Tutorial - Building an App

Qlik Sense®
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Contents

1 Welcome to this tutorial!

Welcome to this tutorial, which will introduce you to app building in Qlik Sense. Qlik Sense is a software product that is used to extract and present data in an intuitive and easy-to-use interface. You extract data by making selections in Qlik Sense. When you make a selection, the app immediately filters the data and presents all associated items. If you want to learn more about selections, go through the *Tutorial - Beginning with the Basics* that is available at help.qlik.com. In this tutorial, the focus is on app building.

1.1 About this tutorial

This tutorial guides you through the building of an app from scratch. You start with an empty sheet and finish with a good-looking app!

It is assumed that you are familiar with the basics of Qlik Sense. You know how to make selections and how to interpret the results of your selection.

These are some of the subjects in this tutorial:

- Data loading
- App design
- Visualization creation
- Reuse of visualizations, dimensions and measures
- Data storytelling

When you have completed the tutorial, you should have a fair understanding of the different steps involved in the building of a Qlik Sense app. You will also be aware of some of the necessary considerations related to the design of the app.

The screenshots in this tutorial are taken in Qlik Sense Cloud. Some differences may occur if you are using Qlik Sense Enterprise or Qlik Sense Desktop.

1.2 Prerequisites

Before you can start working with Qlik Sense, you need one of the following:

- Access to Qlik Sense Enterprise.
- Qlik Sense Desktop installed on your computer.
- Access to Qlik Sense Cloud.

You can download Qlik Sense Desktop from www.qlik.com. If you need help with the installation, you can find instructions at help.qlik.com.

You access Qlik Sense Cloud by typing https://qlikcloud.com in your web browser. You need to enter your user name and password. If you don’t have a user name you need to register.

1.3 Building an app

Building an app involves some basic steps that you need to take to be able to design and use the app.

1. Preparing the data files.
   Make the data files available in Qlik Sense Enterprise, Qlik Sense Desktop or Qlik Sense Cloud.
2. Creating an empty app.
   Basically, what you do is to give the app a name.
3. Loading data.
   Qlik Sense is built for analyzing data, and without any data the app is not very useful.
4. Creating one or more sheets and adding visualizations.
   The sheet is where you create your visualizations. It is also where you analyze your data, when the app is ready.

These are the basic steps. In more advanced apps, scripting often includes much more than just loading data.

1.4 Further reading and resources

Qlik offers a wide variety of resources when you want to learn more.

At help.qlik.com, you find the Qlik Sense online help and a number of downloadable guides.

If you visit www.qlik.com, you will find the following:

- Training, including free online courses
- Demo apps
- Qlik Community, where you will find discussion forums, blogs, and more

These are all valuable sources of information and are highly recommended.

2 Making preparations

2.1 Opening Qlik Sense

Do one of the following depending on which version of Qlik Sense you are using.

Opening Qlik Sense Enterprise

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

When Qlik Sense has started, you arrive at the hub, where you can create a new app from **Work**.

Opening Qlik Sense Desktop

When you have installed Qlik Sense Desktop, you start it from the shortcut on your desktop, the left pane in the **Start** menu, or the Qlik Sense folder, under **All Programs**.

When you start Qlik Sense Desktop, you arrive at the hub. You can close the greeting message.

The hub is the storage of your apps. If you have installed Qlik Sense Desktop recently, you may not have many apps yet, and in that case, you are about to begin building your first app!

Opening Qlik Sense Cloud

You access Qlik Sense Cloud by typing https://qlikcloud.com in your web browser. You need to enter your user name and password. If you don't have a user name you need to register.

When you log in to Qlik Sense Cloud, you arrive at your personal cloud, where you can create a new app.

2.2 Placing tutorial source files

The folder *Tutorial source* is included in the zip file and contains the data files. Before you start building the app you need to make sure you can access the data files. Do one of the following depending on which version of Qlik Sense you are using.

Placing tutorial source files in Qlik Sense Enterprise

If you are using Qlik Sense Enterprise, you need to place the *Tutorial source* folder on your computer. A specific file location is not required.

Placing tutorial source files in Qlik Sense Desktop

If you are using Qlik Sense Desktop, you need to place the *Tutorial source* folder in the *Sense* folder.

Do the following:

1. Open the folder *Documents*. (It is sometimes called *My Documents*.) From there, the path is *Qlik\Sense*.
2. Place the *Tutorial source* folder in the *Sense* folder.

Uploading tutorial source files in Qlik Sense Cloud

If you are using Qlik Sense Cloud, you need to upload the data files to the cloud.

Do the following:

1. Log in to Qlik Sense Cloud.
2. Click **Import data**.
3. Drag all data files from the *Tutorial source* folder and drop them in the designated area in the upload dialog.
   The data files are added to your personal data files.

3 Creating a new app

Your first step towards a complete app is to create an empty app. Do one of the following depending on which version of Qlik Sense you are using.

3.1 Creating a new app in Qlik Sense Enterprise or Qlik Sense Desktop

Do the following:

1. In the hub, click **Create new app**.
   The **Create new app** dialog opens.
2. Enter the name *Tutorial* for the app.
3. Click **Create**.
   A creation confirmation is displayed.
4. Click **Open app**.
   The app is opened. You are now prompted to start adding data.

3.2 Creating a new app in Qlik Sense Cloud

Do the following:

1. In **My work**, click **New app**.
   The **New app** dialog opens.
2. Enter the name *Tutorial* for the app.
3. Click **Create app**.
   The app is opened. You are now prompted to start adding data.

4 Adding data

Your second step towards a complete app is loading the data. You will load the following files:

- *Sales.xlsx*
- *Item master.xlsx*
- *Cities.xlsx*
- *Sales rep.csv*
- *Customers.xlsx*

Do one of the following depending on which version of Qlik Sense you are using.

4.1 Loading data from the first data file in Qlik Sense Enterprise

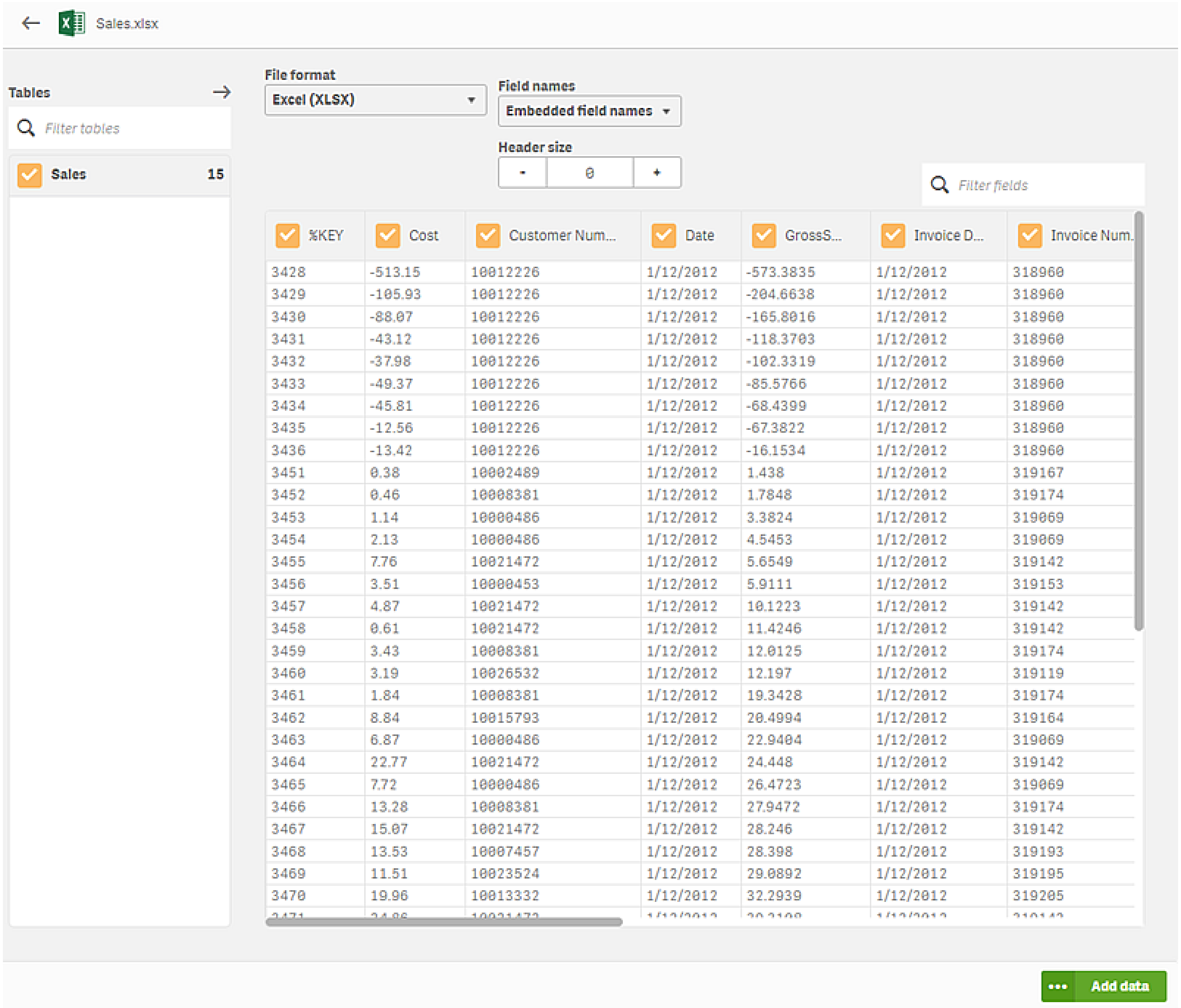
It is good practice to add the most important file first, which in this case is *Sales.xlsx*.

If you are using Qlik Sense Enterprise, you will add the data files from the *Tutorial source* folder, which you have placed on your computer if you followed the previous instructions.

Do the following:

1. Click **Add data from files and other sources**.
   A data source selection dialog is displayed.
2. Click **Attached files** and do one of the following to upload the file:
   - Drag and drop the file *Sales.xlsx* onto the dialog.
   - Click in the designated area at the bottom of the dialog, browse to the file *Sales.xlsx* and click **Open**.

   Either way a progress window is displayed and then the data selection window opens. You can see that *Sales*, which is a sheet in the data file, is already selected. **Embedded field names** is also selected. This is correct.



3. Click **Add data**.
   A progress window is displayed before the associations view of the data manager opens. In this view your data is illustrated using bubbles. The table *Sales* is added and marked with *, which indicates a new or updated table.

Before you load data you will add more data files. Continue with *Adding the file Sales rep.csv (page 14)*.

Loading data from the first data file in Qlik Sense Desktop

It is good practice to add the most important file first, which in this case is *Sales.xlsx*.

If you are using Qlik Sense Desktop, you must have a data connection to the *Tutorial source* folder, which contains the data files. The data connection to the *Tutorial source*folder will be created when you load the first data file *Sales.xlsx* from the *Tutorial source* folder.

