Myths of Power BI

Myth 1: Power BI is a self-service Excel tool, and isn't suitable for Enterprise Solutions.

Myth 2: Power BI is easy to use, and doesn't require a training course.

Myth 3: Power BI is only for Microsoft based environments and platforms.

Myth 4: Power BI is not a powerful and fully functional BI tool, and cannot be compared with other tools in the market.

SO WHAT IS POWER BI?

Cloud-based self-service business analytics service.

Suite of business analytics tools to analyze data and share insights

Enables visualizations and data analysis with greater speed, efficiency, and understanding.

Connects users to a broad range of data through easy-to-use dashboards, interactive reports, and compelling visualizations that bring data to life.

EVOLUTION OF POWER BI

2009: **Power Pivot** was released as a free Excel add-in from Microsoft.

2012: **Power View** was released as part of SharePoint.

Early 2013: **Data Explorer** was released, also as an Excel add-in.

Late 2013: **Data Explorer** was renamed **Power Query**. The goal of Power Query was to make it easier to access data and bring it into Power Pivot.

Having **Power Query** and **Power Pivot** available as Excel add-ins made them accessible, but there was a problem. You could build something amazing, but then you had to email your (sometimes very large) Excel file to anyone who wanted to use it. There was also the problem of not being able to automatically schedule the data to refresh.

January 2015: Microsoft announced a new **Power BI** service that could be accessed at **PowerBI.com**. Although **PowerBI.com** was only in preview mode**,** over 500,000 people jumped on board to test it and help shape its future.

July 2015: **PowerBI.com** exited the "Preview" phase and entered "General Availability".

Bottom line, Power BI is not some new, untested thing. It has been in the making for the past 10 years. Also, it stands on the shoulders of one of the most widely used OLAP/Cube software products in the world (Microsoft SQL Server Analysis Services) and the most popular BI software on the planet (Microsoft Excel).

POWER BI DESKTOP

Power BI Desktop is a free desktop application you can install right on your own computer. Power BI Desktop works cohesively with the Power BI service by providing advanced data exploration, shaping, modeling, and report creation with highly interactive visualizations. You can save your work to a file, and publish your data and reports right to your Power BI site to share with others.

SIGNING UP TO POWER BI ONLINE

Signing up for Power BI, as an individual, is easy! You can choose to use a free account, a Pro trial account, or purchase Power BI Pro, even if you are in an existing organization.

Power BI requires that you use a work, or school, email address to sign up. Power BI does not support email addresses provided by consumer email services or telecommunication providers. This includes outlook.com, hotmail.com, gmail.com and others.

If you try to sign up with a personal email address, you will get a message indicating to use a work or school email address.

SETTING UP POWER BI DESKTOP

Installing Power BI Desktop

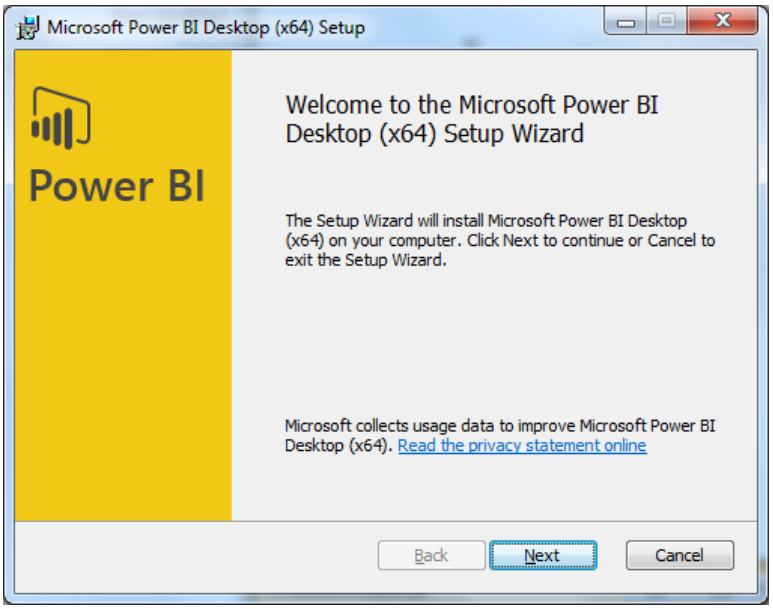
Minimum requirements for installation:

- Windows 10, Windows 7, Windows 8, Windows 8.1, Windows Server 2008 R2,Windows Server 2012, or Windows Server 2012 R2
- Internet Explorer 10 or greater

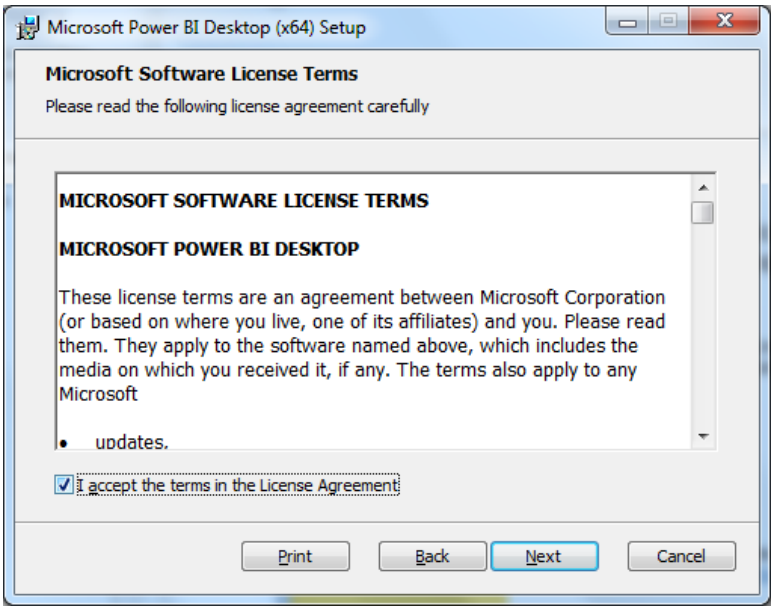
There isn't a minimum memory requirement, but you need to be aware that although the application itself is not a memory hog, it can let you load huge amounts of data. Given that all of this data will be loaded into memory, you need to ensure that you have enough available memory if you intend to analyze large amounts of data—even if the data is compressed.

