EXPERIMENT 9

Aim: Create Dashboards and Reports using Power BI for the E-Commerce Data Analysis with the following information:

- Import data from SQL database and use Power Query for data cleaning, transformation.
- Create charts and Use slicers and filters effectively.
- Use drill-down Capabilities and create relationships.
- Create effective dashboards and reports for the given data set and analyze the data to identify meaningful insights and make data driven decisions.

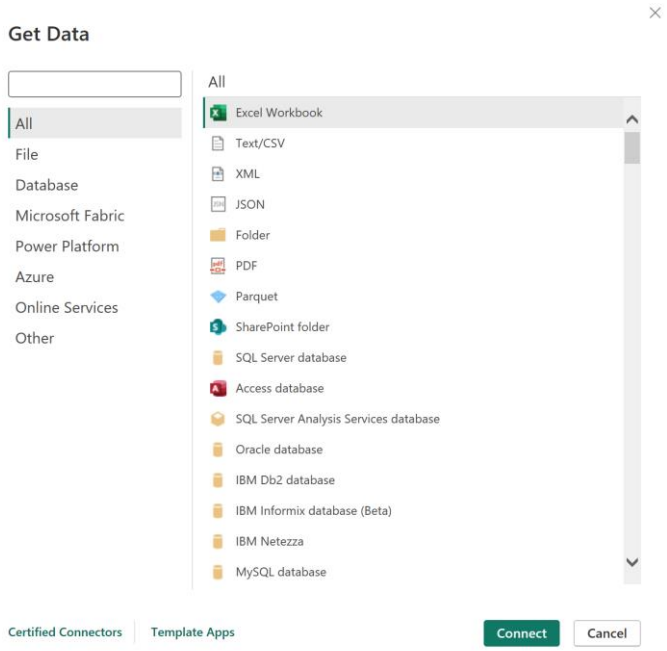
To fulfill the above given objectives we need to create business report in Power BI desktop using Sales Performance Analysis using the following steps:

- Import data from various sources.
- Use Power Query for data cleaning and transformation.
- Build calculated columns and measures using DAX.
- Create different types of charts, tables and Use slicers and filters effectively.
- Design interactive dashboards.
- Analyze the data to identify meaningful insights and make data driven decisions.

1. Import Data from MySQL

Objective: To bring all necessary data into Power BI for analysis.

- *Open Power BI Desktop:* Launch the Power BI Desktop application.
- *Get Data:* Click on the "Get Data" button located on the Home ribbon.



- *Choose Data Source*: Select the type of data source you want to connect to (e.g., Excel, CSV, SQL Server, SharePoint, etc.). Power BI supports a wide range of data sources including cloud-based services like Azure and web-based data.

2. Build Calculated Columns and Measures Using DAX

Objective: To perform advanced calculations and derive new insights from your data.

- DAX (Data Analysis Expressions) is a powerful language for creating complex calculations and aggregations.

Steps:

- *Open Data View*: Click on the "Data" icon on the left sidebar to view your tables.
- *Create Calculated Column:*
- *New Column:* Click on "New Column" in the "Home" ribbon of table view.

- *DAX Formula*: Enter a DAX formula to define the new column.
  For example, to calculate profit margin: Profit Margin = DIVIDE([Profit], [Sales]).
- *Create Measures:*
- New Measure: Click on "New Measure" in the "Home" ribbon of table view.
- *DAX Formula*: Define a measure using DAX.

Average Order Value (AOV) Measure Description

Measure Name: AOV

DAX Formula: AOV = [Amount] / [Quantity]

Description:

The Average Order Value (AOV) is a key performance indicator (KPI) that calculates the average revenue generated per order over a specified period. It is derived by dividing the total sales amount (Amount) by the total number of orders (Quantity).

