

Report Title

Retail Insights: A Panoramic View of Global E-Commerce Performance

Introduction

The main goal of this project was to explore complex global e-commerce sales data and customer interactions. The analysis focused on uncovering trends, patterns, and unusual behaviors in buying and selling activities. This helps in developing informed strategies to improve operational efficiency and enhance customer experiences.

Exploring the Dataset:

The dataset we selected consists of a detailed record of transactions from an online retail website. It includes data on customer purchases, product choices, and the effectiveness of sales across different regions. This dataset serves as a rich source of information, capturing the dynamic nature of online commerce through various indicators like revenue flows and product returns. The dataset comes from Kaggle and includes more than half a million entries, giving us a really detailed look at the online market. Here is the link to the dataset:

<https://www.kaggle.com/datasets/thedevastator/online-retail-sales-and-customer-data>.

Source and Composition of the Dataset:

The dataset unfolds from the digital shelves of Kaggle, an open database. It's composed of the following columnar headings:

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

Analysis Methodology

Tool Selection for Analysis:

The analytical voyage was charted using Power BI, celebrated for its formidable data wrangling capabilities and advanced visualization arsenal. Power BI's user-friendly interface and adeptness at managing hefty datasets rendered it the perfect compass for this journey, converting raw figures into engaging and insightful dashboards.

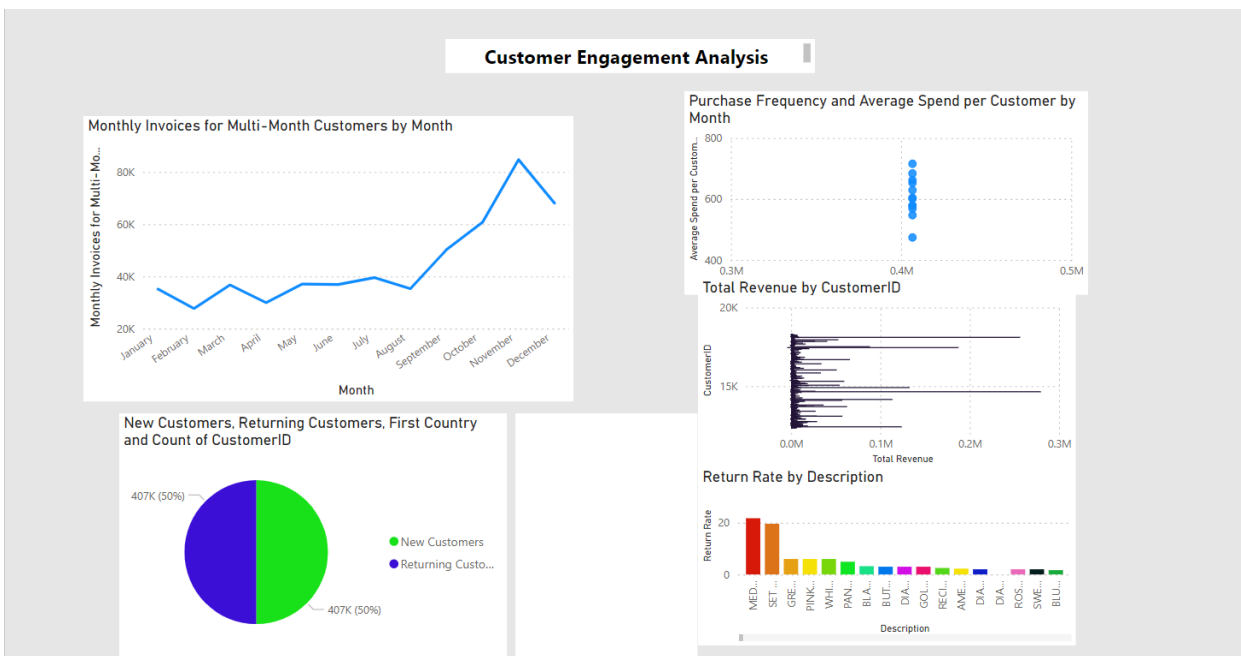
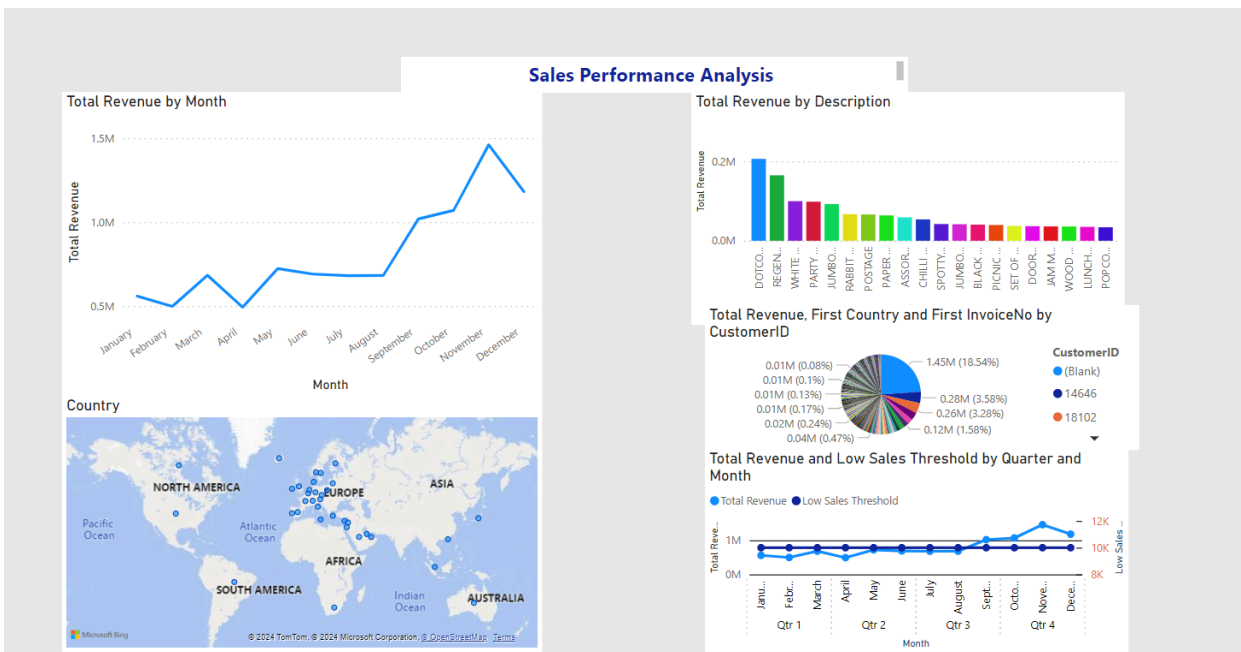
Process of Crafting Visualizations:

