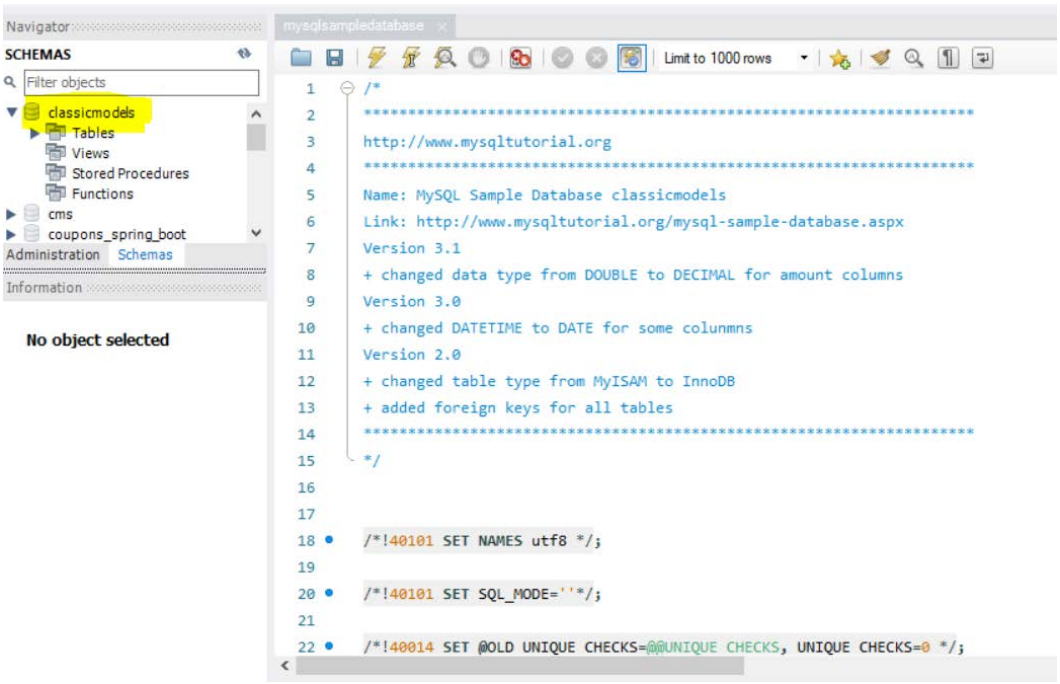
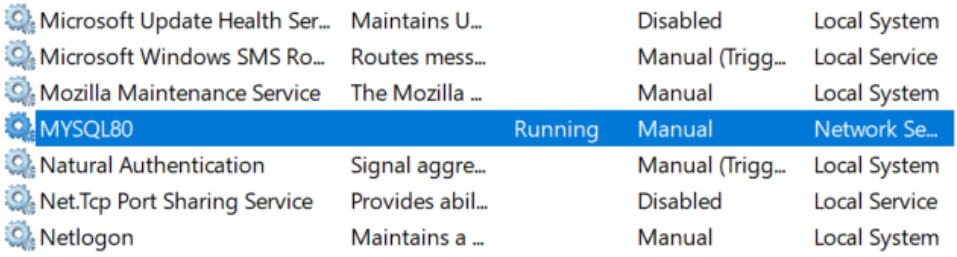
Documented Report for Power BI Capstone Project

- Vibhore Aggarwal (S5289)

