# Power BI Desktop

*Note: This guide uses the “Updated Ribbon” feature. To turn this on, open Power BI, go to settings, click on “Preview Features” and turn on “Updated ribbon”. You will then need to restart Power BI Desktop.*

## Lab 1: Business Goals

In our fictional scenario, your manager wants you to build a report which:

* Shows sales performance by sales territory
* Shows % to target, where the target is 2% higher profit than last year
* Has some cutting edge technology that’s still easy to use
* Shows trends over time
* Shows what contributes to profitability
* Looks nice and could be shared on a TV in the main office

## Lab 1: Step-by-Step Guide (90 minutes)

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| **Locating Data**  Let’s start by selecting the kind of data we want to connect to. From the main report tab of Power BI Desktop:   * Select the “Get Data” button from the ribbon * When the window opens, choose “Azure” from the left hand selections * Select “Azure SQL database” from the selection on the right * Click the “Connect” button.   Now we’ll enter our database information and login credentials.   * Enter “ppiad.database.windows.net” in the Server Box * Enter “WideWorldImportersDW” in the Database Box * Leave the Data Connectivity mode selected as “Import” * Click “OK”   Once the login credentials page has loaded:   * Select “Database” on the left selection * Select “Use alternate credentials” * User name: (provided in class) * Password: (provided in class) |  |
| **Loading Data**  PowerBI should now display a list of all the tables and views in your database.   * Click the check box next to every table which begins with either ‘Dimension’ or ‘Fact’ * Click the “Load” button.   The data load should take less than 3 minutes. This data is pre-formatted to work, but if you need to clean anything up, you would have clicked ‘Transform’ instead of ‘Load’. |  |
| **Confirm model relationships**  With the data loaded, we need to check and ensure that it is modeled correctly. PowerBI has already created relationships between the Fact and Dimension tables, but we should confirm it’s picked the correct relationship types.   * From the main “Report” page of Power BI Desktop, navigate to the “Model” tab to display all the reports. * You may want to rearrange the tables in a way that makes sense to you.   + For example, drag all dimensions to the far left, arranged in a single column, then drag all facts into a single column on the right * Ensure that Dimensions Tables are displaying as expected. Select the connector links and ensure that the relationships match to the respective keys on other tables. * Take note of any inactive relationships. In cases where Power BI could relate two tables on more than one column, it will pick one relationship and set the rest as inactive. A common place to see this is between a Date Dim table and a Fact table with multiple dates in it. * The Data table should have no relationships associated with it at this time.   To create relationships:   * Click on the “Manage Relationships” button in the top menu. * When the window opens click the “New” button. * In the next window called Create relationship click on the first drop down menu and select “Dimension Date” * In the second drop down select “Fact Sales” * Next select the “Date” column in each table by clicking to highlight * Then click “OK” * When finished click the close button and those tables will connect inside of the model   Note: with end table that have multiple dates you will need to decide which one to connect to your date dimension or you have to create multiple date dimensions and name them differently based on what kind of date they are connected to. |  |
| **Clean the Data**  Generally speaking, we neither need nor want to display primary and foreign keys to end users, even though we need them for our model. Let’s hide them.   * On the right under the “Fields” blade, type the word “key” in the search bar at the top * Holding CTRL, select all the key columns (there’s quite a few) * Once everything is selected, under the “Properties” blade, set “Is Hidden” to ON   To make our reports cleaner, we’re also going to pre-format some common fields, starting with quantity.   * Under the “Fields” blade, set the search box to “quant” * Holding CTRL, select all the quantity columns * On the “Properties” blade under “Formatting” set the “Thousands Separator” to ON * Make sure “Decimal Places” is set to 0   Once quantities are properly formatted, move on to Dates. Select all tables with Dates using your CTRL key   * Clear the search bar and open the Dimension Date table in the “Fields” blade * Select the “Date” column * Set the Date TIme Format to something simple, like MM/DD/YY   Next, let’s format all our currency columns.   * From the “Fields” blade, look through your tables for columns to money (e.g. unit price, tax, amounts, totals, etc.).   + If you’re uncertain, navigate to the “Data” tab on the left, select the table, and review your raw data to confirm whether the column is a currency amount * Hold CTRL to select your columns and set the “Data Type” to “Decimal Number” and the “Format” to “Currency”   Finally, let’s make sure geographic datapoints are recognized as such.   1. Start by assigning Geographic roles to the 'City' table  * Click on the “Data” button on the left-hand menu bar. * Ensure that the “Modeling” tab on the top menu bar is selected * Then proceed to the “Fields” menu and select the “City” Table and highlight “City” * In the “Modeling” menu select the drop down for “Data Category” and select “City” * Repeat this process for Continent, Country, State/Provence, City ID (Zip or Postal Code)  1. Create a new Measures table  * Click on the “Home” tab on the top menu * Click on the “Enter Data” option and a new window will open * In the Name box call this table “MeasuresTable” * Then click the “Load” button * When the new table is created, you will see it displayed in the “Fields” menu. Select and right click on the “Column1” and select “Hide in report view”  1. Create new measures by selecting the “MeasuresTable” and right click on Colum1 to pull up the menu.  * Select “Hide” this will hide the MeasureTable * Next right click on any table under the Fields Menu and select “New Measure” and create a series of new measures to move to our hidden table  1. Create a measure for  * For Profit Enter “Profit = SUM(‘Fact Sale’[Profit]) * For Average Profit Enter “Avg Profit = AVERAGE(‘Fact Sale’[Profit]) * Click on one of the newly created measures under the Fields menu. Then select “Measure tools” from the top menu and select from the “Home Table” drop down menu “MeasuresTable” * Repeat this step for the other measure that you created * Once you have created that create the other measures * For Profit 2018 “Profit 2018 = CALCULATE([Profit],’Dimension Date’[Year] = 2018) * Create a new measure for Profit 2019 * For Profit 2019 “Profit 2019 = CALCULATE([Profit],’Dimension Date’[Year] = 2019) * Create a new measure for Profit Goal * For Profit Goal “Profit Goal 2019 = [Profit 2018] = 1.02 * Create a new measure for Profit Percent to Goal * For Profit Percent to Goal “Profit % to Goal – DIVIDE([Profit 2019] – [Profit Goal 2019],[Profit Goal 2019])  1. Create a 'Profit' display folder  * Using the menu on the left, select the “Model” view and then expand the “MeasuresTable” under the “Fields” menu and select all the measures and fill out the “Display Folder” text box in under the “Properties” Menu with the title “Profit” |  |