Visualizations were born out of a rigorous regimen of data sanitization, transformation, and modeling within the Power BI ecosystem. This journey involved plotting data relationships, maintaining data quality, and handpicking visual components that resonated with the data's story. Each visual iteration was polished to enhance readability and convey the narrative effectively.

Analysis Results

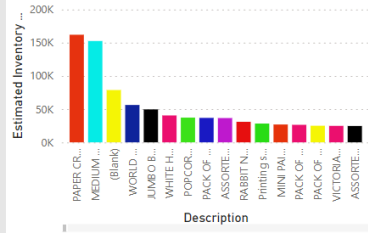
Presentation of Final Dashboards:

The culmination of our analysis is manifested in three dynamic dashboards, each a visual narrative:

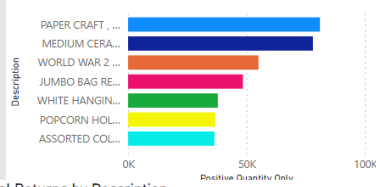


Product Analysis

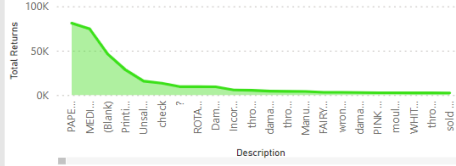
Estimated Inventory Depletion by Description



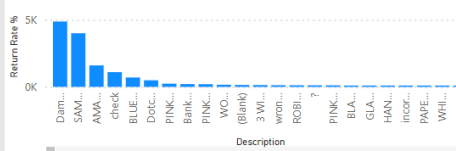
Positive Quantity Only by Description



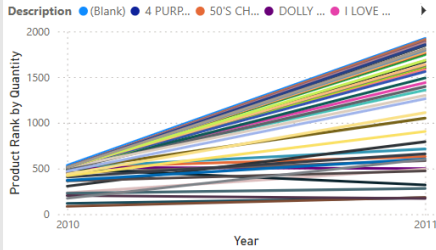
Total Returns by Description



Return Rate % by Description



Product Rank by Quantity by Year and Description



These dashboards were meticulously designed to prioritize user engagement, featuring legible fonts, logically placed visuals, and titles that succinctly summarize the data's essence.