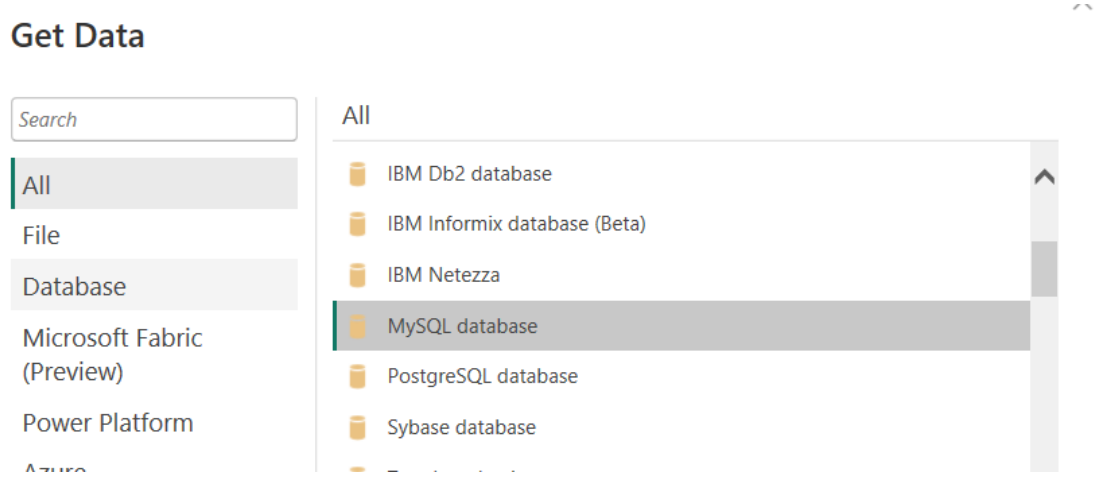
1. SQL Data Source

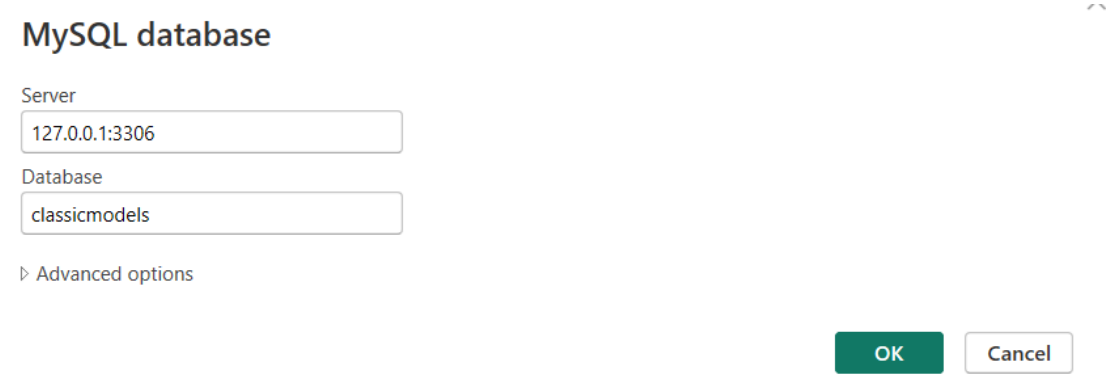


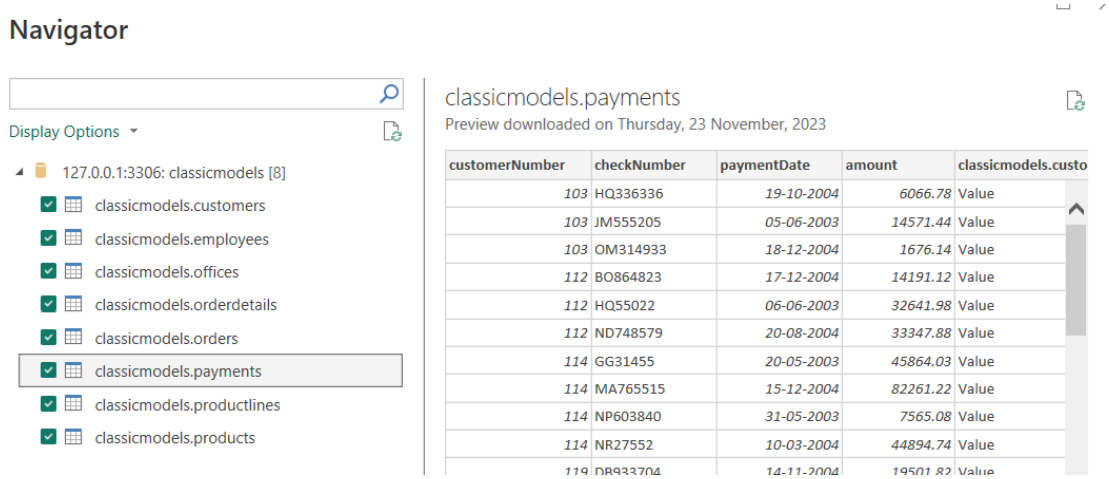


1. Downloaded the “mysqlsampledatabase.sql” file from LMS
2. Downloaded the MYSQL Server and Workbench
3. Made sure “MYSQL80” service is running in background services
4. Imported the sql file in the workbench and ran it to create “classicmodels” database
5. Downloaded the mysql connector/net and installed it.

