Power BI

Business Analytics Immersion

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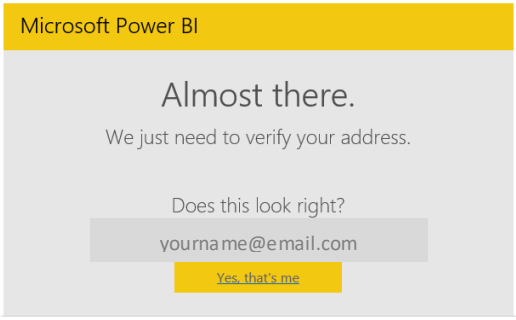
Business Scenario

Our mobile executive in this case wants contextual data around specific stores and their performance. They would also like an understanding of where stores are located, who the store manager is, how long they have been managing the store, and a way to evaluate those manager's performance.

The executive has requested these performance metrics be displayed in the form of an interactive dashboard. This dashboard solution should be able to display location specific information, such as employee, store, address, and phone number data as well as the profile of the store manager. The dashboards should also be filterable to selected cities and stores.

Sign in / Sign Up for Power BI

<table>
<tr><td>Scenario</td><td>Steps</td></tr>
<tr><td rowspan="5">If you already signed up for Power BI sign in at PowerBI.com otherwise sign up for Power BI.</td><td>Go to http://PowerBI.com.</td></tr>
<tr><td>Click the get started for free button
 
</td></tr>
<tr><td>Enter your work email (Gmail, Hotmail, yahoo etc. will not work).</td></tr>
<tr><td>Check your email.</td></tr>
<tr><td>Click the Yes that's me button.
 
</td></tr>
<tr><td>Enter Your Details and password.</td></tr>
<tr><td colspan="2">You now have access to the industry leading self-serve analytics tool.</td></tr>
</table>

The Files for this Immersion

All files for today have either been given to you on a USB drive or placed in a folder on your desktop. We will refer to this root file location as <<FileLocation>>. There are several sub folders that contain different files to be used throughout this exercise we will refer to them as <<FileLocation>>\Foldername.

The Folder Structure you have been provided is:

Custom Visuals – visuals to extend Power BI's capabilities downloaded from the PBI Visuals Gallery

Data Files – The Source Data files we will load into Power BI

Images – Report Header Images and other files to improve the visual appeal of the dashboard

Other Samples – Other Prebuilt Dashboards and data files we can load into Power BI

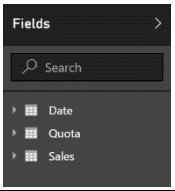
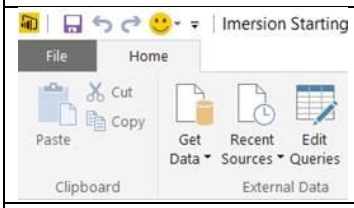
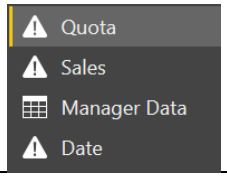
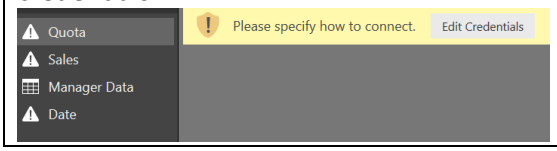
Participant Files – Files to guide you through this Immersion Experience

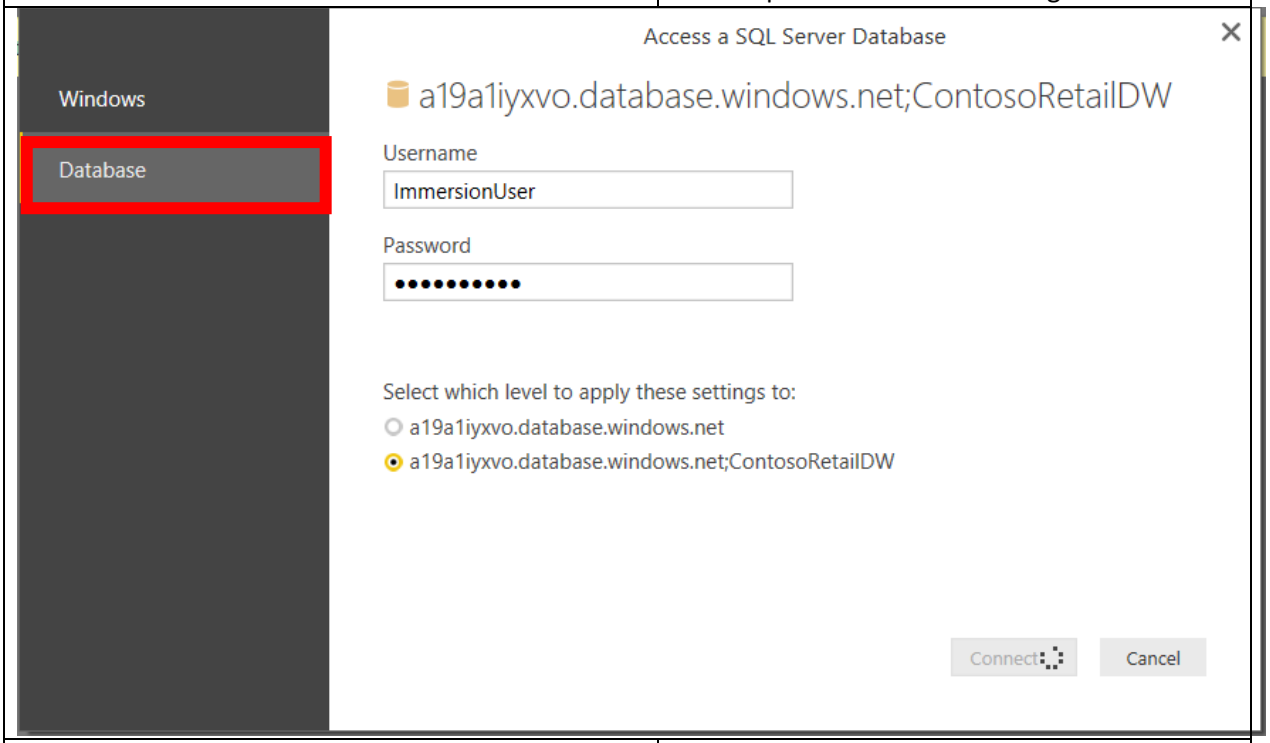
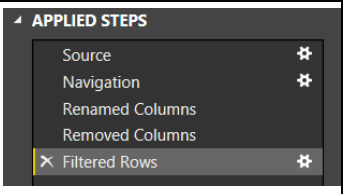
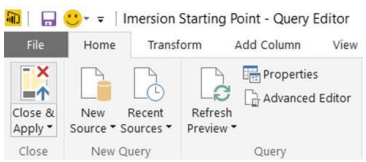
Pre Baked Bits – Just like a cooking show we have pre baked all of the major step to help you keep up if you fall behind or have technical issues

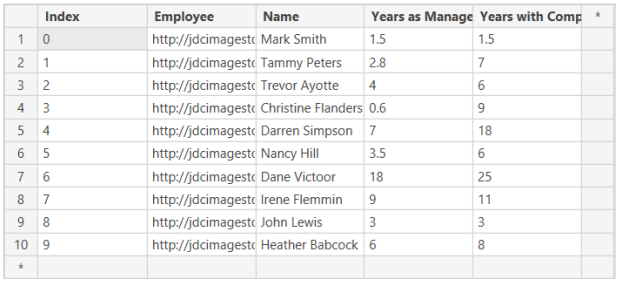
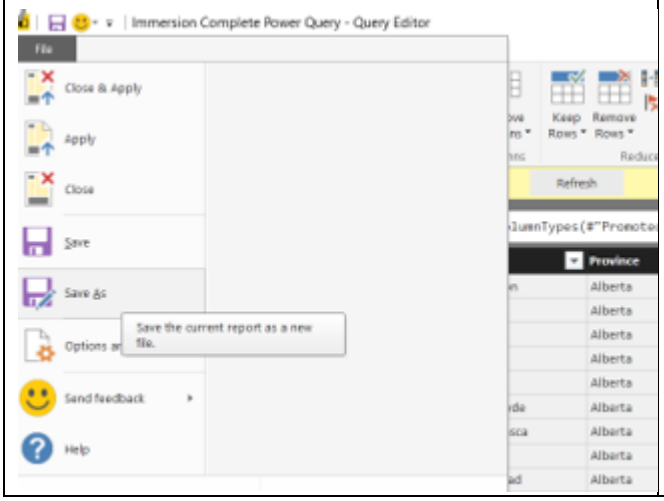
Power BI Desktop

Let's start by opening the Starting point for this Immersion Experience

We are going to open the file we will be working with for this immersion, this file already has some data preloaded and some calculations pre-built to make the best use of our time today.	Open the file <<FileLocation>>\Participant Files\Immersion Starting Point.pbix
This file contains 4 tables pre-loaded: Quota Sales Manager Data Date 3 of these tables have been loaded from an Azure SQL Data Database. The reason they are preloaded for this Immersion Experience is there are almost 4 million rows of data loaded between these 2 tables and it takes about 3 mins to pull the data down over the internet.	