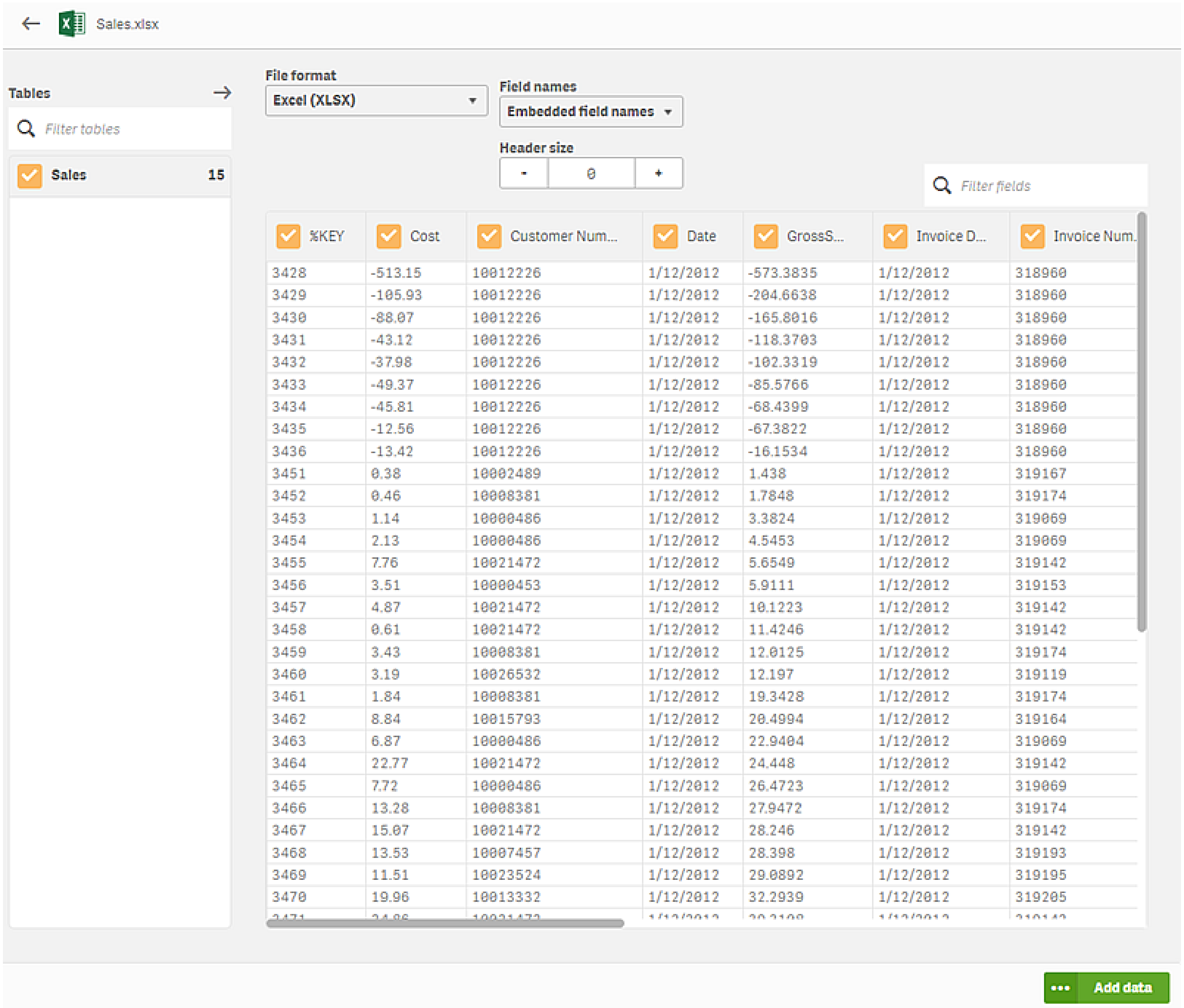
Do the following:

1. Click **Add data from files and other sources**.
   A data source selection dialog is displayed. You now need to navigate to the *Tutorial source* folder, which contains with all the data files that you will load.
2. Click **My computer**.
3. If you followed the previous recommendation on where to place the *Tutorial source* folder, browse to the *Tutorial source* folder under **Documents** > **Qlik** > **Sense**. If you stored the *Tutorial source* folder somewhere else, you need to navigate to the folder location and open the folder.

File selection dialog where no data source is selected and all file types in the folder are shown

Do the following:

1. In the file selection dialog, select the file *Sales.xlsx*.
   A progress window is displayed and then the data selection window opens. You can see that *Sales*, which is a sheet in the data file, is already selected. **Embedded field names** is also selected. That is correct.



2. Click **Add data**.

A progress window is displayed before the associations view of the data manager opens. In this view your data is illustrated using bubbles. The table *Sales* is added and marked with *, which indicates a new or updated table.

Before you load data you will add more data files. Continue with *Adding the file Sales rep.csv (page 14)*.

Loading data from the first data file in Qlik Sense Cloud

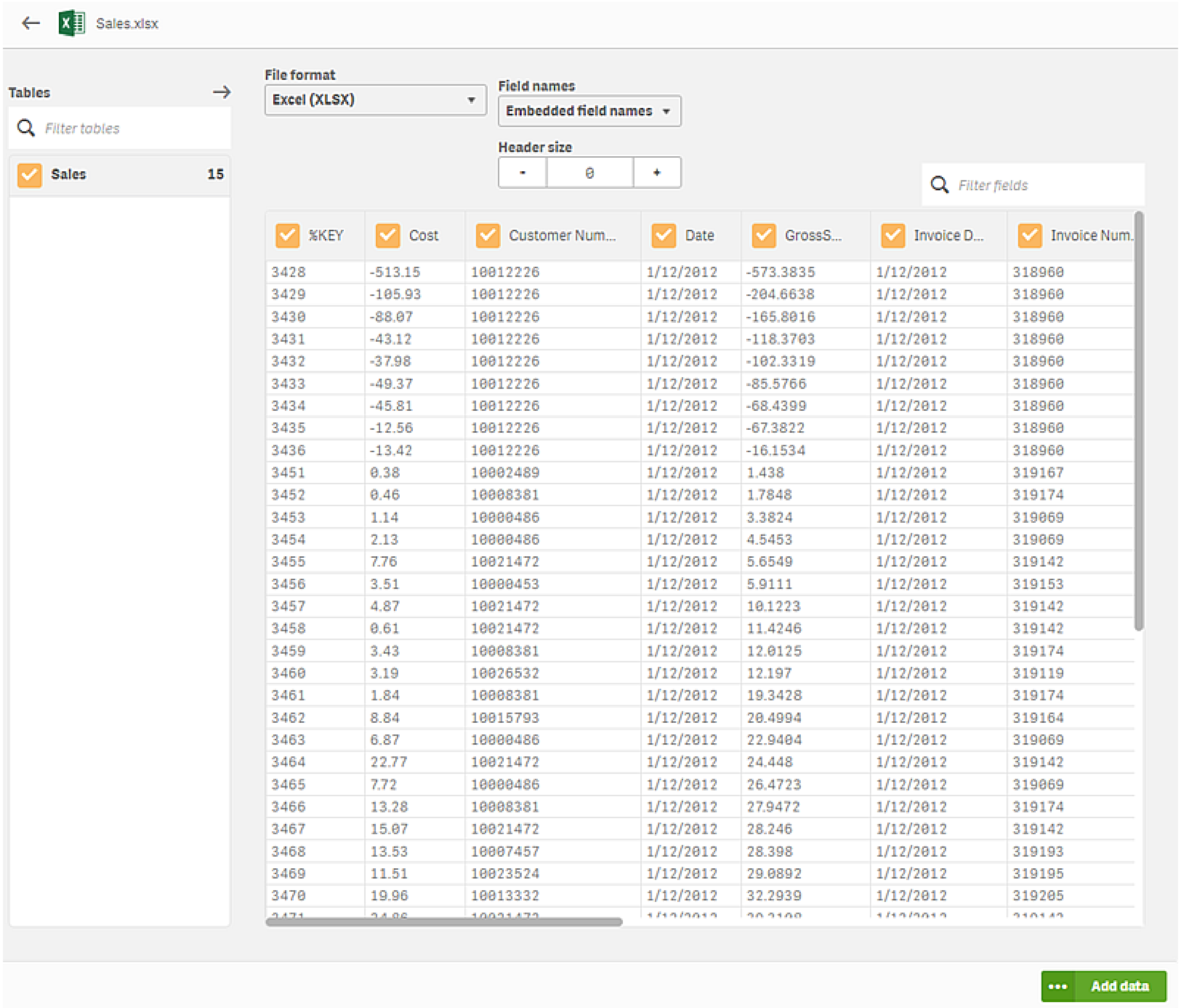
It is good practice to add the most important file first, which in this case is *Sales.xlsx*.

If you are using Qlik Sense Cloud you will use a connection to your personal data files when loading the data.

When you use and select the **Add data from files and other sources** option, a data source selection dialog is displayed.

Do the following:

1. Click **Add data from files and other sources**.
   A data source selection dialog is displayed.
2. Under **File locations**, click **Data files**.
   A data fileselection dialog is displayed.
3. In the file selection dialog, select the file *Sales.xlsx*.
   A progress window is displayed and then the data selection window opens. You can see that *Sales*, which is a sheet in the data file, is already selected. **Embedded field names** is also selected. That is correct.



4. Click **Add data**.
   A progress window is displayed before the associations view of the data manager opens. In this view your data is illustrated using bubbles. The table *Sales* is added and marked with *, which indicates a new or updated table.

Before you load data you will add more data files. Continue with *Adding the file Sales rep.csv (page 14)*.

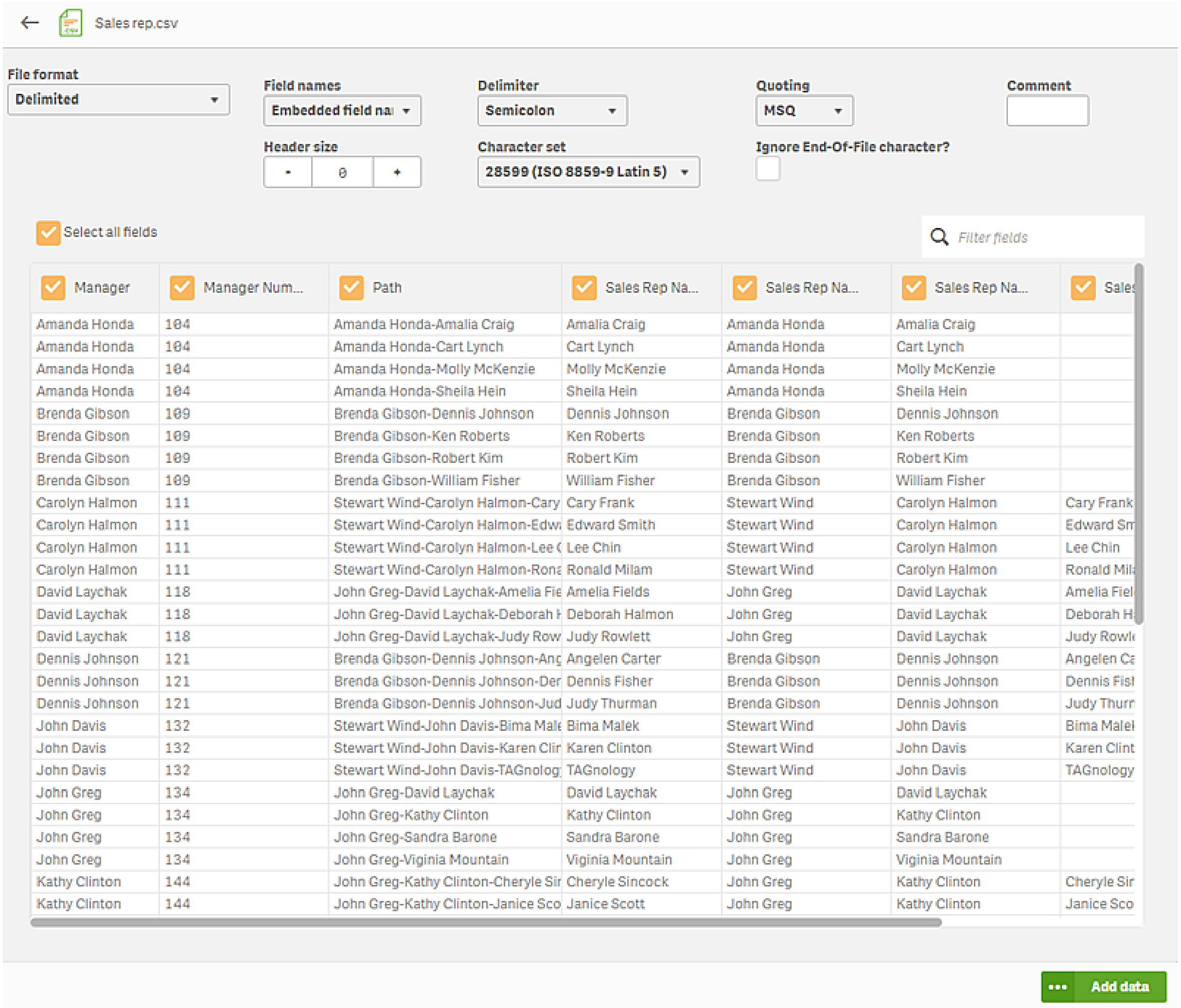
4.2 Adding the file Sales rep.csv

The next data file you will add is *Sales rep.csv*, with a slightly different data selection interface.

In the Associations view, do the following:

1. Add the *Sales rep.csv* file by dropping it on the app:
   The data source selection dialog is displayed.
   Under **Field names**, make sure that **Embedded field names** is selected to include the names of the table fields when you load the data.

The **Delimiter** field is set to **Semicolon**, and that is correct. Qlik Sense automatically recognizes the delimiter and by default displays the data with the correct delimiter.



