Online Retail Data Analysis and Dashboard Report

Page 1: Project Overview and Data Analysis

Project Title:

Online Retail Data Analysis and Dashboard Reporting

Objective:

The primary objective of this project is to analyze historical online retail transaction data to uncover purchasing trends, identify customer segments, evaluate performance by country, and visualize insights through an interactive Power BI dashboard.

Dataset Description:

The dataset used ('cleaned_online_retail.xlsx') contains records of transactions from an online retail store, including:

- InvoiceNo
- StockCode
- Description
- Quantity
- InvoiceDate
- UnitPrice
- CustomerID
- Country

The data was cleaned to remove null values, correct data types, and standardize entries for more accurate analysis.

Data Processing:

- Missing CustomerIDs and blank Descriptions were removed.
- Data types were converted (e.g., InvoiceDate to datetime).
- A 'TotalPrice' column was created by multiplying Quantity and UnitPrice.

Key Analytical Metrics:

- Top-selling products by volume and revenue.
- Sales trend over time (monthly/daily granularity).
- Customer segmentation based on RFM (Recency, Frequency, Monetary) analysis.
- Country-level analysis to identify major revenue contributors.
- Basket analysis to find commonly bought-together items.

Tools Used:

Excel, Power BI, Python/Pandas (possibly used in preprocessing).

Page 2: Dashboard Insights and Conclusions

Key Dashboard Insights:

1. Revenue Distribution:
  - The majority of revenue comes from a small subset of countries, with the UK being the dominant contributor.
  - A few products contribute disproportionately to total sales.

2. Customer Behavior:
  - RFM analysis reveals three key customer segments:
    * High-value, frequent buyers
    * New, potentially loyal customers
    * Dormant or churn-risk customers

3. Time Trends:
  - Sales show periodic spikes, especially during holiday seasons, indicating seasonality.
  - Weekly sales patterns also indicate a preference for mid-week purchases.

4. Returns and Cancellations:
  - Negative quantities highlight returns. These are concentrated among certain products/customers.

5. Top Products:
  - Most frequently sold items include gift-related merchandise and home decor.

Recommendations:

- Customer Retargeting: Focus marketing on high RFM segment.
- Inventory Planning: Adjust stock levels based on top-selling product patterns.
- International Expansion: Consider expanding to countries with growing purchase patterns.
- Reduce Returns: Investigate products with high return rates for quality or expectation issues.

Conclusion:

This analysis provides a holistic view of retail performance and customer behavior. The Power BI dashboard allows stakeholders to interactively explore the data, make data-driven decisions, and continuously monitor key performance indicators.