If your PC or laptop is ready for Power BI Desktop, you can install it by following these steps:

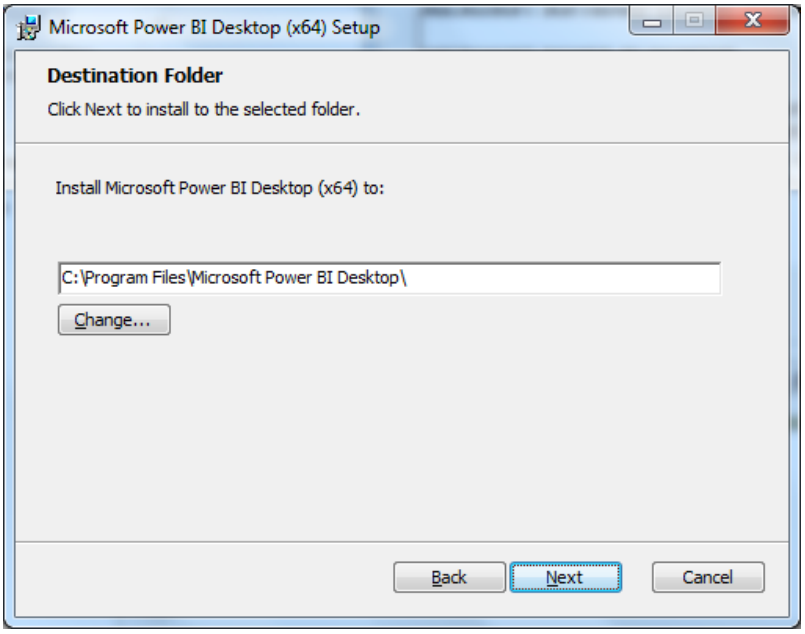
1. Click on the installation file (PBIDesktop_x64.msi) located in the 'Installation' folder within the 'Labs' folder provided. The initial setup dialog will appear.



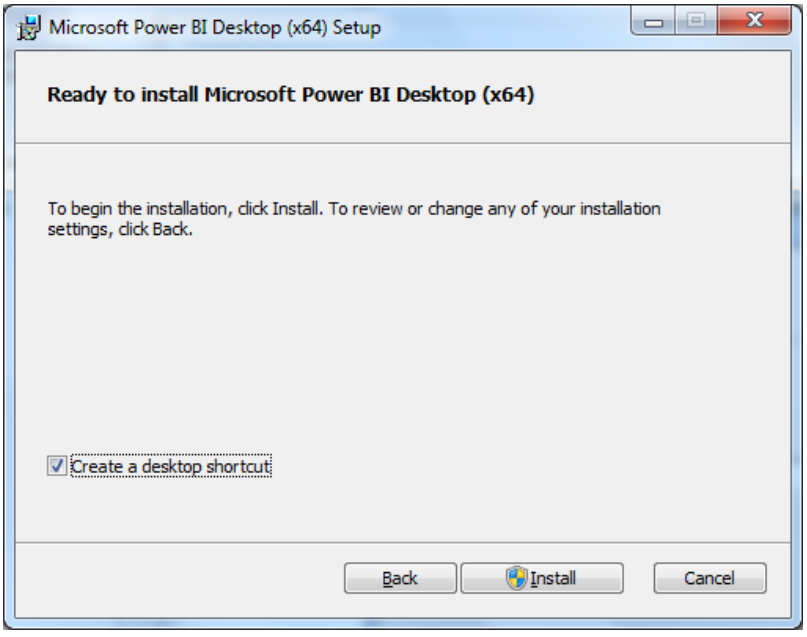
2. Click Next. The Setup Licensing dialog will appear.



3. Check the check box to accept the license agreement and click Next. The setup destination dialog will appear. If you prefer to install the Power BI Desktop files in a different directory, then you can enter it here (or click the Change button and browse to select it). For the purpose of this training, don't make any changes to the installation path.



4. Click Next. The final confirmation dialog will appear.

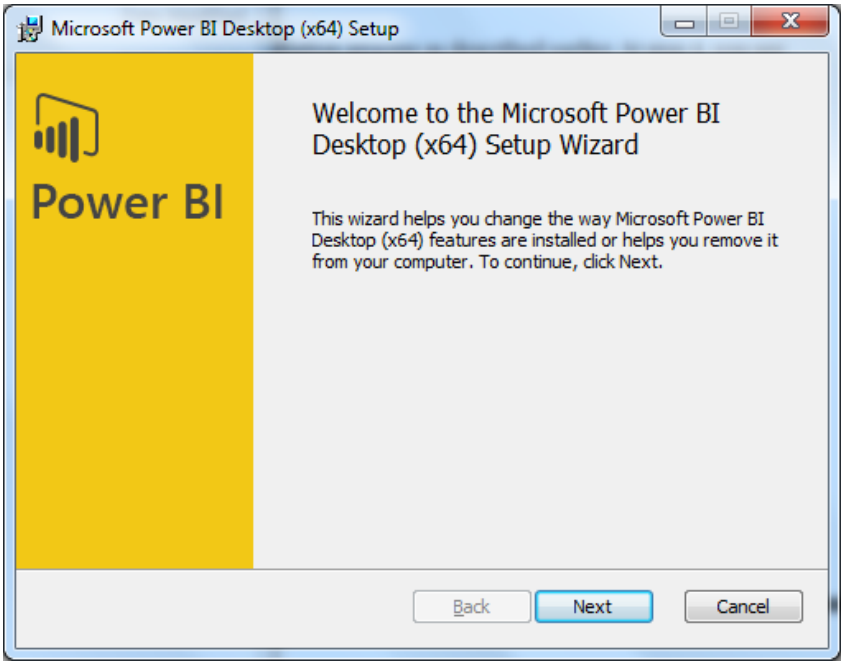


5. Click Install. The Power BI Desktop installation package will run and will complete the installation. Once the installation process has finished successfully, you will see the completion dialog

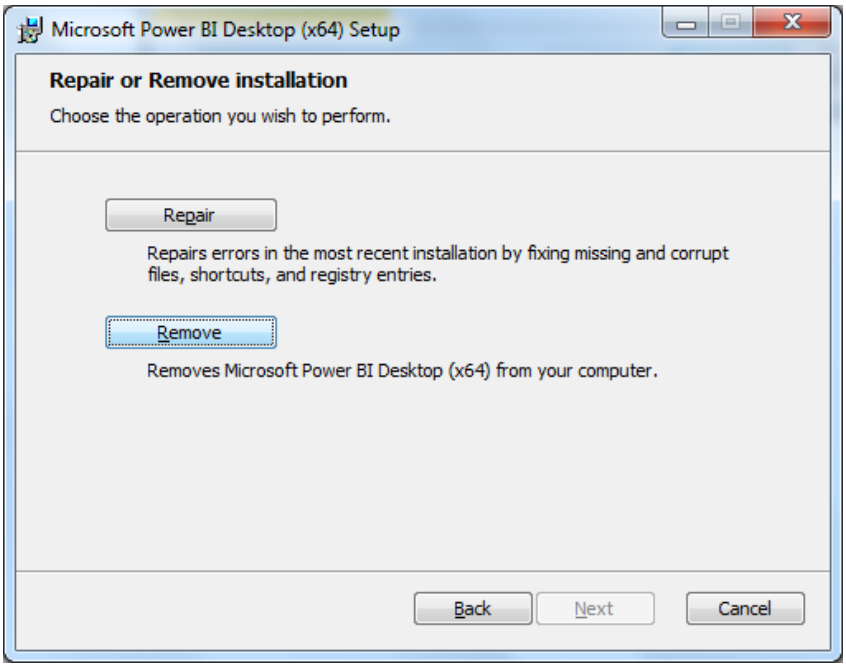
6. If you want to run Power BI Desktop immediately, then leave the Launch Power BI Desktop check box ticked; otherwise, uncheck it and click Finish. The dialog will close and Power BI Desktop is now installed on your computer.

