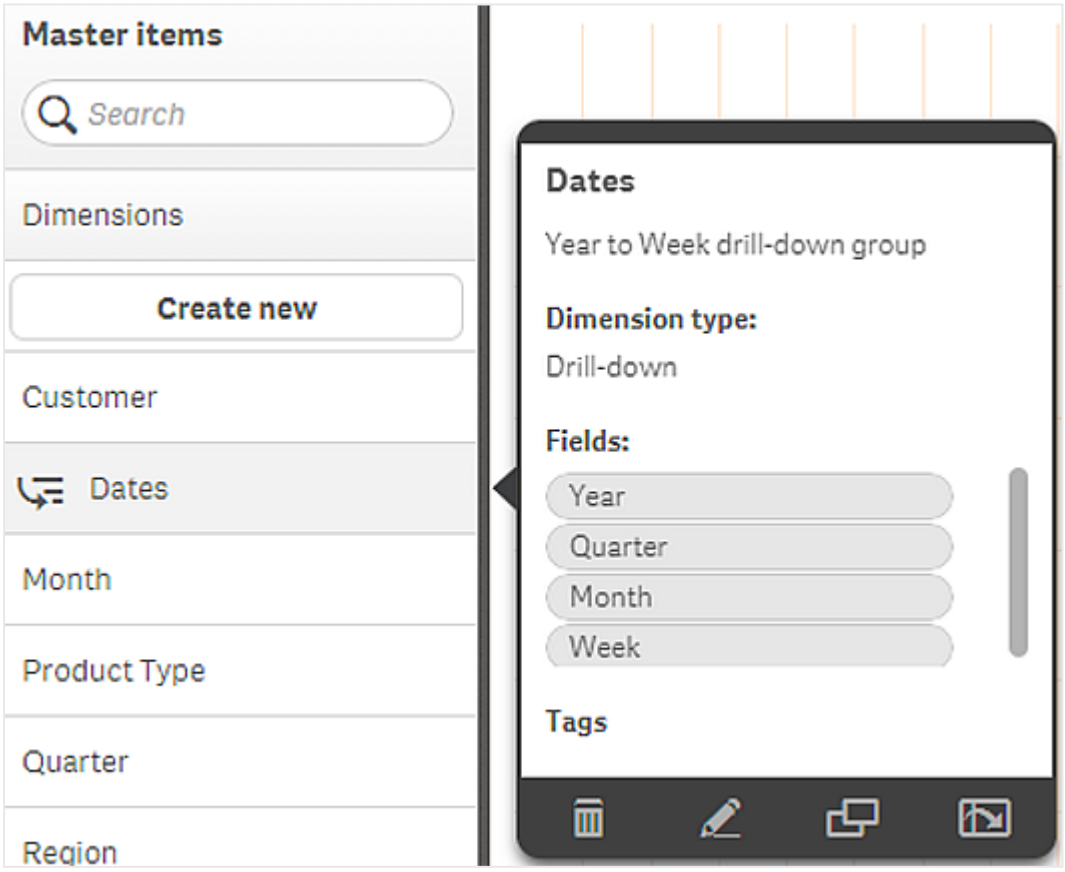
1. Select **Drill-down** as dimension type.
2. Click at least two fields from the fields list on the left-hand side to insert them as the referenced fields.

   > *You can filter which table to select fields from in the drop-down list.*

   > *You can rearrange the order of the fields you have selected by dragging them to new positions in the list of selected fields.*
3. Type a name for the dimension.
4. Type a description for the dimension (optional).
5. Add tags (optional).
6. Click **Add dimension**.
7. Click **Done** to close the dialog.

The drill-down dimension is now saved in the **Dimensions** category among the master items.

When you click the dimension in the panel on the left-hand side, the preview displays the dimension type and which fields are included in the drill-down dimension.



Creating a calculated dimension

You can create a calculated dimension from the **Master items** tab in the assets panel. The expression editor opens from the **Create new dimensions** dialog.

Do the following:

1. Click the **Dimensions** heading on the **Master items** tab to expand the category.
2. Click **Create new**.
   The **Create new dimensions** dialog opens.
3. Click fx in the **Field** text box to open the **Add expression** dialog.

You will now be able to add expressions in different ways, depending on you preferences and of different levels of complexity.

*You can also add an expression by typing directly into the **Field** text box , but you will then not be provided with syntax highlighting and syntax check.*

Using a common function

1. Click the function you want to use.
2. Select a field from the drop-down list.
3. Click **Insert** to insert the function and the field into the expression editor.

   You can insert just a function or just a field by selecting only one of them.
4. Click **Apply** to close the **Add expression** dialog.
   For a measure, you continue by adding the descriptive data for the measure.

Adding an expression by typing

1. Type the expression directly in the expression editor.
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect. Additional error information may be available by clicking the icon next to the hint.

   Each line in the expression editor is numbered and syntax highlighting is used.
2. Click **Apply** to close the **Add expression** dialog.
   For a measure, you continue by adding the descriptive data for the measure.

Adding an expression through the properties panel

You can add an expression to a visualization through the properties panel.

1. Open the sheet with the visualization that you want to edit.
2. Click **Edit** to open the properties panel. (If it is hidden, click in the lower right-hand corner to open it.)
3. Click the visualization that you want to edit.
4. Click **Dimensions**.
5. Click **Add dimensions**.
   A dimension text box is displayed.
6. Type your expression. The expression must begin with an equals sign (=), otherwise the string will be interpreted as text.

Detailed syntax help

You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name.

This feature is supported only when using a computer with a keyboard.

Adding the descriptive data for the dimension

After having entered the expression, you need to add some descriptive information.

1. Type a name for the dimension.
2. Type a description for the dimension (optional).
3. Add tags (optional).
4. Click **Add dimension**.
5. Click **Done** to close the dialog.

The calculated dimension is now saved in the **Dimensions** category of the **Master items**, and you can use it in visualizations.

