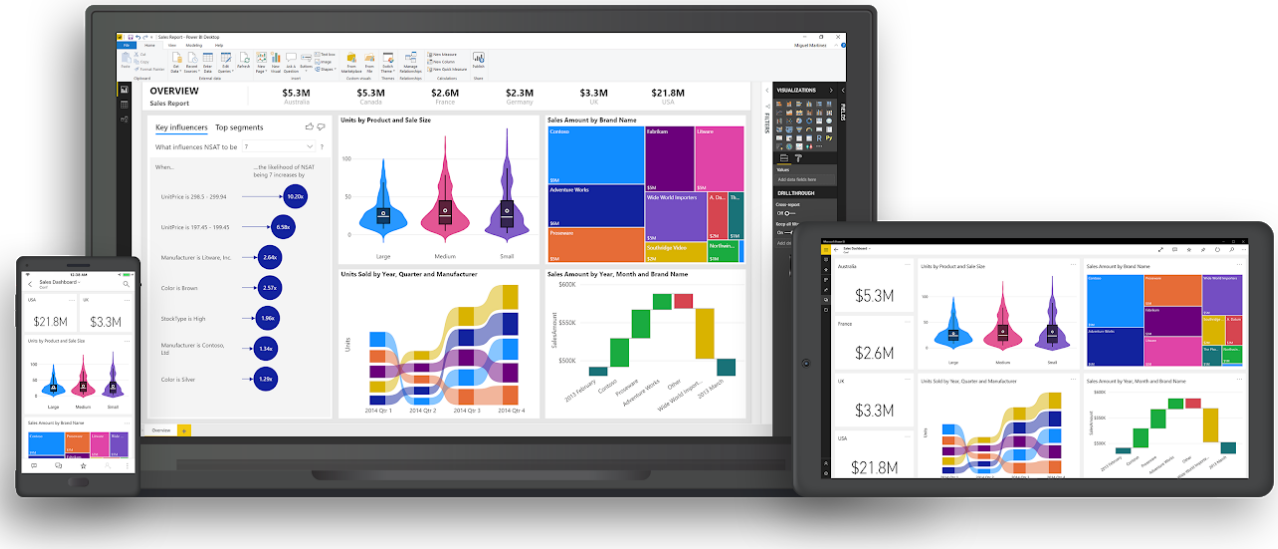
SellerCloud Power BI Guidance

(Self-Service BI Reporting)



Harold Hoffman

Overview

What is Power BI

Power BI is Microsoft's interactive data visualization and analytics tool for business intelligence (BI). You can use it to pull data from a wide range of systems in the cloud and on premises and create dashboards that track the metrics you care about the most, or drill in and (literally) ask questions about your data. You can create rich reports or embed dashboards and reports into reporting portals you already use. The dashboards, reports and visualizations you can create go far beyond bar and pie charts.

Empower Decision Makers

The primary goal of a self-service BI is to give Business executives the power to quickly access the data they need and generate an easy-to-understand report with dynamic visualizations.

WATCH OVERVIEW

Adoption Plan - Roles needed to implement a Power BI solution

There are 3 major skill sets or roles needed to implement a successful Power BI project.

1. **Data Visualization** (graphic designer) role. This developer needs to be able to design and develop rich interactive reports that clearly communicate the message in your data and quickly help you gain insights into your business data. (PBI Reports have a built in Filtering Pane that can be used for Report filtering. There is no need to create custom filters on the report itself).

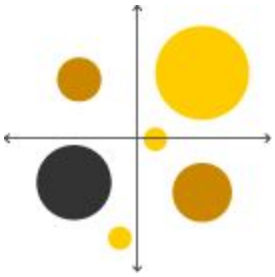
2. **Data Modeling** role, including Data Load (accessing the data from one or more data sources) and Relational Schema Definition (defining table relationships). You find data sources, connect to them, import what you need and then add any required calculations before creating dashboards.

3. **Solutions Architect** role to design and architect the overall solution

Data Visualization Role

The skills needed to create visualizations include:

- Layout design (similar to HTML layouts in web applications)
- Themes to enhance Reports (similar to CSS in web applications)
- Selecting the appropriate Visualization. Which chart do I use (Bar, Line, Pie, Doughnut)
- Designing with Mobile app compatibility in mind.



Data Modeling Role

The skills needed to model data include:

- Selecting the appropriate Tables for the datasets needed in the reports
- Building the Table Relationships
- Renaming the Tables and Columns to meaningful names
- Use of appropriate Measures (YTD Sales)
- Creating Date Hierarchies in DirectQuery Mode

Solutions Architect Role

This role includes:

- Determining the use of an On Premises Database (DirectQuery) connection or a Cloud (Import) service solution.
- Use of an Enterprise Gateway connection to refresh data in the cloud (up to 8 times per day).
- Designing PBI Template Files and create standards for the file names (.pbit) for each major Report Module (Sales, Inventory, Purchasing, Returns, Settlements, Salesman, Buyer etc..)
- Designing a Template Versioning Methodology.
- Determination of the scope of clients allowed to use this new functionality (Possible restriction to clients on Dedicated Servers only to allow for reusable templates)

Connecting to your data

There are 2 ways to connect to your data source. You can import a copy of the data into the Power BI Desktop or connect directly to the data source using DirectQuery

Comparison between Import and DirectQuery Models

Capability	**Import**	**DirectQuery**
Size	Up to 1 GB per dataset	No limitation
Data Source	Import data from Multiple sources	Data must come from a single Source
Performance	High-performance query engine	Depends on the data source response for each query
Data Change in the underlying data	Not Reflected. Required to do a Manual refresh in Power BI Desktop and republish the report or Schedule Refresh	Power BI caches the data for better performance. So, it is necessary to Refresh to ensure the latest data

Schedule Refresh	Maximum 8 schedules per day	Schedule often as every 15 mins
Power BI Gateway	Only required to get latest data from On-premise data sources	Must require to get data from On-premise data sources
Data Transformations	Supports all transformations	Supports many data transformations with some limitations
Data Modelling	No limitation	Some limitations such as auto-detect relationships between tables and relationships are limited to a single direction.
Built-in Date Hierarchy	Available	Not available
Clustering	Available	Not available
Calculated Tables	Available	Not supported
Quick Insights	Available	Not available
Q&A	Available	Not available
Change Data Connectivity mode	Not possible to change Import to DirectQuery	Possible to change DirectQuery to Import

Direct Query Model Limitations

- **Your BI report performance depends greatly on the performance of the underlying data source.** If you distribute your reports to a massive number of users, each request and each periodically refreshed dashboard tile will be sending at least one query per visual to the underlying source via the gateway. If your network/database/server becomes too bogged down, any query that takes longer than a few minutes will time out.
- When importing data, we can combine data from multiple sources into a single data model, mixing your own excel or csv files and SQL Server tables. **But for DirectQuery, all tables must come from a single database.**
- **No built-in date hierarchy for DirectQuery.** To counter that, you need to have a Date table.
- **Very limited functions in calculated columns.** Yes, the simple FirstName + LastName, in all examples given, can be done easily but anything a bit more elaborated will leave you scratching your head such as masking a partial Customer/Account ID or putting a period somewhere in the DeptID and append DeptName for display. Not impossible but you will end up finding yourself spending so much time looking up DAX or M language just to do simple things like that. My advice in this case: do it in the backend.
- **The ability to define a calculated table using a DAX expression is not supported in DirectQuery mode.**
- **When using DirectQuery, it is not possible to use the Clustering capability, to automatically find groups.**
- Quite a few more…