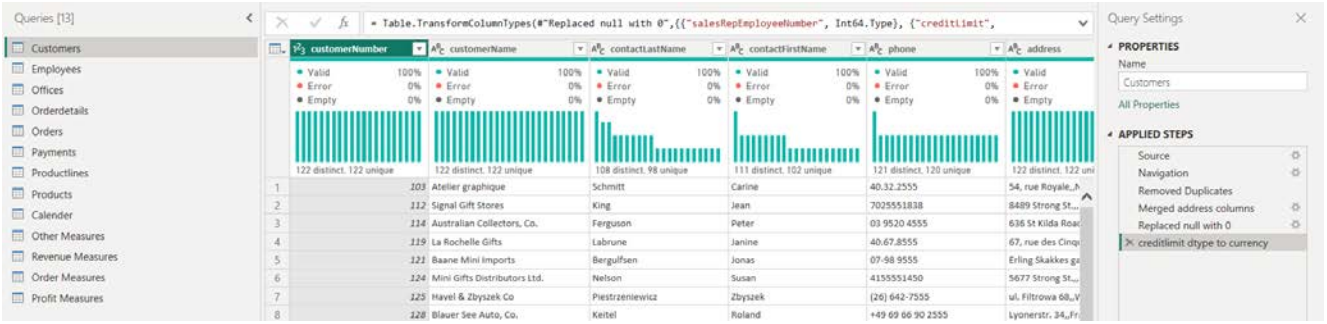
2. Power BI: Data Cleaning and Loading





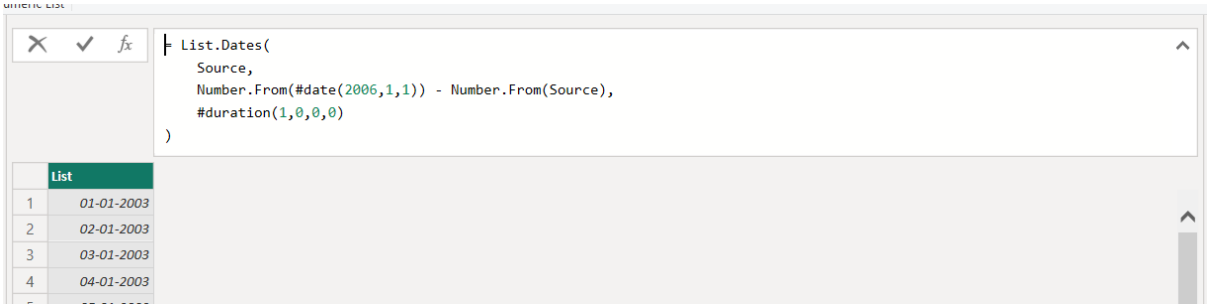


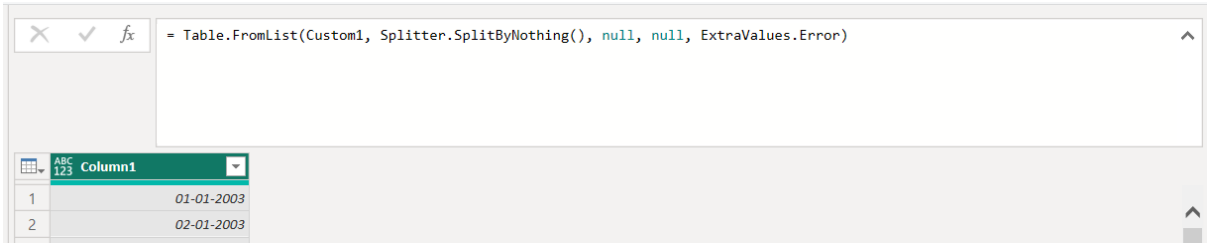
1. Downloaded and installed the Power BI Desktop.
2. Get Data → MySQL Database → Server and Database options
3. Fetched the data from "classicmodels" database hosted on MySQL server
4. We could see all the tables on Navigator screen → Transform Data

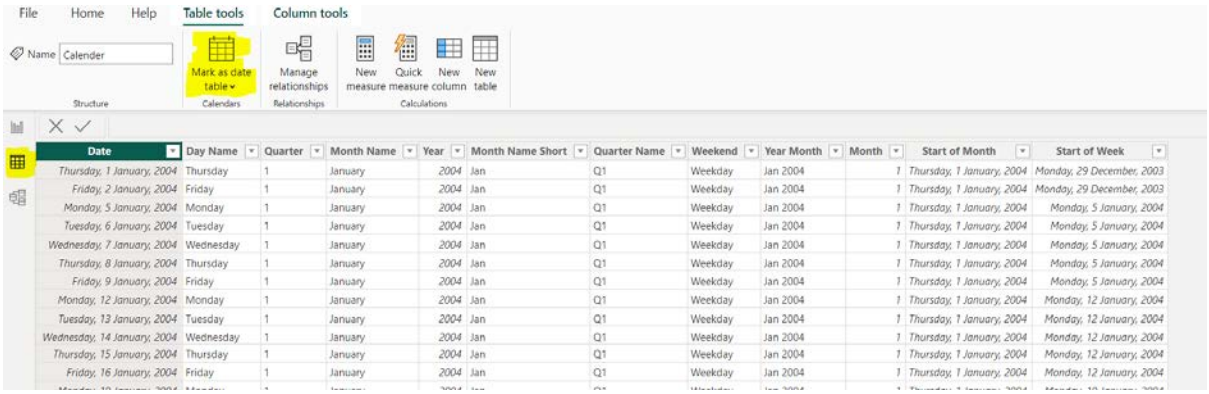


5. In Power Query Editor, Used column profiling tools such as "Column Quality and Column Distribution" to identify the error and empty/missing values. Also checked the unique and distinct values.
6. Applied "First Column as Headers", removed the duplicates, merged address columns, and replaced text null values with "NA" and numerical null values with "0". Also, assigned the correct dtype to columns such as fixed decimal number for currency.
7. Finally once the data is cleaned, it was loaded into the Power BI front end/data model