Uninstalling Power BI Desktop

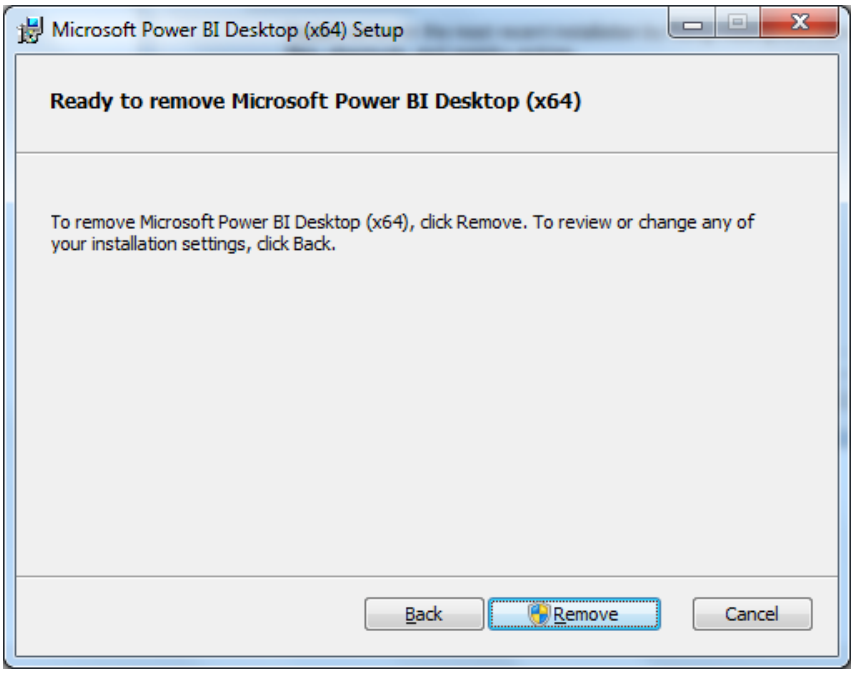
1. Run the installation file from above. The setup dialog will appear.



2. Click Next. The dialog asking if you want to repair or remove Power BI Desktop appears



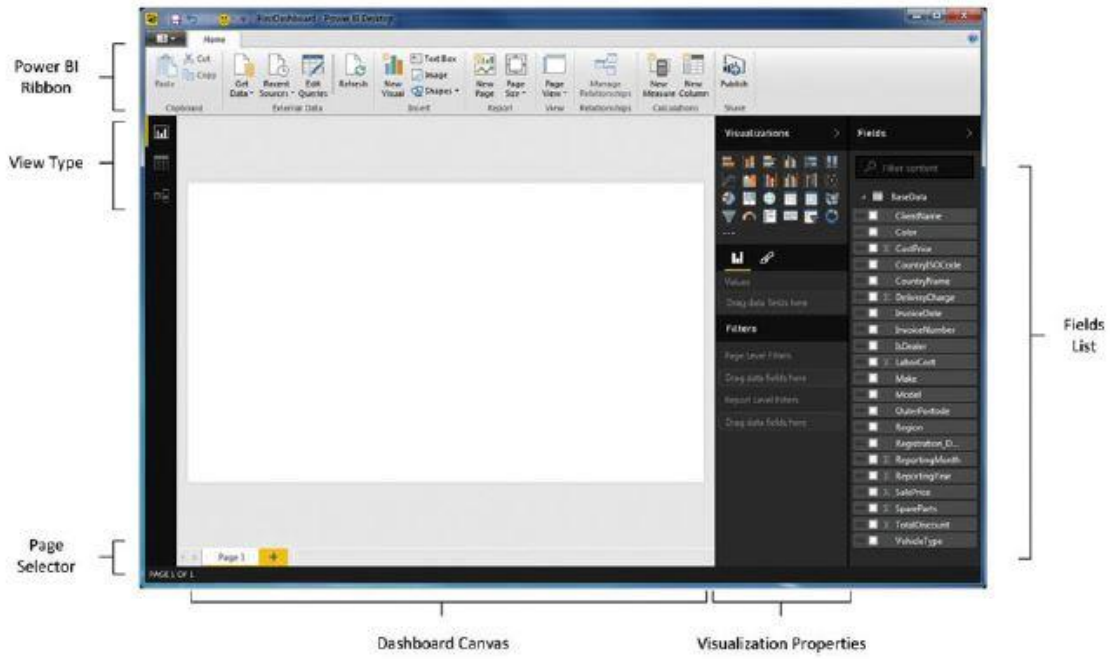
3. Select the Remove option. The final confirmation dialog to remove the application will appear.



4. Select the Remove option once more. The application will be uninstalled.

The Power BI Desktop Window

Before we go any further, I would like to explain the Power BI Desktop window, since it is something that you will use a lot in this section from this point onward. The Power BI Desktop window contains the elements that are outlined in the figure below:



As you can see, the Power BI Desktop screen is simple and uncluttered. The various elements that it contains are explained in Table below:

