Edy Stores Data Analysis

Introduction:
Edy Stores is an e-commerce platform helping small businesses in Nigeria thrive online. They provide tools for online store creation, inventory management, sales tracking, and more.

Data Cleaning and Transformation:
From the Excel file, I observed inconsistencies in the order_id and store_id columns. To begin, I converted the Excel file into a CSV format and loaded it into my Python script for processing. Using the script, I checked for missing values, which turned out to be zero. I then ensured that the date column was properly formatted and verified that key columns, such as revenue and quantity_sold, had no inconsistencies.
Next, I checked for duplicate records and removed all duplicates to maintain data integrity. To address the inconsistencies in store_id and order_id, I assigned unique identifier numbers to these columns.
I also added new columns to enhance analysis, including:
● Revenue per Unit: To understand unit-level revenue.
● Month and Year: To enable easy filtering.
● Week: To accurately study sales trends over time.
● Revenue Group: Grouping revenue into "low," "medium," and "high" categories for quick identification of sales performance.
After cleaning and transforming the dataset, I saved the updated file as a new CSV, ready for analysis. This process ensured the data was consistent, structured, and optimized for insights.

Exploratory Analysis:
Using Python, I conducted an exploratory analysis of the dataset, uncovering the following insights:

Product Performance Analysis
1. Product Category Sales Performance:
○ Food was the leading category in terms of quantity sold during January and February, demonstrating consistent demand across the first quarter. However, Beauty products outperformed Food in March, highlighting a shift in customer preference for that month.

○ Cumulatively, Food emerged as the top category over the three months, with 9 units sold, emphasizing its sustained popularity.

2. Key Product Insights:
○ Plantain Chips was the most purchased product by quantity, with 5 units sold, suggesting its widespread appeal as a high-demand, low-cost item.
○ Smartphones, however, were the highest revenue-generating product at ₦120,000, reinforcing the significance of high-ticket items within the Electronics category.

3. Category Standouts:
○ Electronics led both revenue and relevance with Smartphones driving performance. ○ Beauty products like Perfume (₦15,000 revenue) and Lipstick (highest quantity sold) were top performers in their category. ○ Within Fashion, Sneakers achieved the highest revenue (₦18,000), while Ankara Dresses saw notable unit sales.
○ Lower-performing categories like Books and Home Decor showed potential through items such as Cookbooks and Wall Art.
Revenue Growth and Trends

4. Weekly and Monthly Sales Growth: ○ Week 2 recorded an exceptional revenue spike (₦123,500), surpassing all other weeks by a significant margin. This was a result of referrals — a marketing channel campaign worth replicating. ○ Monthly revenue analysis revealed January as the strongest month (₦164,000), followed by a sharp decline in February (₦38,500) and a moderate recovery in March (₦45,000). This downward trend underscores the need to stabilize post-peak performance.

5. Revenue by Product Category:
The top 5 performing product categories are ○ Electronics ₦145,000 ○ Fashion ₦40,500 ○ Beauty ₦25,500 ○ Home Decor ₦25,000 ○ Food ₦7,500 ○ Books ₦4,000
○ Electronics which generated the highest total revenue (₦145,000), far surpassing other categories. Fashion (₦40,500) and Beauty (₦25,500) also contributed significantly. ○ Food, despite being the most sold category by quantity, accounted for only ₦7,500 in revenue, highlighting its position as a volume-driven, low-cost segment.

6. Average Revenue Per Category: ○ Electronics products averaged ₦48,333 in revenue per item, demonstrating their high-value nature. ○ Beauty, Home Decor products and Fashion averaged around ₦8,500, ₦8,333 and ₦8,100 respectively, indicating mid-range pricing. Books and Food had the lowest averages of ₦2,000 and ₦2,500 respectively, reinforcing its lower price points.

Customer Insights

1. Top Customers: ○ Customer C003 was the highest spender, contributing ₦120,000, primarily through the purchase of a Smartphone. Other high-value customers included C148 (₦18,000) and C149 (₦15,000), both favoring premium products.
○ High-revenue customers predominantly purchased Electronics, Fashion, and Beauty products, underlining a preference for premium categories.