Manager	Manager Num...	Path	Sales Rep Na...	Sales Rep Na...	Sales Rep Na...	Sales
Amanda Honda	104	Amanda Honda-Amalia Craig	Amalia Craig	Amanda Honda	Amalia Craig	
Amanda Honda	104	Amanda Honda-Cart Lynch	Cart Lynch	Amanda Honda	Cart Lynch	
Amanda Honda	104	Amanda Honda-Molly McKenzie	Molly McKenzie	Amanda Honda	Molly McKenzie	
Amanda Honda	104	Amanda Honda-Sheila Hein	Sheila Hein	Amanda Honda	Sheila Hein	
Brenda Gibson	109	Brenda Gibson-Dennis Johnson	Dennis Johnson	Brenda Gibson	Dennis Johnson	
Brenda Gibson	109	Brenda Gibson-Ken Roberts	Ken Roberts	Brenda Gibson	Ken Roberts	
Brenda Gibson	109	Brenda Gibson-Robert Kim	Robert Kim	Brenda Gibson	Robert Kim	
Brenda Gibson	109	Brenda Gibson-William Fisher	William Fisher	Brenda Gibson	William Fisher	
Carolyn Halmon	111	Stewart Wind-Carolyn Halmon-Cary	Cary Frank	Stewart Wind	Carolyn Halmon	Cary Frank
Carolyn Halmon	111	Stewart Wind-Carolyn Halmon-Edwa	Edward Smith	Stewart Wind	Carolyn Halmon	Edward Sm
Carolyn Halmon	111	Stewart Wind-Carolyn Halmon-Lee C	Lee Chin	Stewart Wind	Carolyn Halmon	Lee Chin
Carolyn Halmon	111	Stewart Wind-Carolyn Halmon-Rona	Ronald Milam	Stewart Wind	Carolyn Halmon	Ronald Mil
David Laychak	118	John Greg-David Laychak-Amelia Fie	Amelia Fields	John Greg	David Laychak	Amelia Fiel
David Laychak	118	John Greg-David Laychak-Deborah H	Deborah Halmon	John Greg	David Laychak	Deborah H
David Laychak	118	John Greg-David Laychak-Judy Row	Judy Rowlett	John Greg	David Laychak	Judy Rowl
Dennis Johnson	121	Brenda Gibson-Dennis Johnson-Ang	Angelen Carter	Brenda Gibson	Dennis Johnson	Angelen Ca
Dennis Johnson	121	Brenda Gibson-Dennis Johnson-Der	Dennis Fisher	Brenda Gibson	Dennis Johnson	Dennis Fis
Dennis Johnson	121	Brenda Gibson-Dennis Johnson-Jud	Judy Thurman	Brenda Gibson	Dennis Johnson	Judy Thurr
John Davis	132	Stewart Wind-John Davis-Bima Male	Bima Malek	Stewart Wind	John Davis	Bima Malel
John Davis	132	Stewart Wind-John Davis-Karen Clir	Karen Clinton	Stewart Wind	John Davis	Karen Clint
John Davis	132	Stewart Wind-John Davis-TAGnolog	TAGnology	Stewart Wind	John Davis	TAGnology
John Greg	134	John Greg-David Laychak	David Laychak	John Greg	David Laychak	
John Greg	134	John Greg-Kathy Clinton	Kathy Clinton	John Greg	Kathy Clinton	
John Greg	134	John Greg-Sandra Barone	Sandra Barone	John Greg	Sandra Barone	
John Greg	134	John Greg-Viginia Mountain	Viginia Mountain	John Greg	Viginia Mountain	
Kathy Clinton	144	John Greg-Kathy Clinton-Cheryle Sir	Cheryle Sincock	John Greg	Kathy Clinton	Cheryle Sir
Kathy Clinton	144	John Greg-Kathy Clinton-Janice Sco	Janice Scott	John Greg	Kathy Clinton	Janice Sco

2. Click **Add data**.
   A progress window is displayed before the data manager opens. The table *Sales rep* is added and marked with **Pending add**. The next step is to associate your data.

4.3 Associating data

Now it is time to create an association between the fields in your tables *Sales* and *Sales rep*.

Do the following:

1. Click **Associations** in the data manager overview.
   In the **Associations** view of the data manager your data is illustrated using bubbles, with each bubble representing a data table, and the size of the bubble representing the amount of data in the table. Bubbles marked with * indicates a new or updated table.
2. Drag the *Sales rep* bubble towards the *Sales* bubble.

Qlik Sense now detects a highly recommended association to the *Sales* table and its bubble is marked with green.

3. Drop the *Sales rep* bubble onto the *Sales* bubble.
   A link is now created between the bubbles and the tables are associated using the recommended fields.
4. Click the link between the *Sales rep* bubble and the *Sales* bubble.
   The association panel, at the bottom of the screen, displays a preview of data in the associated fields.
5. Click the association *Sales rep ID-Sales Rep Number* in the association panel and rename it *Sales Rep Number*.

   The association is now named *Sales Rep Number*.

Now you have associated the first two tables. The next step is to add more data files.

4.4 Adding and associating more data

You will add the final three data files before you load data and start building the app.

In the **Associations** view, do the following:

1. Add the following data files by dropping them on the app:
   - *Cities.xlsx*
   - *Customers.xlsx*
   - *Item master.xlsx*

   > *Under **Field names**, make sure that **Embedded field names** is selected to include the names of the table fields when you load the data.*

   You should now see five data files.

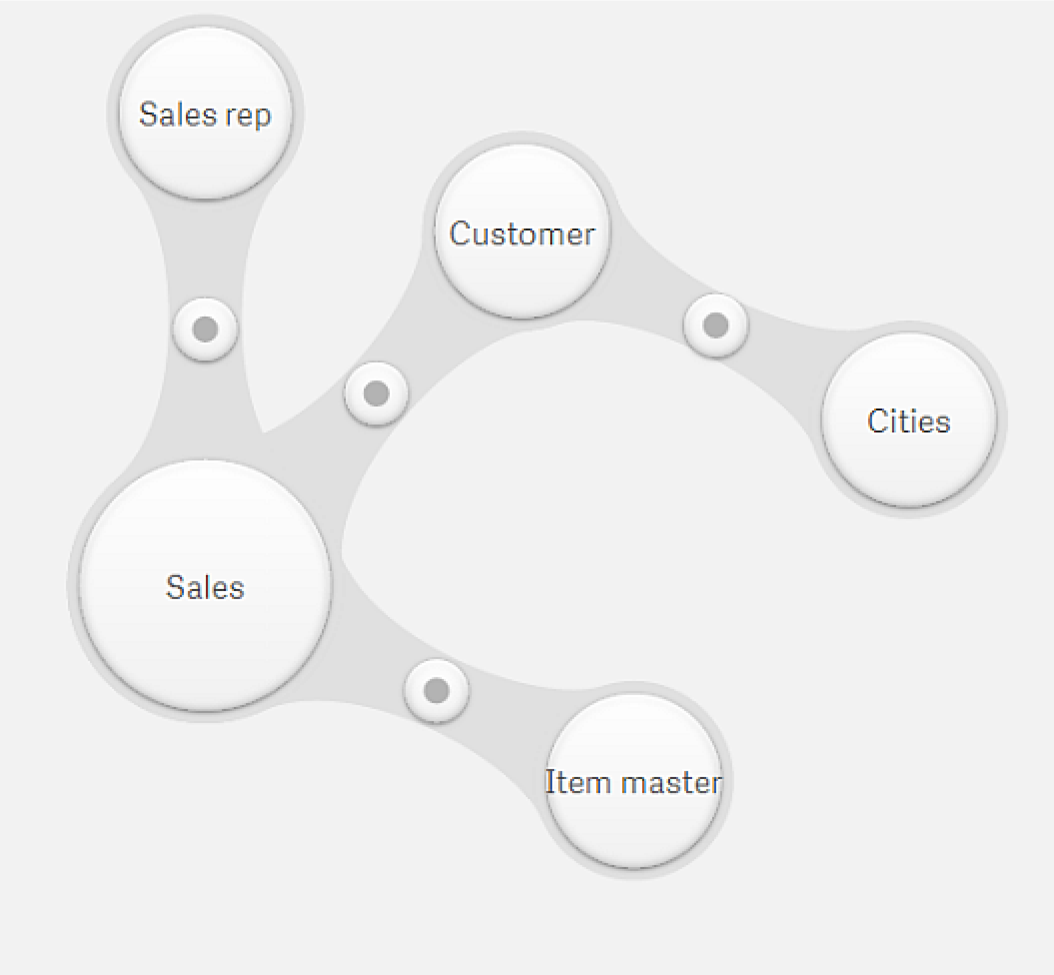
   You have already associated the tables *Sales* and *Sales rep*. Qlik Sense helps you identify recommended associations and you will now explore this.

2. Click and hold the bubble *Customer*.
   The bubbles *Sales* and *Cities* are marked green because Qlik Sense highly suggests associating these two tables to *Customers*.
3. Click and hold the bubble *Cities*.
   The bubble *Customer* is marked green. The bubble *Sales* is marked orange, which indicates a medium recommendation.
4. Click and hold the bubble *Item master*.
   The bubble *Sales* is marked green.

Recommended associations are identified between all tables and you will now let Qlik Sense create the associations for you.

Do the following:

- Click .
  If you're using Qlik Sense Desktop, click **Save**.
  The tables are now associated according to Qlik Sense recommendations.



All tables are now associated and you will now load the data.

4.5 Loading data

Do the following:

1. Click **Load data**.
   A progress window is displayed while the data is loading. When the data load is complete, you can continue.
2. Click **Close**.

You will now adjust the regional settings.

4.6 Regional settings

You need to change the regional settings, to prepare the time and date formats for this tutorial.

Number interpretation variables are system defined, that is, they are automatically generated according to the current regional settings of the operating system when a new app is created.

In Qlik Sense Desktop,the regional settings is according to the settings of the computer operating system. InQlik Sense Enterprise, it is according to the operating system of the server whereQlik Sense is installed. In Qlik Sense Cloud, it depends on which browser you are using.

To be able to use the tutorial files provided for this tutorial, you need to define the time and date formats in the app.

Do the following:

1. Click and select **Data load editor**.
2. In the left panel, click **Main** to go to the existing regional settings.
3. Delete the existing regional settings (they all begin with **SET**) and copy and paste the following regional settings at the top in the data load editor.

```
SET ThousandSep=',';
SET DecimalSep='.';
SET MoneyThousandSep=',';
SET MoneyDecimalSep='.';
SET MoneyFormat='$#,##0.00;($#,##0.00)';
SET TimeFormat='h:mm:ss TT';
SET DateFormat='M/D/YYYY';
SET TimestampFormat='M/D/YYYY h:mm:ss[.fff] TT';
SET FirstWeekDay=6;
SET BrokenWeeks=1;
SET ReferenceDay=0;
SET FirstMonthOfYear=1;
SET CollationLocale='en-US';
SET CreateSearchIndexOnReload=1;
SET MonthNames='Jan;Feb;Mar;Apr;May;Jun;Jul;Aug;Sep;Oct;Nov;Dec';
SET
LongMonthNames='January;February;March;April;May;June;July;August;September;October;November;D
ecember';
SET DayNames='Mon;Tue;Wed;Thu;Fri;Sat;Sun';
SET LongDayNames='Monday;Tuesday;Wednesday;Thursday;Friday;Saturday;Sunday';
```

You should now have 18 **SET** statements at the beginning of the script.

```
SET ThousandSep=',';
SET DecimalSep='.';
SET MoneyThousandSep=',';
SET MoneyDecimalSep='.';
SET MoneyFormat='$#,##0.00;-$#,##0.00';
SET TimeFormat='h:mm:ss TT';
SET DateFormat='M/D/YYYY';
SET TimestampFormat='M/D/YYYY h:mm:ss[.fff] TT';
SET FirstWeekDay=6;
SET BrokenWeeks=1;
SET ReferenceDay=0;
SET FirstMonthOfYear=1;
SET CollationLocale='en-US';
SET CreateSearchIndexOnReload=1;
SET MonthNames='Jan;Feb;Mar;Apr;May;Jun;Jul;Aug;Sep;Oct;Nov;Dec';
SET LongMonthNames='January;February;March;April;May;June;July;August;September;October;November;December';
SET DayNames='Mon;Tue;Wed;Thu;Fri;Sat;Sun';
SET LongDayNames='Monday;Tuesday;Wednesday;Thursday;Friday;Saturday;Sunday';
```

4.7 Loading data

Now you have added all data files, associated their tables and changed the regional settings. Before you start building your app you must load the script.