Direct Query Model Advantages

- **Data is changing frequently, and near 'real-time' reporting is needed.**
- **Data is very large.** The 1 GB dataset limitation does not apply to DirectQuery.
- **Security rules are defined in the underlying data source.**
- **Data cannot leave the organization.**

Implementation Recommendations

For small to medium sized organizations you should probably use the **Import** model. Each client will need to create their own tenant on office 365 and buy the appropriate PBI licenses for each user. Users can sign up on powerbi.com. They will automatically appear in office 365.The client can either install Power BI Desktop on their dedicated SC server and connect to their SC database on the local server or connect through a VPN connection if they do not have access to their dedicated server. They will need read rights to the SC database. They can either create their own pbit and pbix files or use a standard SC predefined template or report file.

Report Distribution to Clients (Templates)

Reports can be developed and packaged as templates and distributed to clients on dedicated servers. Templates consist of the data model and (optional) visualizations. It does not include actual data (unlike a pbix file that includes data also). The clients would then need to update the sql connection to point to their sql server with their credentials. Clients can be set up with

VPN connectivity to their dedicated server and import data into power bi desktop on their office workstation or laptop.

Publishing to Power BI

Power BI Desktop can publish the pbix file to a workspace in the Power BI service. The name of the pbix file is the Report and Dataset name, So a file named Sales.pbix will appear as Sales in the Reports and Datasets tabs of the workspace. See below.

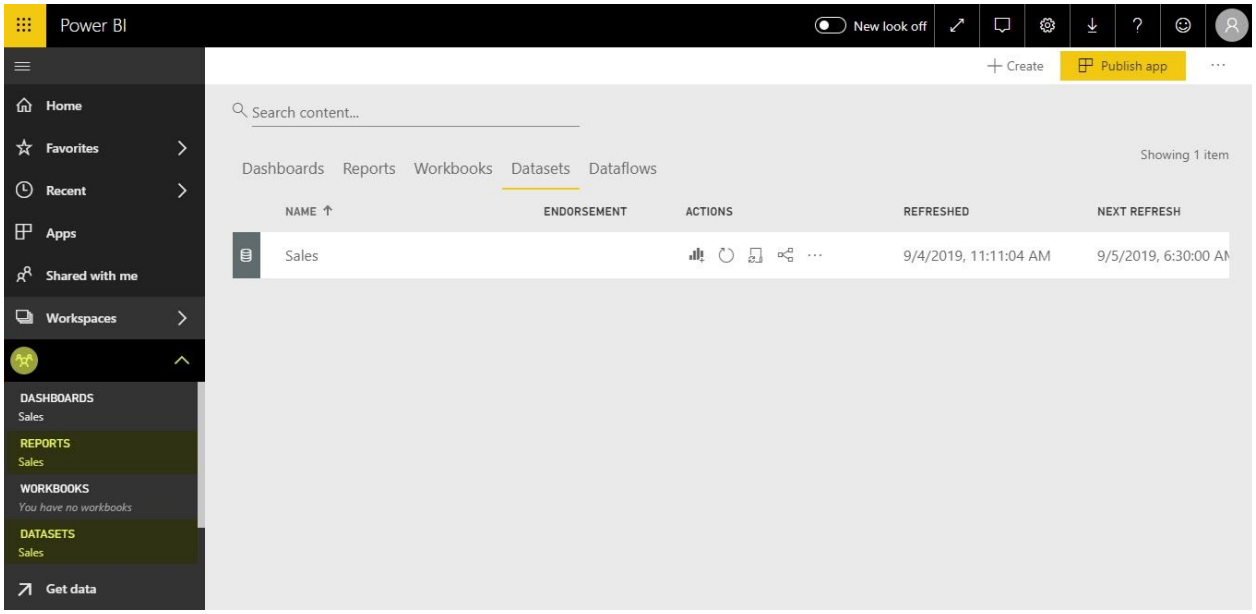
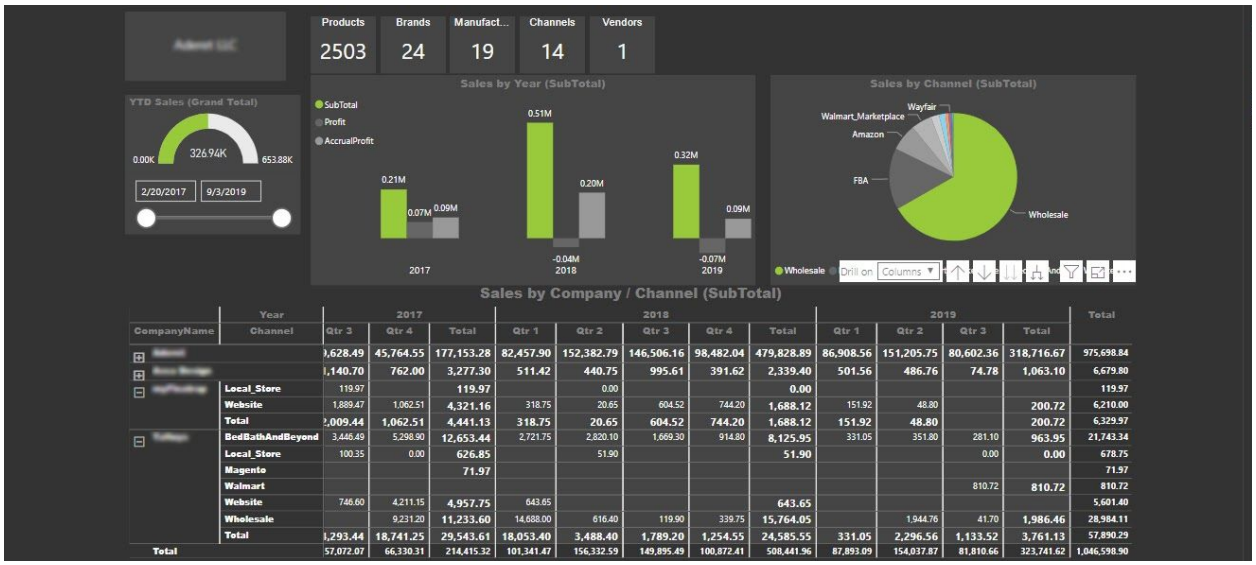


Figure 1, Power BI web site

A workspace can have many Reports and Datasets created from multiple pbix files with different names.