Table 1-1. Power BI Desktop Options

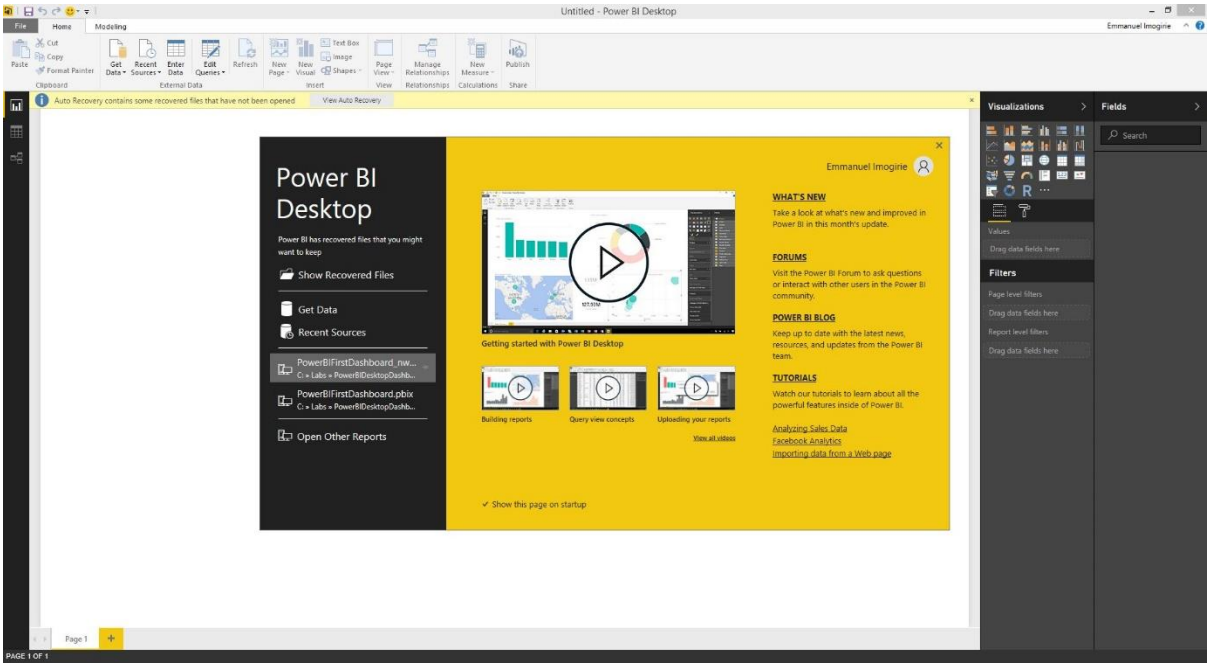
Option	Description
Power BI Ribbon	This contains the principal options that are available to you when developing dashboards with Power BI Desktop.
View Type	These three icons let you flip between Dashboard view (where you create dashboards and reports), Data view (where you add calculations), and Relationships view (where you join data from different sources).
Dashboard Canvas	This is the main area, where you add visualizations and design your dashboards.
Visualization Properties	This area of the application is specific to each type of visualization and lets you set the specific attributes of each element on a dashboard. It also allows you to filter dashboards, pages, and individual visualizations.
Fields List	Here you can see all the available fields from the source data that you can use to build your visualizations.
Visualization Palette	This area contains all the currently available types of visualization that you can add to a dashboard.
Page Selector	These are tabs that let you switch from page to page in a report.

A First Power BI Desktop Dashboard

In the following sections, we will go through the process of creating a simple dashboard to help you appreciate the ease of working with Power BI and give you first-hand experience of the sheer power and simplicity of the tool. You will see, that even as a new user to the tool, there is a lot that you can accomplish.

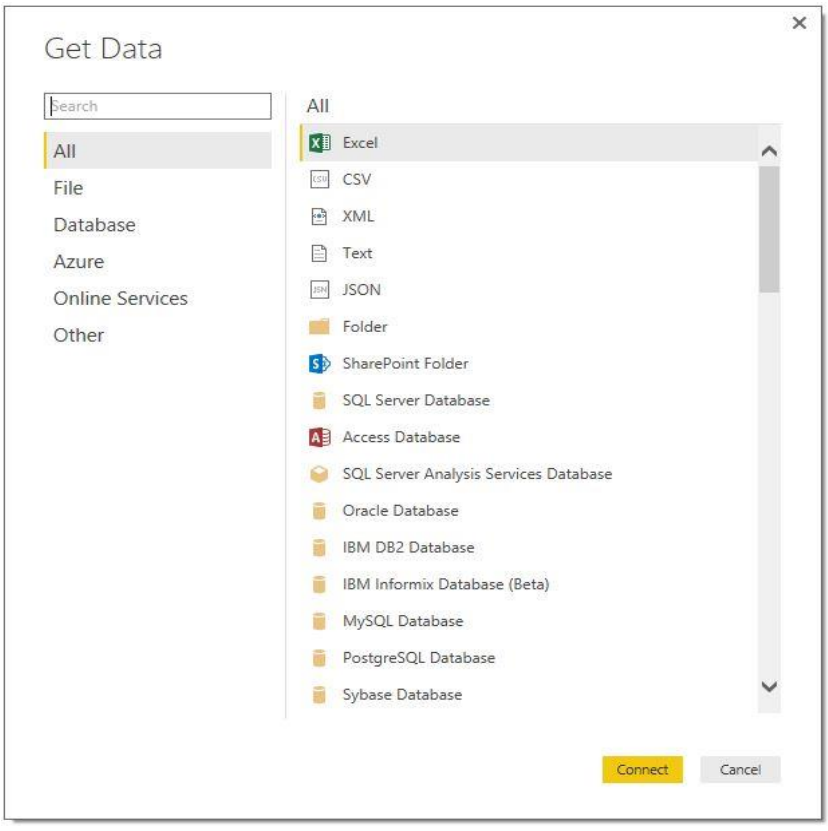
Loading Data

Once you start up Power BI, you are presented with the following screen:

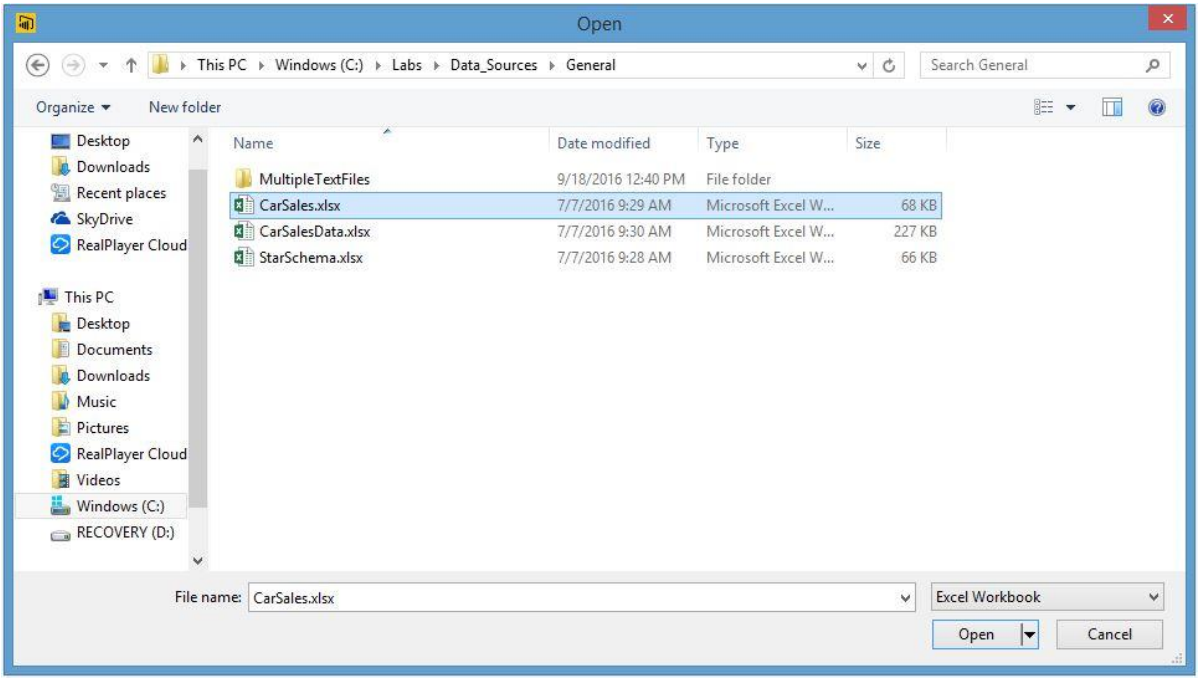


As Data is the basis of everything that is done in Power BI, it is fundamental that Data is typically the first step is to find and load data.

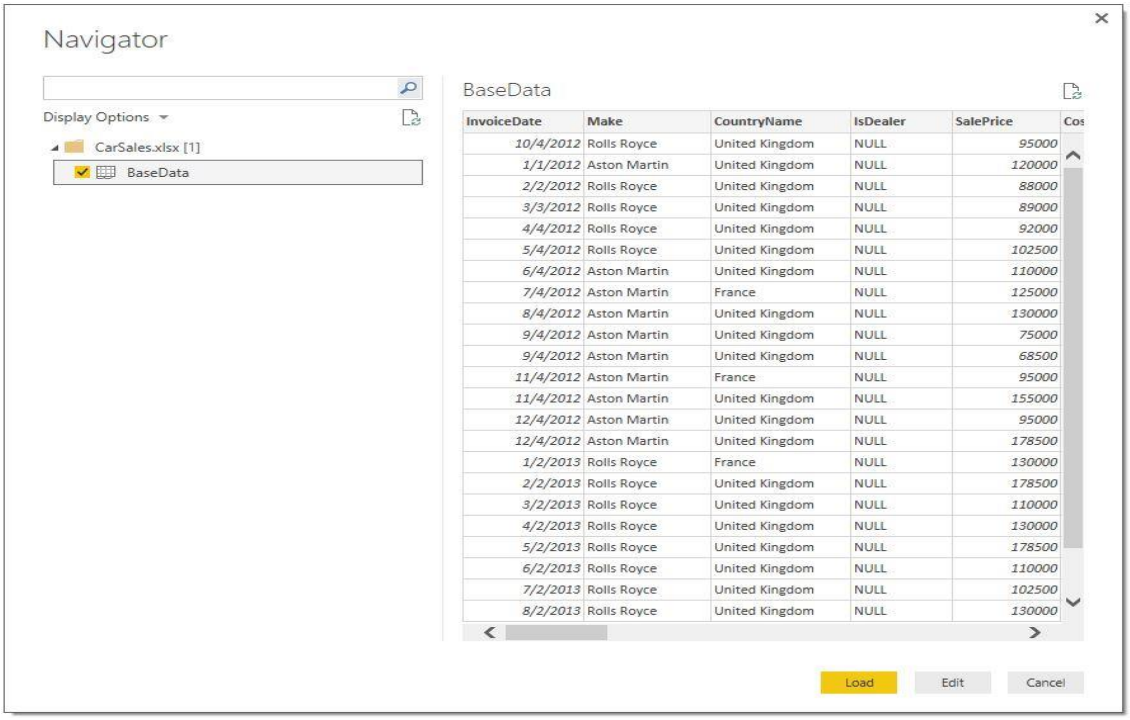
1. Click Get Data in the startup screen. The Get Data dialog will appear, as shown in below:



2. In the list of all the possible data sources on the right of this dialog, click Excel, and then click Connect. The Windows Open File dialog will appear, as shown below:

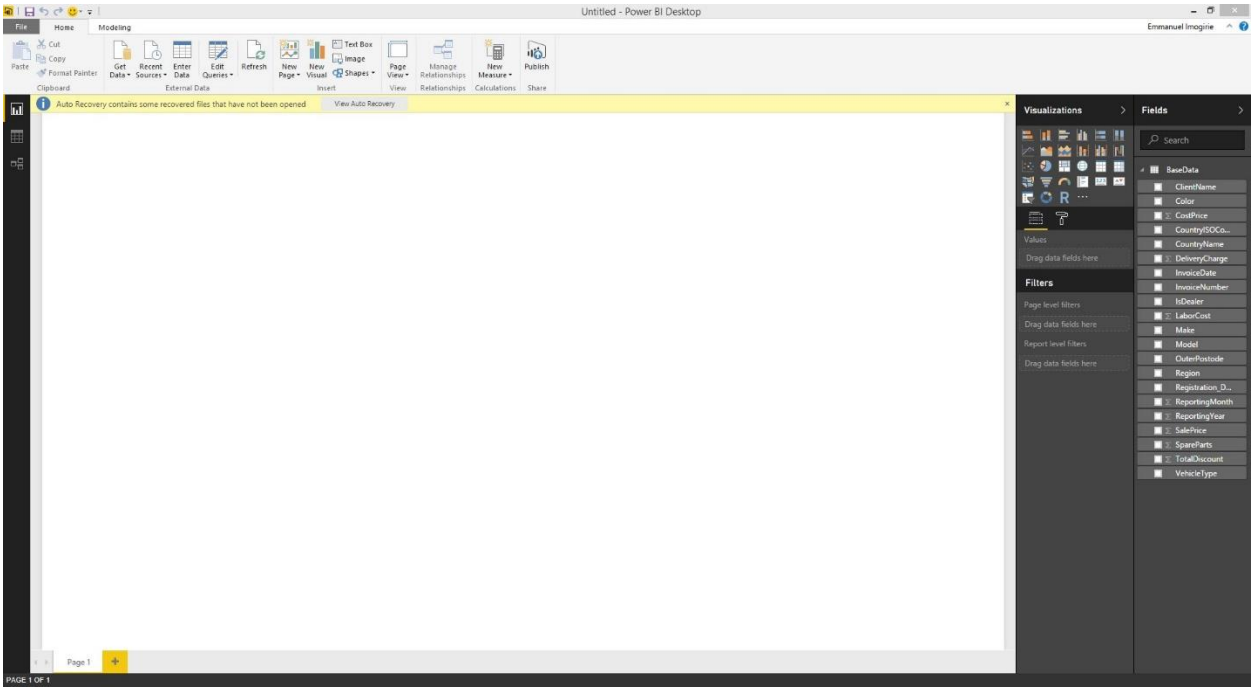


3. Click the file C:\Labs\Data_Sources\General\CarSales.Xlsx.
4. Click the Open button. The Connecting dialog will appear for a second or two and then the Navigator dialog will appear.
5. You will see that the CarSales.xlsx file appears on the left of the Navigator dialog and that any workbooks, named ranges, or data tables that it contains are also listed. Click the BaseData worksheet name that is on the left. The contents of this workbook will appear in the data pane on the right of the Navigator dialog.
6. Click the check box for the BaseData worksheet on the left. The Load and Edit buttons will be activated. The Navigator dialog should look like the figure below:



InvoiceDate	Make	CountryName	IsDealer	SalePrice	Cos
10/4/2012	Rolls Royce	United Kingdom	NULL	95000	
1/1/2012	Aston Martin	United Kingdom	NULL	120000	
2/2/2012	Rolls Royce	United Kingdom	NULL	88000	
3/3/2012	Rolls Royce	United Kingdom	NULL	89000	
4/4/2012	Rolls Royce	United Kingdom	NULL	92000	
5/4/2012	Rolls Royce	United Kingdom	NULL	102500	
6/4/2012	Aston Martin	United Kingdom	NULL	110000	
7/4/2012	Aston Martin	France	NULL	125000	
8/4/2012	Aston Martin	United Kingdom	NULL	130000	
9/4/2012	Aston Martin	United Kingdom	NULL	75000	
9/4/2012	Aston Martin	United Kingdom	NULL	68500	
11/4/2012	Aston Martin	France	NULL	95000	
11/4/2012	Aston Martin	United Kingdom	NULL	155000	
12/4/2012	Aston Martin	United Kingdom	NULL	95000	
12/4/2012	Aston Martin	United Kingdom	NULL	178500	
1/2/2013	Rolls Royce	France	NULL	130000	
2/2/2013	Rolls Royce	United Kingdom	NULL	178500	
3/2/2013	Rolls Royce	United Kingdom	NULL	110000	
4/2/2013	Rolls Royce	United Kingdom	NULL	130000	
5/2/2013	Rolls Royce	United Kingdom	NULL	178500	
6/2/2013	Rolls Royce	United Kingdom	NULL	110000	
7/2/2013	Rolls Royce	United Kingdom	NULL	102500	
8/2/2013	Rolls Royce	United Kingdom	NULL	130000	

7. Click Load. The data will be loaded from the Excel file into Power BI Desktop. You will see the Power BI Desktop report window, like the one shown in Figure below:



It is important to note that this is a very simplified scenario. Other scenarios will be explored during the course of the training.

In this short example, you nonetheless saw many of the key elements of the data load process. These included:

• Accessing data that is available in any of the source formats that Power BI Desktop can read.

• Taking a first look at the data before loading it into Power BI Desktop.

What you did not see here is how Power BI Desktop can add an intermediate step to the data load process and edit the source data in Power BI Desktop Query Editor. This aspect of data manipulation is covered extensively in subsequent sections.

Your First Visualizations

With your data safely in place inside Power BI Desktop, you can now begin to create the tables, charts, maps, and other elements that you want to add to a dashboard, which you can use to present your first insights into Brilliant British Cars. As this is a first "taster" exercise, I am not looking at explaining all that can be done using Power BI Desktop. All I want to do is to show you how easy it is to create dashboards in minutes rather than hours. Indeed, I only hope that this first simple dashboard will leave you hungry to learn more—and so to move on to the rest of this book.

Before creating a few simple visualizations, let me clarify some of the terms that you will meet when working with Power BI Desktop.

• **Visualization***:* Also known as *visuals,* these are the individual presentation elements that you create based on the underlying data. A visual can be a table, a chart, a gauge, a map, or many things indeed.

• **Dashboard***:* A Power BI Desktop dashboard is a collection of visualizations on a single page. We use the terms *page* and *dashboard* interchangeably.

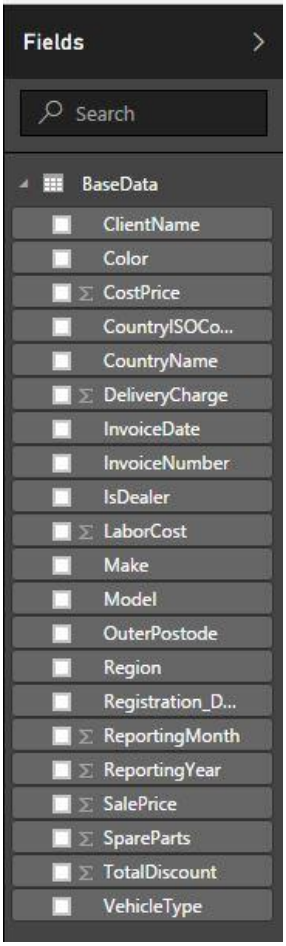
• **Report***:* This is a collection of pages (or dashboards) in a single file, all using the same dataset.

Display Available Fields

One of the first things to do is make sure that you can see the data that you will be working with in dashboards and reports. If you look at the right of the Power BI Desktop Report view, you see a vertical pane with the label *Fields* at the top. This is the Fields pane. It is from here that you access all the data that you will use in your visualizations and dashboards.

For the moment, however, all that you can see is probably the name of the data table that you imported previously—the BaseData table. Do the following to see all the fields that this table contains.

1. Click the small triangle to the left of the table name. The table will expand to reveal all the available fields that it contains. You can see what this looks like in Figure below:



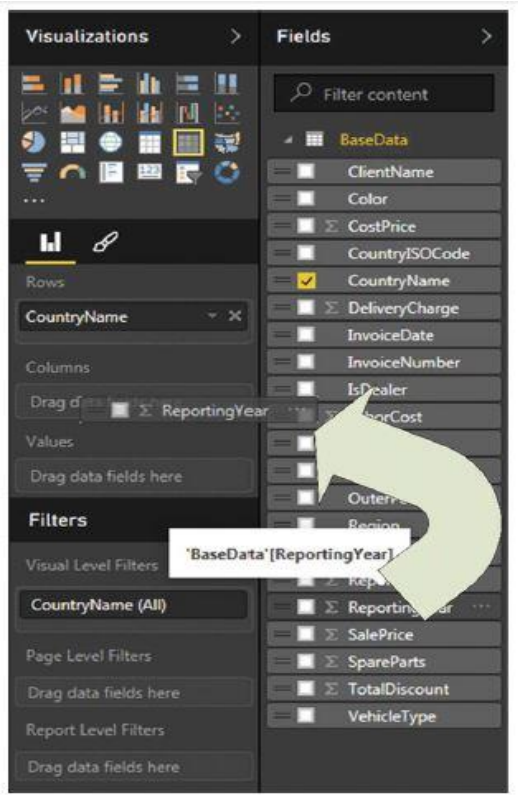
Add a Matrix of Sales per Country by Year

It is now time to draw on the blank canvas that is your first dashboard. To begin, with let's start with a simple matrix of sales per country for each year that Brilliant British Cars has been trading.