Let's explore this data Opening the data view will show the available tables in the right navigation pane. 	 Select the Data Icon in the Left Hand navigation pane.
TABLE: Quota (2,863,774 rows) At the bottom of the screen you will see the number of records in the Quota Table.	Click on the Quota Table in the Fields bar on the right.
TABLE: Sales (957,958 rows) At the bottom of the screen you will see the number of records in the Sales Table.	Click on the Sales Table in the Fields Bar on the right.
Table: Manager Data (10 rows) This table is greyed out, meaning it is not available for reporting – we will come back later on this	Click on the Manager Data Table in the Field Bar on the right.
TABLE: Date (731 rows)	Click on the Date Table in the Field Bar on the right.
We will add some more data to this data model shortly, but first we are going to transform the data that is already loaded. To do this we will use the same tool that was used to pull the data in and that we will use to add additional data to this model, Power Query.	
	Click the Edit Queries button in the ribbon bar (the buttons in the external data section on the Home tab of the Ribbon all launch Power Query). This will open a separate Query Editor window.
We are now in the Power Query Editor. Notice the 2 queries in the left hand query pane. 	Select the Quota Query in the left pane.
As these tables were pre-loaded and then distributed, we may need to enter our credentials. 	Select Edit Credentials.(or click Data source settings, then Edit Permissions)

Enter the access credentials.	See Image Below In the credentials pane select *Database* in the left pane enter the following credentials:
	
	username: ImmersionUser password: pass@word1 Select a19a1iyxvo.database.windows.net;ContosoRetailDW.
In the right hand Query Setting pane, you can see all the transformations that have already been applied to this data.	Click on each step in the applied steps window and you will see how the data has been transformed. 
In the Power Query Ribbon, on the Home tab, you can also click the advanced editor button and see all the code that has been generated for each of the query steps. 	 Close the Advanced Editor Window
Lets look at the Manager Data, this has been manually entered in power BI and not loaded from	Click on the Manager Data Table in the Fields bar on the left.

any source. This is a common scenario we see where people create lookup or reference tables when we need to join data from 2 different systems that do not have common fields.	
Enter the create table window Create Table Create a table by typing or pasting content.  To enter a new table you can use the Enter Data button in the ribbon bar	Double click the source step this will open the already existing manually entered data.
Save the file. 	Click file Save As. Change the name to ***Your Name PBI Report.***

	Index	Employee	Name	Years as Manage	Years with Comp	*
1	0	http://jdcimagestc	Mark Smith	1.5	1.5	
2	1	http://jdcimagestc	Tammy Peters	2.8	7	
3	2	http://jdcimagestc	Trevor Ayotte	4	6	
4	3	http://jdcimagestc	Christine Flanders	0.6	9	
5	4	http://jdcimagestc	Darren Simpson	7	18	
6	5	http://jdcimagestc	Nancy Hill	3.5	6	
7	6	http://jdcimagestc	Dane Victoor	18	25	
8	7	http://jdcimagestc	Irene Flemmin	9	11	
9	8	http://jdcimagestc	John Lewis	3	3	
10	9	http://jdcimagestc	Heather Babcock	6	8	
*						

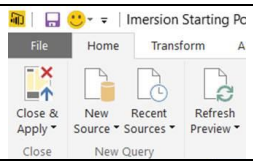
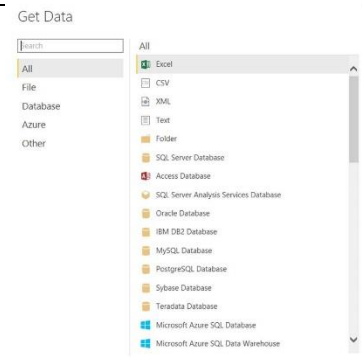
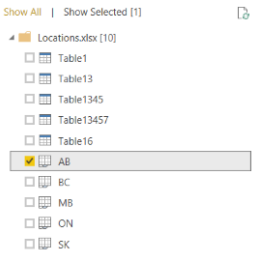
Import Data

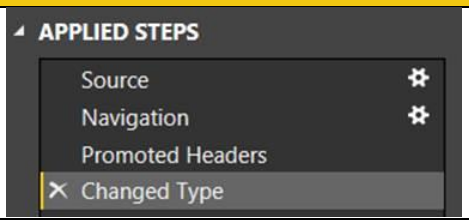
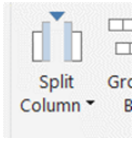
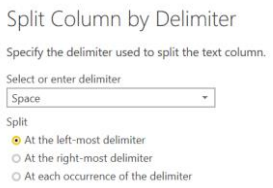
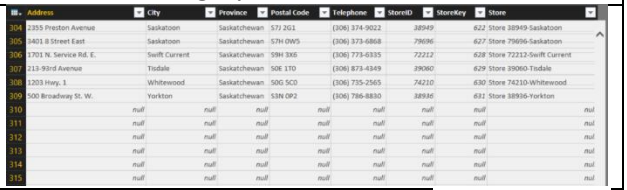
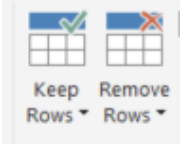
So we have already got some base data loaded as well as some transformations and cleansing of the data built in. We will add more data and perform some of the same clean up tasks to augment the Sales and sales Quota data we already have.

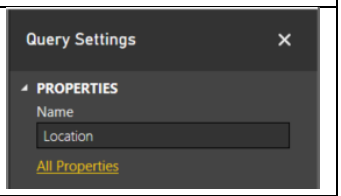
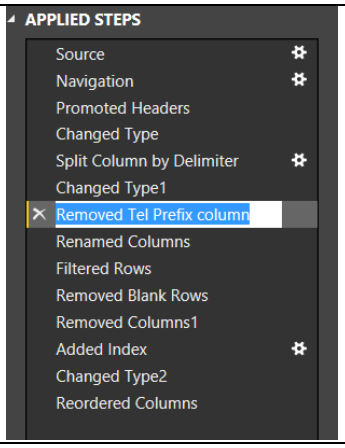
We will add location data from an excel file as well as Product Data from a SQL Server database, ultimately combining it with the data we already have to build our data model and report. This is very similar to the types of scenarios we see business users doing in Excel every day. By using Power BI we can automate this work and have it scheduled to run each day.

As per the scenario, the mobile executive wants contextual data around specific stores and their performance as well as an understanding of where stores are located, who the store manager is and how long they have been managing the store. To do this, we will add some master data about the store locations, which is maintained in an Excel file. We will import this data, prepare it to be used in our reports and dashboards, and connect it to the Quota and Sales to add context around the store.

Import Location Data from Excel

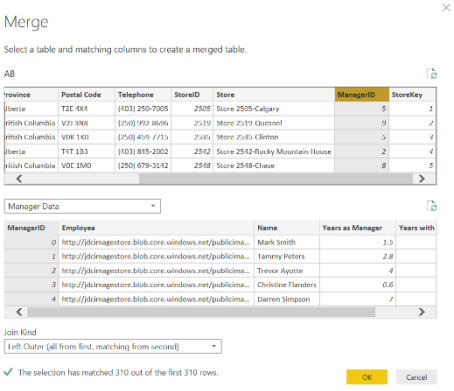
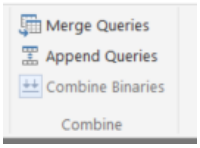
The first data we are going to get is the store location data related to the retail location that the sales originated from.	In the Power Query Ribbon Click the New Source 
Note all of the different options available (new sources are added on a regular cadence as part of the monthly updates). 	Select Excel. Click connect. Enter the following file location in the file name dialogue: <<FileLocation>>\Data Files\Locations.xlsx Select the Appropriate Province Worksheet (AB) for your Location table. 
Note that if you were creating a new connection from the Power BI Desktop screen and not the Power Query Editor you would have the option to select Edit, which would open the Power Query Editor.	Click OK.

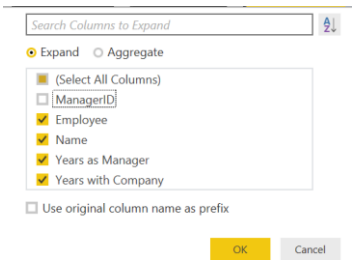
The data from the location table will now load into Power Query. Notice how power query interpreted the source data and applied some standard steps to the data.	
We will now continue to clean up the data and prepare it for analysis. The Tel column has Tel: appended to the front of each data point. As we do not want this, we will use Power Query to cleanse this data.	Select the Tel Column. Click the split column button in the Home tab of the Editor ribbon. Choose by Delimiter.  In the Split Column by Delimiter dialogue box, choose Space from the Select or Enter Delimiter drop-down menu. Choose at the left-most delimiter. Click OK. 
Now let's clean up the 2 columns we just created. First, we do not need the tel. prefix column (Tel.1), so let's delete it.	Select the column Tel.1 column header. Right click and select remove. Note that this can also be accomplished from the ribbon tools. Select column Tel.2. Double click the column header and rename to Telephone. Another way to do this could be replace values "Tel.:" by nothing, and rename to Telephone.
Now let's add a store name to our store.	Select the column City and StoreID then click on the arrow below Column by Example and choose from selection. In the new column write Store followed by StoreID then "-" then the City Name. For the first line, it should be something like "Store 2505-Calgary".
If we scroll to the bottom of the Locations table you will notice we have imported a lot of empty rows, designated by the null value.	
Let's clean those up.	In the Home tab on the ribbon, click the Remove Rows button. Choose the remove blank rows option. 

	Review that all blank rows have been deleted.
One Last thing we will do is rename this query from the Province name you selected to Location.	In the right Query settings pane, change the name from the Province you selected to *Location.* 
Click through all the steps that have been generated as you transformed the data Right click on any step and you have the option to rename it to give meaningful metadata about the transformations you are applying to the data for future reference	
Rename index column in Manager Data by ManagerID.	Select ManagerData then rename index column in by ManagerID
Save the file.	

Merge Data Sets

Now that we have our manually entered data we are going to merge that data set with the Excel data we have already created.