Sample Screen Shots

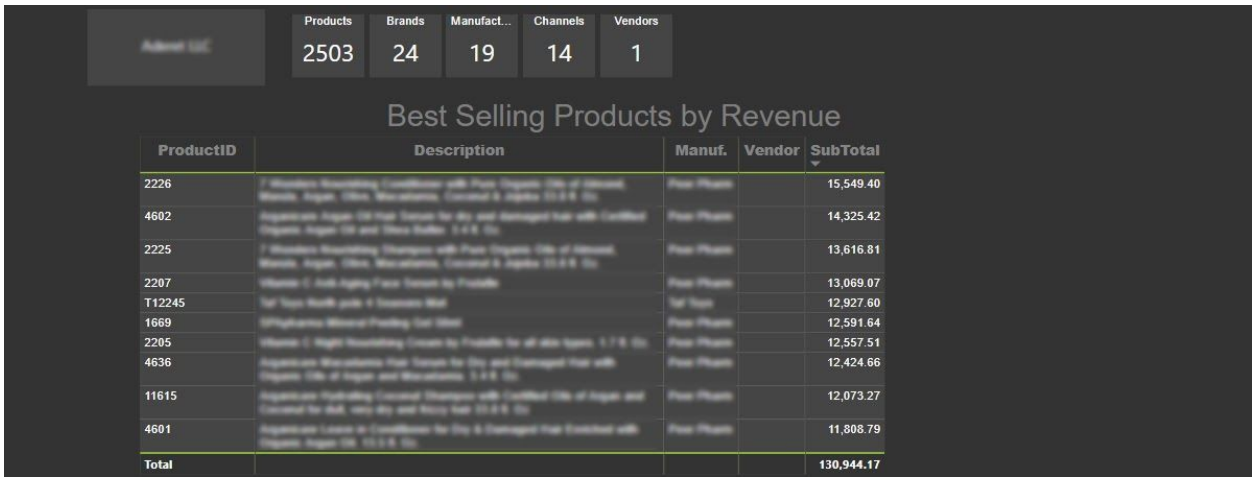
Sales Report



CompanyName	Year / Channel	2017 Qtr 3	2017 Qtr 4	2017 Total	2018 Qtr 1	2018 Qtr 2	2018 Qtr 3	2018 Qtr 4	2018 Total	2019 Qtr 1	2019 Qtr 2	2019 Qtr 3	2019 Total	Total
[redacted]		6,628.49	45,764.55	177,153.28	82,457.90	152,382.79	146,506.16	98,482.04	479,828.89	86,908.56	151,205.75	80,602.36	318,716.67	975,698.84
[redacted]		1,140.70	762.00	3,277.30	511.42	440.75	995.61	391.62	2,339.40	501.56	486.76	74.78	1,063.10	6,679.80
[redacted]	Local_Store	119.97		119.97		0.00			0.00					119.97
	Website	1,889.47	1,062.51	4,321.16	318.75	20.65	604.52	744.20	1,688.12	151.92	48.80		200.72	6,210.00
	Total	2,009.44	1,062.51	4,441.13	318.75	20.65	604.52	744.20	1,688.12	151.92	48.80		200.72	6,329.97
[redacted]	BedBathAndBeyond	3,446.49	5,298.90	12,653.44	2,721.75	2,820.10	1,669.30	914.80	8,125.95	331.05	351.80	281.10	963.95	21,743.34
	Local_Store	100.35	0.00	626.85		51.90			51.90			0.00	0.00	678.75
	Magento			71.97										71.97
	Walmart											810.72	810.72	810.72
	Website	746.60	4,211.15	4,957.75	643.65				643.65					5,601.40
	Wholesale		9,231.20	11,233.60	14,688.00	616.40	119.90	339.75	15,764.05		1,944.76	41.70	1,986.46	28,984.11
	Total	1,293.44	18,741.25	29,543.61	18,053.40	3,488.40	1,789.20	1,254.55	24,585.55	331.05	2,296.56	1,133.52	3,761.13	57,890.29
Total		57,072.07	66,330.31	214,415.32	101,341.47	156,332.59	149,895.49	100,872.41	508,441.96	87,893.09	154,037.87	81,810.66	323,741.62	1,046,598.90

Figure 2, Sales Report

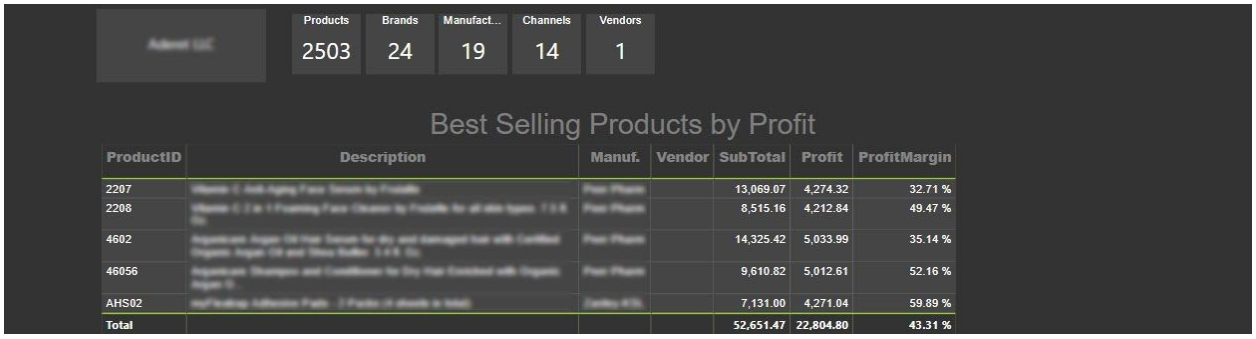
Best Selling Products by Revenue



ProductID	Description	Manuf.	Vendor	SubTotal
2226	[redacted]	[redacted]		15,549.40
4602	[redacted]	[redacted]		14,325.42
2225	[redacted]	[redacted]		13,616.81
2207	[redacted]	[redacted]		13,069.07
T12245	[redacted]	[redacted]		12,927.60
1669	[redacted]	[redacted]		12,591.64
2205	[redacted]	[redacted]		12,557.51
4636	[redacted]	[redacted]		12,424.66
11615	[redacted]	[redacted]		12,073.27
4601	[redacted]	[redacted]		11,808.79
Total				130,944.17

Figure 3, Best Selling Products by Revenue

Best Selling Products by Profit Margin



ProductID	Description	Manuf.	Vendor	SubTotal	Profit	ProfitMargin
2207				13,069.07	4,274.32	32.71 %
2208				8,515.16	4,212.84	49.47 %
4602				14,325.42	5,033.99	35.14 %
46056				9,610.82	5,012.61	52.16 %
AHS02				7,131.00	4,271.04	59.89 %
Total				**52,651.47**	**22,804.80**	**43.31 %**

Figure 4, Best Selling Products by Profit Margin

Power BI Group Storage Capacity (Import Mode)

Server	Tables	# of Rows	Pbix file size	Pro Max allowed	Gateway Connection Setup for Auto Refresh
Sample	bvc_OrderSaleTransaction_PandL	695K	175MB	10GB per User	No
Sample	bvc_OrderSaleTransactionItem_PandL	730K	175MB	1GB per dataset	No

Figure 5, Storage Capacity

Power BI / SellerCloud Integration Platform

Dedicated SellerCloud server

Power BI integration is only supported on dedicated servers. If you are on a shared server you will need to upgrade to a dedicated server. You will need a VPN account to connect to SQL Server with read only access. Please contact the SellerCloud support team to install the VPN connection and supply you with credentials needed to connect to the network.