- **Purpose**: AOV helps businesses understand consumer spending behavior by indicating how much, on average, customers are willing to spend when they make a purchase. This metric is crucial for evaluating sales performance, guiding pricing strategies, and improving marketing efforts.
- **Calculation**:
  - **Numerator**: The total sales revenue generated from all orders.
  - **Denominator**: The total number of orders placed during the same period.
- **Interpretation**:
  - A higher AOV suggests that customers are purchasing more items per transaction or opting for higher-value products, indicating effective upselling or cross-selling strategies.

- Conversely, a declining AOV may signal a need for revisiting product offerings, pricing strategies, or promotional campaigns to encourage larger purchases.

Use Cases:

- Monitor AOV trends over time to identify seasonality or the impact of marketing campaigns.
- Compare AOV across different product categories or customer segments to tailor promotional efforts effectively.
- Set benchmarks for sales teams to encourage larger transactions.

This AOV measure provides valuable insights that can drive data-driven decision-making, helping to optimize sales strategies and improve overall revenue generation.

3. Create Different Types of Charts, Tables, and Use Slicers and Filters Effectively

Objective: To visualize data in various forms to communicate insights clearly.

Steps:

Add Visualizations:

- *Select Visualization Type*: From the "Visualizations" pane, choose a chart type (e.g., bar chart, line chart, pie chart).
- *Drag Fields*: Drag and drop fields onto the visual to populate it with data.

Customize Visuals:

- *Format Visual:* Use the "Format" pane to customize the appearance of the visual (e.g., colors, labels, titles).
- *Add Legends and Tooltips:* Enhance visuals by adding legends and tooltips for better clarity.

Use Slicers and Filters:

- *Slicers:* Add slicers to allow users to filter data dynamically.
- *Filters:* Apply visual-level, page-level, or report-level filters as needed

The dashboard titled "Ecommerce Data Analytics" contains several visualizations, each presenting different insights related to e-commerce data. Here's a breakdown of the plots and details presented in the dashboard:

1. **Sum of Quantity by Category**:
   - A bar chart showing the total quantity of items sold across different categories:
     - Clothing
     - Electronics
     - Furniture
   - The total quantity for each category is indicated, with clothing showing the highest quantity.
2. **Sum of Profit by Sub-Category**:
   - A horizontal bar chart displaying the profit generated by different sub-categories:
     - Printers
     - Bookcases
     - Saree
     - Accessories
     - Tables
   - Each sub-category's profit is represented in a bar, with printers generating the highest profit.
3. **Key Metrics**:

- Several key metrics are highlighted in boxes:
  - **Sum of Profit**: 37K
  - **Sum of Amount**: 438K
  - **Sum of Quantity**: 5615
  - **Sum of AOV (Average Order Value)**: 121K

4. **Sum of Quantity by State**:
- A pie chart showing the distribution of quantity sold by state, including cities like:
  - Ahmedabad
  - Amritsar
  - Bangalore
  - Bhopal
  - Chandigarh
  - Others
- Each segment represents the percentage of total sales for that state.

5. **Sum of AOV by Quantity**:
- A line graph illustrating the Average Order Value based on the quantity of items sold.
- The graph shows how AOV changes with different quantities, with a noticeable drop after a certain point.