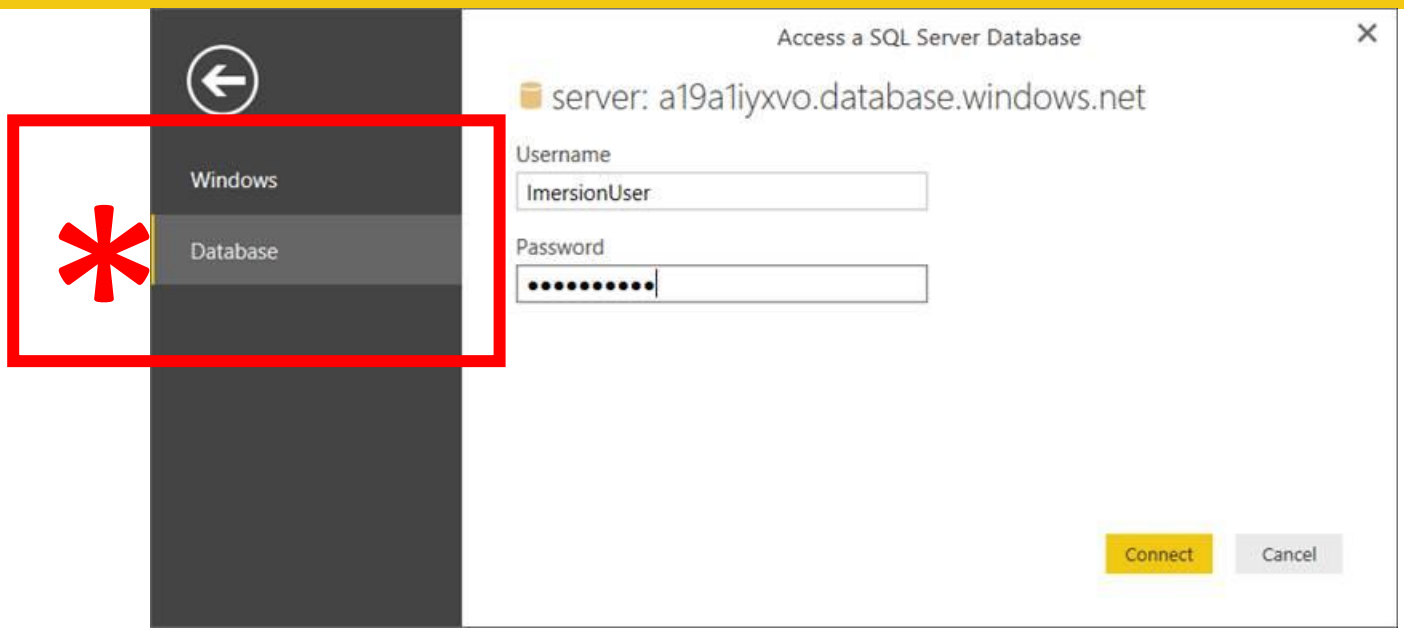
Now let's merge the manually entered in the Manager Data table with the Location Data. 	Select the last Step in the location Table From the Home tab of the ribbon, click Merge Queries.  Select the ManagerID field in the Location table. In the blank drop-down, select the Manager Data table. Select the ManagerID field from the Manager Data table. In the Join Kind drop-down, select Left Outer (all from first, matching from second).

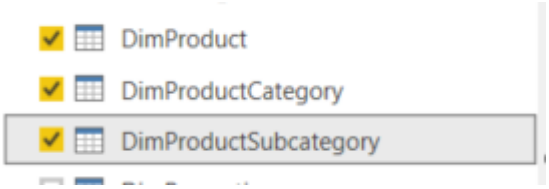
	Click OK.
You will see a new column with a value of Table has been added.	Click on the expand button beside the NewColumn name to choose the columns we want to add.  Uncheck the Manager ID column checkbox. Uncheck the *Use original column name as prefix* checkbox.  Click OK.
We have now merged the data that was manually entered with the data that was originally imported from Excel.	Click back through the applied steps on the right hand side. Note all the steps of the transformations that you have performed and how the data looks at each step.

Import Product Data from Database

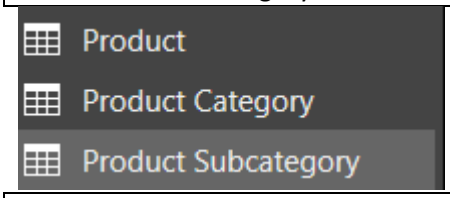
In order to complete our dataset, we will now import some product data from a database. We will be importing from an azure SQL database to allow for portability of this session, but we could easily connect to an on premise SQL Server, Oracle Server, or any of the other data connections we saw in the Get Data list.

Let's add the last piece of data which will provide more insight into the products that we are selling.	Click New Source from the Home tab in the ribbon. Select Microsoft Azure SQL Database from the All tab or the Azue tab. Click connect.
Enter the Following Server Details. *You have an option to write a SQL statement. For this exercise, we will just select a table.	Server: a19a1iyxvo.database.windows.net Database: ContosoRetailDW Click OK.
Enter the access credentials. *If you have already authorized this Azure connection in a previous step, you may not be prompted to enter your credentials again.	If Prompted: In the credentials window, select the Database tab from the left pane.



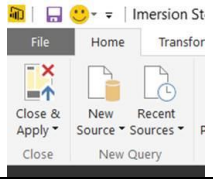
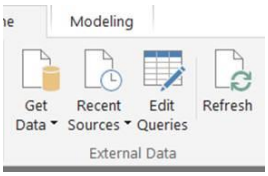
	Enter the following credentials: Username: ImmersionUser Password: pass@word1 Click Connect.
Select the Product tables:  	Expand The Contoso Retail DW and select the following tables: DimProduct DimProductCategory DimProductSubCategory Click OK.
For each of the tables that were imported, we would normally go through and perform transforms and cleansing similar to our previous steps. For the sake of time, we will not repeat those steps as a part of this experience. We will only rename each query and the primary fields within the table.	

Convert the table names as follows:	
From	To
DimProduct	Product
DimProductCategory	Product Category
DimProductSubCategory	Product Sub Category



Convert the column names as follows:

From	To
ProductName	Product
ProductCategoryName	Category
ProductSubCategoryName	Subcategory
Remove columns we don't want to appear for end users	Remove unnecessary fields in Product Category table, Product Subcategory table

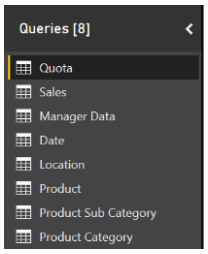
We have now collected and transformed the data we need to build our data model for our reports and analysis.	From the Home tab, click Close and Apply. 
We can return to the Power Query window at any time to perform additional transforms by clicking Edit Queries from the Power BI ribbon. We can also click Get Data from the Power BI Desktop ribbon to add additional data connections.	
Save the file.	

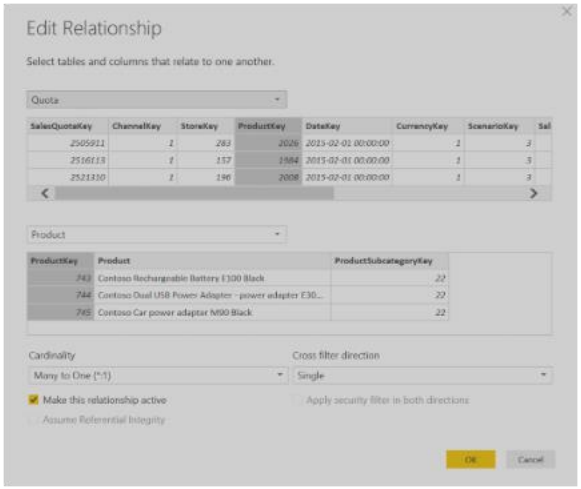
Explore

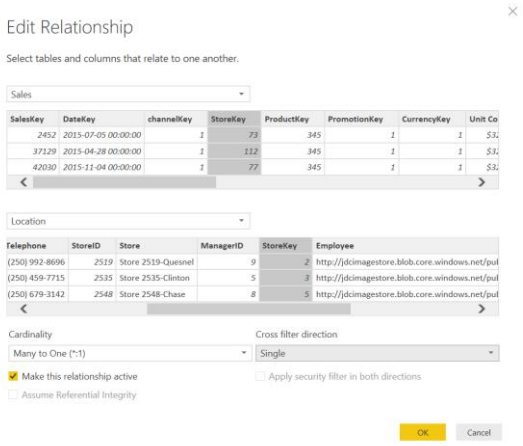
Building a Data Model

So far we have collected the data we need for our analysis and have also performed some transformations and cleansing on the imported data.

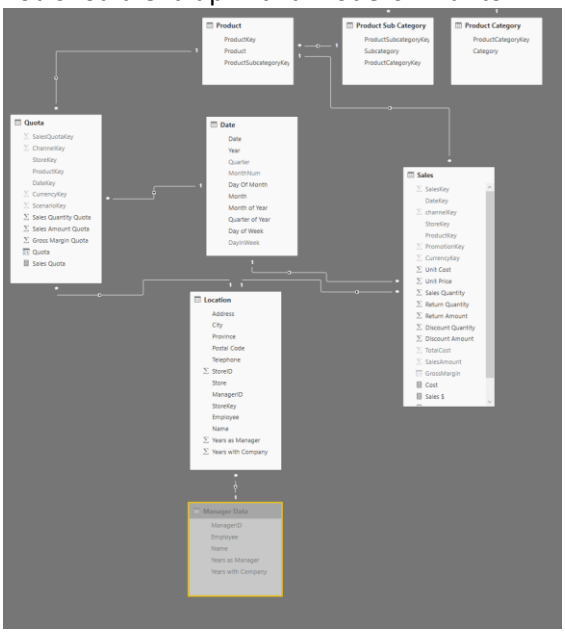
You will notice that we now have 8 tables of data in Power BI from multiple database and Excel sources. It's now time for us to combine this data into a single data model that can be used for our analysis and reporting.