Create a Microsoft 365 account

To use the Power BI online service you should create a Microsoft 365 account at https://admin.microsoft.com/ . Create an Administrator user using your company domain name email (user@domainname.com). Create a **Tenant** in Microsoft 365 as a container for all domain users. Microsoft 365 will then ask you to create a txt DNS record to confirm you are the owner of that domain.

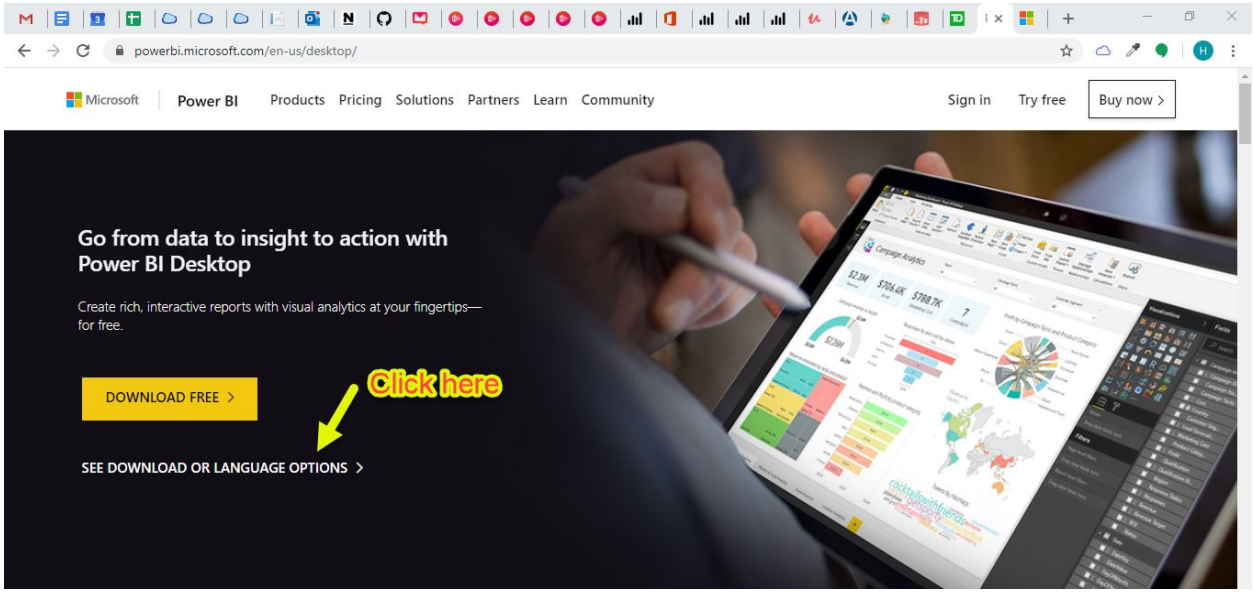
Additional users can sign up on powerbi.com using their company domain name email. They will automatically be added as a user in Microsoft Office 365.

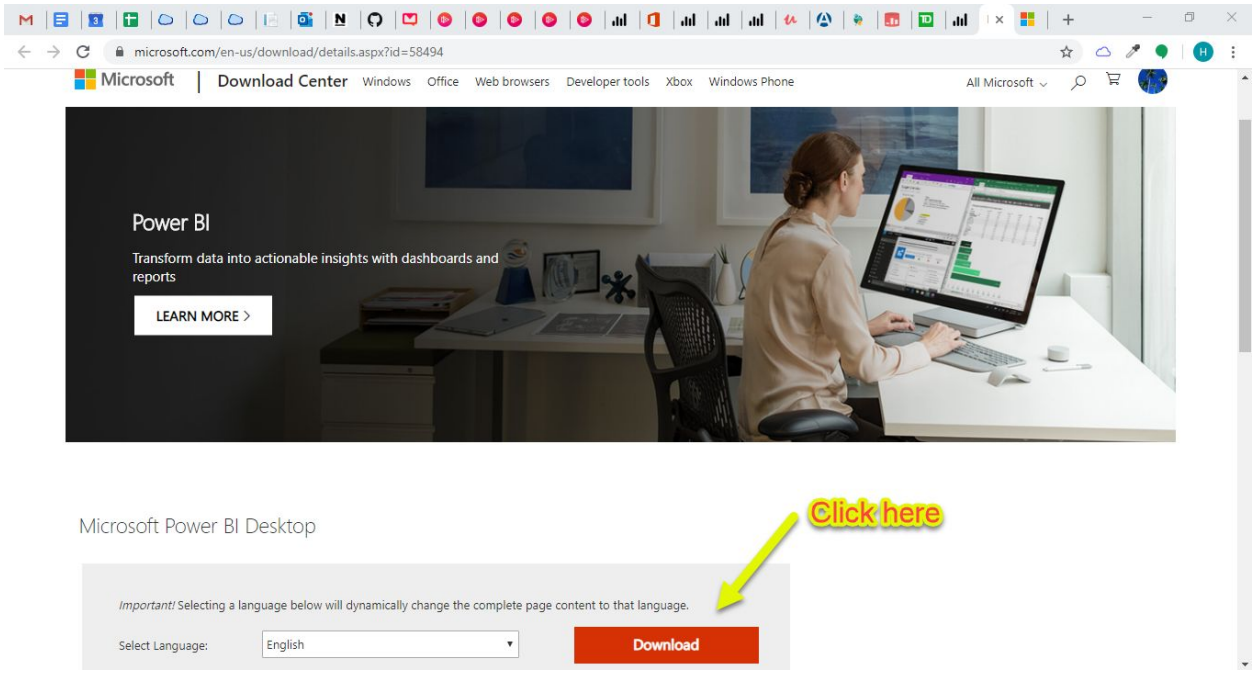
Installing SellerCloud Components

The SellerCloud support team will install the required SC components on your SQL Server instance to interact with Power BI. This includes Stored Procedures (pbi schema) and Scheduled Tasks that together create and update the summary data (pbi schema tables) needed for Power BI reports and dashboards.

Download and install the latest Power BI Desktop

Navigate to https://powerbi.microsoft.com/en-us/desktop/ and follow the instructions in the following images to download the installer. Once it is downloaded, install the PBI Desktop on your local machine.