Do the following:

1. Click **Load data**.
   A progress window is displayed while the data is loading. When the data load is complete, you can continue.
2. Click **Close**.

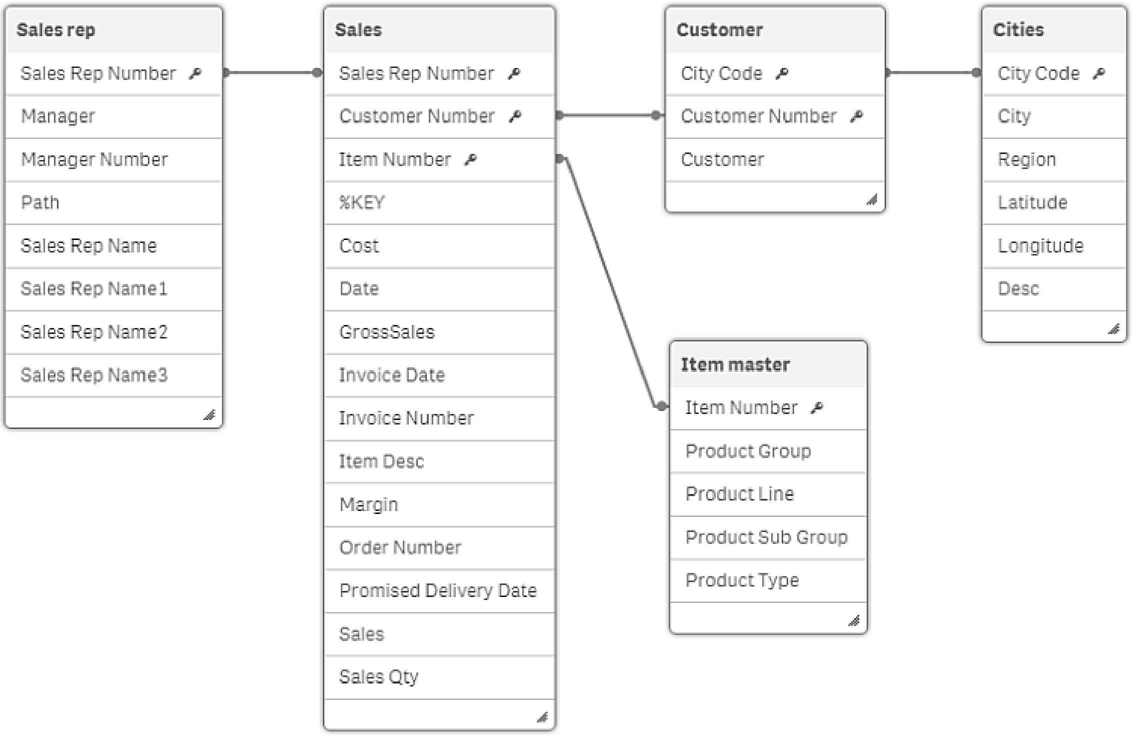
Viewing the data model

Now you are ready to start building your app, but before you start, let's have a look at the data model.

Do the following:

1. In the toolbar, click and select **Data model viewer**.
2. In the toolbar in the data model viewer, click to expand the tables.
3. In the toolbar, click **Save** to save your work.

All tables are now connected and the data model viewer should have the following content. A field connecting one or more tables is called a key.



You have now finished adding data and can start building your app.

5 App design

You have loaded the data. Now it is time to create sheets and visualizations. Dashboard design involves using the right objects in the right way, and making the sheets well structured and user-friendly. This app will be fairly simple, but you will learn some basic design principles that are good to know. If you want to build an app of your own, and want some inspiration, you should visit the Qlik web site www.qlik.com. You can find a large number of apps serving a wide variety of different purposes there. If you are looking for a template when you want to design your own app, chances are pretty good that you can find something useful.

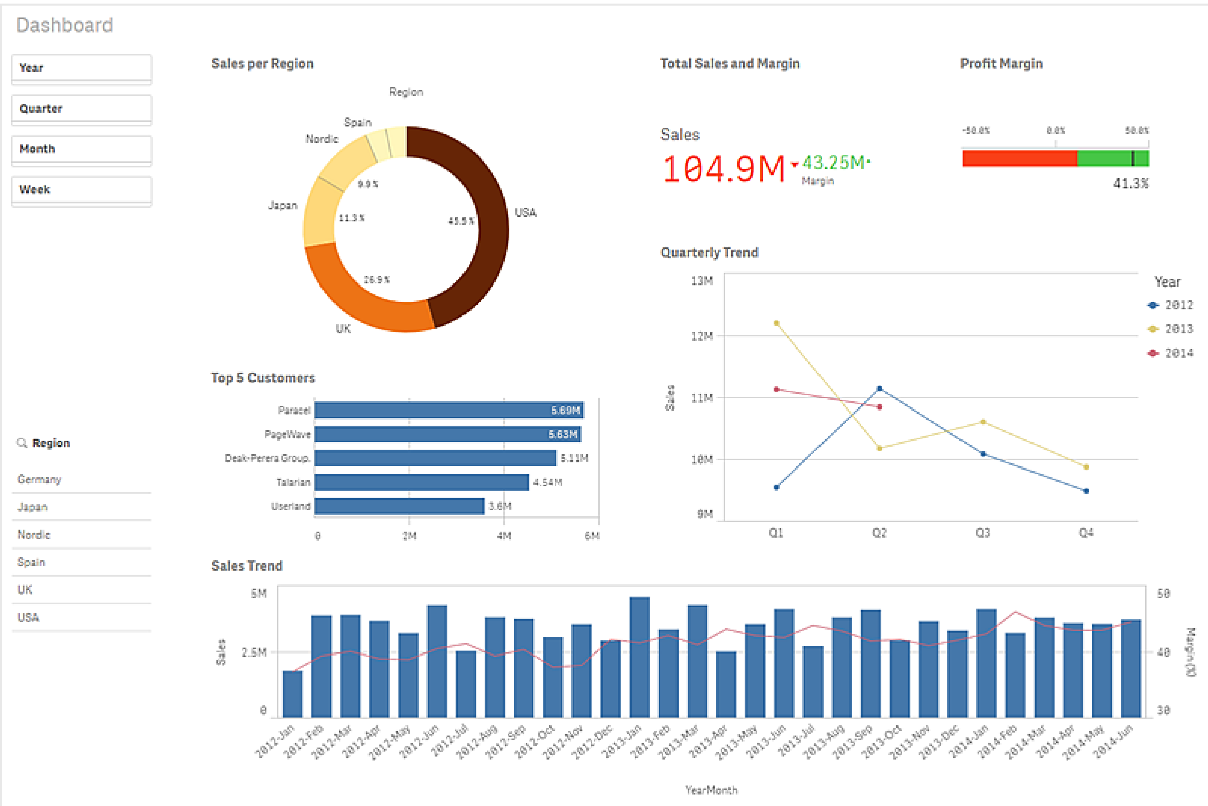
5.1 Creating the sheets

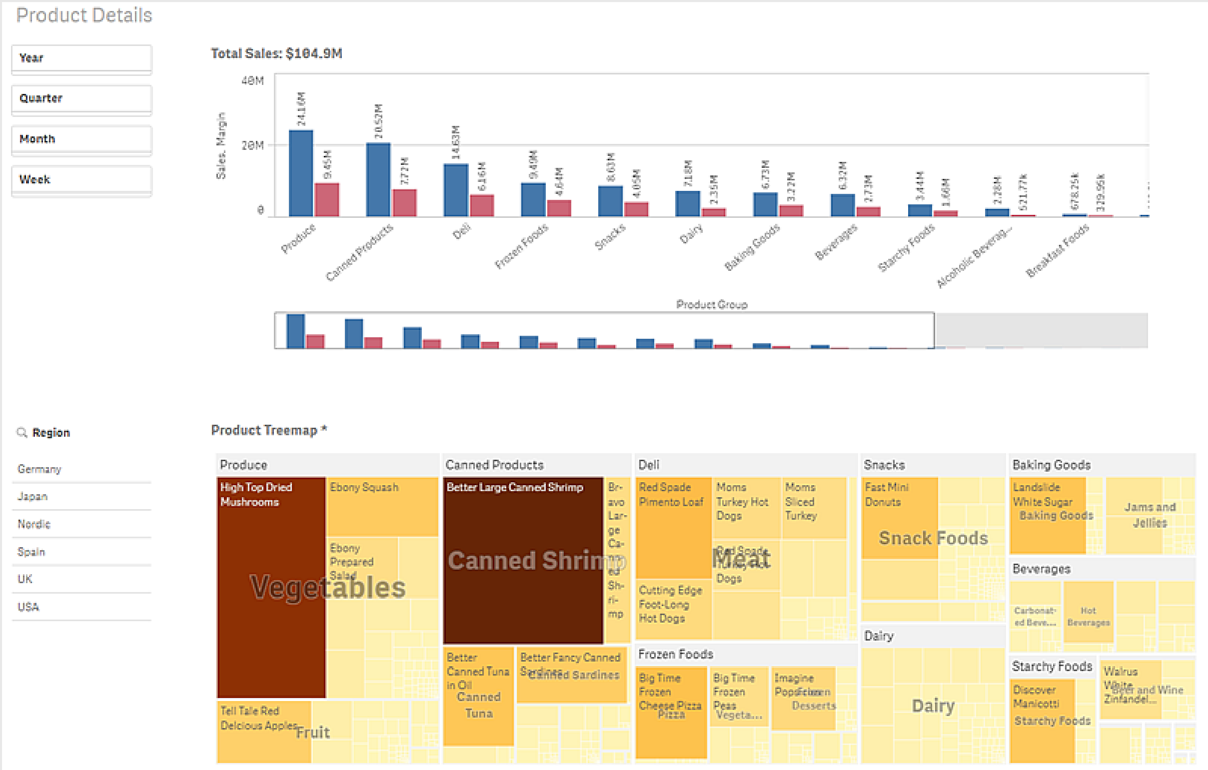
The app that you are building will contain four sheets: *Dashboard*, *Product Details*, *Customer Details*, and *Customer Location*.

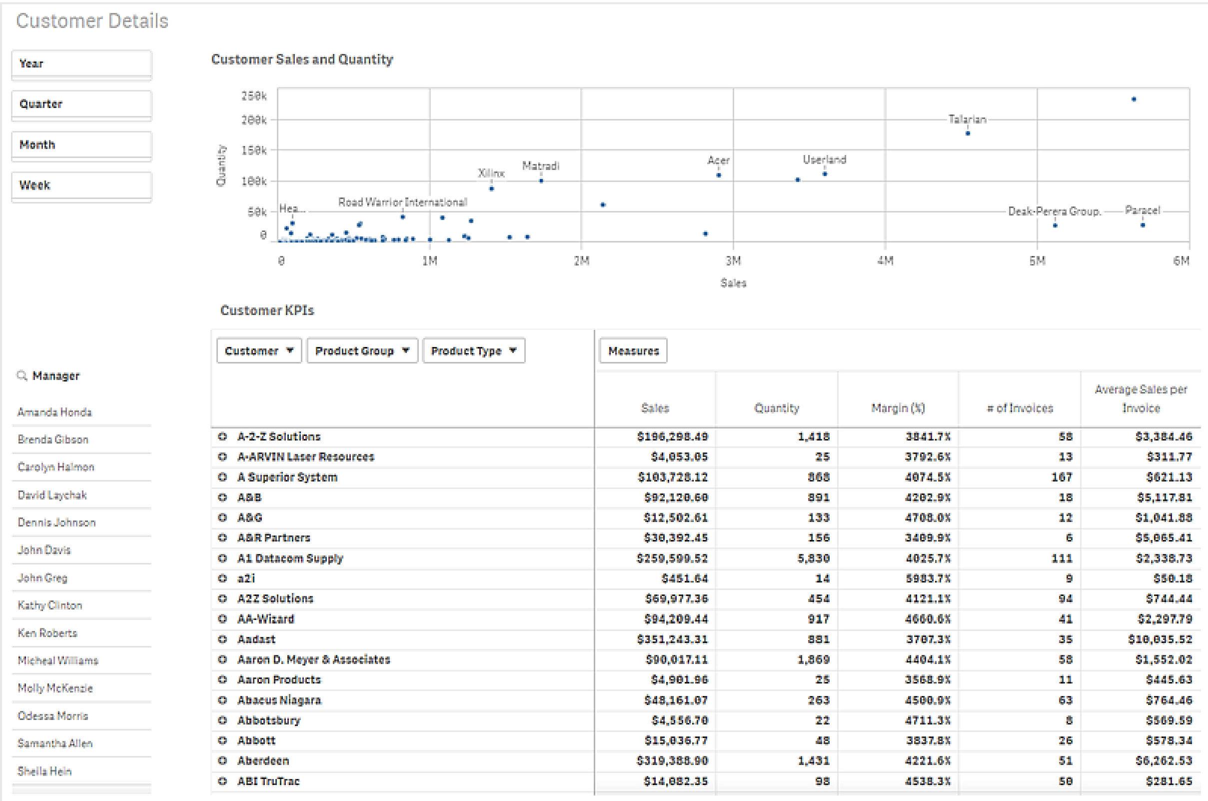
Do the following:

1. Click and select **App overview**, where you create new sheets and arrange your existing sheets.
2. Click **Create new sheet** and name the sheet *Dashboard*.
   Do the same for the sheets *Product Details* , *Customer Details* and *Customer Location*. You now have four sheets that all belong to the same app, *Tutorial*.