	Click on the Relationships tab from the left hand navigation pane. 
Notice how Power BI has identified a few common fields from the existing data sets and created relationships for us. Power BI may have set them up the way we want them or we may need to edit them to get the behavior we desire.	
Power Query has Identified the relationships that exist within the data and created them in the model. *it is always best to verify any auto generated relationship For the sake of this immersion we will assume the relationships are correct.	Double click on any relationship to verify its details 
We now want to add a relationship that Power BI didn't recognize. We will join the Locations table	Drag the StoreKey field from the Location table to the StoreKey field of the Sales table.

to the Sales and Quota using the StoreKey field we created earlier in the Locations table.	Double click the relationship and set it to be single direction. 
	Repeat the above steps for the Quota table if necessary.

You should end up with a model similar to:



Save the file.

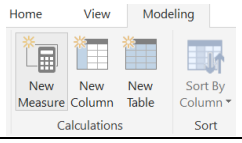
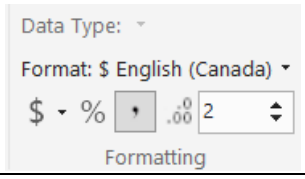
We have now imported our data, transformed and cleansed it, and have also create a data model with relationships between these disparate data sources.

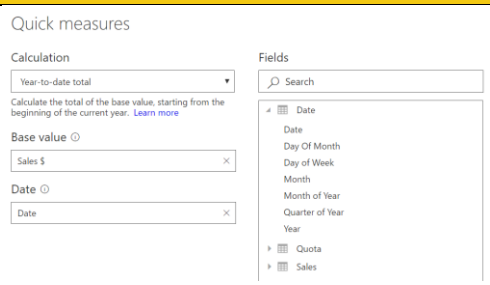
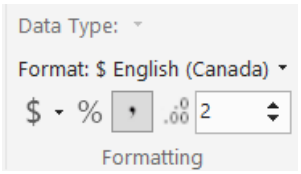
Build DAX Calculations

Now let's add some context and calculations to our data to aid in our reporting, analysis, and self-service exploration. We can create 2 types of calculations in Power BI. The first is called a Calculated Column, which are row based calculations. The second type is called a Measure, which is a set based calculation on our sets or sub-sets of data.

Let's take a look at the data and use DAX to create new Calculated Columns and Measures. We will also define specific data fields as special data types to enable behaviours related to these data types.	Click on the Data Tab in the left hand navigation pane. 
To make this session move faster and avoid repetition, we have pre-built some of these base calculations as a starting point. The pre-built calculations are below and let's take a look. The code for the new one can be found at <<File Location>>\Participant Files\Copy & Paste File.txt.	

Quota	**Sales**
Sales Quota = SUM(Quota[Quota])	Cost = SUM([TotalCost])
Budget = CALCULATE('Quota'[Sales Quota],'Quota'[ScenarioKey]=2)	Sales $ = SUM([SalesAmount])
YTD Budget = TOTALYTD('Quota'[Budget],'Date'[Date])	Gross Margin = SUM(Sales[GrossMargin])
	Profit = [Sales $] -[Cost]
	Attainment = Sales[Sales $]/'Quota'[Budget]

We will create a calculation to compute the margin based on the profit and the Sales.	Select the Sales table. From the Modeling tab in the ribbon, click new Measure. 
Copy and Paste the following into the formula bar.	Margin = Divide([Profit],[Sales $],0)
Format the Measure as %.	Select the Budget Measure field. From the Modeling tab, select %. 
Let's create another calculation on this table using Power BI's time intelligence functions to create a YTD Sales calculation. You could use the formula YTD Sales = TOTALYTD('Sales'[Sales $],'Date'[Date]) But this time we will use quick Measures to do so.	Select the Sales table then right click on Sales $ then select Quick measures. Then in calculation select Year-to date total. For the Date section in the left, drag the Date Attribute by expanding the date table.

	 Finally click on OK.
You shoud have a formula like this	Sales $ YTD = IF(ISFILTERED('Date'[Date]), ERROR("Time intelligence quick measures can only be grouped or filtered by the Power BI-provided date hierarchy."), TOTALYTD('Sales'[Sales $], 'Date'[Date].[Date]))
Rename the measure	Right click on Sales $ YTD and select Rename. Change the name to YTD Sales
Format the Measure as Currency.	Select the YTD Sales Measure field. From the Modeling tab, select Format. Select Currency. Click $ English (Canada). 
Hide columns we don't want to appear for end users	Hide unnecessary fields in Product Category table, Product Subcategory table such as ProductKey, ProductCategoryKey, ProductSubCategoryKey.
Save the file.	

We've now added some powerful calculations to augment our source data and allow us to perform the analysis we need to do. To learn more about the DAX calculation language, please read the following references:

http://www.daxpatterns.com/

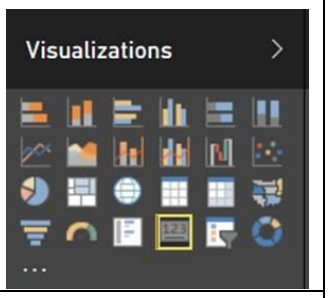
http://social.technet.microsoft.com/wiki/contents/articles/677.power-bi-data-analysis-expressions-dax-language.aspx

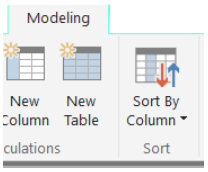
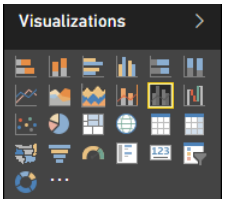
Let's take a 10 Min Break.

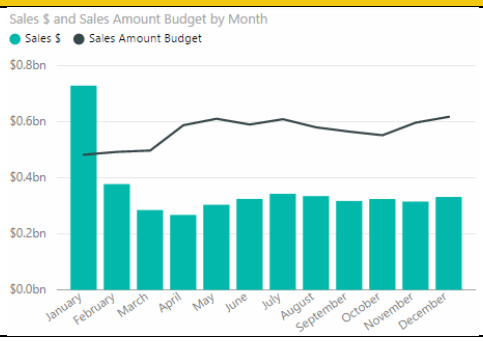
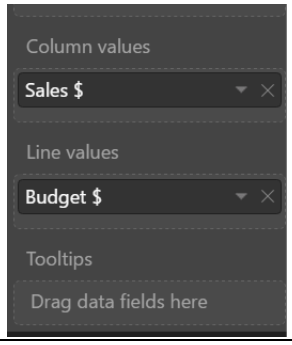
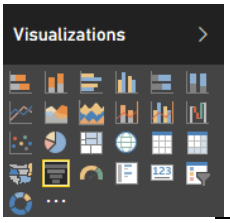
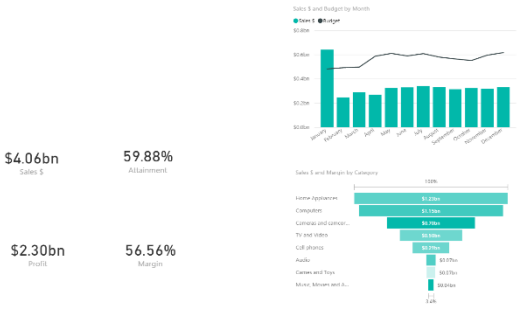
Anyone had trouble signing up for Power BI see the instructor now to get a temporary login

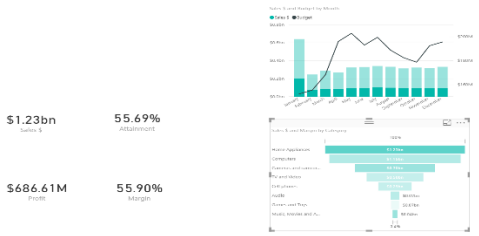
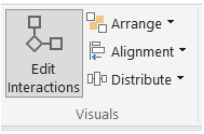
Visualize

The final step in Power BI Desktop is to build reports. Report design and creation does not need to be completed in the desktop tool, but can also be completed in the web client at PowerBI.com. The model you have built so far can be published to the Power BI site, where users have access to the visualization toolkits.

Let's take all the data we have prepared and build a report out of it.	Click on the Report tab in the left navigation pane. 
The executives want an interactive report that can visually display how a store is performing.	In the right Fields pane, expand the Sales Table. Drag the Sales $ field onto the Canvas.
By default, a bar chart will be created.	Click on the bar chart to select it. In the Visualizations Pane click the card button to change this visualization into a card type. 
Now Let's add the Attainment, Profit, and Margin fields to the report. We will also format them the same way we did the Sales $ visualization.	Repeat for Attainment, Profit, and Margin.
You should end up with something like this	
Now Let's add more details to the report.	Drag the Sales $ field onto a blank area of the Canvas.

	Drag the Budget field from the Quota table onto the chart. Drag the Month field from the Date table onto the chart.
Well that looks funny, Power BI has sorted by default the sales amount from largest to smallest. This is useful for any axis except for our time axis. Let's change this. It still doesn't look right?	Click the ellipses (…) in the upper right of the control. Select Sort by. Choose Month. Click the sort by again to choose month as it has defaulted to sort largest to smallest and we want our months to ascend
That looks like it's done some kind of alpha sort. Let's fix this by setting a sort by property on the Month field.	Click on the Data tab in the left hand navigation pane.  Expand the Date table. Select the Month column. Click the sort by column in the ribbon bar. Select the MonthNum column.  Return to the Report tab. If the visualization is sorted in reverse (for example, Dec-Jan) click the ellipses and select the sort by month option again.
Let's change this into a combination Line and Clustered Column chart, with the budget values as our line.	Select the Bar Chart visualization you just built. Click the Line and Clustered Column Chart visualization type in the Visualizations panel. 
That doesn't look like anything changed. We still need to move the Budget field to the line axis.	In the visualization fields panel drag the Sales Amount Budget field from the column value area to the line value area.