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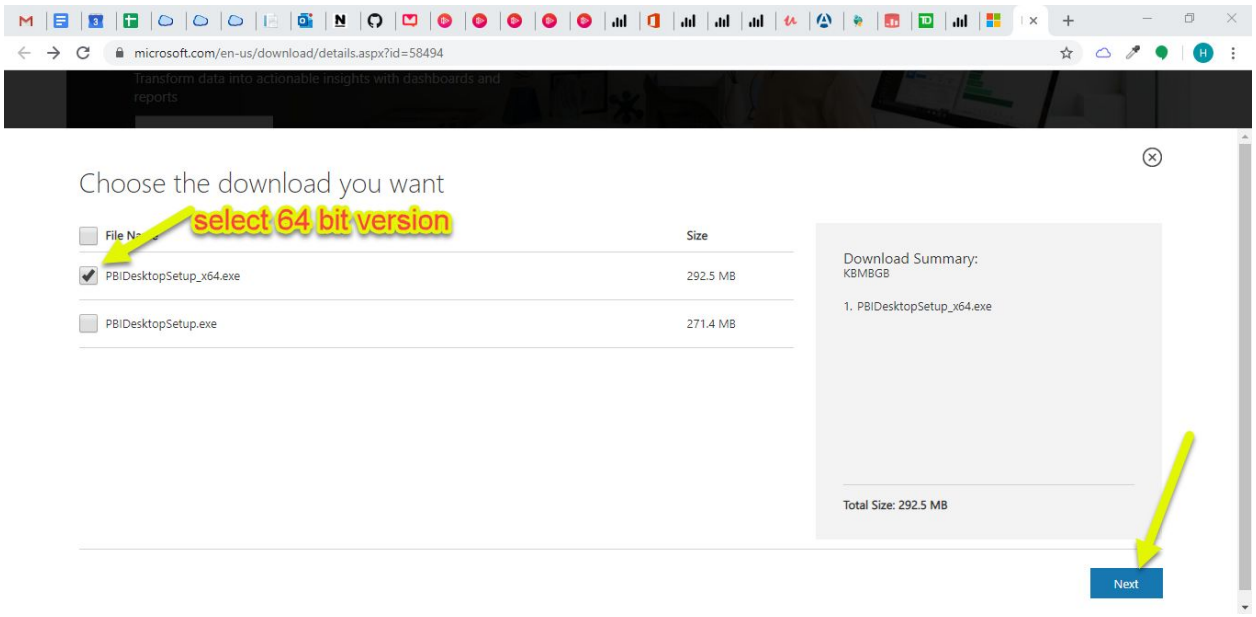
microsoft.com/en-us/download/details.aspx?id=58494
Choose the download you want
select 64 bit version
Size
PBIDesktopSetup_x64.exe
292.5 MB
PBIDesktopSetup.exe
271.4 MB
Download Summary:
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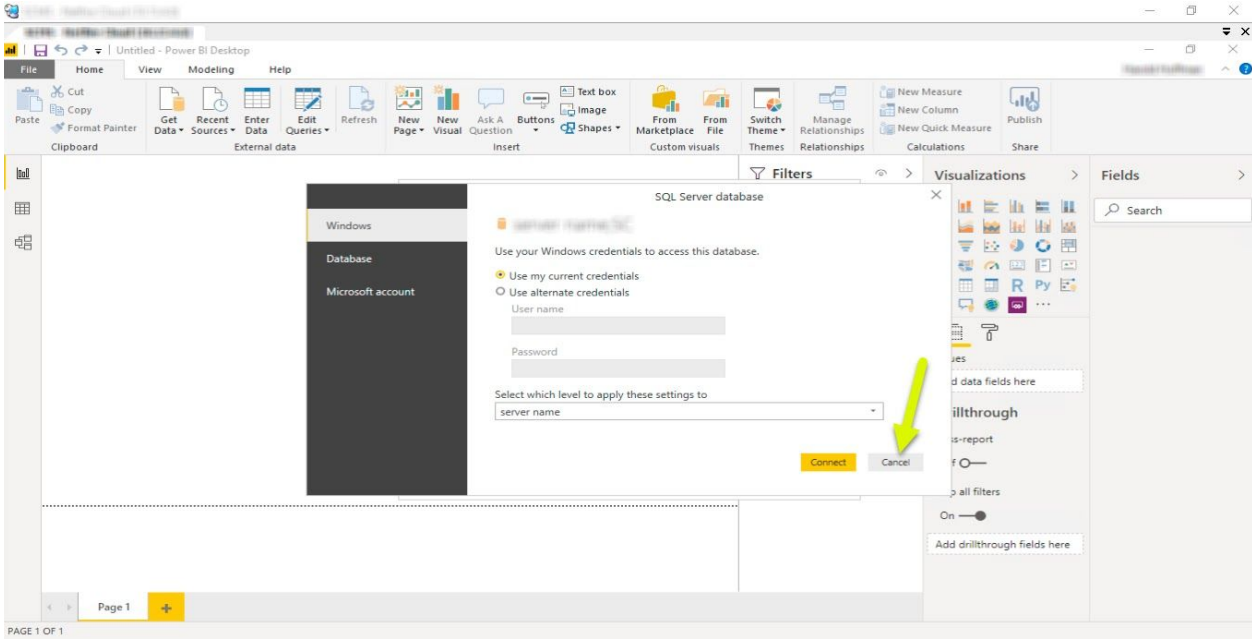
1. PBIDesktopSetup_x64.exe
Total Size: 292.5 MB
Next

Power BI SellerCloud Sales Template file (Sales.pbit)

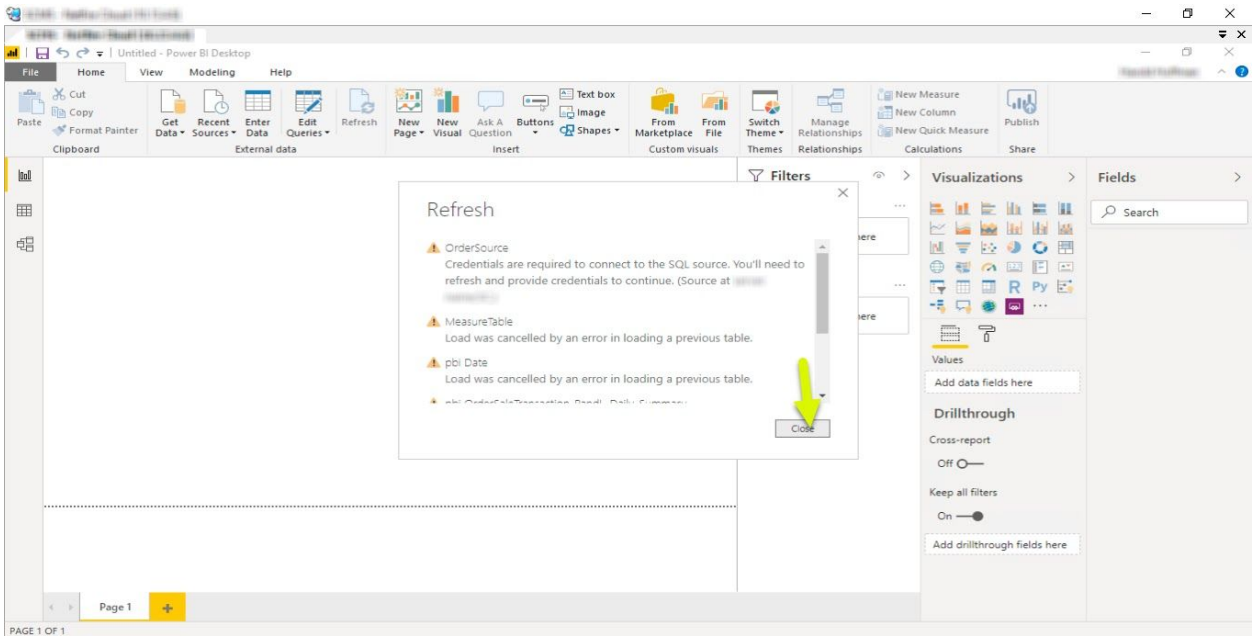
You can download the SellerCloud Sales template file (Sales.pbit) from https://github.com/SellerCloudTeam/PowerBI.Templates/tree/master/Sales.