3. Power BI: Creating of Calendar(Date) Table



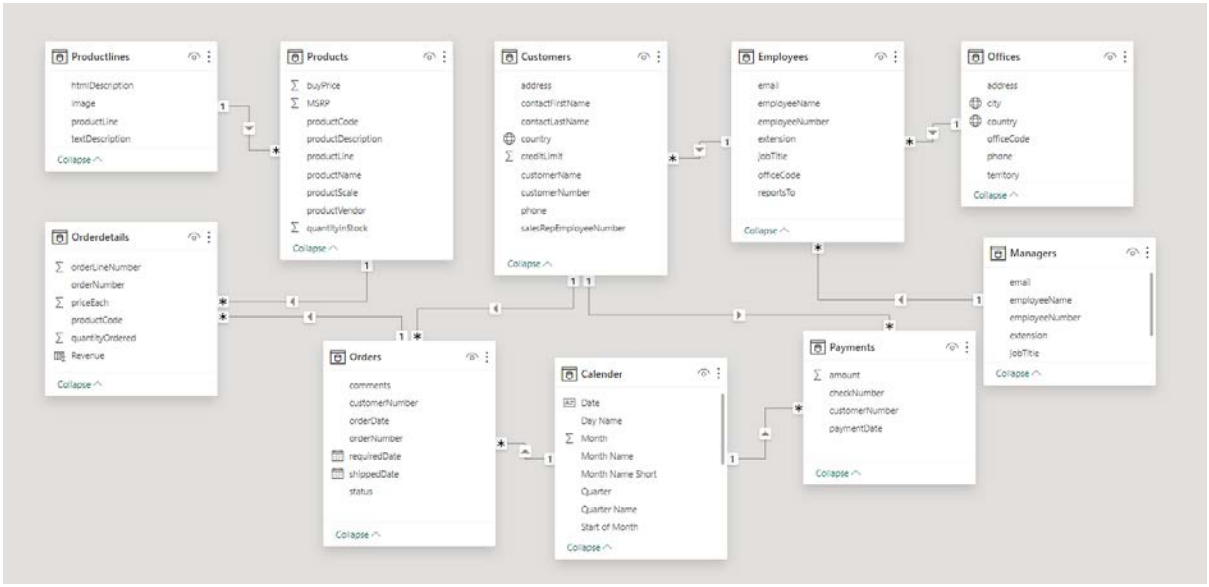




Date	Day Name	Quarter	Month Name	Year	Month Name Short	Quarter Name	Weekend	Year Month	Month	Start of Month	Start of Week
Thursday, 1 January, 2004	Thursday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 29 December, 2003
Friday, 2 January, 2004	Friday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 29 December, 2003
Monday, 5 January, 2004	Monday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 5 January, 2004
Tuesday, 6 January, 2004	Tuesday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 5 January, 2004
Wednesday, 7 January, 2004	Wednesday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 5 January, 2004
Thursday, 8 January, 2004	Thursday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 5 January, 2004
Friday, 9 January, 2004	Friday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 5 January, 2004
Monday, 12 January, 2004	Monday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 12 January, 2004
Tuesday, 13 January, 2004	Tuesday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 12 January, 2004
Wednesday, 14 January, 2004	Wednesday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 12 January, 2004
Thursday, 15 January, 2004	Thursday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 12 January, 2004
Friday, 16 January, 2004	Friday	1	January	2004	Jan	Q1	Weekday	Jan 2004	1	Thursday, 1 January, 2004	Monday, 12 January, 2004

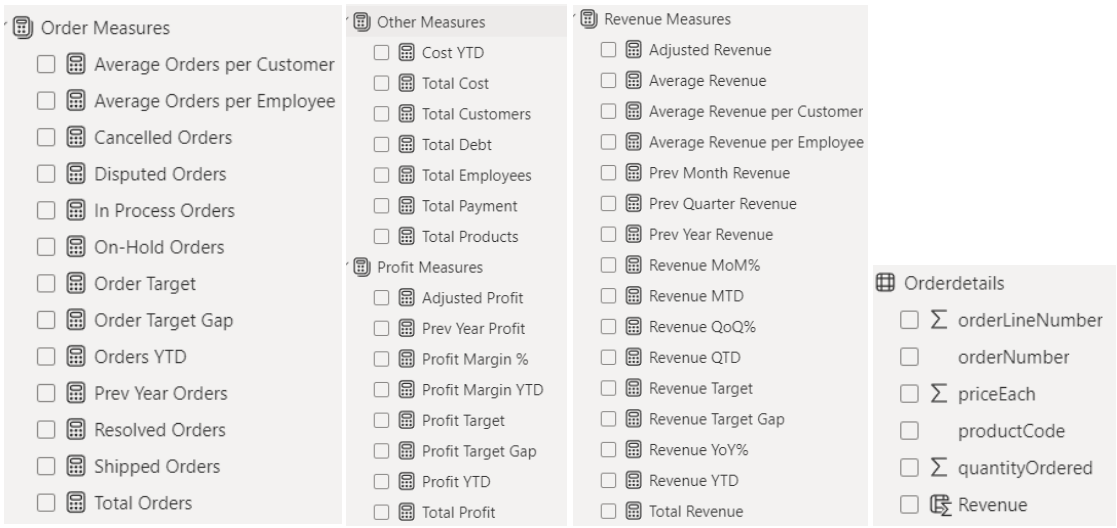
1. After loading the cleaned data in model, we found there was no separate date table.
2. Selected a blank query in Power Query Editor and created a list of dates by providing the start and end date. These ranges covers the dates in the data model. Also, the calendar should have full dates starting from 1st of January to 31st of December.
3. Converted the list to a table format and changed the dtype to “Date”.
4. Under Add Column tab, created many columns such as “Day Name”, “Start of Month”, ”Quarter”, “Year”, “Start of Week”, “Weekday/Weekend” etc.
5. Finally applied it to the data model and “Marked it as Official Data Table” in Data View.