You should now have a combined Line and Clustered Column chart that looks something like the following:	
You can rename the measures in the chart. The measure will be renamed in the chart but not in the model.	Double click on the budget measure and rename it to Budget $. 
Let's add one more chart.	Drag the Sales $ field onto a blank area of the report canvas. Drag the Margin field onto the chart. Drag the Category field from the Product Category table onto the chart. Click Funnel to change the visualization type to a Funnel chart. 
You should now have a report that looks something like the following:	 Click the funnel visualization and use the format options to change the number of decimal places the values are displayed to

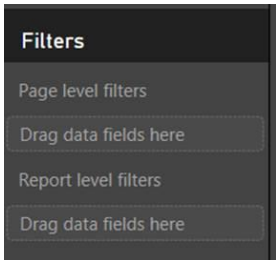
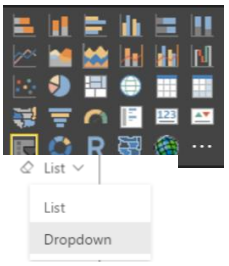
Clicking on any of the data values (bars or lines) in the visualizations will filter all the visualizations in the report to the context of the data you selected. This dynamic adjustment is enabled by the work you did earlier building your data model.	
By default, filtered charts show a contribution of the total. We can change how these report filters interact between other visualizations using options in the ribbon. By selecting a visualization and clicking Edit Interactions from the ribbon, you are selecting that visualization as the point of reference for how other visualizations interact with the chosen visualization. For example, selecting the bar chart uses the bar chart as the point of reference. Hovering over the funnel chart displays how the funnel chart will behave when a report filter is applied by selecting within the bar chart.	
For example, let's change how the bar chart interacts with the funnel chart.	Select the bar chart On the format tab Click on the Edit Interactions button in the ribbon. 
Notice the filter icons that appear at the top of each visual. Depending on the visual, different options will become available. The first icon will filter the visualization (show only the selected data), the second icon will slice the visualization (show selection as a sliced contribution of the total), and the third will not filter the visualization.	Choose the filter interaction type (displayed via the highlighted icons in the upper right corner of each visualization). Now click on the month in the chart and see how the visualizations interacts. Clicking on the funnel bar will still slice the other card visualizations as each visualization interactions must be customized.
Let apply a Theme. You can find theme on the power bi web site: http://community.powerbi.com/t5/Themes-Gallery/bd-p/ThemesGallery	In Home, select "Switch Theme" then "Import Theme". Choose in participant files, the "Immersion Theme.json" file.

	Now you color will change and new theme color are available.
Save the file.	

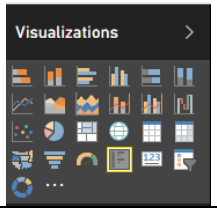
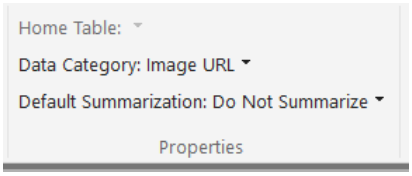
Page and Report Filters

In addition to the interactive filtering within the report, we can also specify filters on either a visualization, a page in a report, or the entire report. For this scenario, we need to add some report level filters. This is the same process for adding visualization or page level filters. In this business scenario, our Executives want to be able to filter to a specific store as well as the city that they are currently in. We decided to use page filters and slicers.

For this report, we need to apply a filter to select the year context we wish to look at. We also need to apply a filter which will allow the selection of a specific store. In this example, we will add a total of 3 filters to the report.

We will first add a Province filter to the report level. 	Click on a blank area in the report canvas to show the Filter area (if a visualization is selected an extra field for visual filters will appear). Expand the Location table in the Field pane and drag the Province field to the report level filters field. Expand the list and select your province (AB).
Next, we will add a Store dropdown Slicer.	Drag the Store Field on the report then select the slicer visualization. On the slicer, you can modify the type of slicer. Mouse over the top right corner. 
We will then add a Year list slicer.	Drag the Year field from the Date table on the report then select the slicer visualization. Select 2015 from the list. 
We will then add a City filter to the page level.	Add the City field to the **page** level filter. Check the Requires single selection checkbox at the bottom of the filter list

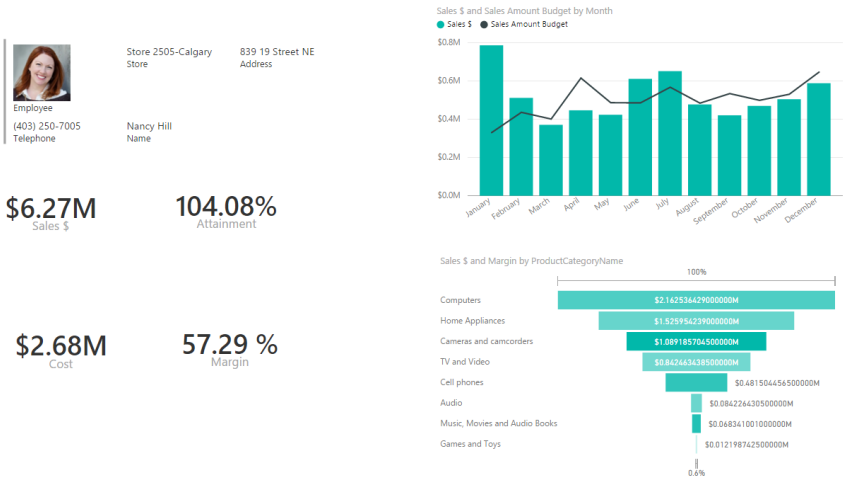
	Select the city (Calgary) in the list.

Now let's add one last visualization containing some information about the selected store in order to provide the details the executives were looking for.	From the Location table, drag the Employee, Name, Store, Address, and telephone fields into a visualization.
	Turn the visualization into a Multi Row Card. 
Now that doesn't look like we expected. The Employee should display a picture of the Store Manager as per the request of the executives. Why would it currently look like a URL? Let's go back into the Data tab, review the Location table, and adjust some properties.	Select the Data tab from the navigation pane. Open the Location table. Select the Employee column. Change the Data Category to Image URL. 
While we are here Let's set the geospatial data attributes too. Select the following column and adjust the Data Category to the following:	

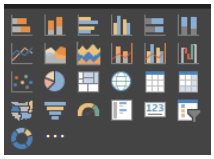
Column	**Data Category**
Address	Address
City	City
Province	State or Province
Postal Code	Postal Code

While we are here, let's do a little clean up.	Hide the StoreID, and ManagerID fields.

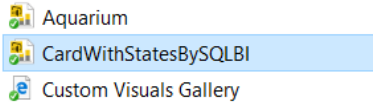
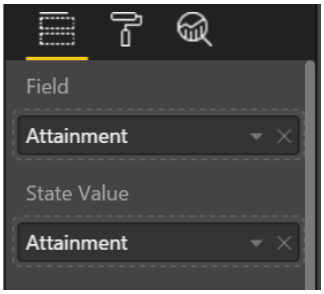
You should now have a dashboard that looks something like the following. This type of Report will satisfy the business requirements put forward to us in our dashboard in a day challenge.



Now suppose you want the Attainment and Margin field to be displayed as a color coded KPI. Right now we don't have a KPI visualization available.

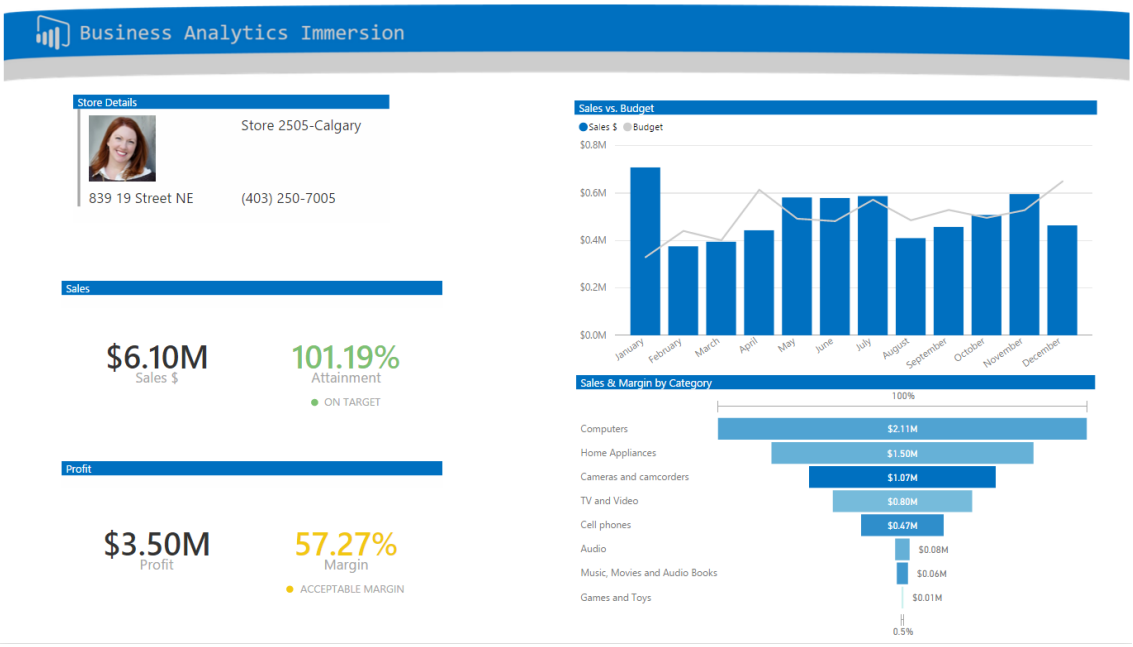


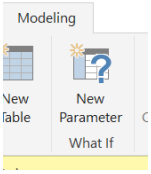
To solve this, we have the ability to add custom visualizations. Custom visualizations can be downloaded from the visuals gallery (https://app.powerbi.com/visuals/) or can be built to your specifications by yourself or a 3rd party developer.