Double Click on the template file to open it in Power BI Desktop. You will need to configure the Data Source Settings in Power BI Desktop to connect to SQL server. Once you are authenticated you can click on the Refresh button and import data from SQL server into the desktop application. You can change and customize the existing template reports or create new reports. You should save your changes and data to a file named Sales.pbix.

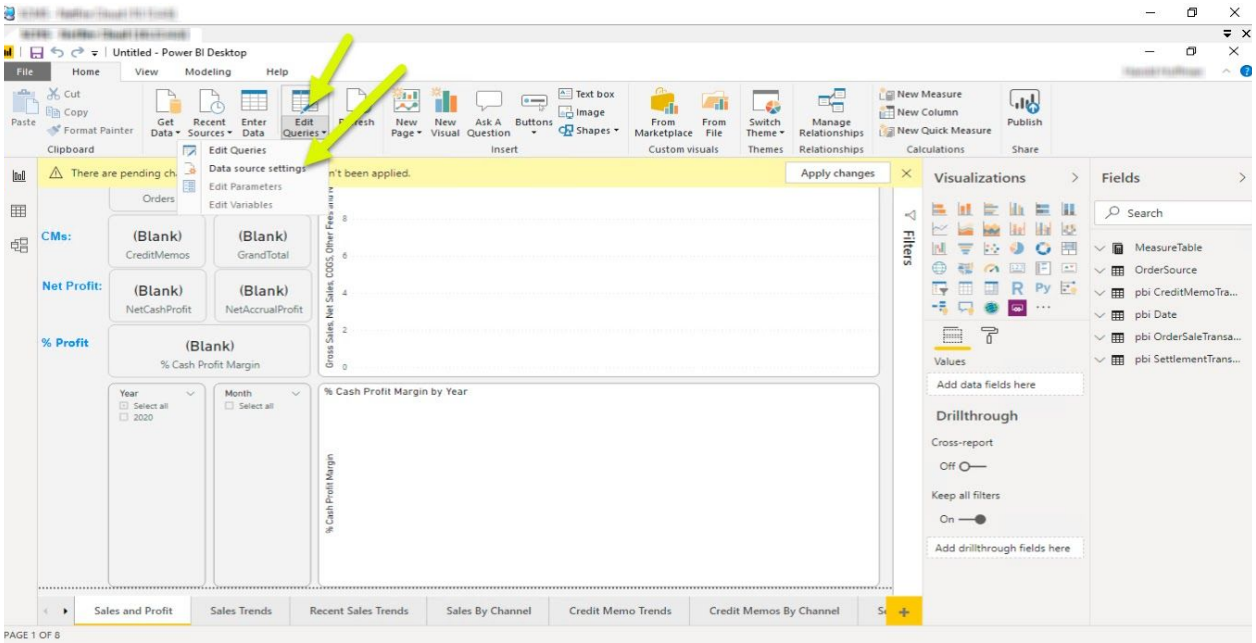
When you open the template file click the Cancel button when the following screen appears (it may take a few seconds before it appears).



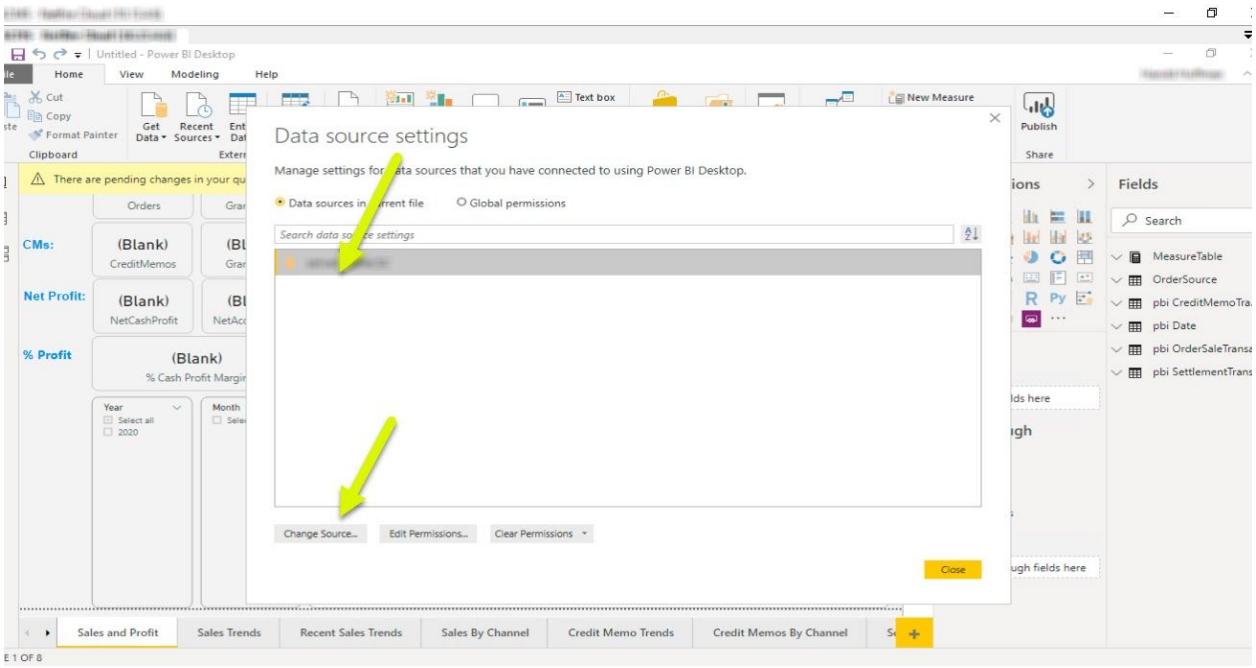
Click the Close button on the next screen.