9.3 Create master measures

When you are working with an unpublished app, you can create master measures so that they can be reused. Users of a published app will have access to the master measures in their library, but will not be able to modify them.

A measure is a combination of an expression and descriptive data, such as name, description and tags. You can add the expression for the measure in different ways.

In addition to creating master measures from the assets panel when working with a sheet, you can also create master measures from the data model viewer.

Creating a master measure from a field

When you are working with an unpublished app, you can create master measures so that they can be reused. You can create a master measure from the **Fields** section of the assets panel.

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the fields tab.
3. Click the field you want to use to create a measure.
   The preview opens.
4. Click at the bottom of the preview.
5. The **Create new measure** dialog opens with the field you selected as a the name of the measure and as a part of the expression.
6. Click in the **Expression** field to open the **Edit expression** dialog.
7. Type the expression directly in the expression editor (the main window).
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect in the lower left-hand corner. Additional error information may be available by clicking the icon next to the hint.

   Each line in the expression editor is numbered and syntax highlighting is used.

   You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.
8. Click **Apply** to close the **Add expression** dialog.
   Now you need to add some descriptive data for the measure.
9. Edit the name if you want to.
10. Type a description for the measure (optional).
11. Add tags (optional).
12. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

*Direct Discovery fields are indicated by in the **Fields** section of the assets panel.*

Creating a master measure with a common aggregation function

When you are working with an unpublished app, you can create master measures so that they can be reused. You can easily create a measure using one of the most common aggregation functions by selecting the function and the field from drop-down lists.

Do the following:

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Measures** heading to expand that category.
4. Click **Create new**.
   The **Create new measure** dialog opens.
5. Click in the **Expression** field to open the **Add expression** dialog.
   You find drop-down lists for selecting a field and a common function on the right-hand side.
6. If you want to show fields from a particular table, select this table in the top drop-down list (optional).
7. Select a field from the **Field** drop-down list.
8. Select a function from the bottom drop-down list.

   You can insert just a field by not selecting a function.

9. Click **Insert** to insert the field and the function into the expression editor.

   You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.

10. Click **Apply** to close the **Add expression** dialog.
    Now you need to add some descriptive data for the measure.
11. Type a name for the measure.
12. Type a description for the measure (optional).
13. Add tags (optional).
14. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

Creating a master measure by typing the expression

When you are working with an unpublished app, you can create master measures so that they can be reused. You can add complex expressions by typing the expression into the expression editor.

1. Click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to select the master items tab.
3. Click the **Measures** heading to expand that category.
4. Click **Create new**.
   The **Create new measure** dialog opens.
5. Click in the **Expression** field to open the **Add expression** dialog.
6. Type the expression directly in the expression editor (the main window).
   The field names you use in the expression are checked, and the syntax of the expression is validated.

   > *As you type in the expression editor, the expression is validated continuously. If there is an error, you see a hint about what is incorrect in the lower left-hand corner. Additional error information may be available by clicking the icon next to the hint.*

   Each line in the expression editor is numbered and syntax highlighting is used.

   > *You can open the online help with the full description of how to use the current function by double-clicking the function name in the expression editor and pressing Ctrl+H on the keyboard. This feature becomes available after having entered the first parenthesis of the expression after the function name, and only when using a computer with a keyboard.*

7. Click **Apply** to close the **Add expression** dialog.
   Now you need to add some descriptive data for the measure.
8. Type a name for the measure.
9. Type a description for the measure (optional).
10. Add tags (optional).
11. Click **Create**.

The measure is now saved in the **Measures** category in the master items, and you can use it in visualizations.

9.4 Creating a master visualization

You can create a master visualization to be able to reuse it. Users of a published app will have access to the master visualizations in their library, but will not be able to modify them.

You can only create master visualizations when you are working with an unpublished app.

Do the following:

1. While editing a sheet, drag a visualization from the sheet to the master items.
   If you have given the visualization a title, this is automatically added as the name of the master visualization.
2. Add a name, or change the name if you want to.
3. Type a description for the visualization (optional).
4. Add tags (optional).
5. Click **Add**.

The visualization is now saved to the master items tab.

You can also add a visualization to the master items by long-touching/right-clicking it on the sheet, and selecting ***Add to master items****.*

9.5 Editing a master dimension

When you update a master dimension, the changes will be reflected in all its instances, including all visualizations that use it.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the dimension that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the dimension is used on a sheet, a dialog is displayed to inform you that any changes to the master dimension will be applied to all its instances on the sheets.
5. Click **OK**.
   The **Edit dimension** dialog opens, where you update the field or expression, name, description and tags.
6. Click **Save**.

The dimension is now updated.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

9.6 Editing a master measure

When you update a master measure, the changes will be reflected in all its instances, including all visualizations that use it.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the measure that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the measure is used on a sheet, a dialog is displayed to inform you that any changes to the master measure will be applied to all its instances on the sheets.
5. Click **OK**.
   The **Edit measure** dialog opens, where you update the expression, name, description and tags.
6. Click **Save**.

The measure is now updated.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

9.7 Editing a master visualization

When you update a visualization in the master items, the changes will be reflected in all instances of the master visualization.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the visualization that you want to edit.
   The preview opens.
4. Click at the bottom of the preview.
   If the visualization is used on a sheet, a dialog is displayed to inform you that any changes to the master visualization will be applied to all its instances on the sheets.
5. Click **OK**.
   The visualization opens for editing.
6. Make the changes you want, and click **Done** in the upper right corner of the visualization to finish editing.

The visualization is updated and reflected in all its instances.

You can also edit a master item from its preview. You open the preview by clicking an item in the master items.

