E-Commerce Sales Analysis – Power BI Project Report

1. Objective

The purpose of this project is to analyze e-commerce sales data using **Power BI** and generate actionable insights. The analysis focuses on:

- Overall sales performance
- Product trends and profitability
- Customer behavior and repeat purchases
- Regional sales distribution

The ultimate goal is to support **data-driven business decisions** that improve product strategy, customer engagement, and revenue growth.

2. Project Overview

This project is built as a **three-page interactive Power BI dashboard**, designed for clarity and professional storytelling.

- **Page 1 – Overview Dashboard**: High-level business KPIs and trends
- **Page 2 – Product Performance Analysis**: Deep dive into product sales and profitability
- **Page 3 – Customer & Region Analysis**: Customer behavior and city-wise performance

Key techniques used:

- **Data Cleaning**: Removing duplicates, handling missing values, formatting dates, and standardizing categories using Power Query.
- **Data Modeling**: Establishing relationships between tables (Orders, Customers, Products, Regions).
- **DAX Calculations**: Creating measures for KPIs such as Profit Margin, Repeat Purchase Rate, and Average Order Value.
- **Dashboard Design**: Professional layout with slicers, filters, and interactive visuals.

3. Dataset Description

The dataset contains ~3,000 rows of e-commerce transactions.

Key Columns:

- **Order Date** – Transaction date
- **Product Name** – Item purchased

- **Category** – Product category (e.g., Beauty, Electronics)
- **City** – Customer location
- **Customer ID** – Unique identifier for each customer
- **Sales** – Revenue generated
- **Profit** – Net profit from the sale
- **Quantity** – Units sold
- **Payment Method** – Mode of payment (UPI, Credit Card, COD, etc.)

Data was initially unstructured and transformed into a clean, analysis-ready format.

4. Dashboard Page 1 – Overview Dashboard

This page provides a snapshot of business health.

KPIs

- **Total Sales**: ₹4M
- **Total Orders**: 439
- **Total Profit**: ₹596.2K
- **Profit Margin**: 72.55%

Key Visuals

- 📈 **Monthly Sales Trend** – Identifies seasonal peaks and troughs.
- 🛍️ **Top 10 Products by Sales** – Highlights best-selling items.
- 💳 **Sales by Payment Mode** – Shows customer preferences (UPI, COD, Credit Card).
- 🏭 **Category-wise Sales & Profit** – Compares profitability across categories.
- 🌍 **Sales by City** – Reveals top contributing regions.

Insight: Sales are concentrated in major cities like Delhi, Pune, and Mumbai, with UPI and COD being the most popular payment methods.

5. Dashboard Page 2 – Product Performance Analysis

This page focuses on **product-level insights**.

KPIs

- **Total Products Sold**: 120
- **Total Product Sales**: ₹359K
- **Average Profit Margin**: 16.4%

Key Visuals

- 🏆 **Top Products by Profit** – Hair Dryer, Perfume, Moisturizer lead profitability.
- 📊 **Monthly Product Sales Trend** – Tracks product demand over time.
- ⚖️ **Sales vs Profit by Category** – Identifies categories with high sales but low margins.
- 📋 **Detailed Product Table** – Shows sales, profit, and quantity for each product.

Insight:

- **Hair Dryer** is the top performer (₹79,733 sales, ₹17,361 profit).
- **Moisturizer & Perfume** also contribute significantly.

- Some products (e.g., Shampoo, Face Wash) have moderate sales but lower profit margins, suggesting pricing or cost optimization opportunities.

6. Dashboard Page 3 – Customer & Region Analysis

This page analyzes **customer engagement and regional distribution**.

KPIs

- **Total Customers**: 2,526
- **Returning Customers**: 422
- **Repeat Purchase Rate**: ~16.7%