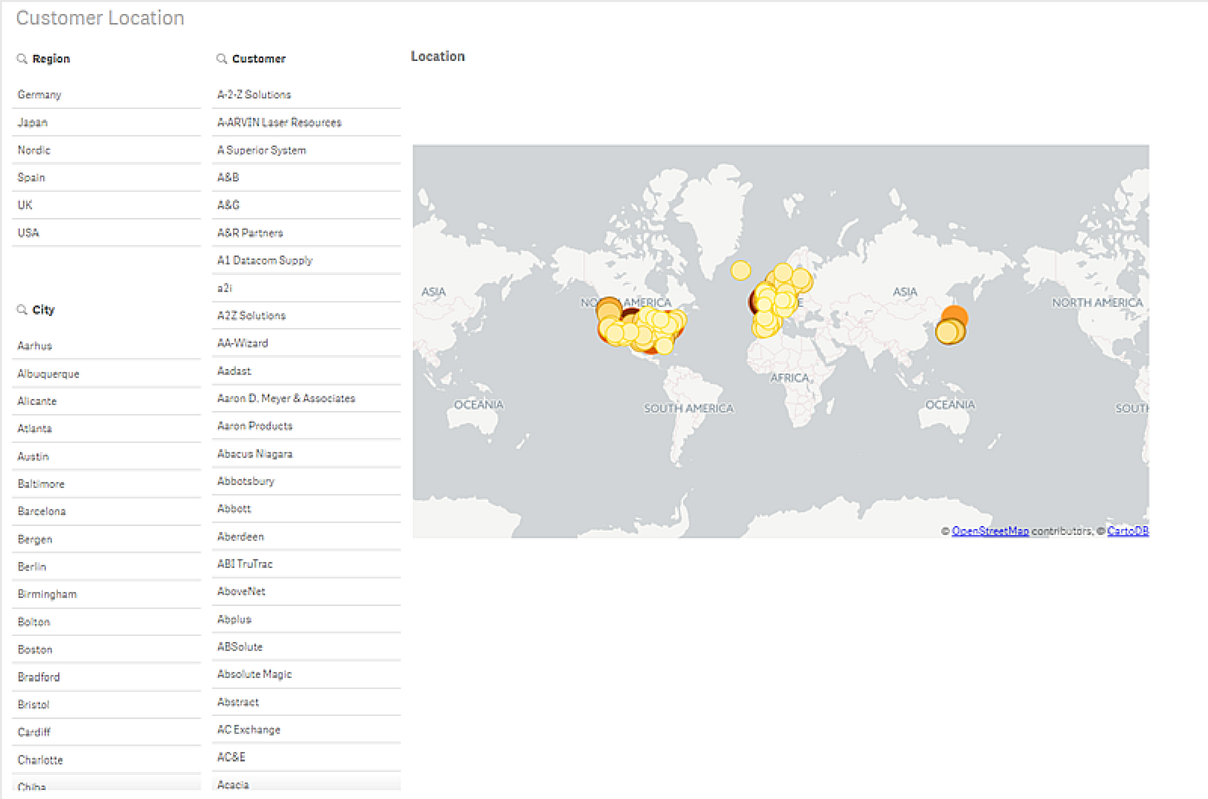
The following screen shots show what the app will look like when it is finished.







	Sales	Quantity	Margin (%)	# of Invoices	Average Sales per Invoice
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
Aadast	$351,243.31	881	3707.3%	35	$10,035.52
Aaron D. Meyer & Associates	$90,017.11	1,869	4404.1%	58	$1,552.02
Aaron Products	$4,901.96	25	3568.9%	11	$445.63
Abacus Niagara	$48,161.07	263	4500.9%	63	$764.46
Abbotsbury	$4,556.70	22	4711.3%	8	$569.59
Abbott	$15,036.77	48	3837.8%	26	$578.34
Aberdeen	$319,388.90	1,431	4221.6%	51	$6,262.53
ABI TruTrac	$14,082.35	98	4538.3%	50	$281.65



As you can see there are similarities between the sheets. They all contain filter panes that are placed to the left. It is good to strive towards consistency when you design an app. Visualizations that are present in several sheets should have the same position in all sheets so that the user knows where to find them. There should be a logic in the design that supports the user in achieving the goal, that is, making data discovery. So, placement is one aspect of the design, another is the choice of visualization.

Each visualization has its own advantages, and to be able to build an efficient and well-functioning app, you need to be aware of those advantages. To some extent the visualizations are self-explanatory. Graphical elements are great for giving overviews and showing trends, whereas tables are economical in that they can present large amounts of data using a limited space. You get exact figures, but lose the quick and easily digestible information that is conveyed in graphical elements.

6 The first sheet: Dashboard

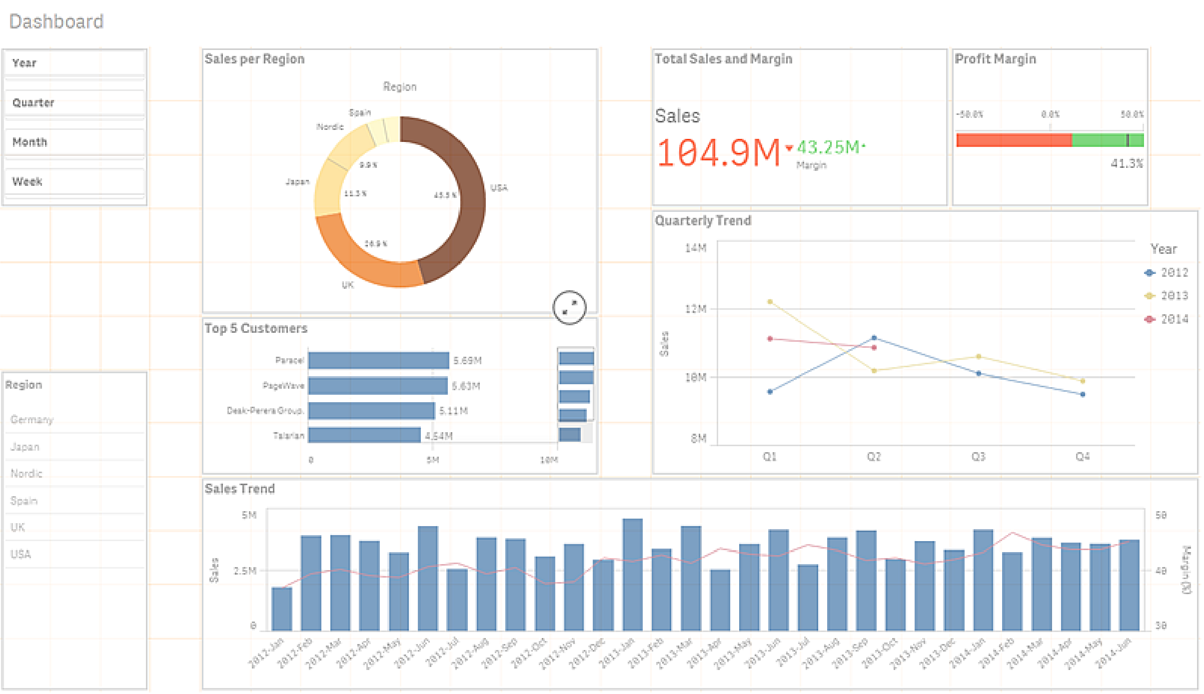
Right-click *Dashboard* and select **Open and edit** to open the first sheet. The sheet is empty, but it will not be for long. The assets panel to the left contains available charts and fields. Click (**Charts**), so that you can start adding charts to the sheet. The properties panel is on the right.

The assets panel and the properties panel have a show/hide functionality. Click in the bottom right to switch between showing and hiding the properties panel.

6.1 Creating visualizations

The purpose of a dashboard is to give a quick overview of the current state of affairs. The focus is on sales trends and figures. The dashboard is not primarily designed for data exploration, but it is of course possible to make selections and analyze the results.

The screenshot for the sheet *Dashboard* shows the sheet when editing. To the left there are two filter panes, the time filter pane without a title and *Region*. You will begin with these.



Dashboard sheet when editing

Drag the charts to the center of the area where you want to place them.

6.2 Adding the filter panes

The purpose of the filter panes is to filter out a limited data set, which you can analyze and explore.

Do the following:

1. Drag a filter pane to the sheet.
2. In the assets panel to the left, click to open **Fields**.
3. Click *Date* in the list to expand it.
4. Drag the field *Year* from to the center of the filter pane, then click ▶ in the properties panel on the right-hand side to expand the dimension and change its **Title** to *Year*.
5. Drag the field *Quarter* to the filter pane, then click ▶ in the properties panel on the right-hand side to expand the dimension and change its **Title** to *Quarter*.
6. Drag the field *Month* to the filter pane, then click ▶ in the properties panel on the right-hand side to expand the dimension and change its **Title** to *Month*.
7. Drag the field *Week* to the filter pane, then click ▶ in the properties panel on the right-hand side to expand the dimension and change its **Title** to *Week*.
8. Use the handles to resize the filter pane according to the screenshot.
   Dashboard sheet when editing (page 24)
9. Right-click the filter pane and select **Add to master items**.
10. Type the name *Period* and click **Add**.

You have created a filter pane and saved it as a master item which facilitates reuse.

The second filter pane only contains one dimension, *Region*.

Do the following:

1. In the assets panel to the left, click to open **Charts** and drag a filter pane to the sheet.
2. Click **Add dimension** and scroll down and select the field *Region*.
3. Use the handles to resize the filter pane according to the screenshot.
   Dashboard sheet when editing (page 24)
4. Right-click the filter pane and select **Add to master items**.
5. Type the name *Region* and click **Add**.

The two filter panes are complete.

6.3 Adding the pie chart

Next we will add a pie chart.

Do the following:

1. In the assets panel to the left, click to open **Charts** and drag a pie chart to the sheet.
2. Click **Add dimension** and add the field *Region*.
3. In the assets panel to the left, click to open **Fields**.
4. Locate the field *Sales*, right-click it and select **Create measure**.
5. In the **Create new measure** dialog, in the **Expression** box, add *Sum* in front of (*Sales*) to create the measure *Sum(Sales)*.
6. Click **Create**.
   The measure is added as a master item.
7. Drag the new measure *Sales* to the center of the pie chart.
8. In the properties panel to the right, click **Appearance** > **Presentation** and select **Donut**.
9. Still in the properties panel, click **Colors and legend**.
10. Set **Colors** to **Custom** and select **By measure** in the list.
11. At the top of the visualization, add the title *Sales per Region*.
12. Use the handles to resize the pie chart according to the screenshot.
    Dashboard sheet when editing (page 24)

The donut pie chart is complete. The colors in the pie chart are by measure, which means the higher the value, the darker the color. You have many options when it comes to coloring the values. Just remember that the colors should serve a purpose and not be used just to make the visualization more colorful.

6.4 Adding the bar chart

The next visualization is a bar chart with the top five customers.

Do the following:

1. In the assets panel to the left, click to open **Charts**.
2. Drag a bar chart to the sheet. Place it under the pie chart.
3. Click **Add dimension** and scroll down and select the field *Customer*.
4. Click **Add measure** and under **Measures**, select *Sales*.
5. In the properties panel to the right, under **Appearance** > **Presentation**, select **Horizontal**.
   The bars are displayed horizontally.
6. In the properties panel under **Data**, click *Customer* to open the dimension.
7. In the list **Limitation**, select **Fixed number**.
8. The default setting is to display the top 10. Change the number to 5.
9. Clear the selection **Show others**.
10. In the properties panel, click **Appearance** > **Presentation** and set **Value labels** to **Auto**.
11. In the properties panel, click **Appearance** > **Y-axis:** *Customer*.
12. Under **Labels and title**, select **Labels only**.
13. Click **X-axis:** *Sales*.