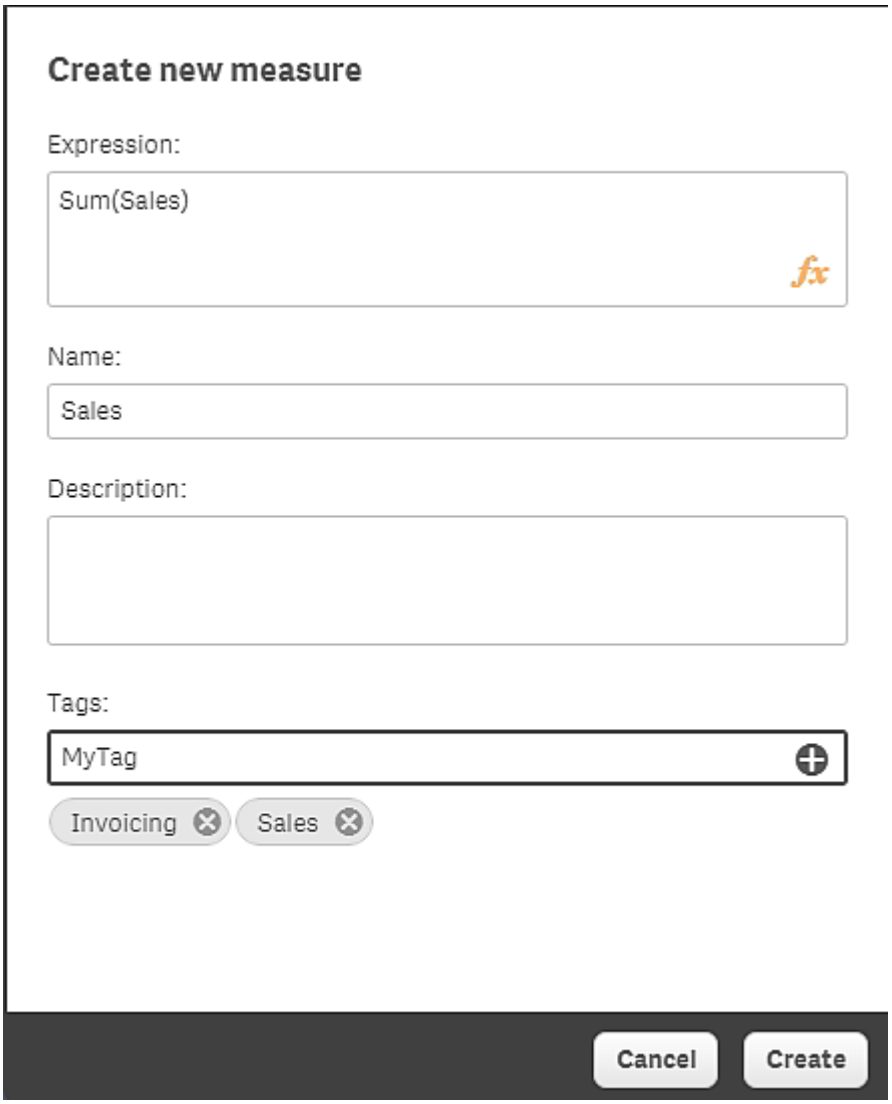
9.8 Tagging master items

You can use tags to organize master items. You will find matches in tags when searching in the library or assets panel.

Each tag can contain a maximum of 31 characters, and each master item can have up to 30 tags.

Adding tags to a master item

You can add tags when creating or editing a master item.

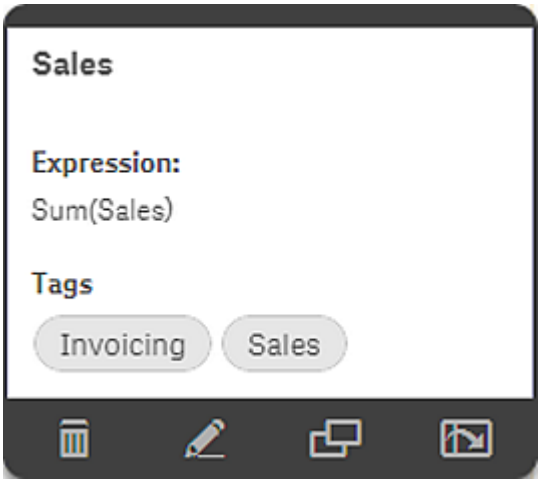


Adding tags while creating a new measure

You can add tags by clicking ⊕ or by pressing Enter.

Previewing tags

In the library and assets panel, tags are displayed when previewing dimensions, measures and visualizations.



9.9 Deleting a master dimension or master measure

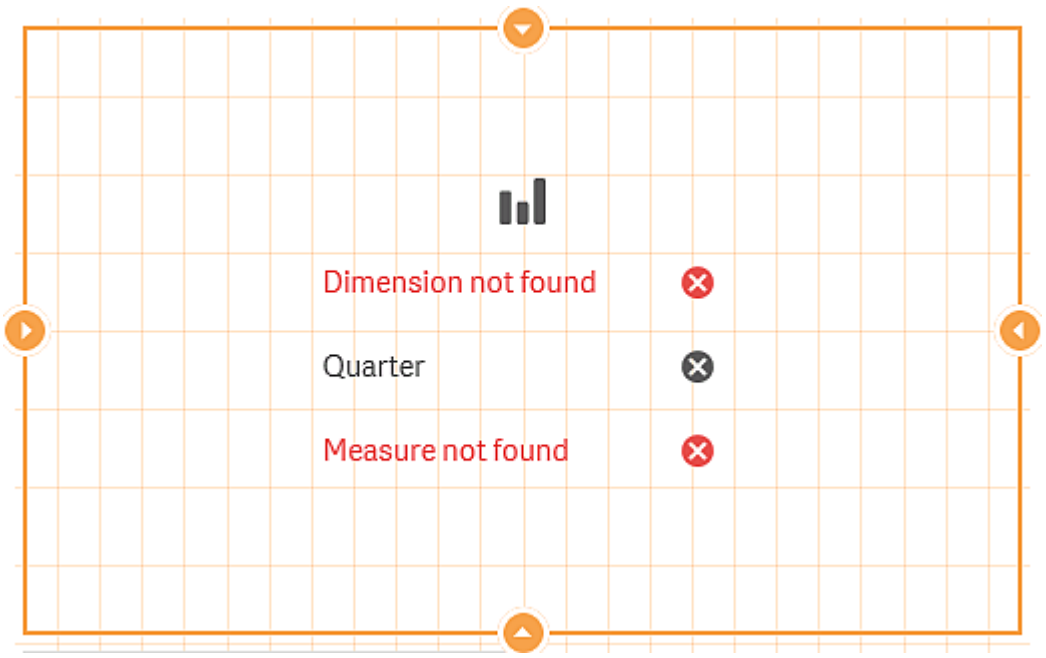
You can delete dimensions and measures from the master items as long as the app is not published.

