Project Name

Global Electronics Retailer Data Analysis

Prepared By (United Group Team)

1- Maged Abdelrazik Ahmed

2- Omar Ahmed Elsyed

3- Salma Amr Abdelmotaleb Aly

4- Dena MOHAMED Khalefa

Supervised By (ENG / Mennatallah Selim Mohamed)

Group Code (CAI1_DAT1-G11d Data Analyst Specialist)

Table of Contents :

Executive Summary:

Sales data for global electronics retailer, including tables containing information about transactions, products, customers, stores and currency exchange rates.

Introduction

Global Electronic retail, which runs a worldwide company to sell different electronics products for its customer. retail time series data for Global Electronic were provided including details on the customer and location, product, sales, store, and delivery.

1- Data Set Overview

This report presents a comprehensive analysis of Global Electronics' customer, product, sales, and store data .

- **Data Type: CSV**
- **Data Structure:** Multiple tables
- **Number of Records:** 62,884
- **Number of Fields:** 37
- **Description:** Transactional data for a global electronics retailer ,
- Customers: Information on customer demographics and locations.
- Sales: Data on sales transactions, including order details and dates.
- Products: Details about products, including costs, prices, and categories.
- Stores: Information on store locations, sizes, and operational dates.
- Exchange Rates: Historical exchange rates for various currencies

Table	Field	Description
Sales	Order Number	Unique ID for each order

Sales	Line Item	Identifies individual products purchased as part of an order
Sales	Order Date	Date the order was placed
Sales	Delivery Date	Date the order was delivered
Sales	Customer Key	Unique key identifying which customer placed the order
Sales	Store Key	Unique key identifying which store processed the order
Sales	ProductKey	Unique key identifying which product was purchased
Sales	Quantity	Number of items purchased
Sales	Currency Code	Currency used to process the order
Customers	CustomerKey	Primary key to identify customers
Customers	Gender	Customer gender
Customers	Name	Customer full name
Customers	City	Customer city
Customers	State Code	Customer state (abbreviated)
Customers	State	Customer state (full)
Customers	Zip Code	Customer zip code
Customers	Country	Customer country
Customers	Continent	Customer continent
Customers	Birthday	Customer date of birth
Products	Product Key	Primary key to identify products
Products	Product Name	Product name
Products	Brand	Product brand
Products	Color	Product color
Products	Unit Cost USD	Cost to produce the product in USD
Products	Unit Price USD	Product list price in USD
Products	Subcategory Key	Key to identify product subcategories
Products	Subcategory	Product subcategory name
Products	Category Key	Key to identify product categories
Products	Category	Product category name
Stores	Store Key	Primary key to identify stores
Stores	Country	Store country
Stores	State	Store state
Stores	Square Meters	Store footprint in square meters
Stores	Open Date	Store open date
Exchange Rates	Date	Date
Exchange Rates	Currency	Currency code
Exchange Rates	Exchange	Exchange rate compared to USD

Objectives

The main objective of this project is to cleaning data by Excel and Python then create an exploratory dashboard using Tableau to track the overall performance that helps decision makers ,customer satisfaction, optimize operations, and drive business growth by the data insight following :

- Sales and Revenue analysis.
- Customer behavior analysis
- Analyze Product performance and Product Categories .
- Diagnose store and delivery performance .

Recommended Analysis

1- What types of products does the company sell, and where are customers located?

2- Are there any seasonal patterns or trends for order volume or revenue?

3- How long is the average delivery time in days? Has that changed over time?

4- Is there a difference in average order value (AOV) for online vs. in-store sales?

Datasets analysis Methodology Tools :

The analysis utilized datasets on customers, products, sales, stores, and currency exchange rates. data was cleaned and merged to perform comprehensive exploratory data analysis (EDA) use more tools for analysis these dada excel Python Tableau and Power Bi .

Data Cleaning and Preparation:

Assumptions were made regarding data completeness and accuracy. Limitations include potential biases due to missing or incorrect data entries.

