POWER BI DASHBOARDS

The Power BI interactive dashboards for this project can be viewed in **Github** saved as **Power BI Dashboards.pbix** Also the dataset is saved in this folder as various CSV files.

I used the software **Power BI Desktop** to do the data cleaning, data modelling, data analysis and data visualization.

DAX is the formula language in Power BI used to analyze data. DAX includes formulas & functions used in relational data models.

The **DAX** formulas & functions I used to create Calculated Columns and Measures are:

- Logical Functions – IF, NOT, AND, OR
- Text Functions – CONCATENATE, LEFT/RIGHT, UPPER/LOWER, LEN, REPLACE, TRIM
- Filter Functions – DISTINCT, FILTER, CALCULATE, RELATED
- Date & Time Functions – DATEDIFF, YEAR/MONTH/DAY, HOUR/MINUTE/SECOND
- Statistical Functions – SUM, COUNT, DISTINCTCOUNT, COUNTROWS, COUNTA
  MAX, MIN, AVERAGE

The scenario for this project involves creating a Business Intelligence (BI) solution for a manufacturing company. The problem that I am trying to solve is that this company wants to be able to track KPIs for revenue, sales orders, profit and returns. In addition the company would like to compare regional performance, analyze trends and forecasts at the product level, and also to identify profitable customers.

The data source for this project is from the course “Microsoft Power BI Desktop for Business Intelligence” by Maven Analytics.

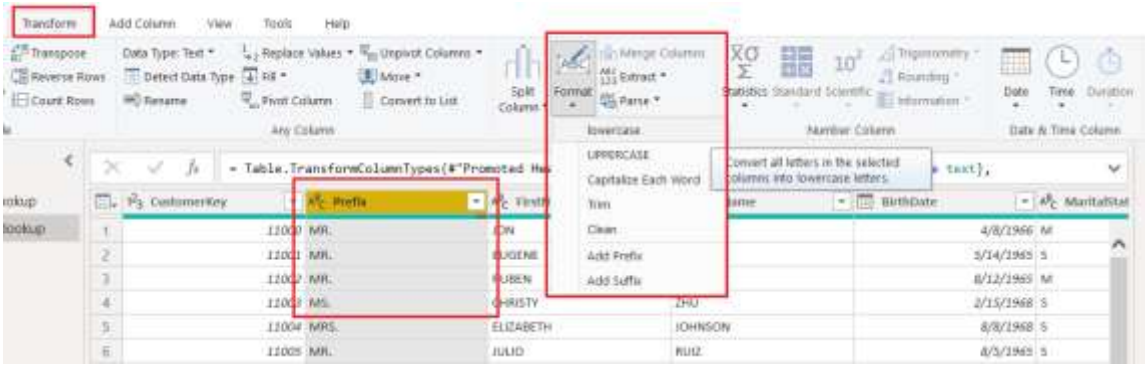
DATA CLEANING

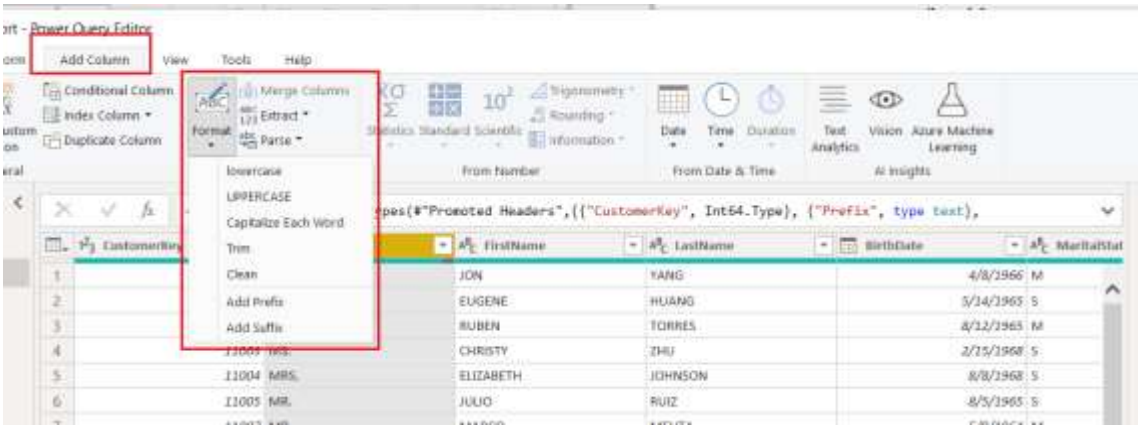
The dataset consisted of various CSV files with data relating to sales orders, returns, products, customers and territories.