If you delete a master dimension or master measure, the visualizations that use the deleted master item will not work unless you replace it with a new dimension or measure.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the dimension or measure that you want to delete.
   The preview opens.
4. Click at the bottom of the preview.
   A dialog is displayed stating that all visualizations that use the dimension or measure will stop working.
5. Click **OK**.

The dimension or measure is deleted from the master items, and all visualizations on the sheets that used the deleted item do not work anymore. You see the text **Dimension not found** or **Measure not found** on those visualizations.



This visualization is lacking both a dimension and a measure, both which have been deleted from the master items

Replacing an invalid dimension or measure

When a dimension or measure has been deleted from the master items, all visualizations that reference to the deleted master item will not work anymore, until the missing dimension or measure is replaced.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side. Click to display the master items.
2. Drag a dimension or measure from the **Dimensions** or **Measures** sections to the visualization on the sheet.
   The shortcut menu opens.
3. Select **Replace invalid dimension** or **Replace invalid measure**.

The visualization is complete and works again.

9.10 Deleting a master visualization

You can delete visualizations from the master items as long as the app is not published.

Do the following:

1. In sheet view, click **Edit** in the toolbar.
   The assets panel opens on the left-hand side.
2. Click to display the master items.
3. Click the visualization that you want to delete.

The preview opens.

4. Click 🗑 at the bottom of the preview.
   A dialog is displayed stating that wherever this visualization is used on sheets, there will be invalid instances of it.
5. Click **OK**.

The visualization is deleted from the master items, and on all sheets where this visualization was used, you see invalid visualizations. You now need to replace the invalid visualization with other ones, or delete the instances.

You can also delete visualizations from the preview that is displayed when clicking the visualization in the master items.

Replacing an invalid visualization on a sheet

The representation of the invalid visualization is there to tell you that there used to be a visualization at a certain location on the sheet, but the invalid visualization serves no purpose.

Do the following:

1. In sheet view, click ✎ **Edit** in the toolbar.
   The assets panel opens on the left-hand side. Click 🔗 to display the master items.
2. Drag a visualization from the master items to the location of the invalid visualization on the sheet.

The invalid visualization is replaced.

Deleting an invalid visualization

1. In sheet view, click ✎ **Edit** in the toolbar.
2. Long-touch/right-click on the invalid visualization and select **Delete** in the shortcut menu.

The invalid visualization is deleted.

10 Managing apps

Once you have created and built an app with the sheets and visualizations you want it to have, you may want to fine-tune it to make it easy and efficient to use, not only for yourself but also for other people.

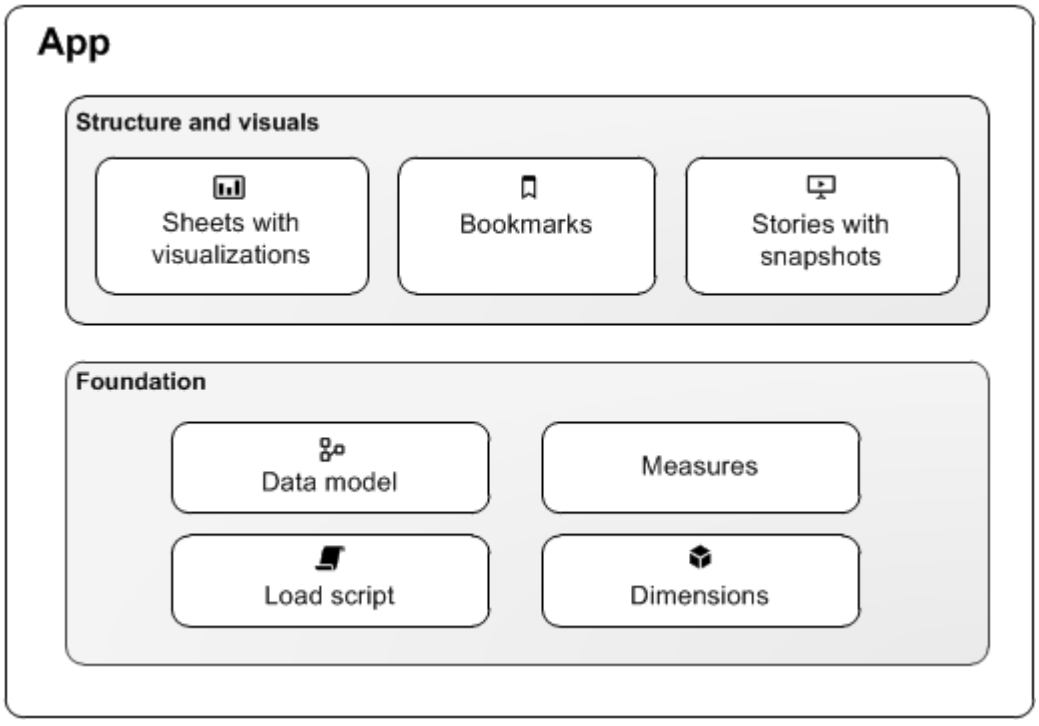
You can, for instance:

- Create reusable master items (visualizations, dimensions and measures)
- Add bookmarks to keep track of important and interesting data selections and connections
- Change the app's title and description, and also add a thumbnail to it
- Duplicate an app, which is useful if you want to use a published app as a base of your own

10.1 Apps

A Qlik Sense app is a collection of reusable data items (measures, dimensions and visualizations), sheets and stories. It is a self-contained entity that includes the data to analyze in a structured data model.

