E-Commerce Sales & Customer Analytics Dashboard

Project Overview

This project is a complete **E-Commerce Business Intelligence solution** designed to analyze **sales, customer behavior, product performance, and retention trends** using **SQL, Power BI, and structured datasets**.

The objective is to convert raw transactional data into **actionable business insights** that can help management make informed decisions about:

- Revenue growth

- Customer retention

- Product strategy

- Regional performance

The project follows a real-world analytics workflow where data is first stored in a **relational database**, processed using **SQL**, and then visualized using **Power BI dashboards**.

Why This Project Matters

Modern e-commerce companies rely heavily on data to:

- Identify **top-performing products**

- Understand **customer purchasing patterns**

- Improve **marketing and retention strategies**

- Optimize **inventory and pricing**

This project demonstrates how a Data Analyst can use data to **answer business questions**, **track KPIs**, and **support strategic decisions**.

Repository Structure

File	Description
`Ecommerce Sales Dashboard.pbix`	Interactive Power BI dashboard
`ecommerce.db`	SQLite database storing cleaned and structured data
`ecommerce.sqbpro`	SQL Browser project file
`orders.csv`	Order-level transaction data
`online_retail.csv`	Raw retail sales dataset
`monthly_sales.csv`	Pre-aggregated monthly revenue
`retention_cohort.csv`	Customer cohort & retention data
`top_products_by_region_month.csv`	Best-selling products by region and month

Data Flow & Architecture

```
CSV Files →      SQLite Database →    SQL Queries
→    Power BI →      Business Insights
```

Step-by-step:

1. Raw sales data is stored in CSV files

2. Data is loaded into an **SQLite database**

3. SQL is used to:

   ○ Clean data

   ○ Join tables

   ○ Aggregate revenue

   ○ Calculate customer metrics

4. Power BI connects to the database

5. Data models and DAX measures are built

6. Interactive dashboards are created

Types of Analysis Performed

1️⃣ Sales Performance

This section focuses on understanding how the business is performing financially.

It includes:

- Total revenue

- Monthly and yearly sales trends

- Order volumes

- Average order value

- Growth patterns

📌 **Purpose:**
 To track business growth and identify high and low-performing periods.

2️⃣ Product Analysis

This analysis identifies:

- Top-selling products

- Products generating the highest revenue

- Product demand by region and time

📌 **Purpose:**
 To help decide:

- Which products to promote

- Which products to stock more

- Which products may need pricing or marketing changes

3️⃣ Regional Performance

Sales are analyzed across different regions to see:

- Which locations generate the most revenue

- Where demand is strongest

- Regional buying behavior

📌 **Purpose:**
 To support regional marketing, logistics, and sales strategy.

4️⃣ Customer & Retention Analysis

Using cohort and order data, the project tracks:

- New vs repeat customers

- Customer lifetime value behavior

- Retention trends over time

📌 **Purpose:**
 To understand customer loyalty and identify churn risk.

Power BI Dashboard

The Power BI dashboard provides:

- KPI Cards (Revenue, Orders, Customers)

- Monthly Sales Trends

- Top Products

- Regional Sales Distribution

- Customer Retention & Cohorts

- Interactive filters for:

  - Date

  - Product

  - Region

This allows business users to explore data dynamically and drill down into details.

Tech Stack

Layer	Tools Used
Data Storage	SQLite
Querying	SQL
Data Files	CSV / Excel
Data Visualization	Power BI
Modeling	DAX
Database Tool	DB Browser for SQLite