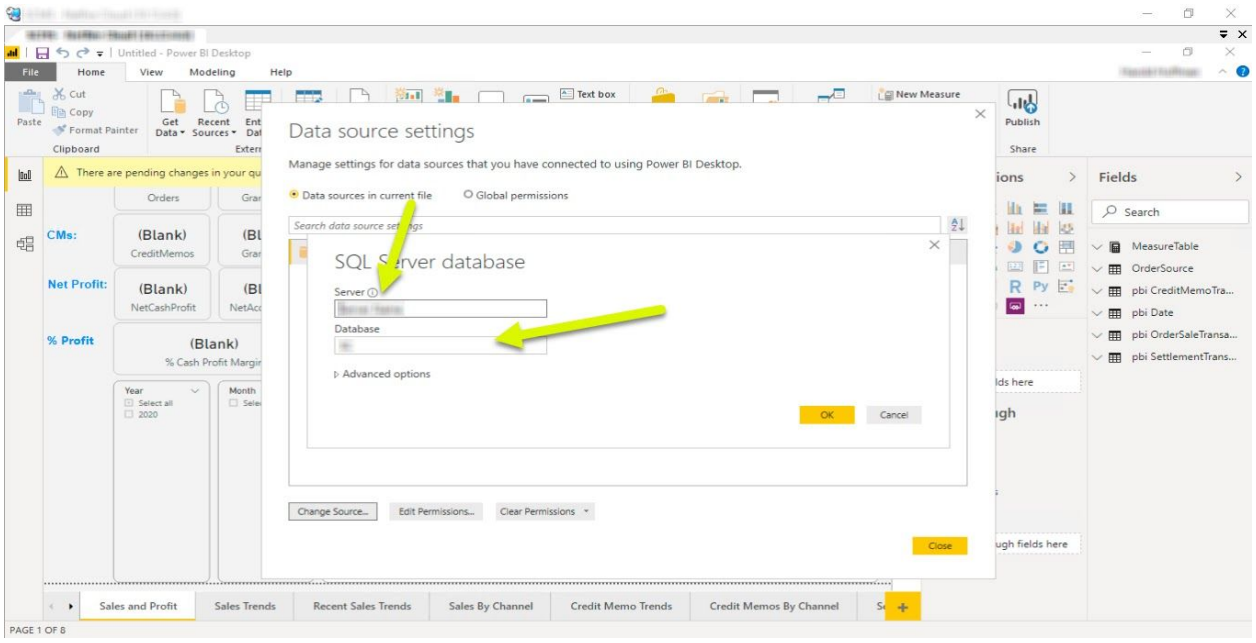
Select Edit Queries from the menu and Data Source Settings from the sub menu.



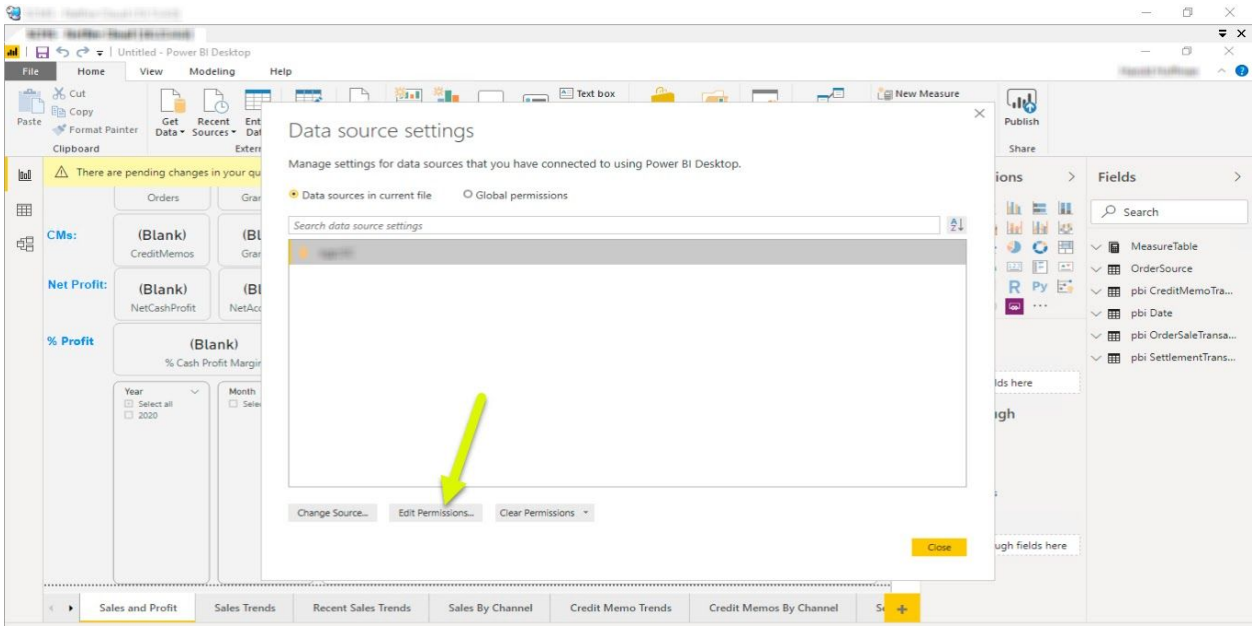
Click Change Source.



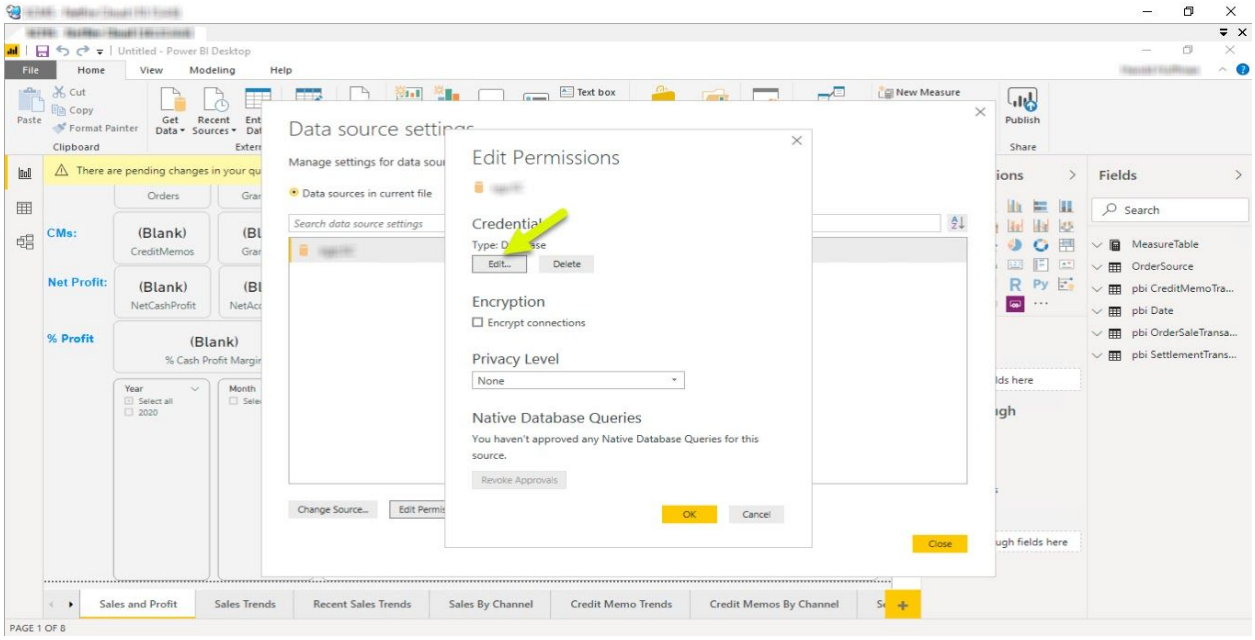
Enter your server's **IP address** as the Server ID and the database name (usually SC).