The purpose of an app is to let you and others make data discoveries and decisions using data visualizations and making selections.



Building blocks of an app

Foundation

Data load script	You use a data load script to load data into the app. The script connects to a data source (database, Excel sheet, etc.) and retrieves the data.	
Data model	The loaded data is structured in a data model. You edit the data load script and reload the data to build the data model you find is best suitable for your app.	
Measures	Measures are calculations for use in visualizations. Measures are created from an expression composed of aggregation functions, such as **Sum** or **Max**, combined with one or several fields.	*Measures (page 203)* *Expressions (page 248)*
Dimensions	Dimensions are fields for use in visualizations. Dimensions determine how the data in a visualization is grouped - for example total sales per country or number of products per supplier.	*Dimensions (page 200)* *Fields (page 209)*

Structure and visuals

Sheets	Sheets include data visualizations, such as charts and tables. You create a structure in the app by grouping visualizations with different purposes on different sheets.	*Sheets (page 143)*
Bookmarks	Bookmarks are shortcuts to a certain set of selections on a particular sheet.	
Stories	Stories are based on snapshots of visualizations. You present your data by creating a story that guides you to new insights by combining snapshots of data at specific times and selection states.	

More about apps

The app makes it possible for people to create new visualizations based on any questions they might have, for example by using dimensions and measures that are defined in the app, thus further developing the app for personal use or to share with others.

Whoever creates an app is automatically designated as its owner. An app can be re-used, modified and shared with others, depending on access rights. Different actions can be carried out depending on if the app is published or not.

The .qvf file format is a proprietary format.

In Qlik Sense Desktop, apps are typically stored in <user>\Documents\Qlik\Sense\Apps, as <Appname>.qvf, where <Appname> is the name of the app.

10.2 Creating an app

The first thing you need to do when building an app is to create an empty placeholder for it. You create the app placeholder from the hub.

Do the following:

1. Click **Create new app** in the hub.
2. Give your app a name.
3. Click **Create**.
   The app is created.
4. Click **Open app**.
   The app opens in the app overview.

The next step is to add data to the new app.

10.3 Converting a QlikView document into a Qlik Sense app

If you have a QlikView document, you can use its load script and data model when creating an app in Qlik Sense. Visualizations, dimensions and measures, however, have to be created using Qlik Sense.

You need to have Qlik Sense Desktop installed to be able to migrate a QlikView document into a Qlik Sense app.

A QlikView document (qvw format) corresponds in Qlik Sense to an app (qvf format).

Do the following:

1. Copy the QlikView document (qvw format) to the directory where your apps are located. Example path: *<user>\Documents\Qlik\Sense\Apps*. The location of the *Apps* directory depends on where you installed Qlik Sense Desktop.
2. Start Qlik Sense Desktop.
   You now see the QlikView document as an app in the hub along with other apps you may have created in Qlik Sense.
3. Click on the app to open it.
4. Create a new sheet.
5. Save the app.

The app is automatically saved into the Qlik Sense format, qvf, and you can start adding visualizations, dimensions and measures. The app is saved into the Qlik Sense format (qvf file) in the folder where your QlikView document (qvw file) was stored. Also, the QlikView document file (qvw) is removed from the folder and automatically converted into a backup file (qvw.backup) stored here: *<user>\Documents\Qlik\Sense\AppsBackup*.

You now have migrated a QlikView document into a Qlik Sense app. You can continue work with it, copy it or import it into your server environment through the Qlik Management Console (QMC).

You can drag and drop a qvw file from a folder onto the Qlik Sense Desktop hub, to open it as a Qlik Sense app. If the Qlik Sense app (qvf file) becomes stored in another folder than <user>\Documents\Qlik\Sense\Apps, move it to the Apps folder to make it available from the hub.

Limitations

Some limitations apply when importing apps to Qlik Sense:

- Your computer must have sufficient memory, at least 32 GB, when importing a large QlikView document.
- When a QlikView document with hidden script is imported, the hidden script will be disregarded.
- A QlikView document with section access cannot be imported to Qlik Sense.

10.4 Changing the title and description of an app

You can change the title and description of your apps. When creating a new app, the name of the app is used as its title. When you change the title, the name of the app is not changed.

Do the following:

1. In the app overview, click ✎ in the app details area.
2. Edit **Title** and **Description**.
3. Click ✎ again.

The changes you made are saved.

You can only change the title and description of an unpublished app.

10.5 Changing the thumbnail of an app

You can replace the default thumbnail of an app with another thumbnail, to make it easier to distinguish between apps in the hub. You can use one of the default images, or an image of your own. If you are using Qlik Sense Desktop, you can also use bundled images saved in the qvf file.

Do the following:

1. In the app overview, click ✎ in the app details area.
2. Click 🖼 on the default thumbnail.
   The **Media library** opens.
3. Click on a folder in the media library, for example **In app** or **Default**.
4. Select the image you want to use as a thumbnail for the app and click **Insert**.
5. Click ✎ again.

The image you selected is now used as a thumbnail for the app.

The optimal aspect ratio of a thumbnail is 8:5 (width:height).

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You need to use the Qlik Management Console to upload images to the default folder. You can upload images to the **In app** folder in the media library.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

You can only change the thumbnail of an unpublished app.

10.6 Duplicating an app

You can duplicate an existing app to create a copy to develop further. You can only duplicate an app that you have created yourself.

When you duplicate a published app, only the base sheets and stories will be included in the copy.

Do the following:

- In the hub, long-touch/right-click the app you want to duplicate and select **Duplicate**.