The steps I completed to perform data cleaning were as follows:

1) Imported various CSV files for datasets relating to sales orders, returns, products and customers.

2) Used the Power Query Editor to Transform Data.
3) Cleaned data using various Text functions.





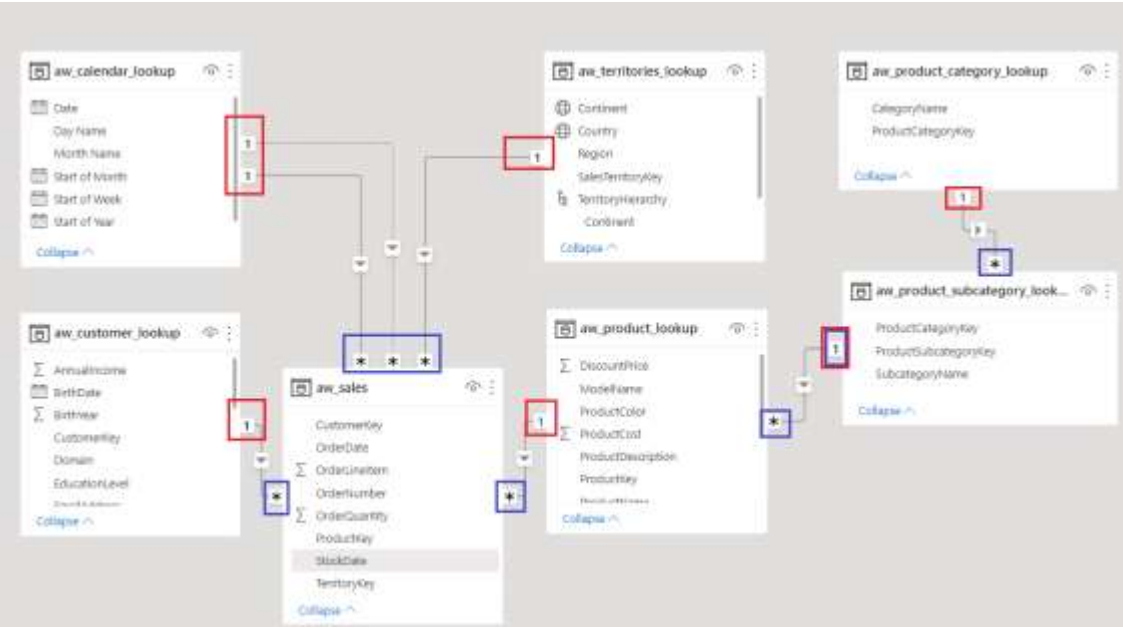
DATA MODELLING

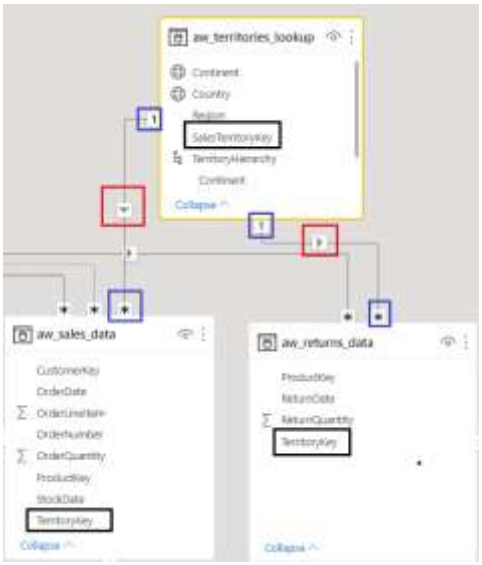
Data Modelling is defined as saving data from different sources into tables and then creating relationships between those tables. The relationships form a connection between the tables based on a common field column (or key).

Each Table will have a Primary Key and several Foreign Keys. Separate tables were created for products, customers, sales calendar dates and location territories by country.

In our data model we used only the One-To-Many cardinality for the relationships between tables.

In this data model the Filter Flow in the table relationships has been set to flow from 1 to Many.





DATA ANALYSIS

The Data Analysis was done by using DAX formulas & functions to create Calculated Columns and Measures.