A KPI visual has been downloaded from the visuals gallery and placed in the folder <<FileLocation>>\ CustomVisuals.	Click the ellipses (…) to import a custom visualization. Navigate to the CustomVisuals folder.  Import the CardWithStatesBySQLBI visualization.
After a successful import you will see the new visual appear in the visualizations pane.	
*Note, if the colors don't adjust drag attainment field back over the visualization to force it to refresh 	Click on the attainment visual and turn it into the new KPI visualization. Drag Attainment to the State Value field in addition to the Field Click on Format. Set State 1 to equal Infinity to 0.899. Turn on the label and set the value of the label to be appropriate for the state. Set State 2 to be 0.9 to 0.999 Turn on the label and set the value of the label to be appropriate for the state. Set State 3 to be 1 to Infinity. Turn on the label and set the value of the label to be appropriate for the state.

Now do the same for the margin,	Click on the Margin visual and turn it into the new KPI visualization. Drag Margin to the State Value field in addition to the Field Click on Format. Set State 1 to equal Infinity to 0.5699. Turn on the label and set the value of the label to be appropriate for the state. Set State 2 to be 0.57 to 0.5799 Turn on the label and set the value of the label to be appropriate for the state. Set State 3 to be 0.58 to Infinity. Turn on the label and set the value of the label to be appropriate for the state.
Now click through the months in the bar chart to see the KPI status change.	

Spend a few minutes to poke around and format the visualizations to make it an appealing looking dashboard. See below for a sample of a cleaned up dashboard.
The custom colours used in the header are
Blue: 0070C0
Grey: CDCDCD
Sample Images can be found in the images folder
<<FileLocation>>\Images
Or you can download your own company images and colours



Now we are going to demonstrate the What if capabilities of Power BI. The goal is to be able to simulate a What if analysis based on the price and the quantity sold. Per example, if I increase the unit price by 10% and I guess my quantity sold drop by 20%, what if the impact on my sales.	
Let's create 2 what if, 1 for the Qunantity Sold and the other one on the Unit Price	In the Modeling tab, click on the New Paramater Button  Name : Quantity Adjust Datatype : Decimal Number Minimum : -0.5 Maximum : 0.5 Increment : 0.01 Default :0 Add a second one with the following information: Name : Price Adjust Datatype : Decimal Number Minimum : -0.5 Maximum : 0.5 Increment : 0.01 Default :0
This will create you 2 slicers that you can adjust on the page.	Select Quantity Adjust In the Table Quantity Adjust and set if format to % Do the same for Price Adjust.
Finally, replace the Sales$ formula by	Sales $ = SUMX(Sales,(Sales[Unit Price]*(1+'Price Adjust'[Price Adjust Value]))*(Sales[Sales Quantity]*(1+'Quantity Adjust'[Quantity Adjust Value])))
Let's test the value based on this 2 slicers.	
Save the file.	

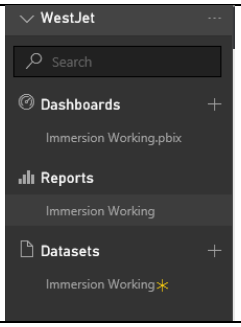
Share & Collaborate

Publish

Publishing allows us to share and collaborate with our colleagues. By publishing your reports, you automatically make those reports available to your mobile devices through the Power BI Mobile app. From the Power BI web client, you can build dashboards from multiple reports to see the business through a single pane of glass.

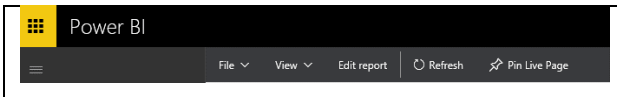
If you haven't published to the Power BI web client before, you will be prompted to enter your credentials for PowerBI.com.	Click the Publish button in the Power BI ribbon to publish to your Power BI site. 

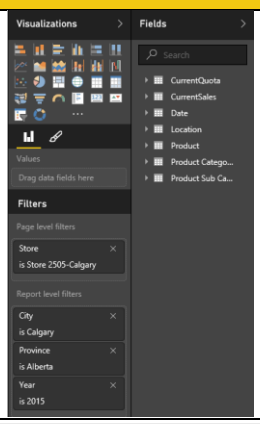
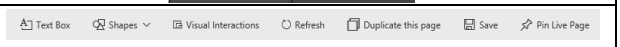
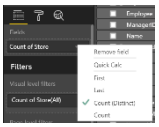
The finished .pbix file is about 135MB, so we will need to wait approximately 3 mins for it to completely upload to the Power BI service. Let's use this time for any questions.

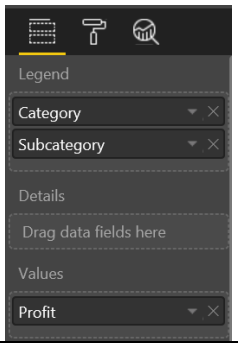
Let's look at the published report.	Now go to PowerBI.com and sign in.
You will see the report you published and a dataset with a matching name. Both with a yellow asterisk beside it, signifying which objects were newly added to your Power BI site.	Double click on the report to open it. 
Navigate around and you will find you have all the same functionality you had in the desktop tool.	

User Self Service.

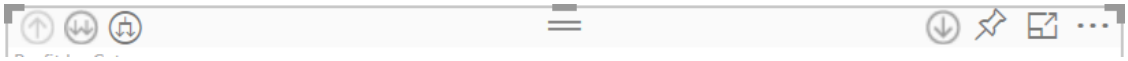
We have the ability to edit existing reports or create new reports from the web client. This is useful for users who want to create reports and visualizations, but are not comfortable working directly with data from an IT perspective. Furthermore, it is useful to the power user who wants to manage and add to the reports they have built. For this exercise, we will add a second page to the report we just published.

	Click the Edit Report in the Power BI web client ribbon.

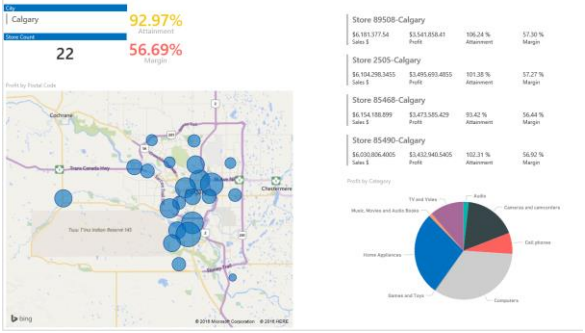
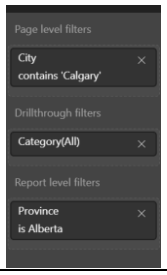
Notice the visualizations, Filters, and Fields pane that have appeared on the right hand side of the page. These tools are positioned just like they were in the desktop tool.	
Additional tools and controls are available through the ribbon.	
	Go to the bottom of the report and click the new page button (+). 
	Double click on Page 2 and rename it to Store Location.
Let's now add some mapping.	Expand the location Table. Drag the Postal Code field on to the canvas (this will automatically default to a Map visualization). Drag the Profit field to the Size field of the map.
Let's add an additional visualization.	Drag the Store field onto a blank area of the report. Add the Profit, Attainment and Margin fields to the visualization. Select the multi row card visualization type.
Let's add some other information on the dashbaord	Drag the Store field onto a blank area of the report. Select the row card visualization type.  In the Fields field change First store by Count(Distinct)  Drag the City field onto a blank area then select the row card visualization type.
	Drag the Category field from the Product Category Table onto the canvas to create a new control. Drag the Profit field to the control. Select the Pie Chart visualization type.

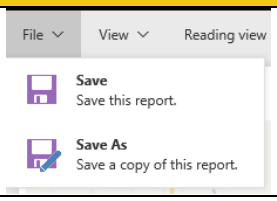
	From the Product Sub Category table, drag the SubCategory field and ensure that it is situated below the Product Category field. 

This will create a drill down on the pie chart. Notice how some arrow controls have been added to the Pie Chart header when hovering over the visualization.



Clicking on the sections of the pie chart will filter the report as we have seen in other interactions. If you click the enable drill down button ( ) you can then drill down to the Sub Category in the pie chart. Clicking the enable drilldown button again will enable us to go back to filter mode, this time at the drilled down level.