A copy of the app is created under **My work**. You can click the app to open it and start adapting it according to your preferences.

Because of how the synchronization of data works in multi-node sites, apps containing images may display broken thumbnails or images inside the apps if opened right after being duplicated or imported. The broken images are restored when the synchronization is complete. To check if the images have been restored, refresh the browser window.

10.7 Deleting an app

You can delete an app that you no longer need.

From the hub, you can only delete apps that you have created and that have not yet been published.

Do the following:

- Long-touch/right-click the app in the hub and select **Delete**.

You can delete a published app from the Qlik Management Console.

10.8 Uploading image files to media library

The media library contains the images you can use in your app: in text & image visualizations, on story slides, and as thumbnails for apps, sheets, and stories.

You can upload images to the media library. Because of limitations in the web browsers supported by Qlik Sense, it is recommended to keep the height and width as well as the file size of the images as small as possible. The maximum file size is 5 MB. The following formats are supported: .png, .jpg, .jpeg, and .gif.

You can open the media library in several ways. Do one of the following:

- In the app overview, click ✎ in the app details area and click 🖼 on the thumbnail.
- If you are editing a sheet, click twice on the text & image visualization to open the editing toolbar and click 🖼.
- In storytelling view, click 🖼 in the story tools panel and drag **Image** onto the slide and then double-click inside the image placeholder.

The **Media library** dialog opens and now you can upload images.

Do the following:

1. Select **Upload media**.
2. Do one of the following:

- Drop one or more image files onto the designated area.
- Click the designated area to open the upload dialog, browse and select images, and click **Open**.

You can cancel an ongoing upload by clicking on ⊗ on the image.

You cannot upload a file if its file name already exists in the media library.

Now you have added images to the media library.

The following formats are supported: .png, .jpg, .jpeg, and .gif.

*For Qlik Sense: You need to use the Qlik Management Console to upload images to the default folder. You can upload images to the **In app** folder in the media library.*

*For Qlik Sense Desktop: If the default folder is empty, or you want to add your own images, you find the folder at: <user>\Documents\Qlik\Sense\Content\Default. When moving an app between installations, images are bundled and saved in the qvf file together with the rest of the contents of the app. You find the bundled images in the **In app** folder in the media library.*

10.9 Deleting image files from media library

The media library contains the images you can use in your app: in text & image visualizations, on story slides, and as thumbnails for apps, sheets, and stories.

You can delete images from the media library.

You can open the media library in several ways. Do one of the following:

- In the app overview, click ✎ in the app details area and click 🖼 on the thumbnail.
- If you are editing a sheet, click twice on the text & image visualization to open the editing toolbar and click 🖼.
- In storytelling view, click 🖼 in the story tools panel and drag **Image** onto the slide and then double-click inside the image placeholder.

The **Media library** dialog opens and now you can delete images.

Delete images using Qlik Sense

Do the following:

1. Select the **In app** folder.
2. Select the file you want to delete.
3. Click 🗑.

A confirmation dialog is displayed.

4. Click **Delete**.

Now you have deleted images from the media library.

For Qlik Sense: You need to use the Qlik Management Console to delete images from the default folder, or other folders that were created from the Qlik Management Console.

Delete images using Qlik Sense Desktop

You can delete images from the default folder by removing the files from this location: <user>\Documents\Qlik\Sense\Content\Default.

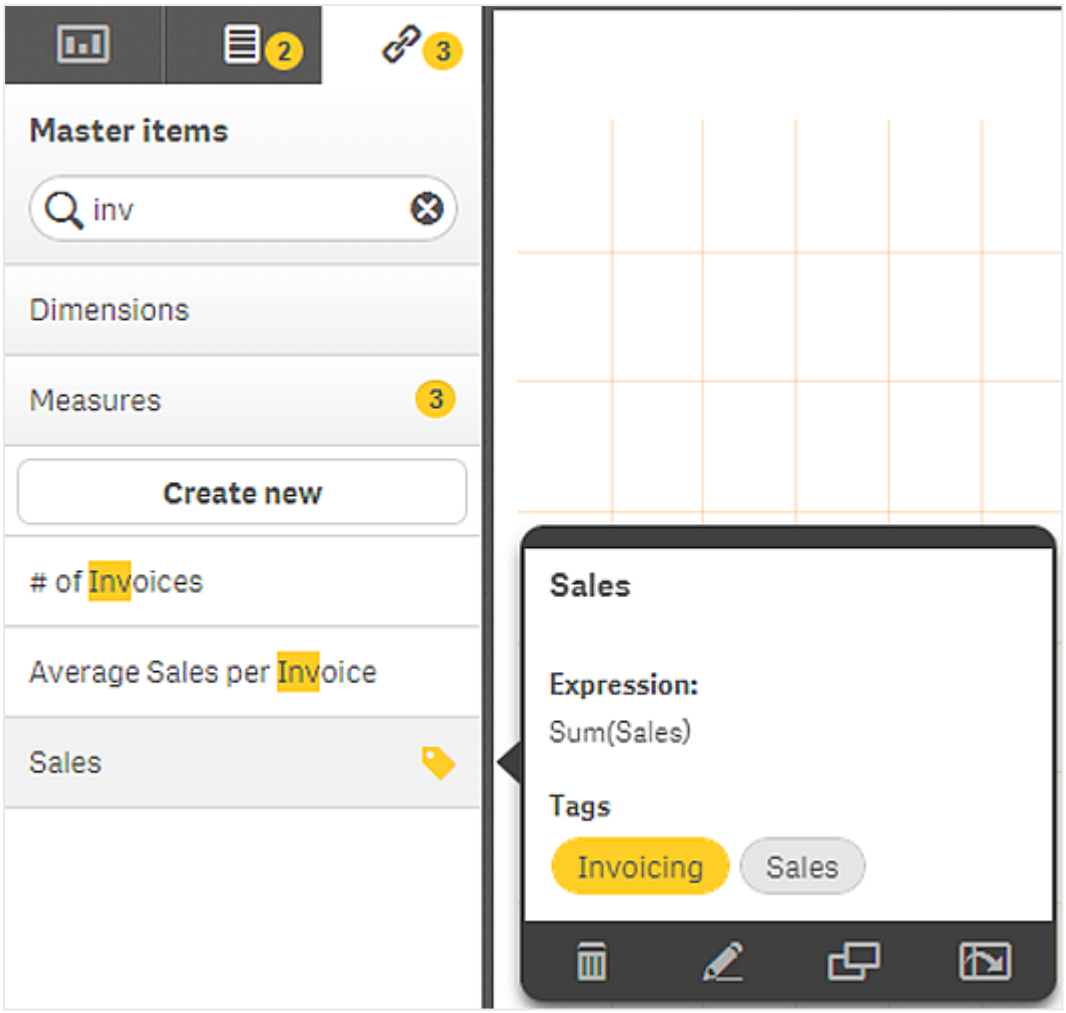
The images in the **In app** folder are bundled images, saved in the qvf file together with the rest of the contents of the app. If a bundled image is no longer used in the app, the image will be deleted from the qvf file when saving the app.

