E-Commerce Sales & Profit Analysis Using Excel

# Project Objective

To analyze the operational performance of a US-based e-commerce company by identifying trends in sales, profits, discounts, and customer behavior. The goal is to derive actionable business insights through interactive Excel dashboards using Power Query, data modeling, and DAX.

# Business Questions

1. Which regions and customer segments generate the highest sales and profit?  
2. Which product categories and sub-categories are top performers?  
3. How do discounts affect profitability across segments?  
4. What is the monthly trend of sales and order volume?  
5. Which shipping modes are most used and most profitable?

# Dataset Overview

- Source: Kaggle – US E-Commerce Dataset  
- Records: ~900,000 rows  
- Fields: Order ID, Order Date, Ship Mode, Segment, Region, Product, Sales, Quantity, Discount, Profit

# Data Cleaning (Power Query)

- Removed duplicate and empty rows  
- Converted data types (e.g., Date fields)  
- Removed irrelevant columns  
- Renamed headers for consistency  
- Standardized categorical values  
- Loaded cleaned data into Excel Data Model

# Data Modeling

- Created a Star Schema with:  
 - Fact\_Sales: Metrics like Sales, Profit, Quantity, Discount  
 - Dim\_Customer: Segment, Region  
 - Dim\_Product: Category, Sub-Category, Product Name  
   
- Relationships created between fact and dimension tables using keys

# DAX Measures Created

- Total Sales = SUM(Fact\_Sales[Sales])  
- Total Profit = SUM(Fact\_Sales[Profit])  
- Total Quantity = SUM(Fact\_Sales[Quantity])  
- Total Discount = AVERAGE(Fact\_Sales[Discount])  
- Average Profit per Order

# Dashboard 1: Sales Performance

Key Metrics:  
- Total Sales  
- Total Orders  
- Quantity Sold  
- Average Order Value  
  
Visuals:  
- Sales Trend by Month  
- Sales by Region (Map/Bar Chart)  
- Top 10 Products by Sales  
- Sales by Customer Segment  
- Sales by Product Category  
  
Filters:  
- Region, Segment, Product Category

# Dashboard 2: Profit & Discount Analysis

Key Metrics:  
- Total Profit  
- Average Discount  
- Average Profit per Order  
- Orders Count  
  
Visuals:  
- Profit by Segment  
- Profit vs Discount by Category  
- Profit by Shipping Mode  
- Profit by Region  
- Discount Impact on Profit (Combo Chart)  
  
Filters:  
- Region, Segment, Shipping Mode

# Analysis & Insights

- Top Regions: East and West contribute most to sales.  
- Customer Segments: Consumer segment generates highest sales and orders.  
- Top Products: Staples and Binders are among the highest-selling categories.  
- Profit vs Discount: High discounts negatively impact profit margins across most segments.  
- Shipping Modes: Standard Class has the highest usage and profitability.  
- Trend: Sales follow a monthly increasing pattern during Q3 and Q4.

# Conclusion

This E-Commerce Sales Analysis project successfully answered key business questions through structured data transformation, star schema modeling, and DAX-based analysis. The dashboards provide clarity on sales drivers, profit leaks due to discounts, and customer behavior trends.  
  
The insights can help business stakeholders:  
- Optimize discount strategies  
- Improve logistics planning  
- Focus marketing on high-performing regions and customer segments  
- Identify product categories for bundling or promotion

# Tools & Skills Demonstrated

- Power Query (Data Cleaning)  
- Data Modeling (Star Schema)  
- DAX (Calculated Measures)  
- Excel Pivot Tables & Charts  
- Dashboard Design using Slicers and KPIs