4. Power BI: Creating Relationships



1. Identified that there are :
   3 Fact/Data Tables – Order, Order Details, Payment
   3 Dimension/Lookup Tables – Product, Customer, Employee
   2 Sub Dimension Tables – ProductLines, Offices
   1 Date Table – Calendar
2. Connected all foreign keys with their respective Primary keys to create multiple 1-to-Many relationships between the tables in the Manage Relationships in section.
3. This led to imitate the tables just like in a relational database. The relationships were falling in the "Snow Flake Schema" paradigm.
4. To eliminate the possibility of confusion/ambiguity, we hide the foreign key columns from the end user visibility so that they select only primary key columns to slice and dice the data while visualizing and reducing the need to for bi-direction cross filtering.
5. We also avoiding creating any Many-to-Many relationship wherever possible.

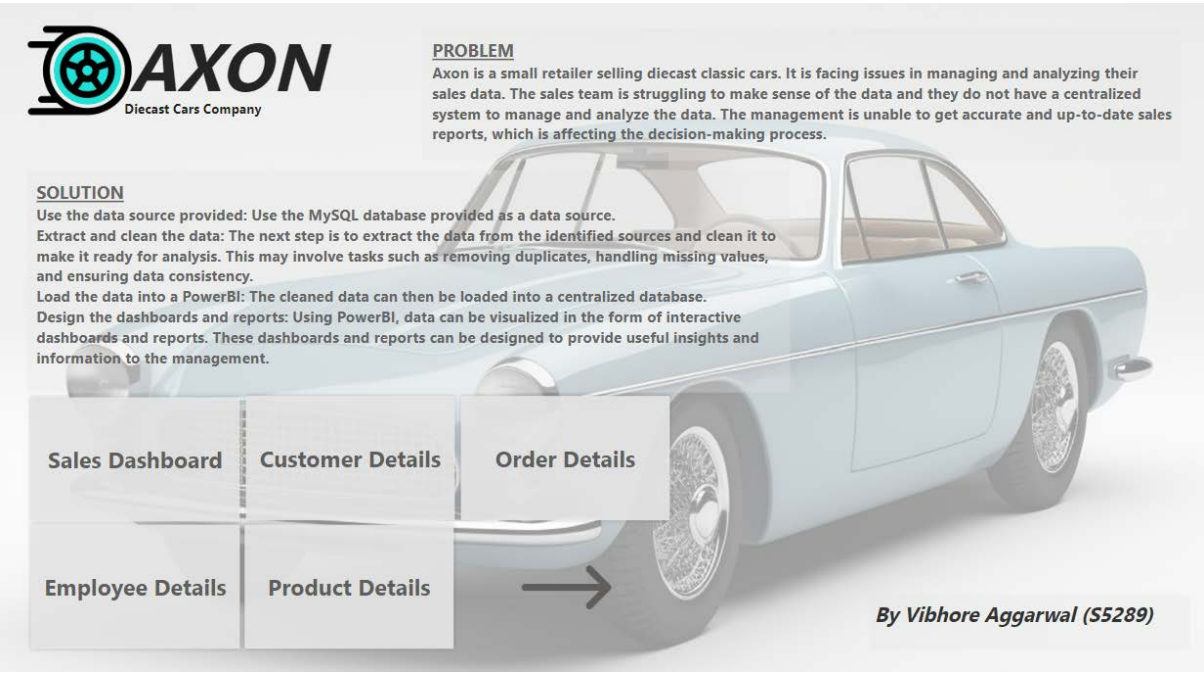
5. Power BI: Using DAX to explore and analyze data



1. Using Data Analysis Expressions, I created calculated columns like "Revenue". I know we should limit creating these columns as they can be redundant and also contribute to file size.
2. Hence I created Measures using DAX to calculate numerous metrics like Total Revenue, Total Cost, Total Profit, Total Orders, Profit Margin% etc.
3. Made use of Time Intelligence functions to create measures like Sales YTD, MTD, QTD, Sales YoY%, Profit MoM%, Target metrics for performance analysis etc.
4. Also created measures for performing the "What-If" Analysis for experiencing the change in Profit by adjusting the selling price etc.