10.10 Searching in the assets

The search field at the top of the assets panel helps you find assets on the different tabs. As you start to type in the search field, all items that have a name or a tag that contains the search string, are presented.

The search function is not case sensitive.

When a matching string is found in a tag, it is indicated by a tag icon in the search result. Clicking the item in the list of results, brings up a preview of it.



Searching for "inv" among the measures presents any measure that contains that string in its name or a tag.

10.11 Designing visualizations with Direct Discovery

Designing visualizations from Direct Discovery fields requires some background knowledge about the nature of the field types that can be used.

Direct Discovery fields in visualizations

DIMENSION

- The Direct DiscoveryDIMENSION field type can be used in the same way as any other dimension.

MEASURE

- A Direct DiscoveryMEASURE must be aggregated with one of the common functions before it can be used in a visualization.
- A regular field that is dropped onto a sheet becomes a filter pane, but not a Direct DiscoveryMEASURE as it must be aggregated first.

DETAIL

The Direct DiscoveryDETAIL field type can only be used in tables, and not in combination with a measure.

When creating a table using a Direct DiscoveryDETAIL field, and the number of rows being retrieved exceeds a value defined in the load script (by default, 1000 rows), you may see a warning message and the table may appear to be invalid. To make the table work normally, try making selections in the app to reduce the data set.

11 Troubleshooting - Navigate and interact

This section describes problems that can occur when navigating in and interacting with Qlik Sense.

11.1 Icons in the hub are not displayed correctly

Possible cause

You are using Windows Internet Explorer.

Proposed action

Add the hub site as a trusted site in Windows Internet Explorer.

Do the following:

1. Open the Windows Internet Explorer**Internet options**.
2. Select the **Security** tab.
3. Click on **Trusted sites**.
4. Click on **Sites**.
5. Enter the website address for the hub in the text field and click **Add**.
6. Click **Close**.
7. Refresh the browser window.

11.2 The shortcut does not load the hub

When using Microsoft Windows Server 2008 R2 or Windows 8.1, the shortcut does not load the hub when using Internet Explorer 10 or Internet Explorer 11.

Possible cause

An Internet Explorer security setting blocks the shortcut.

Proposed action

Add your computer to the local intranet zone.

Do the following:

1. Open the Windows Internet Explorer**Internet options**.
2. Select the **Security** tab.
3. Click on **Local intranet**.
4. Click on **Sites**.
5. Click **Advanced**.

6. Enter *https://<machinename>/* in the text field and click **Add**.
7. Click **Close**.
8. Refresh the browser window.

Add to the local intranet zone in the Internet Explorer settings: **Internet options**/**Security** tab/**Local intranet**:**Sites**/**Advanced**.

11.3 I can access the hub, but I see no streams at all

Possible cause

You have no access type.

Proposed action

The Qlik Sense administrator needs to allocate you access or include you in a login access group.

11.4 I cannot create or edit sheets and stories, or take snapshots

In some situations, you can make selections and navigate in an app, but not create new content.

Small screen device

Possible cause

You are using a device with a very small screen (480 pixels wide or smaller).

Proposed action

Open the app from a computer or a device with a larger screen.

See: *Exploring apps on a small screen (page 129)*

Insufficient privileges

Possible cause

You don’t have privileges to create content.

Proposed action

The Qlik Sense administrator needs to give you privileges with the security rules.

11.5 I can access the hub, but I cannot see the streams I want to

Possible cause

You don't have access to the stream.

Proposed action

The Qlik Sense administrator needs to give you access with the security rules.

11.6 A login dialog is displayed when I try to browse to the hub

Possible cause

You are using Windows Server 2012.

Proposed action

Log in using the dialog. After this, you will be able to browse to the hub.

11.7 I cannot use more than five web browser tabs

The page is not loading when I open more than five browser tabs from the hub.

Possible cause

You are using Internet Explorer.

Proposed action

Close one of the other tabs and reload the page. Alternatively, if you want to work with more than five tabs at a time, use another web browser.

11.8 Error message: **App is already open**

I am using Internet Explorer and the error message **App is already open** is displayed, when I try to open an app.

Possible cause

The file did not close properly after being imported.

Proposed action

Close Internet Explorer and open Qlik Sense again.

11.9 Error message: **403 Forbidden**

When I try to open an app or browse the hub, the error message **403 Forbidden** is displayed.

Possible cause

- There are too many root certificates on the computer (> ~300), which entails that the Qlik Sense services are not allowed to communicate.
- You are trying to access a resource that you are not granted access to, according to the rule engine in the repository.

