# E-Commerce Sales & Customer Insights Dashboard

## Dataset Source & Description

The dataset used in this project is a realistic e-commerce sales dataset containing multiple related tables: FactSales (transactions), Customers (demographics), Products (items), and Calendar (time). It includes more than 200 rows and covers details such as order dates, product categories, sales amounts, quantities, customer age and gender, regions, and shipping status.

## Business Problem

E-commerce businesses often struggle to track sales performance and customer behavior across different regions, demographics, and product categories. Without clear insights, decision-makers cannot effectively identify top-performing products, customer segments, or seasonal sales patterns. The objective of this project is to design an interactive Power BI dashboard that helps stakeholders make data-driven decisions by analyzing KPIs, trends, and customer insights.

## Approach

1. Data Cleaning & Preparation:  
 - Verified data quality (100% valid records).  
 - Renamed columns, corrected data types, and removed redundancies.  
  
2. Data Modeling:  
 - Built a star schema with FactSales linked to Customers, Products, and Calendar.  
 - Added Calendar table with Year, Month, Quarter hierarchy for trend analysis.  
  
3. Feature Engineering:  
 - Created calculated columns: Profit, Profit Margin %.  
 - Developed measures: Total Sales, Total Profit, Average Order Value, Total Customers.  
  
4. Dashboard Design:  
 - Visuals included: KPI Cards, Column Chart (Sales by Category), Line Chart (Monthly Sales Trend), Donut Chart (Sales by Region), Bar Chart (Sales by Gender), Matrix (Product Performance).  
 - Added slicers for Year, Category, Region, Gender.  
 - Applied a professional theme, structured layout, and logo for branding.

## Key Insights

- Category Performance: Certain categories dominate sales, suggesting a focus on best-sellers for promotions.  
- Regional Trends: Specific regions contribute higher revenue, while others remain underdeveloped, indicating growth opportunities.  
- Customer Demographics: Gender-based analysis shows differences in purchase behavior; customer age can be segmented for targeted campaigns.  
- Sales Seasonality: Line trends reveal peaks during specific months, highlighting strong seasonal influence.  
- Profitability: Profit margin varies significantly across categories, offering scope for cost optimization and price strategy.  
- Operational Insight: Shipping status analysis shows performance differences across regions, indicating logistic improvements are possible.

## Expected Outcome

The final dashboard empowers decision-makers to:  
- Monitor overall business performance using KPIs.  
- Drill down into category and product-level sales.  
- Explore customer behavior by demographics and regions.  
- Identify seasonal demand patterns and optimize inventory.  
- Improve operational decisions such as pricing and shipping efficiency.  
  
This project demonstrates the ability of Power BI to transform raw e-commerce data into actionable business insights through interactive dashboards.