Project Title:

Retail Sales Analysis Using Excel & Power BI

Abstract

This project focuses on analysing retail sales data using Excel as the primary data source and Power BI as the visualization tool. The objective is to derive meaningful business insights by evaluating sales performance, customer behaviour, product categories, and the impact of discounts. The project demonstrates practical data analysis, data modelling, and dashboard design skills suitable for entry-level Data Analyst roles.

Project Description:

- Analysed 12,000+ retail transactions to identify sales trends and customer behaviour
- Cleaned and transformed data using Excel and Power Query
- Built interactive Power BI dashboards with KPIs and slicers
- Generated actionable insights on category performance, discounts, and payment method.

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1. Objectives of the Project

- Analyse overall sales performance
- Identify top-performing product categories
- Understand customer purchasing behaviour
- Evaluate the impact of discounts on sales
- Build an interactive Power BI dashboard for decision-making

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2. Tools & Technologies Used

- **Microsoft Excel** – Data storage, cleaning, and preprocessing
- **Power BI** – Data modeling, DAX calculations, and dashboard visualization
- **DAX** – KPI calculations and time-based analysis

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3. Dataset Description

- **Source:** Retail_Sales Project.xlsx
- **Total Records:** 12,575

- **Total Customers:** 25
- **Key Columns:**

This dataset contains **12,575 transactions** with these columns:

- Transaction ID
- Customer ID
- Category (Food, Beverages, Milk Products, etc.)
- Item
- Price Per Unit
- Quantity
- Total Spent
- Payment Method
- Purchase Method (Online / Store)
- Transaction Date
- Discount Applied

Data cleaning and imputation were performed to handle missing values and ensure accuracy.

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4. Data Preparation & Cleaning

Before analysis, the dataset was cleaned to ensure accuracy and consistency:

- Removed duplicate records
- Handled missing and inconsistent values
- Standardized data types for numeric and date fields
- Created derived fields such as **Month** from transaction dates
- Pivot table

📌 *Outcome:* A clean and analysis-ready dataset suitable for reporting and visualization.

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5. Methodology

1. Imported Excel data into Power BI
2. Created a Date Table for time intelligence analysis
3. Built relationships between fact and dimension tables
4. Developed DAX measures for KPIs such as Revenue, AOV, and Transactions

5. Designed interactive visuals with slicers and filters

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6. Key Performance Indicators (KPIs)

- **Total Revenue:** ₹1,552,071
- **Total Transactions:** 12,575
- **Total Customers:** 25
- **Average Order Value:** ₹123.43
- **Discounted Revenue:** ₹5,40,913.5
- **Year To Date Revenue**

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7. Sales Trend Analysis

- Sales exhibit **monthly fluctuations**, indicating seasonal purchasing behavior.
- Certain periods show higher sales volumes, possibly due to promotions or festive demand.
- Overall sales performance remains stable with no extreme declines.

📌 *Insight:* Seasonal trends can be leveraged for targeted marketing and inventory planning.

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8. Category Performance Analysis

- **Food and Beverage categories** contribute the highest share of total revenue.
- Some categories generate high sales volume but lower revenue, indicating lower-priced products.
- Premium items contribute higher revenue per transaction but in smaller quantities.

📌 *Insight:* Revenue optimization can be achieved by balancing high-volume and high-margin categories.

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9. Sales Channel Analysis (Online vs Store)

- Online sales slightly outperform store sales in total revenue.
- Store sales remain consistent, indicating continued relevance of physical retail.
- Online channel shows stronger growth potential due to convenience and digital payments.

📌 *Insight:* Expanding online sales strategies can drive future growth.

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10. Payment Method Analysis

- Digital wallets and credit cards are the most commonly used payment methods.
- Cash transactions are comparatively lower, showing a shift toward digital payments.
- Payment preferences vary slightly between online and store channels.

📌 *Insight:* Enhancing digital payment options improves customer experience and transaction efficiency.

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11. Discount Impact Analysis

- Discounted transactions result in **higher average quantities purchased**.
- However, non-discounted sales often contribute more to total revenue.
- Discounts drive volume but may reduce overall profitability if not managed properly.

📌 *Insight:* Discounts should be applied strategically to maximize sales without eroding margins.

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12. Customer Behavior Analysis

- A small segment of customers contributes a significant portion of total sales.
- Majority of customers make low to mid-value purchases.
- Repeat customers play a key role in revenue generation.

📌 *Insight:* Loyalty programs and personalized offers can help retain high-value customers.

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13. Power BI Dashboard Description

The Power BI dashboard was designed to provide a clear and interactive view of retail sales performance. It enables users to monitor KPIs, analyze trends, and compare performance across categories and time periods.

Dashboard Pages Overview

Page 1: Sales Overview

- Displays key KPI cards: Total Revenue, Total Transactions, Total Customers, and Average Order Value (AOV)
- Line chart visualizing sales trends over time
- Bar chart showing category-wise total sales

- Slicers for Date, Category, Payment Method and Purchase Method
- Bar chart comparing revenue by product category
- Table visual highlighting top customers by total spend
- Quantity vs Revenue comparison to identify high-volume and high-value categories

Purpose: To give management a high-level summary of overall business performance and identify top-performing categories and valuable customers.

Page 2: Operational and Discount Analysis

- Comparison of sales with and without discounts
- Visual showing quantity purchased vs discount applied
- Pie/column chart for payment method distribution

Purpose: To evaluate the effectiveness of discounts and customer payment preferences.

Interactive Features

- Dynamic slicers allow filtering by time period, category, and payment method
- Cross-filtering enables users to click on visuals to highlight related data
- Drill-down options help analyze data at monthly or category level

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Business Value of the Dashboard

- Helps management track sales performance in real time
- Supports data-driven decisions for pricing and promotions
- Improves visibility into customer behavior and product performance

The dashboard is designed to be intuitive, visually clean, and suitable for both technical and non-technical users.

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14. Conclusion

The analysis highlights that **product category performance, online sales growth, digital payment adoption, and discount strategies** are the primary drivers of retail success. Strategic use of discounts, focus on high-performing categories, and strengthening online channels can significantly improve overall business performance.

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15. Tools & Skills Used

- **Excel:** Data cleaning, Pivot Tables, basic analysis
- **Power BI:** Power Query, DAX measures, interactive dashboards
- **Analytical Skills:** Trend analysis, KPI reporting, business insights

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Future Enhancements

- Add profit and cost analysis
- Implement customer segmentation (RFM analysis)
- Include forecasting using Power BI analytics

Project Type: Academic / Portfolio Project
Role: Data Analyst
Tools: Excel, Power BI, DAX