1. In the Visualizations pane, click the matrix icon, as highlighted in Figure below, a blank matrix will appear on the dashboard canvas.

2. leaving the freshly created matrix selected, click the check box to the left of the CountryName field in the Fields list. The list of countries where cars have been sold will appear as the left-hand column of the matrix.

3. Drag the ReportingYear field into the Visualizations pane over the Columns fields area (this is called the *field well*). The figure below, shows how to do this. This adds the model years as column headers in the matrix.



4. Leaving the matrix selected, click the check box to the left of the SalePrice field in the Fields list. The aggregated sale price for all vehicles sold by country and by year will appear in the matrix.

5. Drag the corner handle of the matrix to resize it so that there is no spare white space inside the matrix itself. It will look like Figure below:

CountryName	2012	2013	2014	2015	Total
France	248000	446950	193200	571950	**1460100**
Germany		75000		85000	**160000**
Spain		92000		86700	**178700**
Switzerland	88200	233625	103200	276125	**701150**
United Kingdom	1702890	3169000	1738190	3583800	**10193880**
USA	113200	162000	2548490	4892375	**7716065**
Total	**2152290**	**4178575**	**4583080**	**9495950**	**20409895**

Add a Column Chart of Delivery Charge by Model

Next, you will use the available data to display the total delivery charge for each model of car sold.

1. Click an empty area of the dashboard canvas to unselect any visualizations.

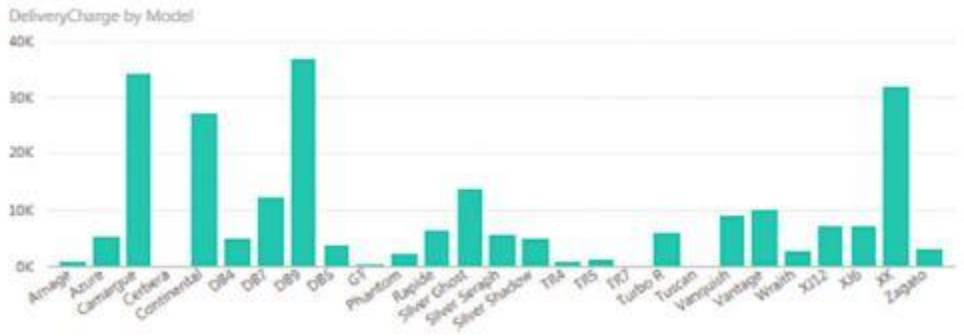
2. Drag the Model field onto an empty area of the dashboard canvas. Power BI Desktop automatically creates a table displaying all the vehicle models sold.

3. Drag the DeliveryCharge field from the Fields pane onto the table that you just created. Power BI Desktop will calculate the total DeliveryCharge for each available make. The table will look like Figure below:

Model	DeliveryCharge
Arnage	975
Azure	5175
Camargue	34140
Cerbera	150
Continental	27175
DB4	4850
DB7	12550
DB9	36950
DBS	3950
GT	550
Phantom	2225
Rapide	6450
Total	**239970**

4. Leaving the table selected, click the column chart icon in the Visualizations pane. This is the second icon on the left on the upper row of the selection of visualizations. Power BI Desktop will switch the table to a chart.

5. Drag the corner handle of the chart to resize it so that all the makes are visible on the bottom axis. The chart will look like Figure below:



Add a Map of Labor Cost by Country

With PowerBI Desktop, it is possible to add maps to our Reports.

1. Click any empty part of the dashboard canvas to unselect any visualizations.

2. Click the filled map icon in the Visualizations pane. You can see this icon in Figure below:

3. Leaving the empty map visualization selected, click the check box to the left of the CountryName field in the Fields list. This will display a map of the world.

4. Leaving the map selected, drag the LaborCost field onto the map. This will highlight any countries where there are labor costs relating to vehicles sold.

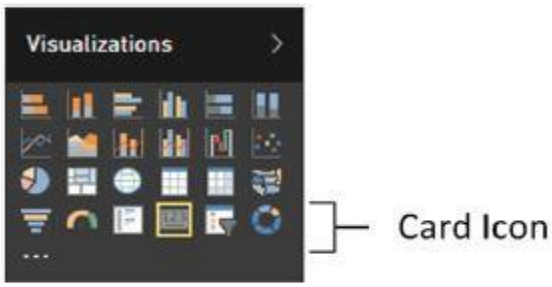
5. Drag the colored European countries to the center of the map.

6. Using the mouse wheel, zoom in to the colored European countries. The finished map will look like Figure below:

Add a Card Showing the Total Cost of Spare Parts

Power BI Desktop has a really effective way of adding a specific single figure to a dashboard. It consists of adding visualizations called *cards,* which are what you will now add to your dashboard.

1. Click the dashboard canvas to unselect any visualizations.
2. Click the card icon in the Visualizations pane, as shown in Figure below:



3. Leaving the (slightly clunky) empty card visualization selected, click the check box to the left of the SpareParts field in the Fields list. This displays the spare parts total in the source data.
4. Drag the corner handle of the matrix to resize it so that there is no spare white space inside the matrix itself. It will look like Figure below:

Add a Slicer by Make

We will now add some interactivity to the dashboard by adding a slicer, that will let you—or any user of this dashboard—filter by any or all car models sold. Follow the following steps:

1. Drag the Make field to a blank area on the dashboard canvas. Power BI Desktop will create a list of vehicle models.

2. Click the slicer icon in the Visualizations pane, as shown in Figure below:

3. Drag the corner handle of the slicer to resize it so that there is no spare white space inside the slicer. It will look like Figure below:

You can now test the slicer by selecting—or deselecting—any car model that is listed in the slicer. The other visualizations on the dashboard will instantly be updated to reflect the choice of models. You will soon get a first look at how this slicer can be used to filter data.

Arranging the Dashboard

Now that you have created a few visuals, it is time to coordinate them on the page so that you can deliver a meaningful dashboard that adds power to your insights.