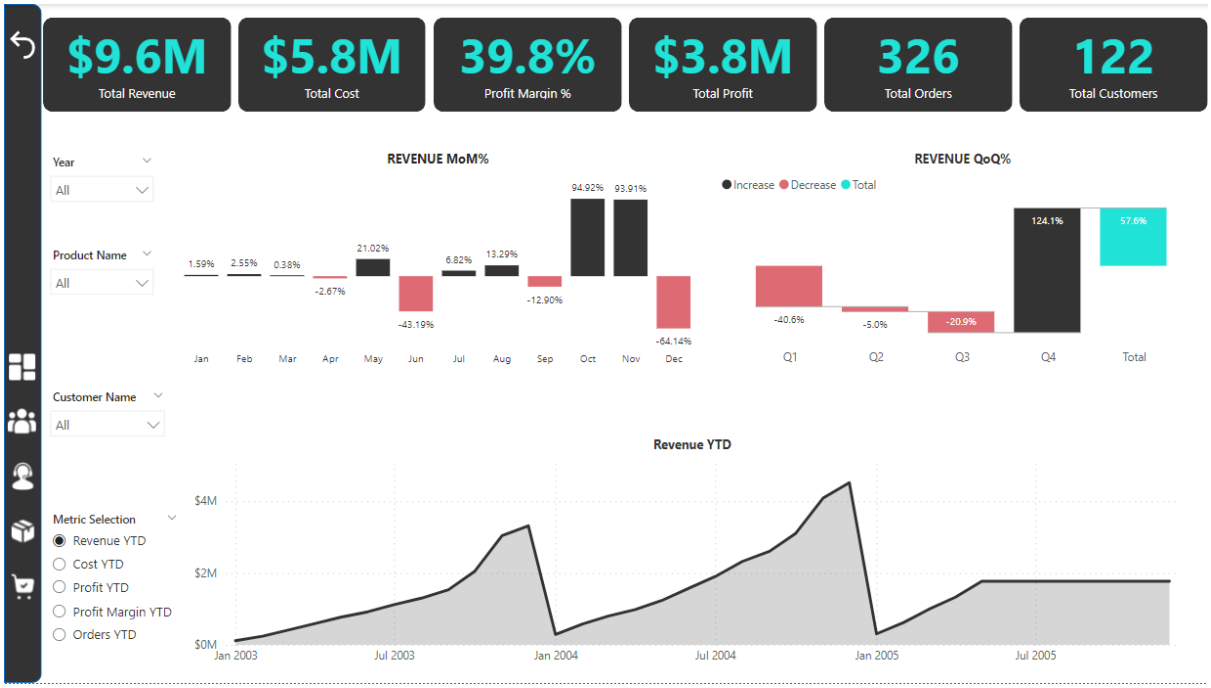
6. Power BI: Visualizing the sales data via reports, charts & Dashboards

1. Home Page



Home Page is the landing page where we have company logo, problem statement and solution and navigation menus to traverse to different report pages.

2. Sales Dashboard



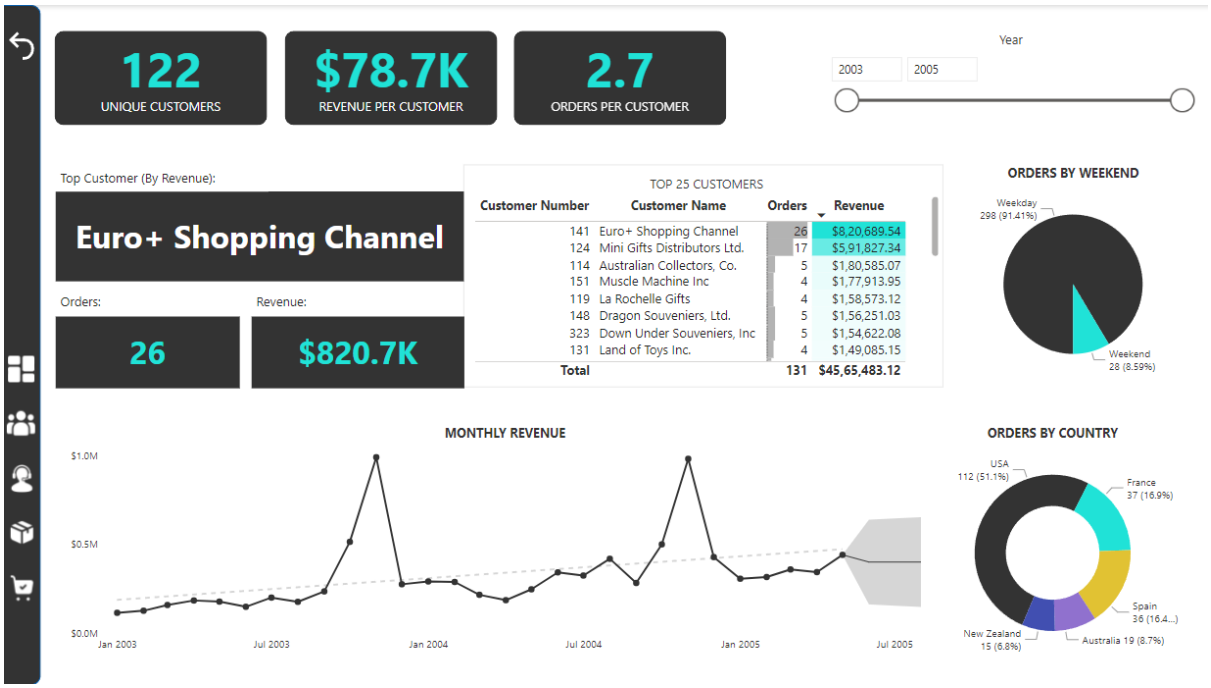
Sales Dashboard is for the Sales management to view the Total Revenue, Total Cost, Total Profit, Profit Margin%, Total Orders and Total customers at a glance.

They analyze sales growth Month over Month and Quarter over Quarter. Select the metrics to view the cumulative values Year To-Date for revenue, cost, profit, orders etc.

On the top of it they can slice and dice the whole data at year level, product level and customer level.

There is a trend that October and November month see a great growth in sales of 93% plus back to back. We must make sure of the inventory and delivery to carry out smooth operations during the peak seasons.