14. Under **Labels and title**, select **Labels only**.
15. At the top of the visualization, add the title *Top 5 Customers*.
16. Resize the bar chart according to the screenshot.
Dashboard sheet when editing (page 24)

The bar chart is complete. You have created a bar chart showing the top five customers. When you make selections in other visualizations, these customers will change, accordingly. If you had not cleared the selection **Show others**, the fifth bar would have been gray, summarizing all the sales values where the company name is missing. This value can be useful to get an understanding of how much of the sales that cannot be referred to a specific company.

6.5 Adding the combo chart

The combo chart combines a bar chart and a line chart and is especially useful when you want to combine values that are normally hard to combine because of their different scales.

Do the following:

1. In the assets panel to the left, click to open **Charts**.
2. Drag a combo chart to the sheet. Place it under the bar chart.
3. In the assets panel to the left, click to open **Fields**.
4. Click *Date*.
5. Drag the field *YearMonth* to the combo chart and click **Add** at the top.
6. Click **Add measure** and under **Measures**, select *Sales*.
7. In the assets panel to the left, click to open **Master items**.
8. Under **Measures**, click **Create new**.
9. Copy and paste the following string into the **Expression** box:
(Sum(Sales) - Sum(Cost)) / Sum(Sales)
10. Type the name *Margin Percent* and click **Create**.
The new measure is added to the list of master item measures.
11. Drag the measure *Margin Percent* to the combo chart.
12. Select **Add** *Margin Percent* > **As line**.
13. At the top of the visualization, add the title *Sales Trend*.
14. Resize the combo chart according to the screenshot.
Dashboard sheet when editing (page 24)

The combo chart is complete. The two measures *Sales* and *Margin Percent* have one axis each, which enables the combination of two totally different scales. The primary axis to the left is used for *Sales* and the secondary axis to the right is used for *Margin Percent*.

6.6 Adding the KPI

The KPI visualization can show one or two measure values, and is used to track performance. Color coding and symbols indicate how the figures relate to the expected results.

Do the following:

1. In the assets panel to the left, click to open **Charts**.
2. Drag a KPI chart to the sheet. Place it to the right of the pie chart.
3. Click **Add measure** and under **Measures**, select *Sales*.
   The sum of sales is added to the KPI.
4. In the properties panel to the right under **Apperance** > **Color**, set **Conditional colors** to **On** and click **Add limit**.
5. Click the left part of the **Value** bar, select **Color** red and **Symbol** ▼ in the dialog.
6. Click the right part of the **Value** bar, select **Color** green and **Symbol** ▲ in the dialog.
7. Drag the value limit to the right, to display the sales value as red in the KPI.
8. In the assets panel to the left, click to open **Master items**.
9. Click **Measures**.
10. Click **Create new** and type *Sum(Margin)* in the **Expression** box.
11. Type the name *Margin* and click **Create**.
    Margin is added to the master item measures.
12. In the properties panel, under **Data** > **Measures**, click **Add** and select *Margin*.
    The sum of margin is added to the KPI.
13. In the properties panel to the right, under **Apperance** > **Color**, click **Second**.
14. Set the limit for *Margin* as you did for *Sales*, but this time drag the value limit to the left, to display the sales value as green in the KPI.
15. In the properties panel, under **Appearance** > **Presentation** select **Left** in the **Alignment** drop-down.
16. In the properties panel, under **Appearance** > **Presentation** set **Show title** to **On**.
17. Type the following into the **Title** text box:
    Total Sales and Margin
18. Resize the KPI object according to the screenshot.
    Dashboard sheet when editing (page 24)

If you are using Qlik Sense Desktop, click **Save**.

The KPI is complete and displays that total sales is below expectations, but still there is a sufficient margin. The different colors and symbols support the interpretation of the value. Red is worrying, whereas green is good.

6.7 Adding the gauge

The gauge is used to visualize a single measure. Just like with the text & image chart, you do not make any selections in the gauge.

Do the following:

1. In the assets panel to the left, click to open **Charts**.
2. Drag a gauge chart to the sheet and place it to the right of the KPI visualization.
3. Click **Add measure**.
4. Select the measure *Margin Percent*.
5. In the properties panel to the right, under **Data** > **Measures** > *Margin Percent* > **Number formatting**, select **Number**, and in the **Formatting** list that is displayed, select **12%**
6. Under **Appearance** > **Presentation**, select **Bar** to present the gauge as a bar.
7. Set **Orientation** to **Custom** and select **Horizontal**.
8. In the **Range limits** just above, set **Min** to *-0.5* and **Max** to *0.5*.
9. Still under **Presentation**, select **Use segments**.
10. Click **Add limit**.
11. In the text box that is displayed, enter *0.12*, which sets the limit between the left and right segment to 12%.
12. Press Enter.
13. Click the left segment and select the red color.
14. Click the right segment and select the green color.
15. At the very bottom of the properties panel, open **Measure axis**.
16. In **Labels and title**, select **Labels only**.
17. At the top of the visualization, add the title *Profit Margin*.
18. Resize the gauge according to the screenshot.
    Dashboard sheet when editing (page 24)

The gauge is complete and displays a large profit margin. The different gauge colors support the interpretation of the value. Red is worrying, whereas green is good.

6.8 Adding the line chart

The line chart will be used to show the quarterly sales trend for the years 2012-2014. The figures for 2014 are for the first half of the year.

Do the following:

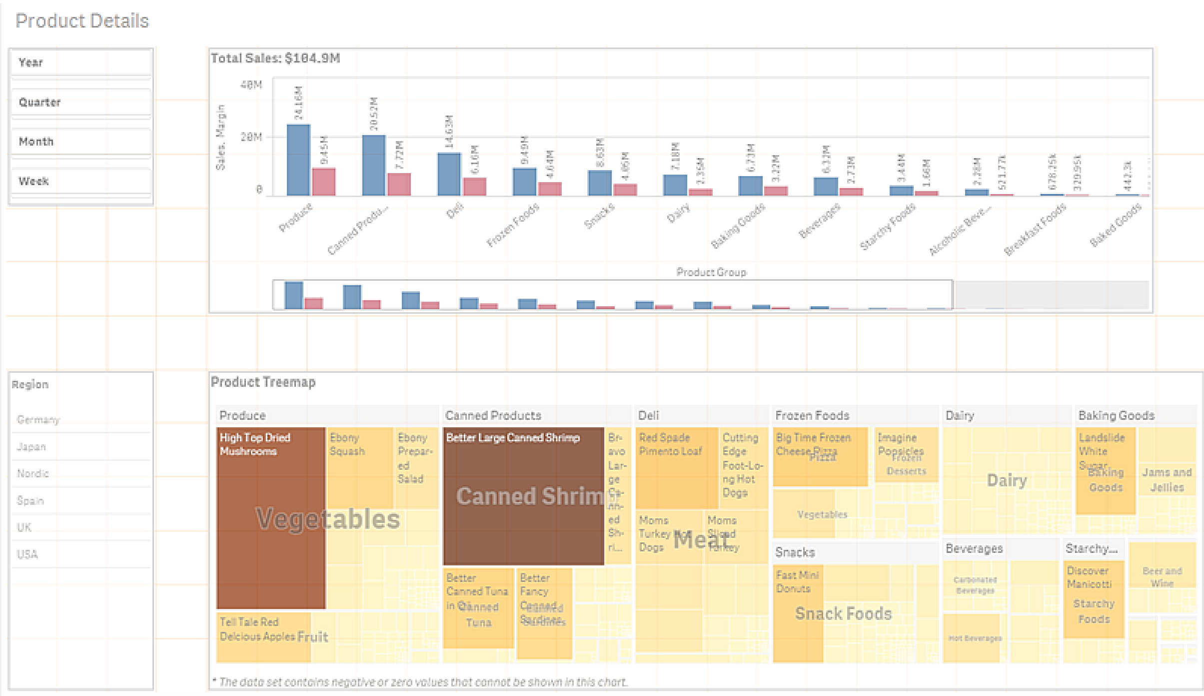
1. In the assets panel to the left, click to open **Charts**.
2. Drag a line chart to the sheet.
3. In the assets panel to the left, click to open **Fields**.

4. Click *Date*.
5. Drag the field *Quarter* to the line chart and click **Add** at the top.
6. Click ▶ in the properties panel on the right-hand side to expand the dimension *Date.Quarter* and change its **Label** to *Quarter*.
7. Click **Add measure** and select *Sales* from the list **Measures**.
8. In the assets panel to the left, click to open **Fields**.
9. Click *Date*.
10. Drag the field *Year* to the line chart and click **Add** at the top.
11. Click ▶ in the properties panel on the right-hand side to expand the dimension *Date.Year* and change its **Label** to *Year*.
12. In the properties panel, click **Appearance** > **Presentation** and select the checkbox **Show data points**.
13. At the top of the visualization, add the title *Quarterly Trend*.

You have completed the first sheet. In the top right corner, click to move to the sheet *Product Details*.

7 The second sheet: Product Details

This sheet focuses on the products.



Product Details sheet when editing

7.1 Adding the filter panes

It is a good thing that you saved the *Period* filter pane as a master item, because now you can reuse it. And that is true for the *Region* filter pane too.

Do the following:

1. In the assets panel, click to open **Master items**.
2. Click **Visualizations**.
3. Drag the filter pane *Period* to the sheet and resize it according to the screenshot. *Product Details sheet when editing (page 31)*.
4. Drag the filter pane *Region* to the area below *Period* and resize it in the same manner.

7.2 Adding the bar chart

The next visualization is a bar chart with the top sales.

Do the following:

1. In the assets panel to the left, click to open **Charts**.
2. Drag a bar chart to the sheet and place it to the right of the *Period* filter pane.
3. Click **Add dimension** and select the field *Product Group*.
4. Click **Add measure** and select *Sales* from the list **Measures**.
5. In the assets panel to the left, click to open **Master items**.
6. Click **Measures**.
7. Drag the measure *Margin* to the bar chart and select **Add**at the top.
8. In the properties panel, click **Appearance** > **Presentation** and under **Value labels** select **Auto**.
9. Resize the bar chart according to the screenshot.
   Product Details sheet when editing (page 31).
10. Copy the following string, and paste it as a title for the bar chart:
    ='Total Sales: $'& Round(Sum(Sales)/1000000, 0.1) & 'M'

The bar chart is complete. By default, the measures are grouped when you add a second measure to a bar chart.

7.3 Adding the treemap

Treemaps are used to show hierarchical data. In this treemap you will create a product hierarchy.

Do the following:

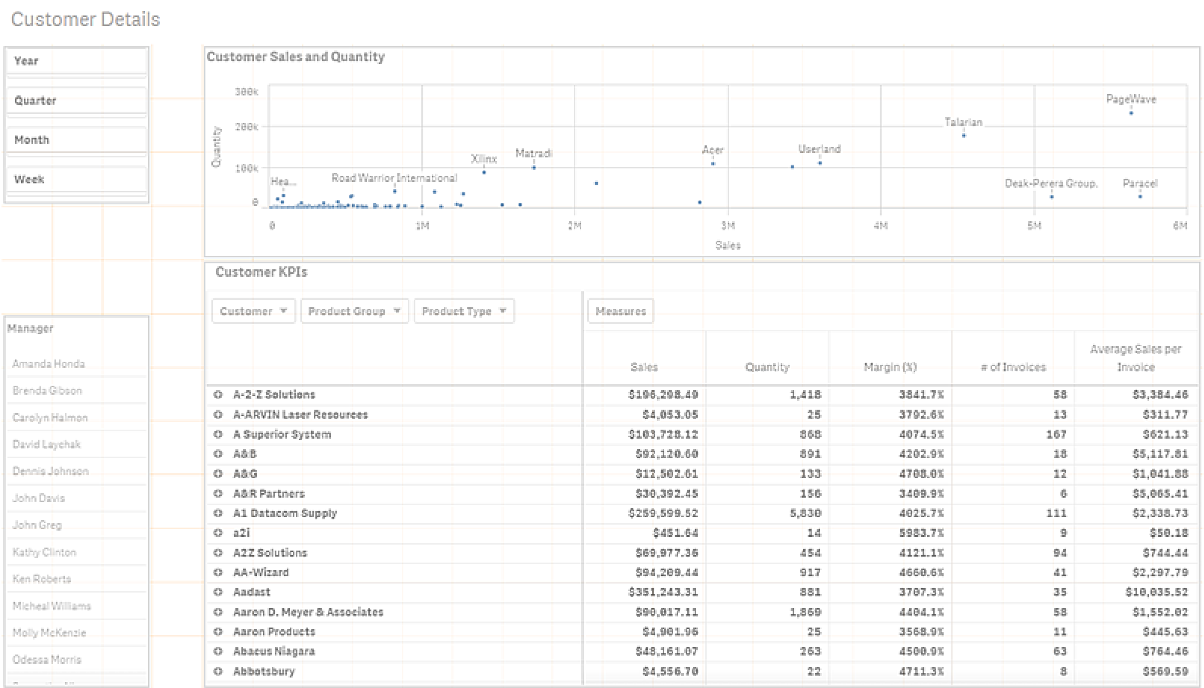
1. In the assets panel to the left, click to open **Charts**.
2. Drag a treemap to the empty space on the sheet.
3. Click **Add dimension** and select the field *Product Group*.
4. Click **Add measure** and select *Sales* from the list **Measures**.
5. In the properties panel to the right, under **Data** > **Dimensions**, click **Add**.
6. In the list, select *Product Type*.
7. Click **Add** again under **Data** > **Dimensions** and select *Item Desc*.
8. Under **Appearance** > **Colors and legend**, set **Colors** from **Auto** to **Custom**.
9. Select **By measure** in the list.
10. Resize the treemap according to the screenshot.
    Product Details sheet when editing (page 31).
11. Add the title *Product Treemap* to the visualization.