Table 1: Sales Performance Analysis Dashboard

Metric	Detail
Total Revenue by Month	Line graph depicting revenue per month with a peak in November
Total Revenue by Description	Bar chart showing revenue contribution by product description
Total Revenue, First Country & InvoiceNo	Pie chart breaking down revenue by first country and invoice number
Total Revenue and Low Sales Threshold	Dual-axis line graph for revenue and low sales threshold by month
Geographic Distribution of Sales	Map with geolocated sales data points across the globe

Table 2: Customer Engagement Analysis Dashboard

Metric	Detail
Monthly Invoices for Multi-Month Customers	Line graph showing the number of invoices per month
Purchase Frequency & Average Spend	Scatter plot showing purchase frequency vs. average spend by month
Total Revenue by CustomerID	Horizontal bar chart of revenue per customer ID
New vs. Returning Customers	Pie chart indicating the proportion of new vs. returning customers
Return Rate by Description	Bar chart showing return rate by product description

Table 3: Product Analysis Dashboard

Metric	Detail
Estimated Inventory Depletion	Bar chart showing estimated inventory depletion by product description

Product Rank by Quantity & Year	Line graph of product rank by quantity over years 2010 and 2011
Positive Quantity Only by Description	Bar chart showing products with positive quantity only
Total Returns by Description	Area chart showing total returns by product description
Return Rate % by Description	Bar chart indicating the return rate percentage by product description

Sales Performance Analysis Dashboard

For our Sales Performance Analysis, I got a line graph that shows our total revenue by month, and it looks like November was a real winner for us. Then, this colorful bar chart that breaks down our revenue by what sold it's like a rainbow of profits and also whipped up a pie chart that slices our revenue by the first country and invoice number and got this cool dual-axis graph for our total revenue alongside the low sales threshold by month. Last but not least, there's a world map dotted with sales figures, so we can see where our customers are globe-trotting from.

Customer Engagement Analysis Dashboard

Moving on to our Customer Engagement Analysis! Here, I plotted monthly invoices for our loyal customers who shop with us more than once, and it's got this neat upward trend. There's also a scatter plot that's all about purchase frequency versus the average cash each customer drops each month — some of those dots are way up there! Then, I got the total revenue by customer ID in a bar chart that kind of looks like a city skyline. I pie-charted the new versus returning customers to show how many are sticking around. Lastly, I got the return rate by what is selling in a bar chart that hopefully doesn't look too much like a game of Tetris.

Product Analysis Dashboard

Last but not least, let's talk about products. I created a bar chart to guess how fast we are running out of stuff, which is super important for keeping our virtual shelves stocked. There's a line graph showing which products are the hot tickets over the last two years and also tracking all the good stuff that's flying off the shelves with another bar chart that shows positive sales only. But hey, not everything's a hit, so charted the stuff that's coming back to us in an area chart. And finally, got a return rate percentage bar chart — kind of hoping the bars stay low on that one.

Resultant Dashboard Tables:

These will be meticulously composed tables that crystallize the essence of each dashboard's analysis into an organized matrix of findings.

Conclusion

This expedition through the data demystified the multifaceted realm of online retail. Notable were the rhythmic fluctuations in sales through the year, the critical role of nurturing customer loyalty, and the significant sway product stewardship holds over the commercial well-being. The crafted visualizations brought to light strategies ripe for implementation, like precision-targeted marketing at peak periods and judicious inventory management. Additionally, the development of DAX formulas to create new columns enhanced our analytical capabilities, allowing for more refined data manipulations and insights. The collective insights gleaned from the dashboards vividly illustrate the layered intricacies of online retail and the indispensable power of analytics in steering the commercial ship.