

## Car Sales & Buyer Insights Dashboard

### 1. Overview of the Dashboard

This Power BI dashboard provides insights into **car sales trends and buyer behavior** using multiple datasets related to buyers, cars, and companies.

The dashboard is designed to present **key performance indicators, trends, comparisons, and behavioral insights** in a clean and interactive manner, with a date slicer enabling time-based analysis across all visuals.

### 2. What Data is Shown on Each Visual

- **KPI Cards**  
Display total number of **brands, companies, and departments**, giving a high-level overview of the dataset.
- **Total Cars by Year (Line Chart)**  
Shows the trend of car purchases over time, helping identify growth or decline patterns.
- **Top 5 Companies by Total Sales (Bar Chart)**  
Highlights the leading companies based on total car sales value.
- **Year with the Highest Average Car Price (Column Chart)**  
Identifies the year in which the average car price was the highest.
- **Average Salary by Country (Bar Chart)**  
Compares average buyer salaries across different countries.
- **Total Buyers by Country (Bar Chart)**  
Shows buyer distribution geographically.
- **Average Salary vs Average Car Price by Country (Scatter Chart)**  
Analyzes the relationship between income levels and car spending across countries.
- **Distribution of Car Prices (Histogram)**  
Displays how car prices are distributed across different price ranges.
- **Most Popular Car Brand by Gender (Table)**  
Identifies the most preferred car brand for each gender using purchase count.
- **Total Cars by Make Year and Gender (Stacked Column Chart)**  
Shows gender-wise preference of car make years.
- **Total Buyers by Buyer Type (Donut Chart)**  
Differentiates between single-time and repeat buyers.
- **Average Car Price by Department (Bar Chart)**  
Identifies departments purchasing higher-priced cars on average.

### 3. Why These Visuals Were Chosen

- **Line charts** were used for time-based trends to clearly show changes over years.

- **Bar and column charts** were used for comparisons across categories such as companies, countries, and departments.
- **Scatter chart** was chosen to identify correlations between salary and car price.
- **Histogram** was used to represent price distribution effectively.
- **Donut chart** was used to show buyer composition.
- **Tables** were used where exact values and categorical clarity were required.

Each visual was selected to best represent the nature of the data and improve interpretability.

#### 4. How Calculations Were Implemented

- **Measures** such as *Total Cars*, *Total Buyers*, *Total Sales*, and *Average Car Price* were created using DAX.
- Aggregations like **AVERAGE**, **COUNT**, and **DISTINCTCOUNT** were used appropriately depending on the business requirement.
- Relationships between fact and dimension tables were used to ensure correct filtering and aggregation.
- A date table was used to enable consistent time-based analysis across visuals.

#### 5. Assumptions Made During Analysis

- **Buyer\_ID** was treated as the customer identifier since no separate customer ID was available.
- Since each Buyer\_ID appeared only once in the dataset, all buyers were classified as **single-time buyers**, which is reflected in the buyer type analysis.
- For clarity and presentation purposes, gender-based analysis focused primarily on major categories.
- Data cleaning involved removing null and invalid records where key identifiers or dates were missing to ensure analytical accuracy.

#### 6. Conclusion

This dashboard provides a consolidated view of car sales performance and buyer behavior, enabling stakeholders to quickly identify trends, patterns, and insights.

Design choices were made to balance **analytical depth and presentation clarity**, ensuring the dashboard is both informative and easy to understand.