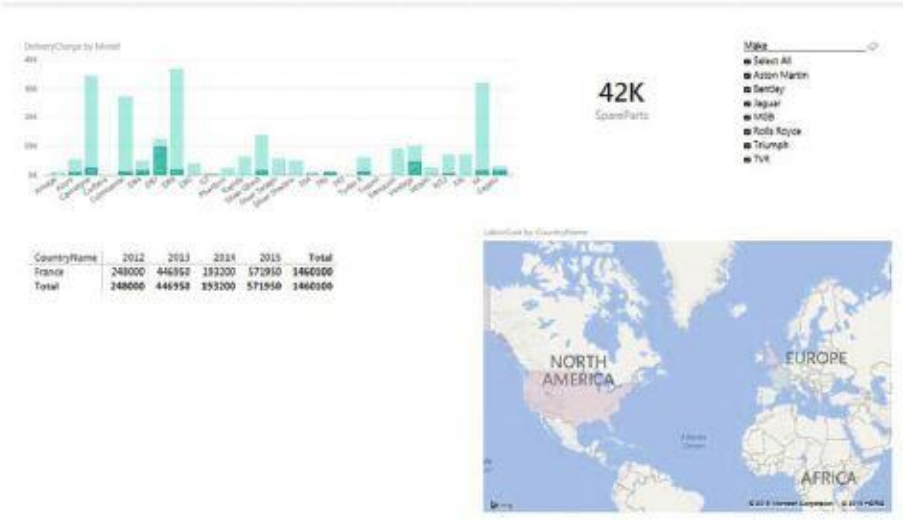
Moving a Visualization

1. Click the visualization that you want to move.
2. Drag the visualization elsewhere on the dashboard canvas.

Resizing a Visualization

1. Click the visualization that you want to resize.
2. Move the mouse pointer over any of the corner or side handles of the visualization. The pointer will become a double-headed arrow.
3. Drag the edge of the visualization to increase or decrease its current size.

After a little effort, your dashboard could look like the one in the figure below:

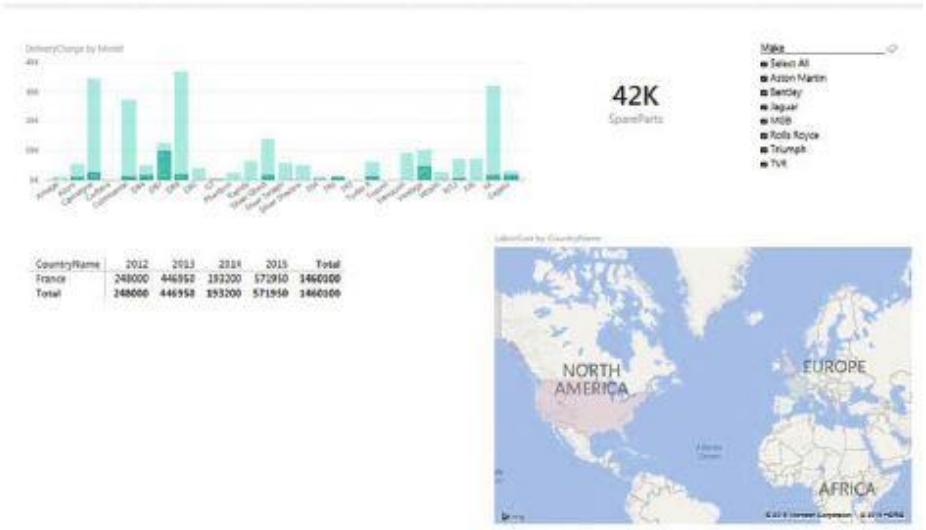


Interactivity in Dashboards

Building a dashboard was only the start, as far as Power BI Desktop is concerned. For a Power BI dashboard is never set in stone. In fact, quite the opposite is true, because every dashboard that you create is instantly and intuitively interactive. This means that you can use it to highlight salient points and drill down to expose the key insights that your analysis has led you to.
Even a simple dashboard like the one that you just created is immediately interactive. As an example, suppose that you want to use this dashboard to display data for only a couple of the makes that the company has sold. The following explains how to do it:

1. In the slicer (on the top right of the dashboard), click Bentley and Rolls-Royce. The dashboard will instantly update to show only data for these car models, as shown in the figure below:.

2. In the slicer, click Select All to clear the filter.
3. In the map, click France. The dashboard will instantly update to show only data for the selected country, as shown in the figure below



Creating and Modifying Reports

So far in this section, we have treated the Power BI Desktop file as if it consisted of only a single page. In practice, you are likely to need to base several pages of analysis and information on the same underlying dataset. Consequently, Power BI Desktop makes it easy to add, copy, and

delete the pages in your original file so that you can create complex data stories that all use the same dataset.

If (as I presume is probably the case for many Power BI users) you are used to using Excel, then you will likely find the way that pages are handled in self-service BI incredibly simple, because in Power BI Desktop, each page is very similar to an Excel worksheet. To make matters clearer, look at the figure below, where you can see the page tabs of Power BI Desktop.

Adding Pages

When you open a new Power BI Desktop file, it always defaults to having a single page, thoughtfully named Page 1. You can add a new page as follows:

In the Home ribbon, click the New Page button. A new blank page named Page *n* will be added to the existing collection of pages in the report.

Renaming Pages

If a page contains a set of elements that you want to reuse (it may be a template page containing a logo and the background for a series of pages in a report, for instance), then you can make duplicates of pages, as follows.

1. Double-click the tab of the page that you want to rename. The existing name will be highlighted.
2. Enter a new name for the page.
3. Press Enter. Click inside the dashboard canvas for the page or click another tab to confirm your changes.

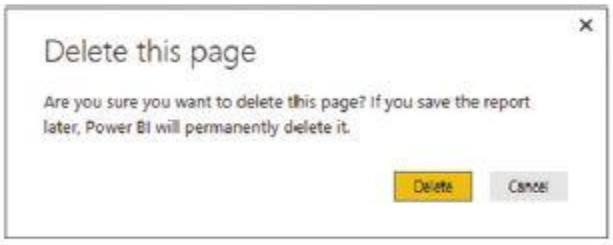
Deleting Pages

If a page is no longer any use to you, then you can delete it, of course.

1. Hover the mouse pointer over the tab for the page that you want to delete.

A small cross appears at the top right of the page name, as you can see in the figure below:

2. Click the cross. A warning dialog will appear, as shown in Figure below:



3. Click Delete. The page will be deleted and *all* visuals on the page are removed from the file.

Moving Pages

To alter the sequencing of the pages in your report, do the following.

1. Click the tab corresponding to the page that you want to move.
2. Drag the page tab left or right to a new position in the set of pages.

Duplicating Pages

If a page contains a set of elements that you want to reuse (it may be a template page containing a logo and the background for a series of pages in a report, for instance), then you can make duplicates of pages, as follows.

1. Hover the mouse pointer over the tab for the page that you want to delete.
2. Right-click the tab. A pop-up menu will appear.
3. Select Duplicate Page.

An identical copy of the page will appear to the right of any existing pages. There is also a Duplicate Page option in the popup menu for the New Page button if you prefer.

Scrolling through Collections of Pages

If your report contains dozens of pages, then it can get very wearing to trawl through the set of pages one at a time. Instead, you can click the page scroll buttons to scroll through the set of pages in a Power BI Desktop file.