The treemap and sheet are complete. The next sheet is the final one. In the top right corner, click to move to the sheet *Customer Details*.

8 The third sheet: Customer Details

This sheet focuses on customers.

By now you have so much experience from creating dimensions, measures, and visualizations that you do not need detailed procedures anymore. The only exception will be when you make changes in the properties panel.



Customer Details sheet when editing

8.1 Adding filter panes

Do the following:

1. Add the filter pane *Period*.
2. Add a new filter pane with the dimension *Manager*.

8.2 Adding the scatter plot

The scatter plot uses the dimension *Customer* and the measures *Sales* and *Quantity*. You need to create the measure *Quantity* and save it as a master item. Use the field *Sales Qty* and the aggregation *Sum*. Because the field *Sales Qty* consists of two words, you need to enclose it with brackets: *[Sales Qty]* in the expression. The expression should look like this: *Sum ([Sales Qty])*

In the properties panel, at the bottom of **Appearance**, use the **Range** setting for the Y-axis and X-axis to exclude the negative part of the axes.

You probably noticed that two measures were added to the scatter plot. The scatter plot is used to visualize the relationship between two or three measures. In this case the measures compared are *Sales* and *Quantity*. Each bubble represents a *Customer* dimension value. The visualization should be namned *Customer Sales and Quantity*.

8.3 Adding the table Customer KPIs

The table named *Customer KPIs* uses the dimension *Customer*.

You add more columns to the table from **Data** in the properties panel: use the measures *Sales*, *Quantity*, and *Margin Percent* that are available as master items. Add them in that order to get the same order as in the screen shot.

The remaining measures, for the last two columns, need to be created:

- For the measure *# of Invoices*, use the following expression:
  Count (Distinct [Invoice Number])
- For the measure *Average Sales per Invoice*, use the following expression:
  Sum(Sales)/Count(Distinct [Invoice Number])

> *The qualifier **Distinct** is used in two of the expressions. By using **Distinct**, you ensure that an invoice number is only counted once, even if it occurs several times in the data source. **Distinct** sorts out unique numbers. Note that **Distinct** must be followed by a space before the field name.*

Adjusting the number formatting

Do the following:

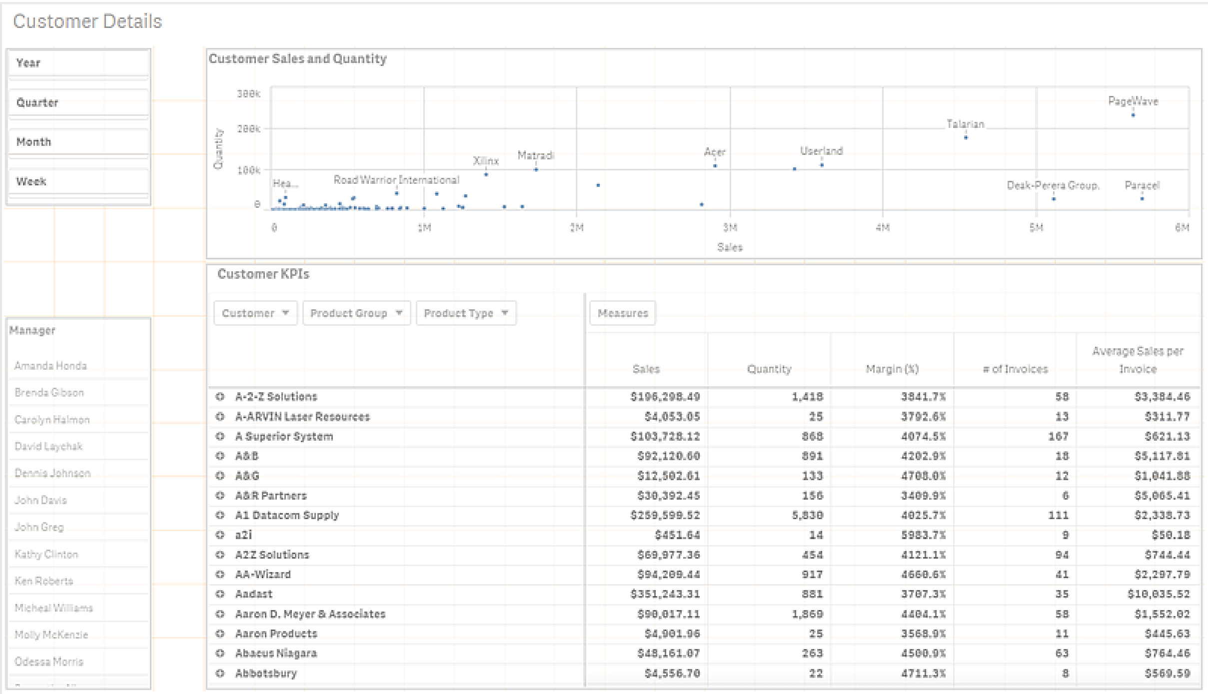
1. In the properties panel, click **Data**.
2. Click *Sales* and set **Number formatting** to **Money**.
3. Click the measure to close it.
4. Click *Quantity* and set **Number formatting** to **Number** (**1,000**).
5. Click the measure to close it.
6. Click *Margin Percent* and set **Number formatting** to **Number** (**12.3%**).
7. Click the measure to close it.
8. Click *Average Sales per Invoice* and set **Number formatting** to **Money**.
9. Click the measure to close it.

8.4 Converting the table Customer KPIs to a pivot table

Changing the Customer KPIs table into a pivot table enables you to include further dimensions or measures and reorganize them to analyze the data in a more flexible and useful way.

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'.

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.



Customer Details sheet after conversion

Converting the table

Do the following:

1. In the assets panel, click to open **Charts**.
2. Drag a pivot table onto the center of the *Customer KPIs* table and select **Convert to: Pivot table**.
3. In the properties panel to the right, under **Data**, click **Add data** and then **Row**.
4. In the list, select *Product Group*.
5. Select **Add data** again and add a *Product Type* row.
6. Add the title *Customer KPIs* to the visualization.
7. Click **Done** in the toolbar.

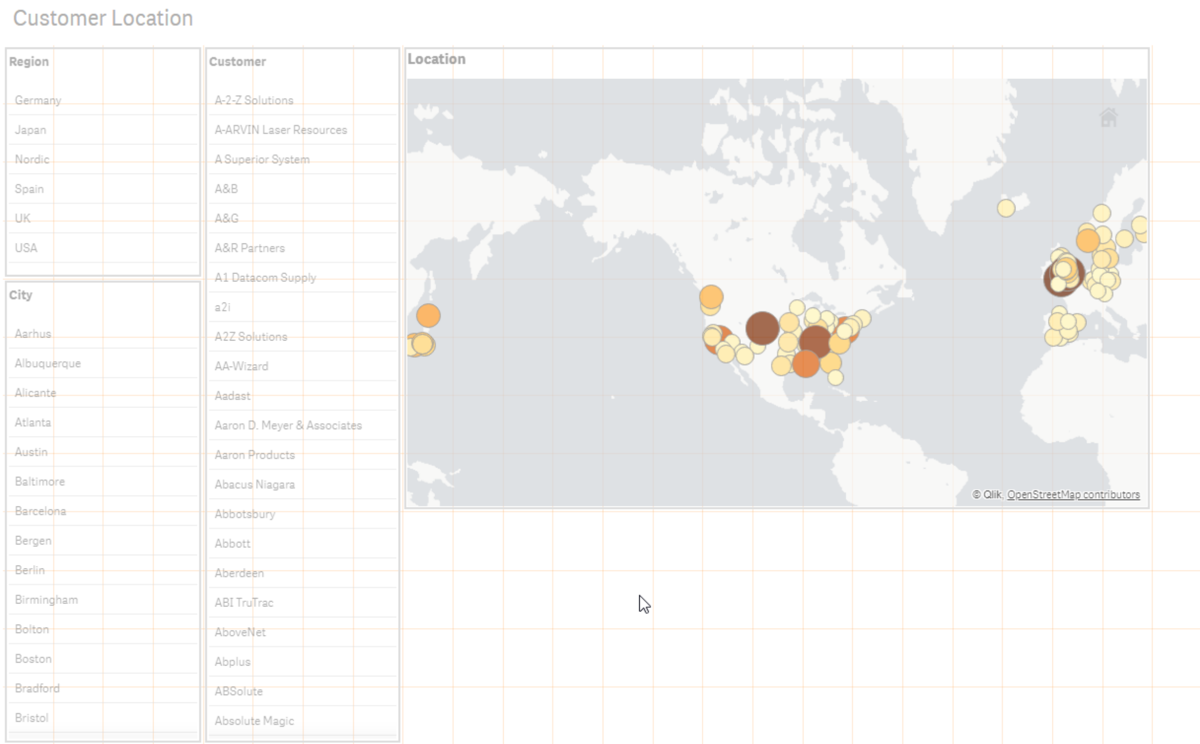
You are now able to look at the sales for individual customers by product group and type. By clicking **Customer**, **Product Group** or **Product Type**, or selecting individual items in the table, you can filter the selections viewed in the table. By moving **Product Group** or **Product Type** to **Measures** and filtering you can achieve differing views of the data presented.

Further information on the use of pivot tables can be found in the Qlik Sense online help at help.qlik.com.

9 The fourth sheet: Customer Location

This sheet focuses on customer location using a map.

You can create a map by adding point layers and area layers to display your data. You need to select a base map to provide the context for the layer data. 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.



Customer Location sheet when editing

9.1 Adding filter panes

Let us begin with the filter panes.

Do the following:

1. Click **Edit** in the toolbar.
2. Add the filter pane *Region*.
3. Add two new filter panes, one with the dimension *City*, the other with the dimension *Customer*.

9.2 Adding the map

In Qlik Sense you can create two types of maps, point maps and area maps. In Qlik Sense you can create maps that display data in point layers and area layers. The map we are using in this tutorial contains a point layer. A point layer is created using point coordinates (latitude and longitude) or location names to mark places of interest, for example cities.

Do the following:

1. Drag a map chart to the sheet.
2. In the properties panel, click **Base map** and select **Pale**.
3. In the assets panel, click **Fields** and drag the field *City* onto the map.
4. Select **Add as new layer**.
5. Select **Add as point layer**.
6. In the properties panel, in **Layers**, click the *City* point layer.
7. In **Location**, after **Location field**, select the field *Longitude_Latitude*.
8. In the assets panel, click **Master items**.
9. Locate *Sales* in **Measures** and drag it onto the map.
10. Select **Use in "City" (Point layer)** and select **Size by: Sales**.
11. In the properties panel, in **Size & Shape** adjust the **Bubble size range** slider. Too small a minimum and the bubble representing sales for one location may not be visible when compared to a location with a large sales volume.
12. In **Colors**, set **Colors** from **Auto** to **Custom**.
13. Select **By measure** in the list and in **Select measure**, select *Sales*.
14. Add the title *Location* to the visualization.
15. Click **Done** in the toolbar.

