E-commerce Sales Analysis Project

Objective

The primary objective of this project was to analyze e-commerce sales data to derive meaningful insights for decision-making. By leveraging interactive dashboards, the analysis focused on understanding key performance metrics, customer behaviour, and sales trends across states, product categories, and payment modes.

Data Overview

The dataset included transactional data for an e-commerce platform, capturing details such as:

- **Sales Amount**

- **Quantity Sold**

- **Profit**

- **State-Wise Distribution**

- **Customer Information**

- **Product Categories and Sub-Categories**

- **Payment Modes**

- **Monthly Sales Trends**

Key Insights

1. Performance Metrics

- **Total Sales Amount:** ₹438K

- **Total Quantity Sold:** 5615 units

- **Average Order Value (AOV):** ₹121K

2. Geographic Analysis

- The top-performing state in terms of sales amount is **Maharashtra**, followed by **Madhya Pradesh** and **Uttar Pradesh**.

- States such as **Delhi** and **Rajasthan** contribute less to the overall revenue, indicating potential growth opportunities.

3. Product Analysis

- **Category Distribution:**

    - The majority of the quantity sold belongs to the **largest category**, accounting for **62.62%**, with smaller shares for other categories.

    - Key sub-categories, such as **Printers** and **Bookcases**, drive higher profits, while categories like **Tables** have lower profitability.

4. Customer Analysis

- High-value customers include **Harihar**, **Madhav**, and **Madan Mohan**, each contributing significantly to the total sales amount.

- There is an opportunity to engage customers with lower spending to increase their lifetime value.

5. Monthly Profit Trends

- Profitability peaks in **December**, indicating a seasonal impact, likely due to end-of-year sales or holiday shopping trends.

- The lowest profits were recorded in **June**, suggesting potential for improvement during this period.

6. Payment Mode Analysis

- The most preferred payment mode is **Mode 1**, accounting for **43.74%** of all transactions.

- Other payment modes like **Mode 2** and **Mode 3** show smaller adoption, which may need further investigation into customer preferences or convenience.

Challenges

1. **Data Completeness:** Missing values for certain states or categories could have affected the analysis.

2. **Granularity:** Limited granularity for some metrics such as specific customer demographics or promotional impacts.

Recommendations

1. **Expand in Low-Performing Regions:** Focus on marketing and operational efforts in states like Rajasthan and Delhi to drive higher sales.

2. **Optimize Low-Profit Products:** Reassess pricing and marketing strategies for sub-categories with low profitability, like **Tables**.

3. **Customer Retention Strategies:** Introduce loyalty programs for high-value customers and targeted promotions for less-engaged ones.

4. **Seasonal Promotions:** Capitalize on high-profit months like December by launching sales campaigns and introducing discounts in low-performing months like June.

5. **Payment Mode Optimization:** Offer incentives for alternative payment modes to drive adoption and streamline checkout processes.

Tools Used

- **Data Cleaning and Analysis:** Python (Pandas, NumPy)

- **Visualization and Dashboarding:** Power BI

- **Database Management:** SQL for data extraction and aggregation.

Conclusion

This project successfully highlighted critical sales insights for the e-commerce business, providing actionable recommendations to boost profitability and customer satisfaction. The interactive dashboard serves as a valuable tool for real-time decision-making, empowering stakeholders to monitor and enhance performance across various metrics.