| Visualize Data   * Select the “Reports” view from the left-hand menu to apply some general formatting * The first step is to apply a theme * Under the “View” option on the top menu select a pre-made theme. Choose the Innovate theme * Add custom background image * Under the “Visualizations” menu on the left side locate the “Format” button with the Paint Roller icon and click. * Scroll down until you locate “Page Background” and click to expand   + Click the “Add image” button and select and image for the background.   + Next, set the transparency to 90% * Add report header * Ensure you are on the “Home” tab on the top menu and select the “Text box” option. * Add the text box to the page and stretch across the page   + For the Title Text enter “Sales Report”   + Under the “Visualizations” menu, select a background color   + Change the font size to 24   + Size the text box appropriately   + Rename the tab at the bottom “Summary Page”   The next step is to create the visuals for the report. There are 6 total visuals and their finished state is displayed to the right   * Start with the % to Quarterly Target – Select the Card template (from the Visualizations menu) and add to the report on the left above Sales Territories * Select the card, then go to the Measure Tools top level menu and select the % sign to format the card * Size the card on the screen and then go to the Profit folder under the MeasuresTable and click on the “Profit % to Goal” and drag that to the Fields box in the Visualizations menu * Next set this to be a quarter. From the Fields menu select the Dimension Date table and select Quarter. Click and drag that to the Filers on all pages. * Under the filer types drop down menu select “Basic Filtering” * Select 1 for first quarter   The second visual is the Monthly Target   * This is a KPI Visual so select the KPI Card from the Visualizations menu * Select and drag to the indicator field “Profit 2019” * Select and drag to the target goal field “Profit Goal 2019” * Then from the Dimension Date select and drag to the trend axis “Quarter” * Then resize the card and move so it is next to the other card   Create a Sales Territory Map   * Under the “Visualization” menu locate and click the Map template and position in the bottom middle of the report page * Go to the “Visualizations” menu and expand the “title” menu   + Make sure “Title” is turned on   + Title report “Sales Territories” * Select “Dimension City” components from the “Fields” menu to fill the report template with data   + Select: City, Continent, Country, Sales Territory and State/Province * Next drill down so you can view on the map the sales territory view * Resize the map and position   Create the next visual for Profit by Year   * Select a bar chart card from the Visualization menu * From the Dimension Date table select Year, Quarter and Month. Click and drag each of these to the Axis field * From the Profit folder select the Profit variable and drag to the Value field   Create a QA Visual, this visual allows the user to type in a question. The question is Profit by Sales Territory   * Start by double clicking on the report background. This creates a new box where you can type in a question. Feel free to resize as you like * Enter the test Profit by sales territory in the box and hit enter   Create the final visual Key Influencers   * Select the Key Influencers card and Click and drag Profit to the Analyze field and really any other areas that you would like to explore in the Explain by field   Next format the visuals   * Move your visuals around to give some white space between the boxes, line them up in a clean and orderly fashion. * Then go in and change the Headers. Select a card, turn off the category, add a title text % to GOAL, center the text and increase the font size * Select the next card, replace the title with OVER/UNDER GOAL, center the text and increase the font size   Select the next card and replace the title with SALES BY TERRITORY, keep the test left justified and increase the font size |  |
| Share and publish your work   * First save your work and give your file a name (File > Save) * Click the Publish button on the top menu * If prompted save your work again * You will need to publish your work to a destination workplace. If you do not have a designated workspace just save to My Workspace   View your report   * Open a web browser * Go to https//app.powerbi.com * Click on your My Workspace (left menu) Select Reports from the next screen and click on the save report. This will open in the browser |  |

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## Lab 2: Business Goals

In our fictional scenario, your want to build a report which:

* Shows Three Refresh Dates for Power BI, SQL and Source
* Shows if anyone has used the report within 30 days

## Lab 2: Step-by-Step Guide (60 minutes)

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| In Power BI, start with the report that you made in the previous module and delete all the visuals that you created   * Once you have removed all the visuals click on the “Transform Data” button on the top menu * We will remove all the unneeded dimensions and pull in some new ones * Select the dimensions you want to delete and push the delete key on your keyboard * Delete Dimension City, Dimension Customer * Select the Recent Sources button from the top menu and connect to the SQL Database we have been pulling from * Add in the Weekload option and click OK      * Once the data loads, select the New Source button from the top menu and then Blank Query * Select Advanced Editor from the top menu * Make your source = DateTime.LocalNow() and click Done * Rename Query1 to “PBI Last Refresh” * Click Home tab and then select “Close and Apply” * Rename the file Data Freshness on the tab at the bottom |  |
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