2. Customer Purchase Behavior:
○ High-value customers displayed a preference for premium and high-price products. Strategic initiatives like loyalty programs, exclusive bundles, and personalized offers for this segment could drive repeat purchases.
Marketing Channel Performance

3. Channel Effectiveness: ○ Referral programs proved to be the most effective, generating ₦170,000 in revenue. This underscores the importance of Edy Stores leveraging customer networks through well-structured incentive programs.
○Social Media was the most frequently used channel but contributed less revenue (₦34,500) compared to Referral and Search channels (₦43,000). Optimizing social media campaigns for higher conversions could improve its performance.

Revenue by Store Plans
1. Store Plan Insight:
○ Stores on the Premium plan achieved the highest revenue (₦176,000), followed by Basic (₦48,000) and Free (₦23,500) plans.

Correlation Analysis
As part of my analysis, I also conducted a correlation analysis to understand the relationships between key variables in the dataset. Here's what I found:

Revenue and Quantity Sold:
● The weak negative correlation (-0.185) suggests that high-revenue products tend to be sold in smaller quantities. This aligns with the findings that premium products, such as Electronics (e.g., Smartphones), contribute significantly to revenue despite low unit sales.

Revenue and Store Plan:
● The near-zero correlation (-0.028) indicates little to no direct relationship between the store plan and total revenue generated. This highlights the importance of focusing on customer behavior within each store plan tier to drive growth rather than expecting revenue increases solely due to plan upgrades.
Revenue and Marketing Channel:
● The moderate positive correlation (0.369) underscores the role of marketing channels in driving revenue. Channels like Referrals and Search are effective in generating revenue, suggesting the need for strategic investment in these areas.
Quantity Sold and Store Plan:
● A weak positive correlation (0.104) suggests that the quantity sold is slightly higher for customers on specific store plans, potentially the lower-tier plans. This behavior could indicate higher-volume purchases of lower-priced items among Basic and Free plan users.
Quantity Sold and Marketing Channel:
● A moderate negative correlation (-0.374) suggests that certain marketing channels are more effective for promoting high-value products (low quantity, high revenue), whereas others may attract purchases of low-cost, high-quantity items. For example, Social Media campaigns might favor volume-driven categories like Food, while Referrals may work better for premium categories.
Store Plan and Marketing Channel:
● The weak negative correlation (-0.159) indicates a minimal relationship between the type of store plan and the marketing channels used. This suggests that customer behavior and channel preferences may vary independently of their subscription level.

Visualization:
I created interactive dashboards in Power BI to effectively present the key findings from the analysis. The dashboards highlighted critical metrics and trends, making it easier to communicate insights.

Key visualizations included:
1. Total Revenue and Quantity Sold
2. Revenue by Store Plan
3. Revenue by Marketing Channel
4. Top-Selling Products
5. Weekly Sales Trends
6. Top 10 Customers

Recommendations:
After analyzing the data, I've identified a few actionable strategies that could help Edy better support small businesses while driving growth and engagement. Here's what I suggest:
1. Empower High-Performing Categories:
● Encourage stores to prioritize high-demand categories like Food by offering bulk sale incentives or subscription plans.
● Highlight premium products such as Smartphones through targeted marketing and product bundling (e.g., phone accessories).
2. Boost Underperforming Categories:
● Provide promotional campaigns for categories like Books and Home Decor to attract niche audiences.
3. Maintain Revenue Growth:
● Help stores replicate successful promotional strategies from high-performing weeks (e.g., referral campaigns).
● Recommend season-specific campaigns, such as Valentine's Day or back-to-school promotions.
4. Retain High-Value Customers:
● Encourage stores to implement VIP loyalty programs and exclusive offers to ensure repeat purchases from top customers.
5. Optimize Marketing Channels:
● Strengthen referral programs with tiered incentives.
● Enhance Social Media campaigns by targeting specific customer segments and aligning ads with high-performing product categories.
6. Data-Driven Personalization:
● Use insights to tailor marketing for stores. For example, encourage referrals for high-price items and social media for volume-driven products like Plantain Chips.