3. Customer Details



Customer details page take a jibe at the customer level details like Average revenue per customer, Average orders per customer and total unique customers.

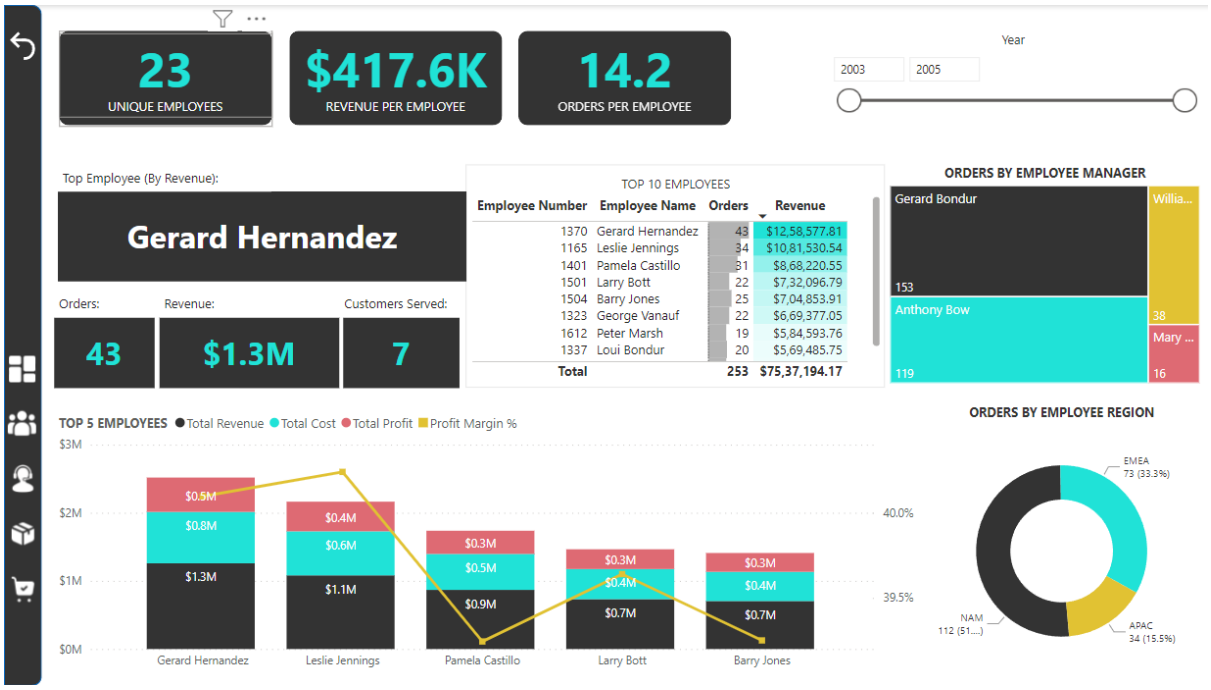
It highlights the Top Customer by revenue, there total orders and revenue provided.

Revenue is also divided on monthly basis to give a picture of monthly engagement.

We can the breakdown of orders by Customer Country from where they belong from and do they tend to order more over weekend or not.

Here is list of top 25 Customers by revenue which the company should keep them engaged so that they keep coming back.

4. Employee Details



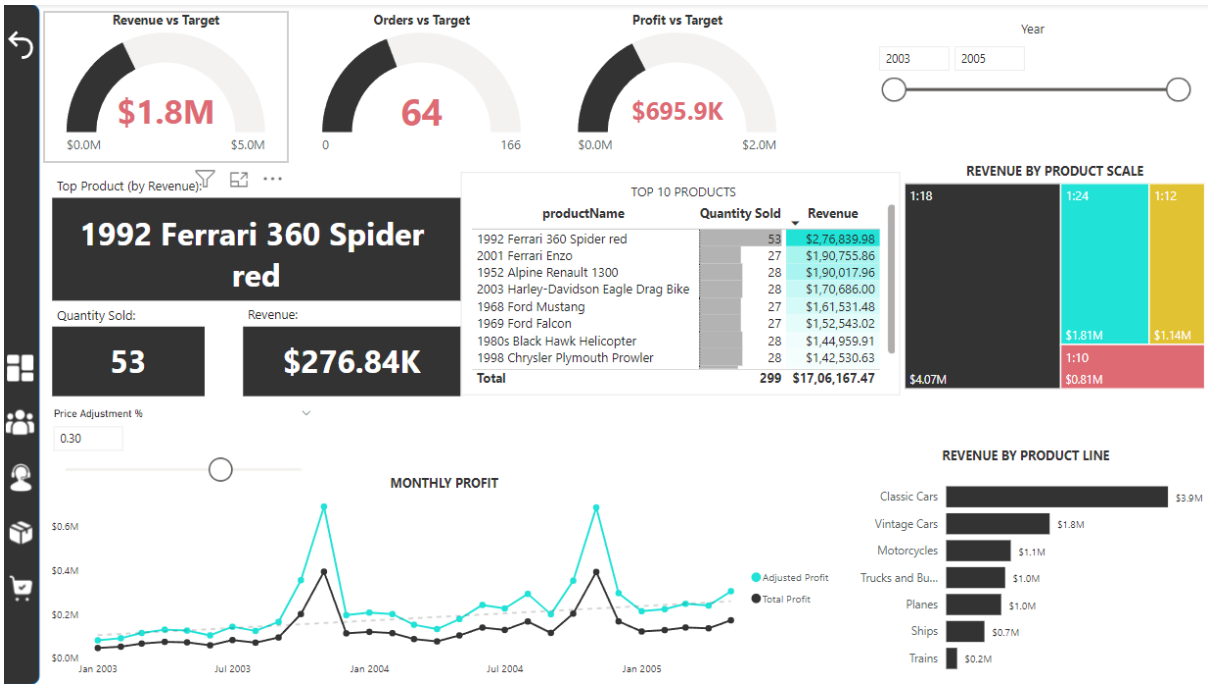
Employee Details report page shows the important employee level metric at a glance like Total unique employees, Average Revenue grossed per employee and average orders created per employee.