Proposed action

Remove any unused root certificates. For more information, see the following Microsoft help articles:

- Clients cannot make connections if you require client certificates on a Web site or if you use IAS in Windows Server 2003
- SSL/TLS communication problems after you install KB 931125

11.10 Error message: **404 Not found**

When I try to open an app or browse the hub, the error message **404 Not found** is displayed.

Possible cause

The URL refers to a non-existent resource.

Proposed action

Close Internet Explorer and open Qlik Sense again.

11.11 Error message: **Internal server error 500**

The error message **Internal server error 500** is displayed.

Possible cause

An unidentified error has occurred.

Proposed action

Check the system log files at the following locations:

- *%ProgramData%\Qlik\Sense\Log\Proxy*
- *%ProgramData%\Qlik\Sense\Log\Repository*

If the error message is displayed repeatedly, please contact your Qlik Sense representative and provide the system log files.

11.12 Error message: **Untrustworthy Proxy SSL-connection/-certificate**

When I try to open an app or browse the hub, an error message is displayed that the Proxy SSL-connection or -certificate is untrustworthy and I am asked if I want to make an exception and trust the certificate authority.

Possible cause

The browser doesn't recognize the root certificate as trustworthy since it is not a known certificate authority such as Thawte or VeriSign.

Proposed action

- Accept making an exception and trusting the certificate authority by answering **Yes** to the question.
- Verify that you have installed a public SSL certificate (on server) since you need this to be able to use the default Qlik Sense certificate.

12 Troubleshooting - Creating apps and visualizations

This section describes problems that can occur when creating apps and visualizations in Qlik Sense.

12.1 Images are not included in the app

Images are part of apps as thumbnails of the apps, sheets and stories, in the text & image object and in story slides.

When you move apps between Qlik Sense environments, images are not moved automatically. The images have to be handled manually, in different ways depending on between which environments the app has been moved.

The app has been moved from one Qlik Sense environment to another

Possible cause

You have created an app in Qlik Sense and moved the app to another Qlik Sense environment.

Proposed action

Import the images from the Qlik Sense environment where the app was created to the target location using the Qlik Management Console.

The app has been imported from Qlik Sense Desktop to Qlik Sense

Possible cause

You have created an app in Qlik Sense Desktop and imported the app to Qlik Sense.

Proposed action

Import the images from the images folder of the Qlik Sense Desktop app using the Qlik Management Console.

The default location of the images in Qlik Sense Desktop is *<user>\Documents\Qlik\Sense\Content\Default*.

If you have organized images in subfolders in the Content\Default folder in Qlik Sense Desktop, these have to be added manually to the app and its sheets, stories and text & image objects after importing the images.

The app has been moved from one Qlik Sense Desktop installation to another

Possible cause

You have moved an app between Qlik Sense Desktop installations.

Proposed action

Do the following:

- Copy the images from the PC where the app was created and paste into the images folder of the target location.

The default location of the images in Qlik Sense Desktop is *<user>\Documents\Qlik\Sense\Content\Default*.

12.2 The image I want to use does not seem to work

Images are part of apps as thumbnails of the apps, sheets and stories, in the text & image object and in story slides.

Possible cause

You are using an image in a format that is not supported.

Proposed action

Do the following:

- Convert the image to one of the supported formats (png, jpg, jpeg or gif).

12.3 I cannot find the fields in the library panel

Possible cause

You are working with a published app. Different content is available before publishing.

12.4 I cannot open my QlikView document in Qlik Sense

If you have a QlikView document, you can use its load script and data model when creating an app in Qlik Sense. Visualizations, dimensions and measures, however, have to be created using Qlik Sense.

Possible cause

The QlikView document (qvw format) has not been converted to a Qlik Sense app (qvf format).

Proposed action

Convert the document to an app using Qlik Sense Desktop.

See: *Converting a QlikView document into a Qlik Sense app (page 279)*

12.5 I cannot edit a variable

I cannot edit a variable that is listed in the variables overview.

Possible cause

The variable is defined in the script.

Proposed action

Edit the variable in the script, using the data load editor, or delete the variable from the script, using the data load editor, to make the variable editable from the variables overview.

See: *Editing a variable (page 258)*

12.6 QlikView variables are missing in the app

My QlikView document contains variables. I have converted the QlikView document into an app, using Qlik Sense version 2.1+. When I open the app in a Qlik Sense version prior to 2.1, I cannot find the user defined variables.

Possible cause

The user defined variables have been removed from the app. This can occur in the following scenario:

1. Create an app from the QlikView document, using Qlik Sense version 2.1+.
   See: *Converting a QlikView document into a Qlik Sense app (page 279)*

   Both the user defined variables and the variables created in the script are listed in the variables overview. An icon indicates if the variable is defined in the script: .
2. Reload the app.
   The script is reloaded. If a variable has been removed from the script it will stay in the app, and be listed in the variables overview, but the script icon ( ) is removed.
3. Open the app, in a Qlik Sense version prior to 2.1.
   Now, the variables that were user defined in the original QlikView document are removed. Only the variables defined in the script stays in the app and you can only work with the variables using the script.

Proposed action

Use Qlik Sense, version 2.1+, to be able to use all variables in the original QlikView document; both script defined and user defined variables.

Only work with variables in the script, if you are a using a Qlik Sense version prior to 2.1.

12.7 I cannot edit a variable that was created in a Qlik Sense installation prior to version 2.1

My Qlik Sense app contains variables and now I cannot edit them.

Possible cause

The variable is defined as a script variable but has been removed from the script. This can occur in the following scenario:

1. Create a Qlik Sense app with a script variable, in a Qlik Sense installation prior to version 2.1.
2. Delete the variable from the script.
   The variable is removed from the script but stays in the app.
3. Open the app, in a Qlik Sense installation version 2.1+.
   Now you see the variable in the variables overview. This icon indicates that the variable is defined in the script: . But you cannot edit the variable since it is not showing in the script.

Proposed action

Reload the script to make the variable editable from the variables overview. The script icon is removed.