Some examples of Calculated Columns created for this data model are as follows:

QuantityType = IF(aw_sales_data[OrderQuantity]>1,"Multiple Items","Single Item")

DayOfWeek = WEEKDAY(aw_calendar_lookup[Date],2)

Current_Age = DATEDIFF(aw_customer_lookup[BirthDate],TODAY(),YEAR)

Weekend = IF(aw_calendar_lookup[DayOfWeek]=6 ||
aw_calendar_lookup[DayOfWeek]=7,"Weekend","Weekday")

Short_Name = UPPER (LEFT(aw_calendar_lookup[Month Name],3))

RetailPrice = RELATED(aw_product_lookup[ProductPrice])

Some examples of Measures created for this data model are as follows:

QuantitySold = SUM(aw_sales_data[OrderQuantity])

Return_Rate = [Quantity_Returned] / [QuantitySold]

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Total_Returns = COUNT(aw_returns_data[ReturnQuantity])

Total_Orders = DISTINCTCOUNT(aw_sales_data[OrderNumber])

Bulk_Orders = CALCULATE([Total_Orders], aw_sales_data[OrderQuantity] > 1)
```

DATA VISUALIZATION

The data must be communicated to users in a meaningful way which enables the users to also interact with the data. This can be done by Data Visualization through reports & dashboards.

For this project various dashboards were created and saved as a Power BI file. Each dashboard was created as a separate tab in this file with the following tab names:

- Summary
- Product Detail
- Customer Detail
- Scenario Analysis
- Key Highlights
- Bookmark

Also there are various different types of filters in these dashboards. These include:

- Visual Level, Page Level and Report Level filters
- Drill down or drill up filters
- Drillthrough filters
- Slicers

Tab Summary contains visuals with higher level data such as KPI cards and Product Category level revenue and orders. Also a map was create to display orders, revenue and profit by country.

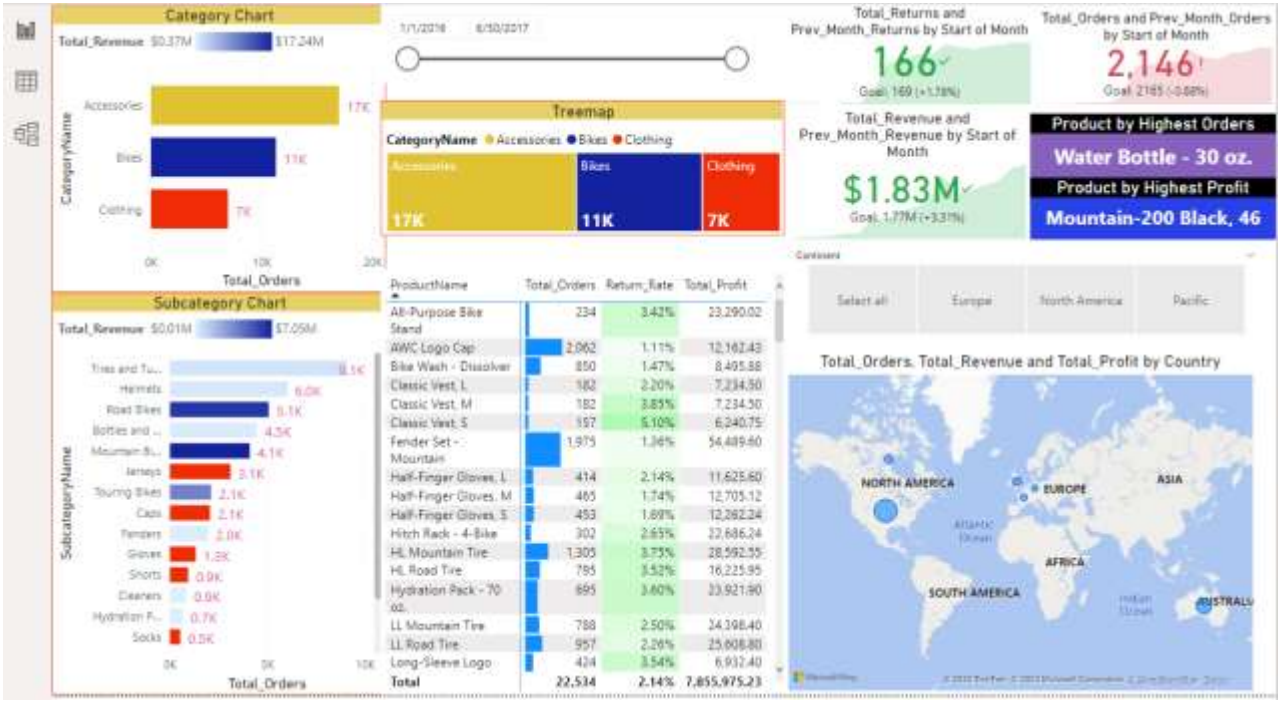
Drillthrough filters were created between Tab Summary and Tab Product Details which contained by the individual products. This tab included visuals as gauge charts, line charts and an area chart.

Tab Customer Details shows data for revenue, orders and profit by the individual customer. The charts have interactive filters. These include a matrix, treemap and bar chart. Also the doughnut charts display customer demographics such as customer gender, customer income level and customer occupation.

Tab Scenario Analysis is used to display What-If Scenario Analysis which is useful for a company's decision making process. This is done in the data model by using What-If

Parameters. What-if scenario analysis is a business planning and modeling technique used to forecast outcomes based on changing input parameters. It enables a company to prepare & create strategies to deal with potential disasters or good fortune. For example What-If prices had increased by 10% ? What would have been the impact on revenue and profit?