It highlights the top employee by revenue, number of orders created, number of customers served and total revenue grossed.

We can compare the Total Revenue, Cost and Profit and margin% for top 5 employees in the company.

Most employees from EMEA territory region created the most number of orders and grossed highest revenue. These sales persons are directly managed by Gerard Bondur.

5. Product Details



Product details report page clearly shows the metrics against their respective targets.

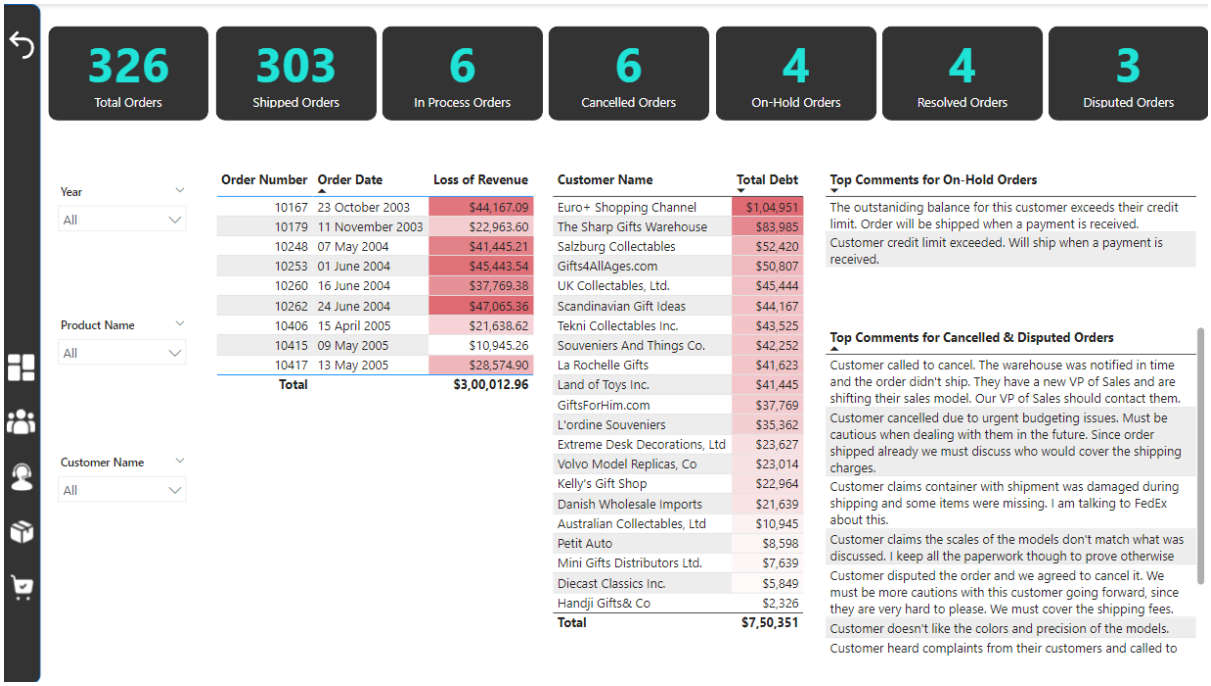
Target are defined as the previous month's performance with an increment of 10% growth. This helps the management to take decisions whether the business is growing in positive direction or not.

Targets like revenue, orders and profit are crucial for the company future aspects and growth.

We can also closely monitor the change in Profit by adjusting the product price. This is called what-If analysis and it helps management decide to whether drop or increase the product price on monthly trend.

Lastly, 1:18 scale die-cast cars falling under classic cars product line are the bestselling category which is bringing good business and profits to the company.

6. Order Details



Order details report page gives holistic breakdown of all the orders based upon the status like “Shipped”, “In-Process”, “Cancelled”, “On-Hold”, “Resolved” and “Disputed” orders.

It highlights the top comments on why the orders were cancelled or disputed or on-hold by the customers. By going through these comments taking them as a feedback for the scope for improvement in the company operations. We need to meet the growing demand and expectations of the vendors and the customers.

We can also take a look at the revenue lost by the company due to cancelled and disputed orders and how we can improve upon them.

Also, few customers have also been upon debt by the company. They have exhausted their credit limits set by the company. Once they settle the debt then only they are eligible for further credits.