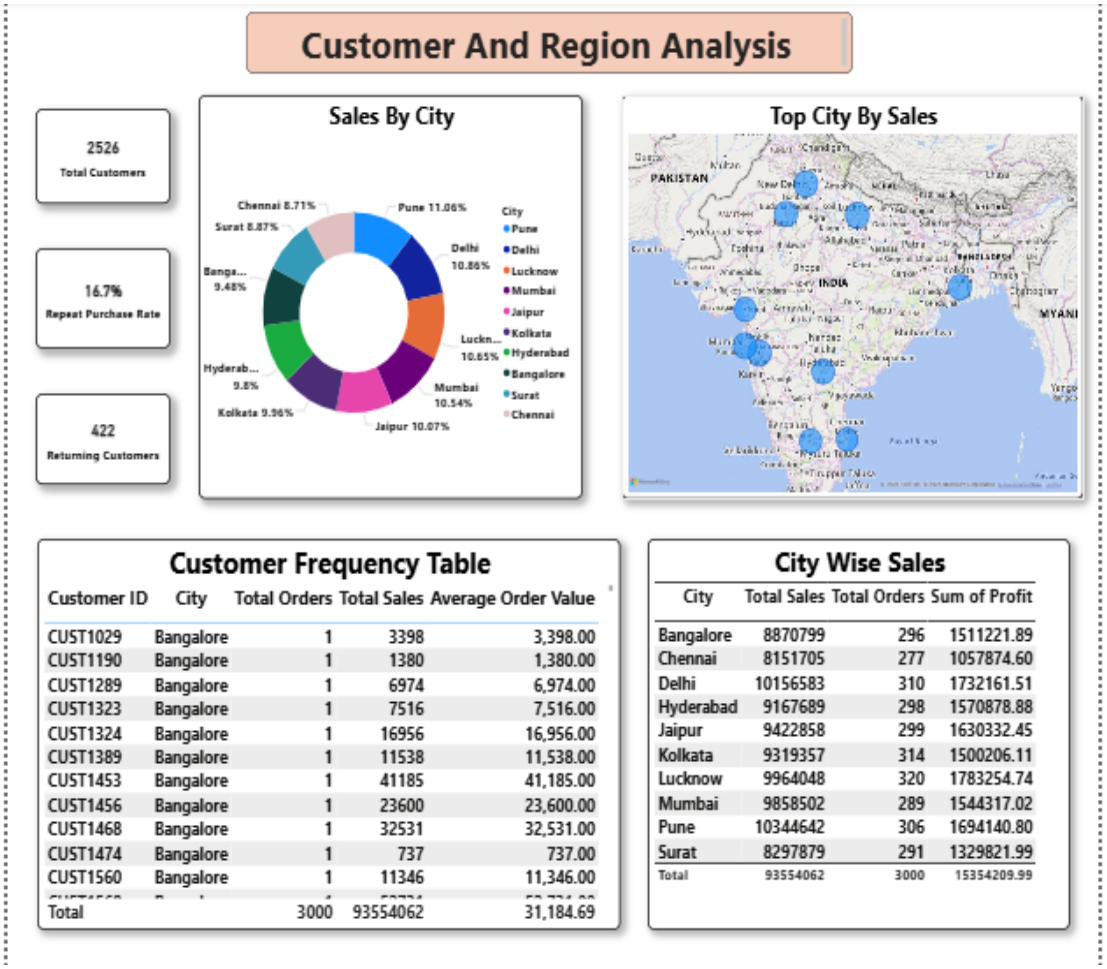
Key Visuals

- 🌍 **Sales by City** – Pune, Delhi, and Lucknow are top contributors.
- 🗺️ **Top Cities Map** – Geographic visualization of sales concentration.

- 👥 **Customer Frequency Table** – Shows total orders, sales, and average order value per customer.
- 🏙️ **City-wise Sales Summary** – Compares sales, orders, and profit across 10 major cities.

Insight:

- Pune leads with ₹10.34M sales, followed by Delhi and Lucknow.
- Repeat purchase rate (~17%) indicates moderate customer loyalty.
- High-value customers in Bangalore and Mumbai contribute significantly despite fewer orders.



7. Summary

The dashboard provides a **comprehensive view of sales, products, customers, and regions**.

- Business leaders can quickly identify top products, profitable cities, and customer retention trends.

- Interactive filters allow deeper exploration of specific categories, time periods, or regions.

8. Conclusion

This project demonstrates strong skills in:

- **Data Cleaning & Transformation** (Power Query)
- **Data Modeling & DAX Calculations**
- **Interactive Dashboard Design**
- **Business Storytelling with Data**

The insights generated can help businesses:

- Optimize product strategies
- Improve customer engagement
- Enhance regional targeting
- Increase overall profitability

This project is highly relevant for roles in **Business Analytics, Data Science, and Marketing Analysis**.