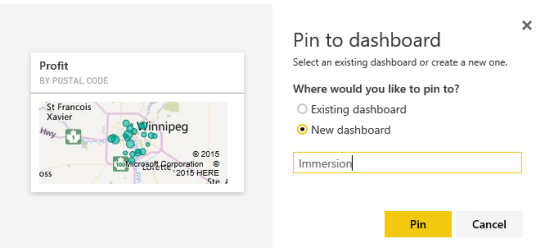
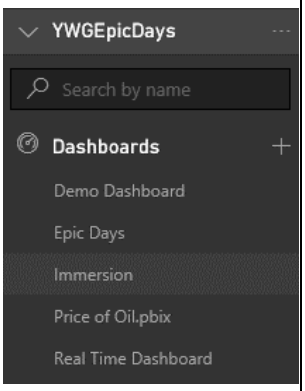
Copy and Paste the Attainment and Margin KPIs from the 1st page to this page	Select the attainment KPI visual on Page 1 Ctrl+C to copy it Ctrl +V to Past it on to the Store Location Page Do the Same for the Profit KPI
Format the Report page to look like:	
Let's add a drill though to this page. You'll notice that an arrow appears on the layout in the top left corner. It will allow you to go back to the previous page.	Drag the Category to the drillthrough filter: 

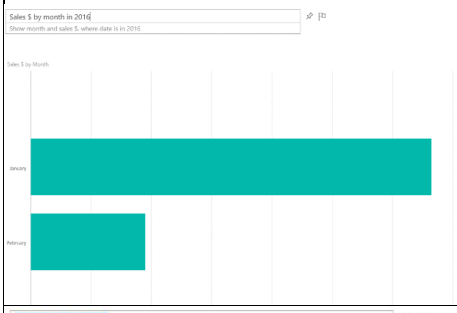
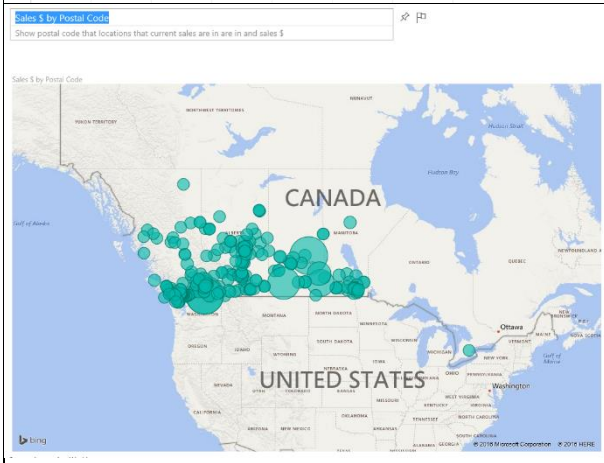
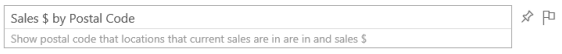
Let's save the updated report.	Click File and Save to save the report. 

We have now added a new page to a report and seen how a non-power user would have the ability to create self-service reports and visualizations

Create a dashboard.

Suppose I'm a business manager or executive. I have several reports I want to look at, but I don't want to open each report up individually to view the information I am interested in. I want to be able to see all of my desired data in one place. Through the Power BI web client, I can create dashboards and pin key visualizations from multiple reports into that single view.

	Select the Profit by postal code map visualization that you just created. Click the Pin button in the top right corner of the visualization. Select the new Dashboard option. Name the dashboard Immersion. Click Pin. 
	Navigate to Page 1 of the Report. Select the Sales $ vs Budget visualization and pin it to the Immersion dashboard.
	Select the Immersion dashboard from the Dashboards tab in the Navigation pane.  Drag and resize the dashboard components on the dashboard canvas.

	Click on the map tile to drill into the source report.
Return to the Immersion dashboard	Click the Power BI Title in the upper left to return to the dashboad you came from 
Lets try the natural Language Q & A Capabilities	
	Type in Sales $ to the Query Bar
	Type in Sales $ by Month in 2016
	Sales $ by Postal Code Pin this to the Immersion dashboard 
Use your report and the Q & A to build a dashboard similar to	

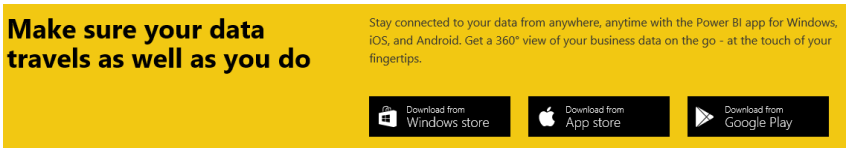
Going Mobile

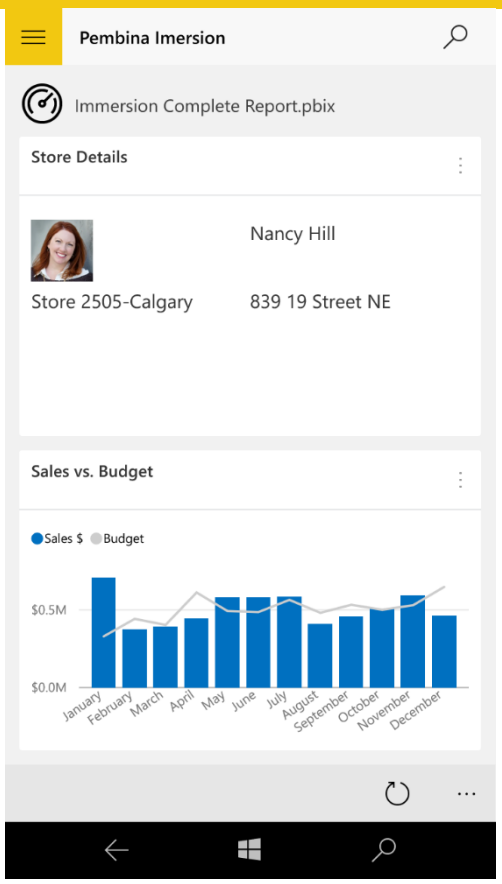
All the work you have done and published to Power BI is also available to you on your Mobile device. Download and install the app from your device app store. Or connect from

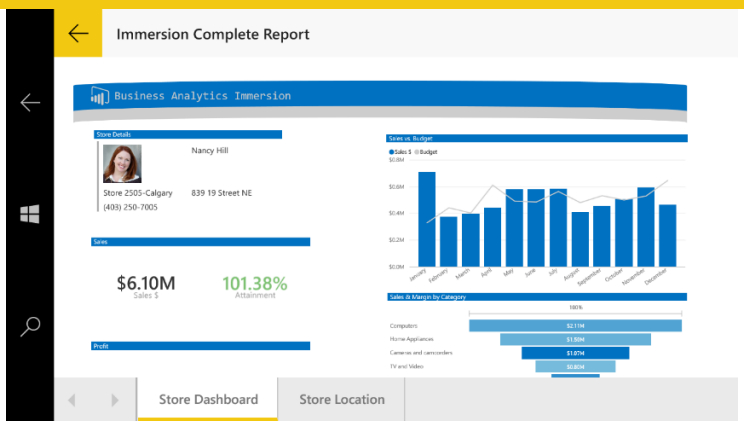
https://powerbi.microsoft.com/en-us/mobile/

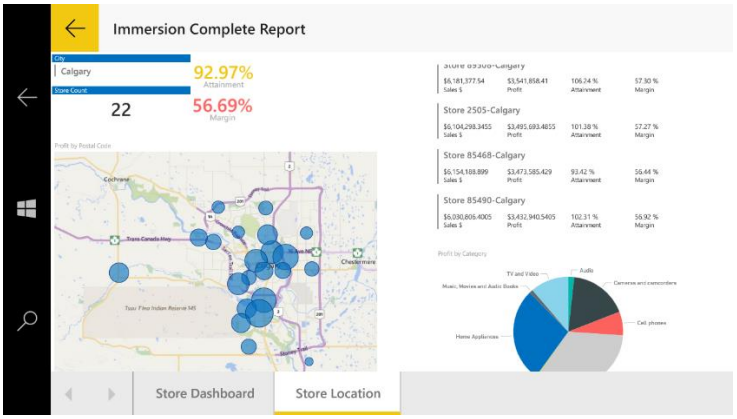
Once you have installed the app log in using your power BI credentials, your dashboards and reports will be available for you. See below for Samples of the dashboard in Mobile.

Report Output on Mobile Device




Pembina Imersion
Immersion Complete Report.pbix
Store Details
Nancy Hill
Store 2505-Calgary
839 19 Street NE
Sales vs. Budget
Sales $
Budget
$0.5M
$0.0M
January
February
March
April
May
June
July
August
September
October
November
December

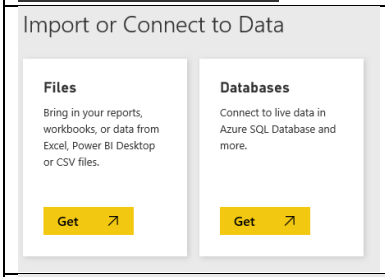
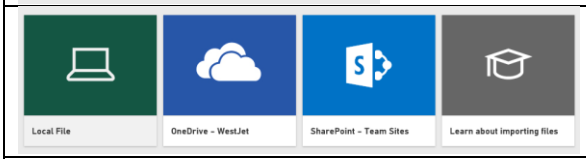
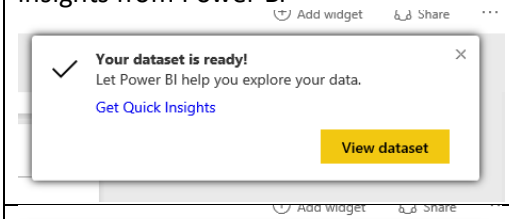
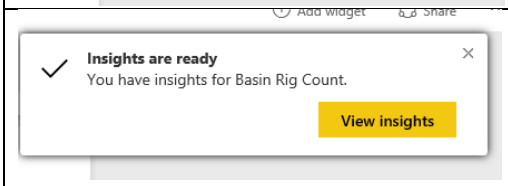

Immersion Complete Report
Business Analytics Immersion
Nancy Hill
$6.10M
101.38%
Store Dashboard
Store Location


