Retail Data set Analysis

1. Executive Summary:

This Analysis of sales data reveals several key insights that can significantly impact business decisions. Notable findings include:

- A steady increase in total revenue over the year 2011, with a sharp spike during the in months September, October and November.
- Identification of high-value customer segments based on RFM analysis.
- Top-performing products contributing significantly to overall revenue.
- Regional variations in sales performance, highlighting opportunities for targeted marketing.

2. Introduction:

This is a transnational data set which contains all the transactions occurring between 01/12/2010 and 09/12/2011 for a UK-based and registered non-store online retail.The company mainly sells unique all-occasion gifts. Many customers of the company are wholesalers.
The objective of this analysis is to inform strategic decision-making and optimise various aspects of the business operations.

3. Data Overview:

The dataset consists of 541909 records, including essential columns such as 'InvoiceNo', 'StockCode', 'Description', 'Quantity', 'InvoiceDate', 'UnitPrice', 'CustomerID', ,Country' . Data preprocessing involved data cleaning, finding rows with missing values, remove duplicate values, taking 2 snapshots of dataset, one for product analysis ignoring the missing values in CustomerID column and one for product analysis with deleted Missing CustomerIDs.

4. Key Metrics:

Total Revenue Trend:

Over the year 2011, the total revenue has shown a consistent upward trend, reaching its peak during the months September, October and November. This trend suggests the effectiveness of the sales strategies and customer engagement during festive periods.The reasons might be:

- People prepare theirselves for Christmas and buying more items and gifts.

- Black Friday: In some regions, the end of November is marked by significant shopping events such as Black Friday and Cyber Monday. These events often result in a surge in retail sales as consumers take advantage of discounts and promotions.

- Weather Conditions: Weather can also impact retail sales. For instance, people may be more in home and tend to buy thing more online

Average Order Value (AOV):

- **Increasing AOV:** the AOV is increasing from July, it may suggest that customers are spending more on average per order. This could be a positive sign, indicating higher customer engagement or the successful implementation of strategies to encourage larger purchases.
- **Decreasing AOV:** the AOV is decreasing from December 2010 until July 2011 and might indicate challenges in maintaining or increasing the average spending per order. It could be worth investigating the factors contributing to this decline, such as changes in product pricing, customer preferences, or marketing effectiveness.

5. Customer Segmentation:

There are 4338 unique Customers in the dataset, 973 of them are new customers based on last 3 months transactions which is about 22% of all customers.

RFM Analysis:

From 4338 unique Customers, 347 are Best customers in the company who are frequent buyers and also generate high revenue.

By segmenting customers based on Recency, Frequency, and Monetary value, we have identified four main segments:

- **Active Customers** : 1596 customers bought 4575.62 units by shopping 9 times approximately every 23 days. They are privileged customers and Surprise offers can be given on birthdays and anniversary.
- **Good Customers**: 1050 customers have bought 924.6488 units by shopping thrice every 70 days. They are loyal customers.
- **Average customers**: 1510 customers have bought approximately 402.97 units by shopping once every 156 days. Tiered pricing of products can be introduced.
- **Inactive customers**: 182 customers have bought approximately 143.80 units by shopping once every 287 days. Personalised emails and SMS can be sent to the customers regarding the offers and more marketing strategies can be introduced to improve the frequency of orders.

These segments provide actionable insights for personalised marketing and retention strategies.

6. Product Analysis:

Top-Selling Products:

Top-selling products by quantity are : 'Assorted colour bird ornament' and 'white hanging heart T-light holder'.

Top-selling products by Revenue are :'Egency cake stand 3 tier' and 'Party bunting'.

And the most unpopular products by quantity and revenue are: 'Hen House w chick in nest' , 'set 12 colouring pencil doily', 'watering can singe hook pistachio'

As a matter of fact, while true that the one with only 1 sell are unpopular but the true unpopular ones are the ones that haven't been sold at all which brings us to the concept of Survivorship bias.

Product Trends:

less prices have more quantity sold, and less quantity something between 1 and 3 shows for all of unit Prices people tend to by this amount of items and also a negative correlation indicates that as one unit price increases, the quantity tends to decrease.

7. Geographic Analysis:

Regional Sales Performance:

Sales vary across different regions, with United Kingdom showing the highest performance and [Netherlands, France and Australia indicating potential for improvement. Targeted marketing efforts can be employed to capitalise on regional opportunities.

8. Time-Series Analysis:

People are more inclined to shop on Thursdays and also in the middle of the day.

And Sundays and the early hours of the day and nights are not the favourite times for this seller's online shopping!

9. Customer Retention:

Retention Rates:

The customers retention rate is decreasing which means the number of customers which come back to make another purchase are decreasing during the time and that means we the company should take Strategies to enhance customer loyalty, which makes customers to come back again, policies like discounts, gifts, free shipping after second purchase etc. during time returning for repeat purchases.

10. Recommendations:

Personalised Marketing:

Leverage RFM segments to implement personalised marketing campaigns targeting high-value and potential churn customers.

Product Optimisation:

Consider optimising inventory based on the performance of top-selling products.

Regional Targeting:

Implement region-specific marketing strategies to capitalise on high-performing areas and improve sales in underperforming regions.