The map size adjusts according to the selections made in the filters. For example, selecting Nordic will zoom the map into the North European area showing the locations of sales in that area.

Specific areas of the map can be selected by holding down the shift key, while using the mouse to draw a lasso around the area to be viewed. The selections in the filter panes then reflect the selection made on the map.

Selecting a specific location on the map shows the customers at that location in the filter panes. Selections in other sheets also affect the data shown in the *Customer Location* sheet.

Now you have finished the Building an App tutorial. Congratulations on your achievement of building a Qlik Sense app!

Before you start doing any data analysis, you can complement the app with data storytelling.

10 Data storytelling

With data storytelling you can create a presentation based on the data in your app. You can take snapshots of selected visualizations and use them in your narrative together with text, shapes, and effects. You create slides and design the story with your particular audience in mind. In your narrative you focus on key elements and create a convincing story to make your message clear.

An additional, useful feature of data storytelling is that you can easily switch between a snapshot in the presentation and its context in the app. In the app context, you can make new selections and continue the analysis from where you left off in the presentation. After the analysis, you can resume the presentation.

10.1 Taking snapshots

You will start the creation of your presentation by taking snapshots in the app. In the top right corner, use ❮ to move to the sheet *Dashboard*.

In the presentation you will focus on the three largest regions and analyze the sales trends.

Do the following:

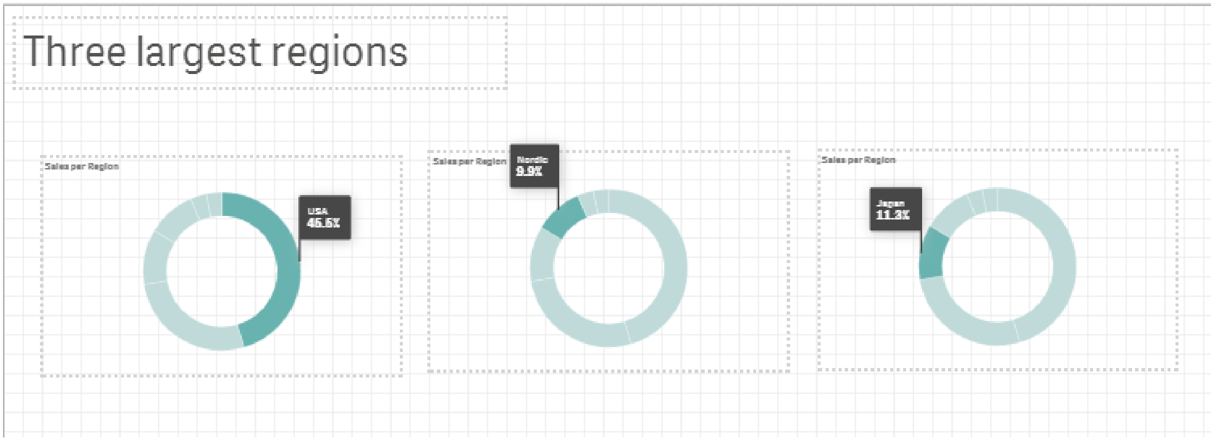
1. Right-click the visualization *Sales per Region* and select **Take snapshot**.
2. In *Region*, select *Nordic*.
3. Right-click the visualization *Top 5 Customers* and select **Take snapshot**.
4. In the annotation dialog that opens:
   a. Type "Nordic" in the annotation text field.
   b. Click outside the annotation dialog to close it.
5. Right-click the visualization *Quarterly Trend* and select **Take snapshot**.
6. In the annotation dialog that opens:
   a. Type "Nordic" in the annotation text field.
   b. Click outside the annotation dialog to close it.
7. In *Region*, deselect *Nordic* and select *USA*.
8. Take snapshots from the same visualizations as for *Nordic* (*Top 5 Customers* and *Quarterly Trend*) and annotate them with "USA".
9. In *Region*, deselect *USA* and select *Japan*.
10. Take snapshots from the same visualizations as for *Nordic* (*Top 5 Customers* and *Quarterly Trend*) and annotate them with "Japan".

You have taken all the snapshots you need and can start creating your data storytelling slides.

10.2 Creating a simple story

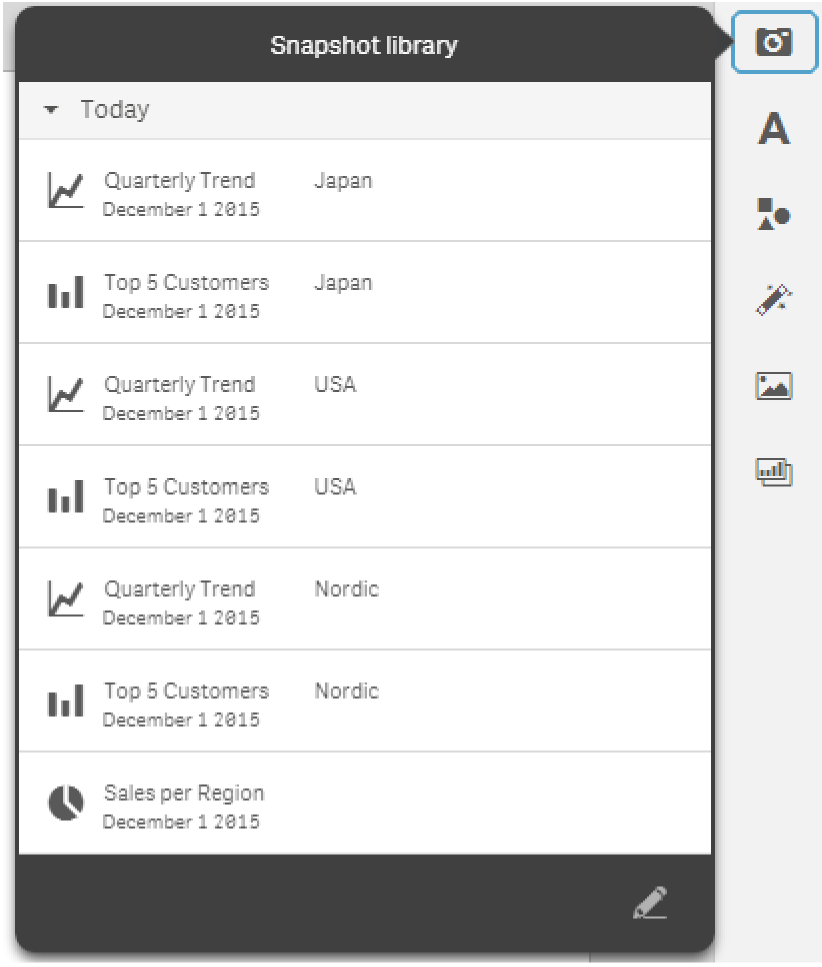
You will create a short and simple story, where the focus is on creating a few slides with snapshots and titles. A screen shot of the slide is presented before the step-by-step instructions.

Slide 1



Do the following:

1. In the toolbar, click and click **Create new story**.
2. Enter the title *Three largest regions*.
3. Click the story *Three largest regions*.
   The data storytelling editor is opened.
4. Click and drag a title to the slide.
5. Type the title *Three largest regions*.
6. Click to see the snapshots that you took previously.

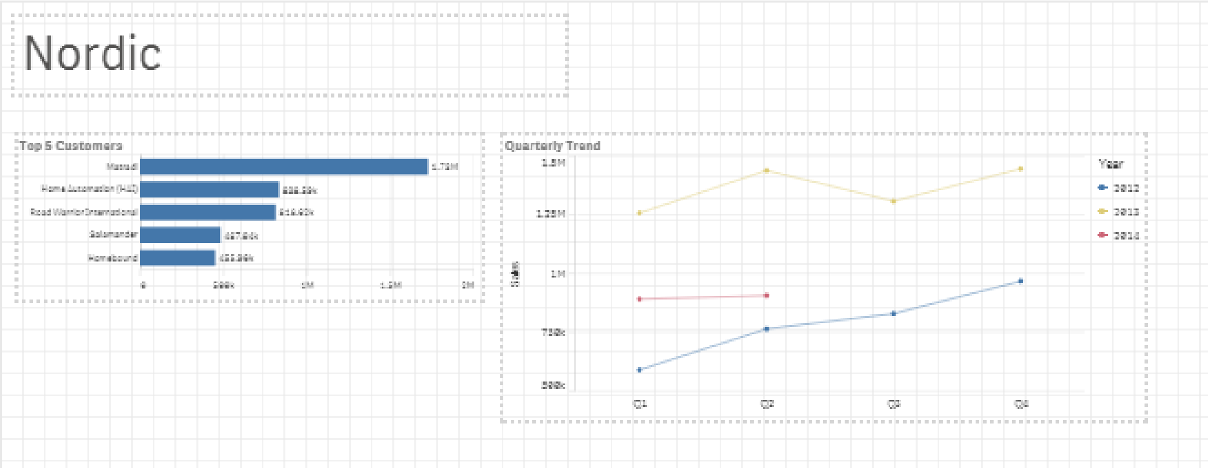


Your snapshots in the snapshot library with date stamps and annotations.

7. Drag the pie chart *Sales per Region* snapshot to the slide.
8. Resize the pie chart and place it to the leftmost on the slide.
9. Click to open the **Effect library**.
10. Drag the option **Any value** to the pie chart.
    The value *USA* is automatically highlighted.
11. Copy the pie chart and paste it next to the first one. You can either use Ctrl+C and Ctrl+V or and in the toolbar at the bottom.
12. In the new pie chart, click and select *Nordic* in the list **Select data point**.
13. In the same manner as for the second pie chart, create a third pie chart and highlight *Japan*.
14. Click **Save** (only if you are using Qlik Sense Desktop).

The slide is complete.

Slide 2-4



Slides 2-4 show the top five customers and the quarterly sales trend for the three regions. The snapshots are stored in the library in the order they were taken, with the latest one at the top. If you have followed the procedures when taking these snapshots, the two at the top should be Japan, the two ones below, USA, and the remaining two, Nordic.

Do the following:

1. In the lower left-hand corner, click and add a blank slide.
2. Click to see the snapshots.
3. Drag the *Top 5 Customers* bar chart for *Nordic* to the slide.
4. Drag the *Quarterly Trend* line chart for *Nordic* to the slide.
5. Click and drag a title to the slide.
6. Type the title *Nordic*.
7. Resize and align title and snapshots according to the screenshots.
8. Right-click the sheet *Nordic* in the story timeline to the left and select **Duplicate** to create a new sheet that can be used as a template for the next sheet.
9. Change the title to *USA*.
10. Select the *Top 5 Customers* snapshot and click to open the **Replace snapshot dialog** where you select the second snapshot in the list. If you followed the instructions it has the annotation *USA*.

    *You can right-click the snapshot and select **Go to source**, if you want to see the selections in that version of the snapshot. Then, click **Return** to go back to the story.*

11. Replace the *Quarterly Trend* snapshot just as you did with the *Top 5 Customers* snapshot.
12. Duplicate the *USA* sheet and adjust it to present *Japan*. Now use the snapshots in the top of the list in the **Replace snapshot dialog**. If you followed the instructions they have the annotation *Japan*.

When analyzing these slides it is important to know that the figures for 2014 are half-year figures. Extrapolating the figures for the full year would then give different forecasts for the different regions.

The story is complete. Click ▶ in the upper left corner to play your presentation. You can navigate with the left and right arrow keys.

Close the story and make edits, if needed. Below the slide you have tools for cutting, copying, and pasting that can be useful when you edit your presentation. And, of course, you can use the panel to the right.

Switching between data storytelling and the app context

In data storytelling, you can switch any time from the presentation to the app context. Right-click the snapshot and select **Go to source** to open the app sheet where the snapshot was taken. This gives you a dynamic option to leave the presentation and make data analysis in response to questions from the audience. When you have finished analyzing, you return to the presentation by clicking in the toolbar.

The go to source option is also useful for the special purpose of verifying that the right bar charts and line charts are used. When you select **Go to source** you will see which region is selected for that specific snapshot.

Additional options

There are many options that have not been used in this story. Experiment on your own. Try and add effects to the bar chart. Add a new slide (Sheet) and embed a complete app sheet where you can make selections when you are in play mode. Add URLs or bookmarks to text strings. There is plenty more to discover.

10.3 Thank you!

You have reached the end of this tutorial. We hope that you have learned a few things and realized that app creation sometimes can be pretty easy and even somewhat fun. Qlik Sense is a powerful tool that is capable of far more than what has been shown here. This is just the beginning!