Power BI 2.0 – Building a Deliverable Report

**Introduction**

Etherpad Location: <https://bit.ly/2RBaBCs>

Today we are going to be working through a basic case study in Power BI. My name is Daniel Brett and I will be guiding you through the steps you might take if you were given some data and asked to build a report out of it that answers specific questions.

Throughout this workshop we will go over:

* Getting Data into Power BI
* Compiling multiple datasets into a single collection
* Creating a calculated column based on data in other columns
* Structuring a report based on questions to be answered

Feel free to ask questions as we go and I will do my best to answer them.

**Getting Data**

Using the **“Web”** option from the **“Get Data”** menu, download each of the datasets provided in the Etherpad. For each one, we will go into the power query editor and make sure that the data types are correct.

Let’s look at our data. Food trucks located at 4 locations around Toronto. Daily sales totals and supply costs for each day in 2019.

**The Questions**

Now that we have our data what are the questions that we are trying to answer?

1. Which location makes the most sales?
   1. Most sales in a day at any 1 location
   2. Least sales in a day at any 1 location
2. Which location makes the most profit?
   1. Most profit in a single day?
   2. Least profit in a single day?
3. What month was the most/least profitable?
   1. Which month was best for each location?
4. What percentage of days had profits over $1280?
   1. $1500?
   2. $2000?
5. Did we make money in 2019?

Lets work our way through the questions and build a report as we go.

**Question 1 - Sales**

Looking at question one we can see that our answer will need to include data from all locations. We could build a visualization using each dataset individually, but it is much easier to create a new dataset combining all four.

To do this:

* Open the Power Query Editor using the **“Edit Queries”** button at the top of the page.
* In the top right section of the editor will be the **“Append Queries”** button. Using the dropdown arrow, select **“Append Queries as New”** option.
* Select **“Three or more queries”** and add all of the datasets from the left side to the right side and click **“OK”**.
* A new dataset named **“Append 1”** will be made.
* Rename this to **“Combined Data”** by right clicking on it and selecting **“Rename”**. Close and Apply the query editor using the **“Close and Apply”** button on the top left.

Now that we have a combined dataset to work with it should be easy to answer the first question. Go ahead and create a visualization that shows the sales by location.

**{Make a column chart showing sales by location as an example}**

Excellent! Now the next part of the question about sales asks which location had the worst day for number of sales and which had the best.

**{Make a bar chart showing Maximum number of sales per day}**

**{Make a bar chart showing Minimum number of sales per day}**

Looking good. Hopefully you all have something similar. Now we have our first page of our report ready with the answer to question one revealed.

Name Page 1 of your report **“Sales”**

**Questions 2&3 – Profit**

Now on to question two. This question asks us about profit. Looking at our data we can see that there is no column for profit but there is columns for sales total and supply costs. We can determine the profit by subtracting the cost of supplies from the total amount of money received from sales. We will do this by making a new column in our data that is made up of the values from the Sale Total column minus the Daily Supply Cost column.

To do this:

* Open the Power Query Editor and navigate to the Combined Data.
* Along the top of the editor there is a tab called **“New Column”**. Open this tab.
* Here we will be making a new custom column by clicking on the **“Custom Column”** button
* Name our new column **“Profit”**
* Insert Sales Total into the formula window by selecting it and clicking **“Insert”**
* Add a minus sign and insert Daily Supply Cost to the formula
* Clicking **“OK”**
* Check your data type for the new column so that Power BI knows we are looking at money.
* Once your new column looks good, go back to the **“Home”** tab at the top of the Query Editor and click **“Close and Apply”**

Make a new page and name it **“Location Profits”.**

Now that we have values for profit to work with, lets build some visualizations to answer question 2.

Firstly, we want to see which location had the most profits. Pick whatever type of visualization you want to use for this.

**{Make a Pie chart showing Profit by Location}**

Next, we want to see the best days and worst days for profits at each location.

**{Make a Bar Chart showing Max Profit by Location}**

**{Make a Bar Chart showing Min Profit by Location}**

Now we have our second page done.

Our third page will be called **“Monthly Profits”** and will include the answers to question 3.

Here we want to look at our profits over time. Make a visualization showing the total profits from each month.

**{Make a Line Chart showing Profit by Month}**

Ok so that gives us our answers regarding profitability during the year but how do we answer the second part of the question? You could make new charts showing each trucks profit by month but that would take up a lot of space in your report. The solution that we will be using today is to use another visualization as a filter.

**{Make a Doughnut Chart of Profit by Location – Turn off legend, Set data label to Category}**

Using this visualization as a filter we can see a chart showing the profits of each truck per month all in the same visualization. That answers question 3.

**Questions 4 – Breaking Even**

Now on to question 4. Here we want to figure out what percentage of days we are breaking even, making a solid profit, and making an exemplary profit. Make a new page called **“Break Percentages”**. Up to this point we have only looked at the cost of supplies for our fleet of trucks. Going off just this cost, our food trucks made over half a million dollars in 2019! That does not seem right does it? That is because supply costs only cover food, gas, maintenance, and vendor permit costs. There is a very important cost that is missing: people. Each truck operates for 10 hours a day with 2 employees on staff at all times each getting paid $16/hour. That adds up to $1280 a day ($320 per truck x four trucks) and $467,200 a year!

With these numbers in mind we can now understand why we would want to know what percentage of days we make over $1280 as that is how much we need to break even. The easiest way to calculate this is using a measured field. A measured field is the result of running a formula on our data. We can make a measured field by clicking the **“New Measure”** button at the top right. This will open up the formula entry box (much like an excel formula field) into which we can write DAX code (DAX = Data Analysis Expressions). Like most mathematic formula’s, DAX code might seem complicated until you have used it a few times. In most cases you can simply google what you are trying to do and you will find the code you need.

Here we will be making measures that contain the number of days that we broke even (Profit more than $1280) and the number of days we did not.

Profit\_over\_1280 = CALCULATE(COUNT('Combined Data'[Profit]),FILTER('Combined Data',[Profit]>=1280))

Profit\_under\_1280 = CALCULATE(COUNT('Combined Data'[Profit]),FILTER('Combined Data',[Profit]<1280))

Repeat the formula for each of the questions and build some visualizations showing what you find. Now based on these findings it is clearly a pretty unforgiving business!

This leads us to the final question of our report.

**Question 5 – Profit 2019**

This is the big final question and I want everybody to take a minute to look at the data and then we will see who thinks what!

Make a fifth page called **“Net Profit”**

Make a Measure that is:

Annual\_Cost\_2019 = SUM('Combined Data'[Daily Supply cost])+ (1280\*365)

**{Dramatically make a Column Chart showing first Sales Total and then Annual Cost 2019}**

**Cleaning up our Report**

Now that we have all the questions in our report answered it is time to tidy it up.

Talk about:

* Themes – vibrant vs accessible
* Format menu – to add backgrounds and set up page
* Text Boxes – for adding title to pages
* Images – to add context
* Shape Tiles – to add shapes and orders