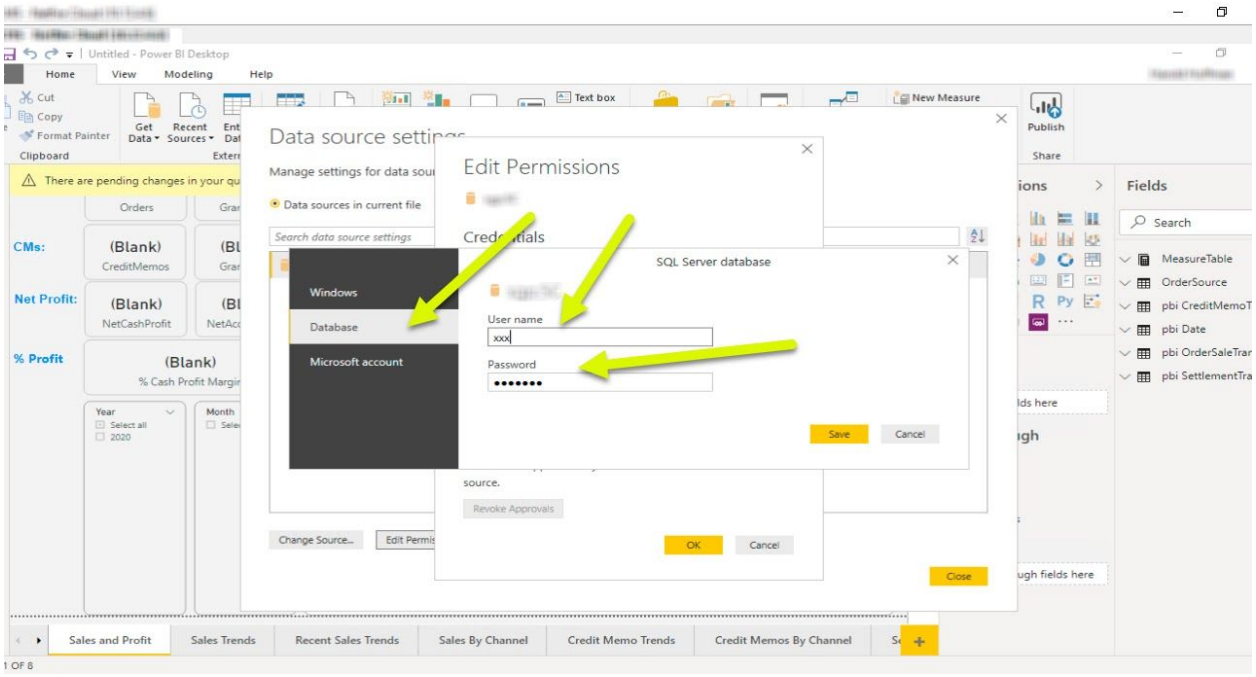
Click Edit Permissions.



Click Edit



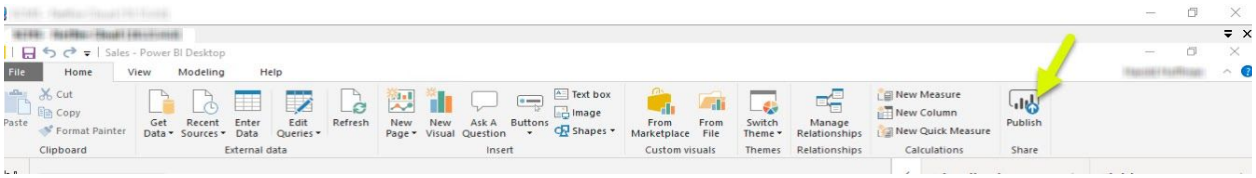
Select the Database Tab and enter your user credentials for SQL Server.
Hit Save when done..



Hit OK and Close to exit. You can now hit the Refresh button to import data from SQL Server.
You should save any changes and data to a file named Sales.pbix.

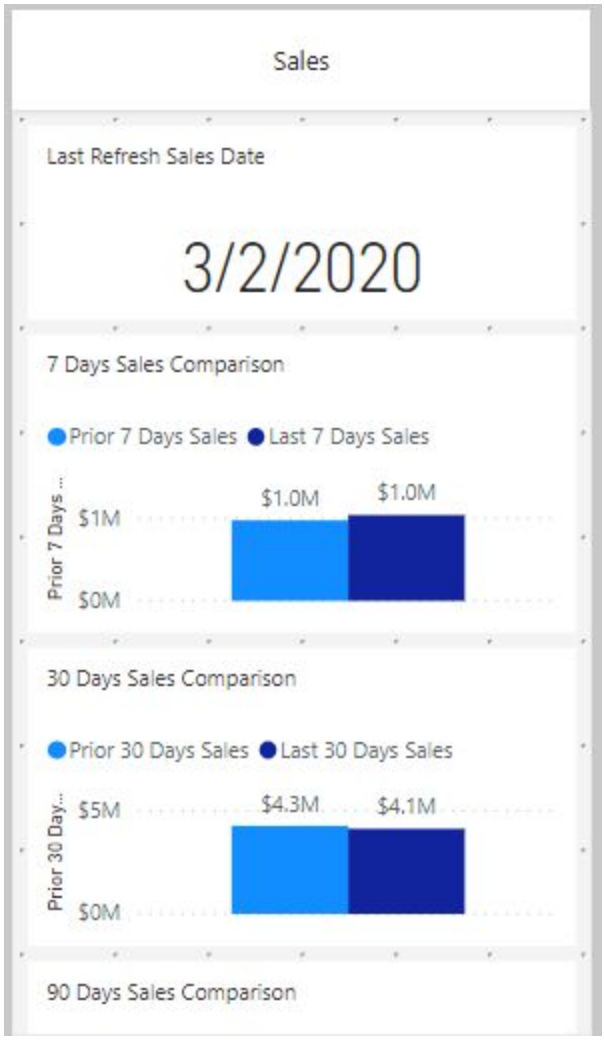
Publish the data to the Power BI service in the cloud (Sales.pbix)

Click on the Publish button and select a Workspace to publish your reports to. The report name will be the same as the file name.



Download and Install the Power BI mobile app

After you download and install the Power BI mobile app you can connect to the cloud service and view your reports and dashboards.



Sample Dashboard