E-Commerce Consumer & Sales Intelligence Report

Purpose

The project focused on translating raw e-commerce data into actionable intelligence. By applying Python, SQL, and BI tools, the goal was to uncover hidden patterns in customer behavior, purchasing habits, and sales performance that businesses can leverage for growth strategies.

Data Sources

- **Customer Dataset** – demographic profiles, regions, and age groups.
- **Order Dataset** – transaction history including dates, amounts, and product categories.
- **SQL Scripts** – queries to compute revenue trends, top contributors, and category-wise performance.
- **Python Notebooks** – data preparation, exploratory analysis, and visualization.
- **Power BI Reports** – interactive dashboards providing dynamic KPIs and trend views.

Methodology

1. Data Preparation

- Eliminated duplicates, corrected missing entries.
- Standardized region codes and date formats.

2. Exploratory Analysis

- Profiled customer segments and demographics.
- Measured order frequency, sales distribution, and product mix.
- Mapped monthly growth patterns.

3. SQL-Driven Insights

- Identified high-value customers.
- Compared profitability across categories.
- Highlighted regions with peak and emerging demand.

4. Business Intelligence Dashboards

- Regional filters and product category comparisons.

- Time-series visualization of monthly revenues.
- Churn monitoring through customer inactivity tracking.

Key Findings

Customer Segments

- Repeat customers account for most revenue.
- Younger buyers (18–30) lean towards affordable products; older segments prefer premium goods.

Order & Sales Dynamics

- Seasonal boosts in sales around festivals and holidays.
- Premium goods = higher margins; budget goods = higher sales volume.

Regional Performance

- Urban markets deliver higher average transaction values.
- Rural zones still small in revenue but show rising adoption.

Retention & Churn

- Customers inactive for 6+ months are highly likely to churn.
- Faster delivery and frictionless payment methods increase loyalty.

Tools & Technologies

- **Python (Pandas, Matplotlib, Seaborn):** data cleaning & visualization
- **SQL:** business queries & KPI extraction
- **Power BI:** executive dashboards & reporting

Conclusion

The analysis built an end-to-end pipeline: from raw transactional and demographic data to refined business dashboards. The findings highlight opportunities in customer retention, targeted marketing, and regional growth strategies. Implementing these insights can help e-commerce platforms optimize product portfolios, reduce churn, and boost sales performance sustainably.