Immersion Complete Report
Calgary
92.97%
22
56.69%
Store 2505-Calgary
Store 85468-Calgary
Store 85490-Calgary
Store Dashboard
Store Location

Extra Activities

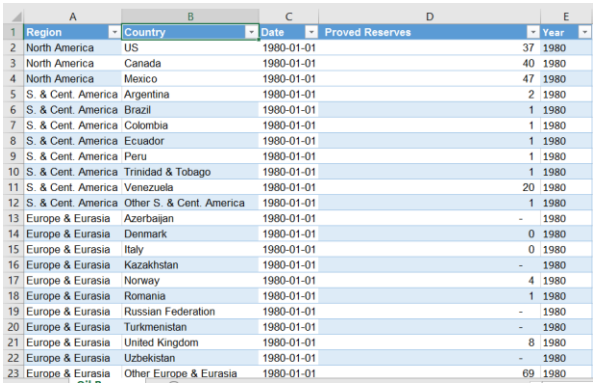
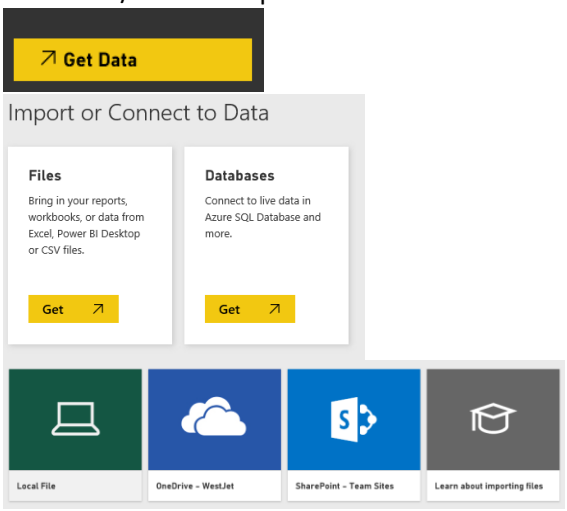
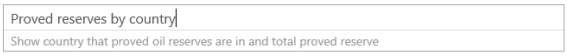
Add more Content

Let's add some more reports and data to our Power BI environment. These files can be found the folder <File Location>/Other Samples

Upload Data 	Push the Get Data Button in the bottom left corner
	Select Get under Files
	Choose Local Files Navigate to the <File Location>/Other Samples Select the Basin Rig Count pbix file
Once the data set is uploaded Let's get some insights from Power BI 	Click the Get Quick Insights link when the dataset is uploaded
 Insights will look for relationships and outliers in your dataset and create some suggested visualizations for you	Click the view insights button to see what Power BI has found in the dataset. Pin one of the insight tiles to your dashboard
Open the Basin Rig Counts Report and create a New Dashboard containing Rig Count and Pricing Data.	

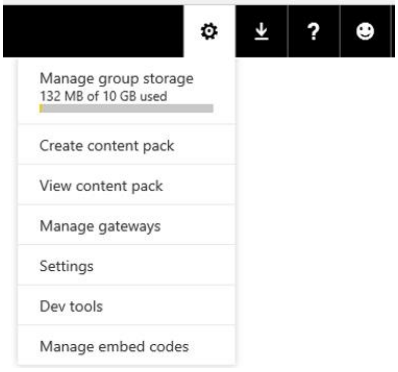
Use the Data You already have in Excel

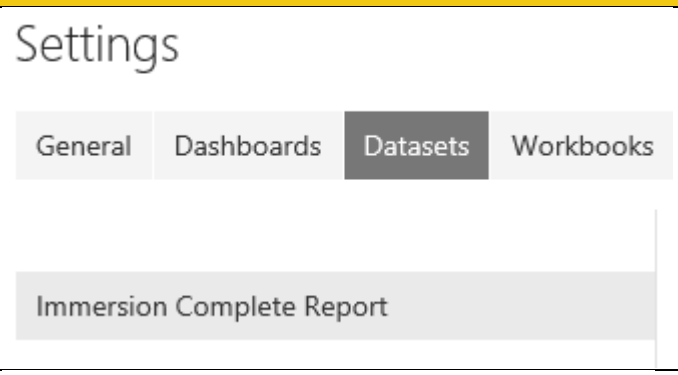
Not only can we build new Power BI models using Power BI desktop but we can also leverage the investment we have already made in Excel. Uploading and excel workbook with a table in it will allow you to build Power BI Visualizations

Repeat the steps to add a file The oil reserves file is a plain excel file with a historical view of the reserves by country. This is not a power bi file or formatted table, just data in excel. 	Add the Oil Reserves File from <File Location>/Other Samples 
Lets Query the data using Q & A	Type in *Proved reserves by year*  Pin the visualization to the Immersion Dashboard
Lets map the reserves	Type in *Proved reserves by country* 
Because this is not a power BI file the Geo Spacial properties are not set so this did not default to a map. But we can choose the visualization typ	Add as map to the query  Pin the map to the Immersion Dashboard
Return to your dashboard	Rearrange the parts to make it meaningful

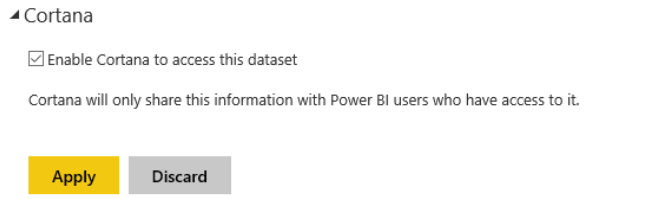
Set up data for Cortana (Windows 10)

In Windows 10 you can leverage to power of Cortana to ask Q & A from the desktop using your keyboard or voice.

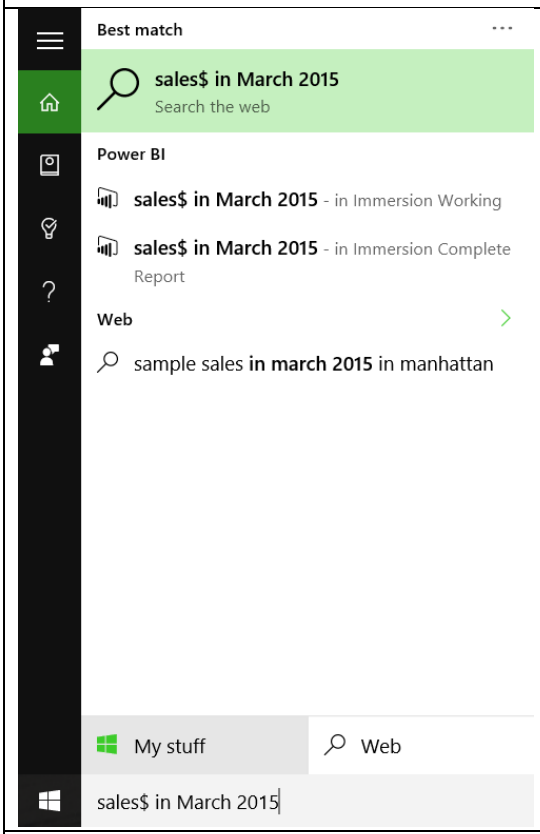
We will add the ability to be accessed by Cortana from the Power Bi Service	Click the settings button in the upper right of the Power BI Service  Select Settings



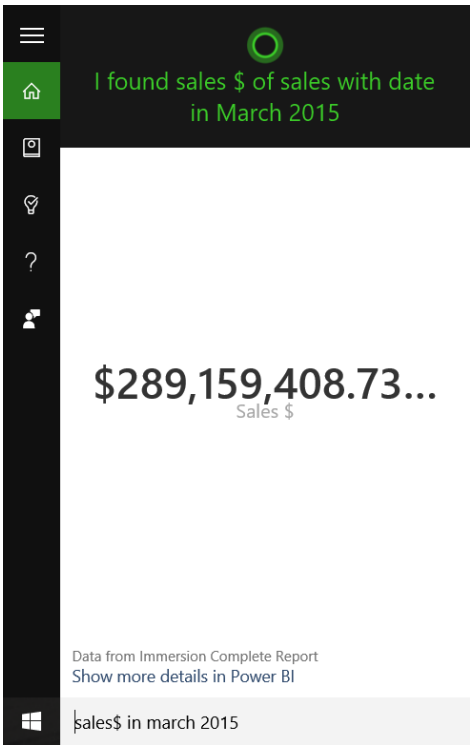
Select Datasets
Select the Dataset you would like to add Cortana to



Scroll down the page and expand the Cortana section
Check the enable Cortana to access this dataset
Click Apply
You can now use Cortana on your desktop to get answers from your power BI

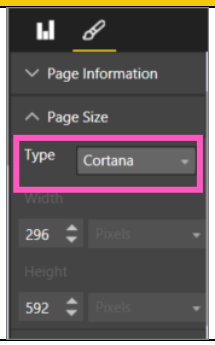
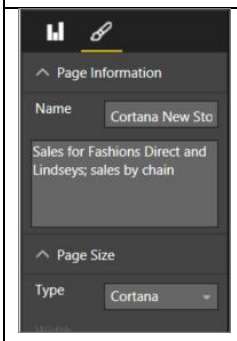


Type into Cortana or use your voice to ask Sales $ in March 2015



You can also create a report custom designed for the Cortana Window

Return to Power BI & Create a new blank report from the dataset you enabled for Cortana

	In the Visualizations pane, select the paintbrush icon and choose Page Size > Cortana
Create a visual or a set of visuals that you want to appear in Cortana in response to a particular question (or set of questions).	
	Name the page and add alternate names. Cortana uses these names when it searches for results.
Save the Report	
You Can now user Cortana to search for your new report