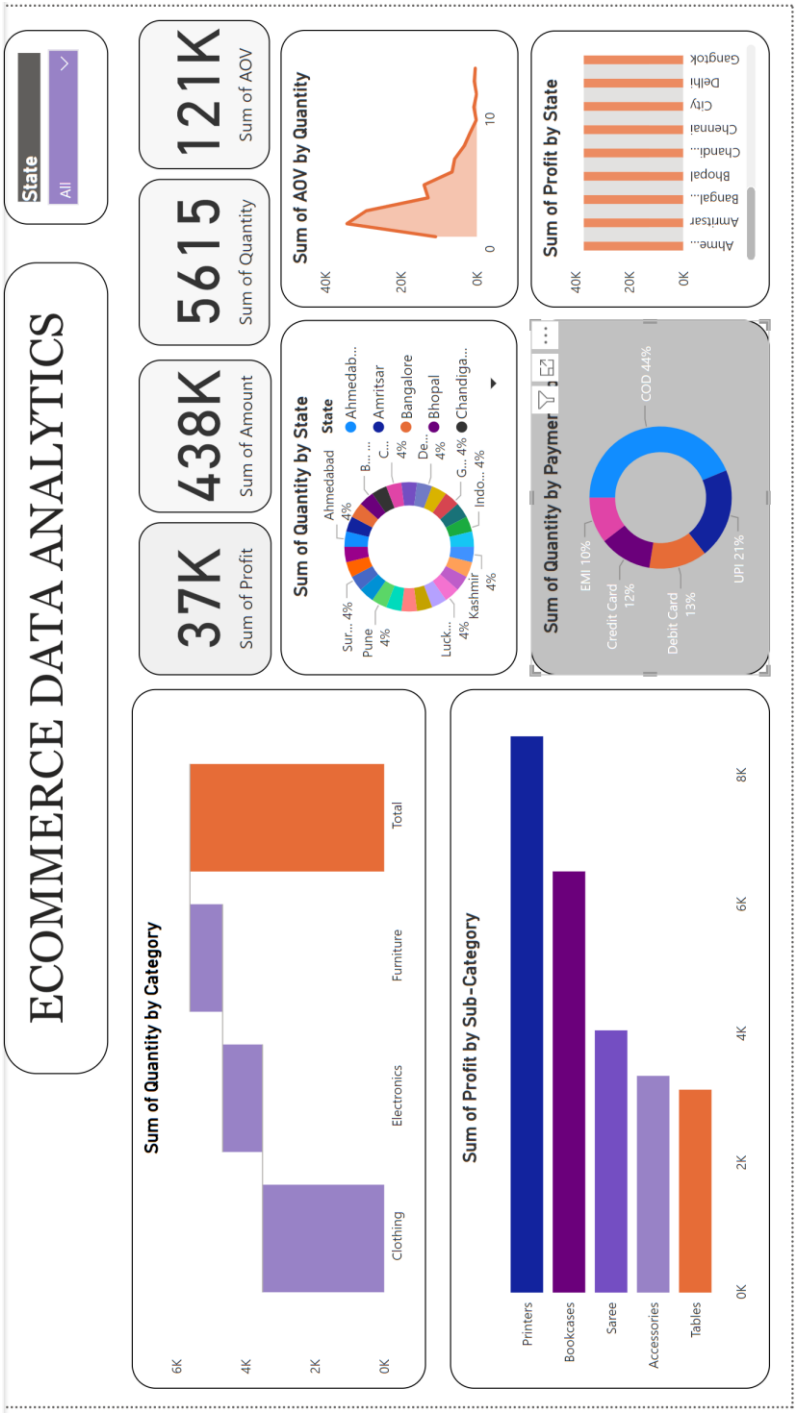
6. **Sum of Quantity by Payment Mode**:
- A pie chart displaying the distribution of payment methods used:
  - Cash on Delivery (COD): 44%
  - EMI: 10%
  - Credit Card: 12%
  - Debit Card: 13%
  - UPI: 21%
- This chart provides insights into customer preferences for payment options.

7. **Sum of Profit by State**:
- A bar chart comparing profits generated from various states.
- States such as Ahmedabad, Amritsar, Bangalore, Bhopal, Delhi, and Chennai are listed, with their corresponding profit amounts.

These visualizations together provide a comprehensive overview of the e-commerce business's performance, revealing key trends in sales, profit distribution, customer preferences, and payment methods. If you need more specific details or insights from any particular plot, feel free to ask!

4. Design Interactive Dashboards

Objective: To create a user-friendly and interactive interface for data exploration.
Ensure the dashboard is intuitive and user-friendly.
Interactive elements should enhance the user experience without overwhelming them.



Result:

Analyzed and presented comprehensive insights into sales, profit and various comparisons.