Tab Key Highlights has a commentary regarding the key performance highlights of the company. This contains a link to Tab Bookmark which displays a pre-filtered visual of the highlights.




Current Month Orders Actual Vs Target
404
0
438
Current Month Revenue Actual Vs Target
$4.07K
$0.00K
$4.29K
Current Month Returns Vs Previous Month
21
0
6
Water Bottle - 30 oz.
Profit by Week
Returns by Week


FullName
Total_Orders
Total_Revenue_Measure2
Mr. Maurice Shan 6 $12,407.95
Mrs. Janet Munoz 6 $12,015.39
Mrs. Lisa Cai 7 $11,330.44
Mrs. Lacey Zheng 7 $11,085.74
Mr. Jordan Turner 7 $11,022.38
Mr. Larry Munoz 7 $10,852.04
Mrs. Ariana Gray 6 $10,391.42
Mr. Marco Lopez 6 $10,289.68
Mr. Franklin Xu 5 $10,164.34
Mrs. Margaret He 4 $9,266.74
Mrs. Kaitlyn Henderson 4 $9,258.92
Mrs. Nichole Nara 4 $9,234.68
Mr. Randall Dominguez 4 $9,210.36
Mrs. Rosa Hu 4 $9,201.20
Adriana Gonzalez 4 $9,195.69
Mrs. Dominique Prasad 6 $9,180.93
Mrs. Brandi Gill 4 $9,168.18
Mr. Brad She 4 $9,161.01
Mr. Francisco Sara 4 $9,125.54
Mr. Kevin Coleman 4 $7,750.53
Mr. Johnathan Sun 4 $7,721.33
Mrs. Crystal Zeng 4 $7,706.81
Mrs. Felicia Blanco 4 $7,669.66
Mrs. Jill Suarez 4 $7,652.61
Mr. Preston Raman 4 $7,599.49
Mr. Willie Xu 4 $7,353.55
Mrs. Abby Subram 4 $7,308.39
Mr. Lance Blanco 4 $7,207.07
Mrs. Audrey Blanco 4 $7,139.17
Mr. Ricky Navarro 3 $7,119.63
Mr. Eddie Dominguez 3 $7,044.38
Total 353 $751,130.39
Total_Orders by Gender
Gender
M
F
NA
Total_Orders by IncomeLevel
IncomeLevel
Average
Low
High
Very High
Total_Orders by Occupation
Manual
Professional
Clerical
Management
Skilled Manual
Total_Orders and Total_Revenue by Start of Month
Total_Orders
Total_Revenue
Start of Month
Total_Orders by Current_Age
Top Customer
Mr. Maurice Shan
Top Customer's Orders
6
Top Customer's Revenue
$12.41K

Key Highlights and Insights

- The Category with the highest orders was Accesories at 17,000 orders
- North America had the highest orders at 7,000 followed by Australia at 5,000
- The product "Sport 100 Helmet Red" had increases in weekly profit as displayed in the line chart and area chart. However this product did not reach its revenue target for June 2017. Actual revenue was $7.21K compared to a target of $9.43K. This product's details can be reviewed in the dashboard Bookmark by clicking the following button:

Sport 100 Helmet Red


Current Month Orders Actual Vs Target
206
0
270
Current Month Revenue Actual Vs Target
$7.21K
$0.00K
$9.43K
Current Month Returns Vs Previous Month
5
0
13
Profit by Week
Total_Profit
Start of Week
Sport-100 Helmet, Red
Returns by Week
Total_Returns
Start of Week