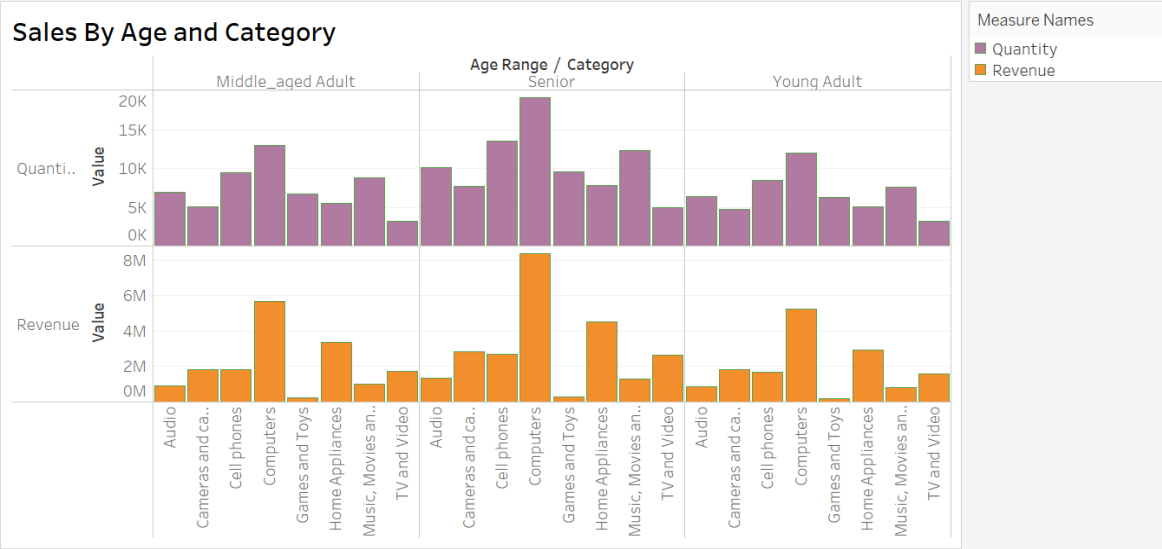
1- Merge all tables into one table using Excel power query.
2- Start cleaning process Using python:

- Convert Customers City into Title Case.
- Fill nulls in column Stores Square Meters.
- Calculated columns like:

  Customer Age(Today-Customers Birthday) ,
  Age Range(Young Adult(20-40),Middle_aged Adult(41-60),Senior(above 61)),
  Delivery Time(Delivery Date – Order Date),
  Order Status(IF StoreKey == 0 then “Online”, else “In-Store”)
  Revenue(Unit Price USD*Quantity),
  Cost(Unit Cost USD*Quantity),Profit(Revenue-Cost).

- Missing values were handled appropriately.
- Data types were corrected.

- Outliers were treated to avoid skewed analysis.
- Data was standardized and normalized where necessary.



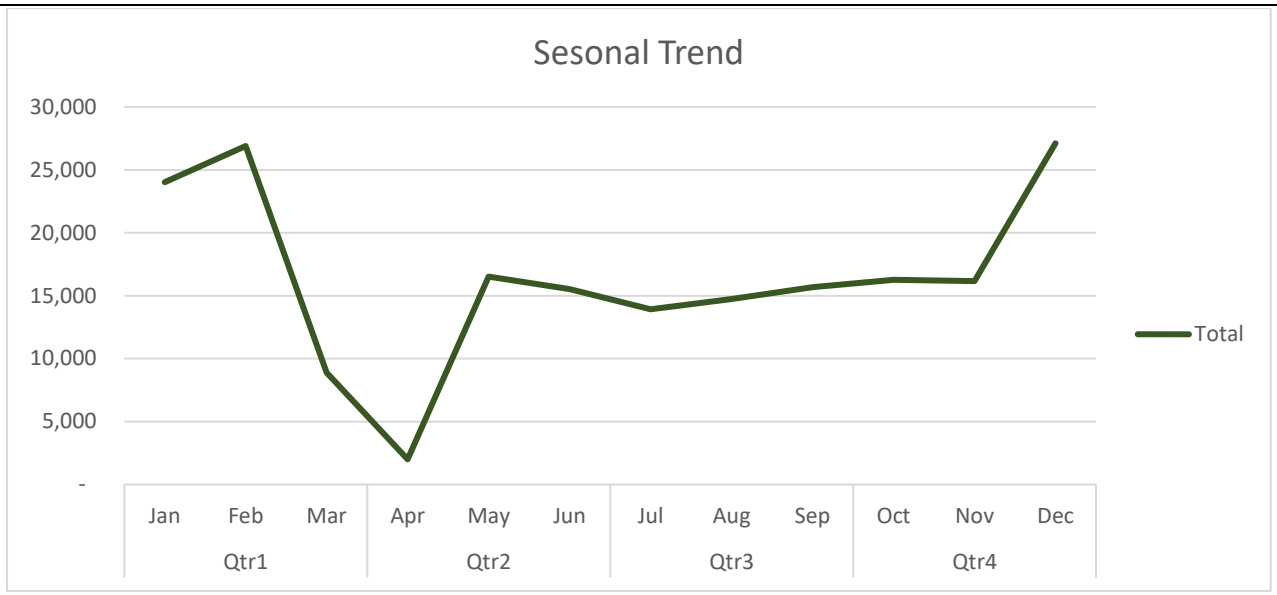
Data Cleaning Steps:

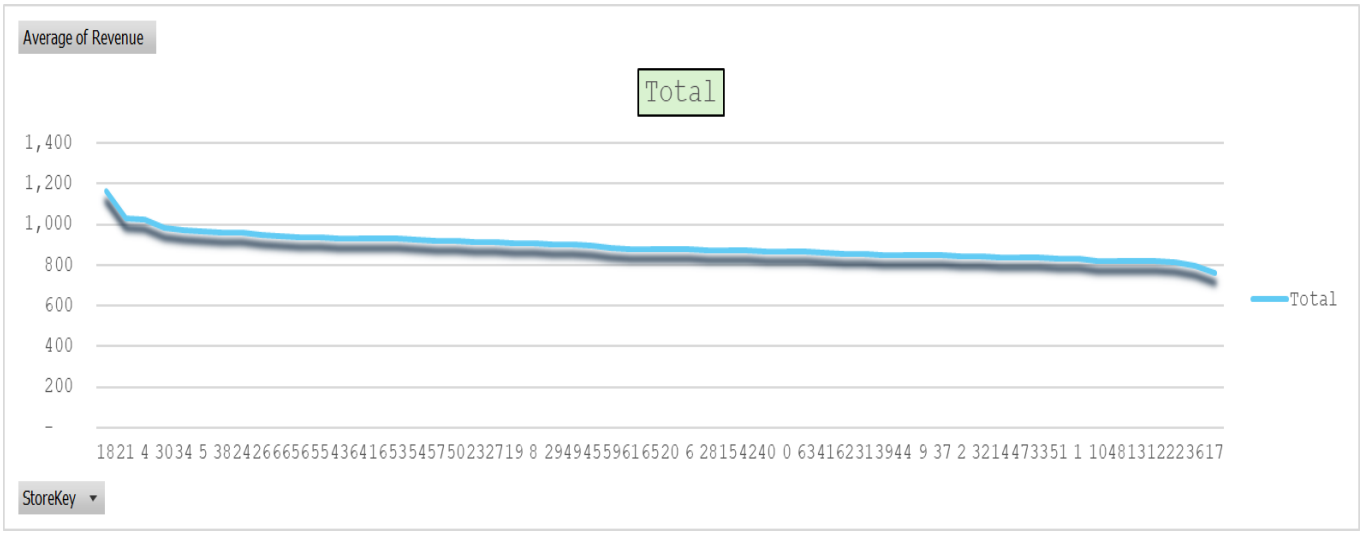
- Handling Missing Values: Identify and treat missing values (Remove rows/columns, Impute missing values).
- Handling Outliers: Identify and treat outliers (Remove outliers, Cap outliers).
- Correcting Data Types: Ensure appropriate data types for each column.
- Standardizing and Normalizing Data: Standardization and normalization.
- Removing Duplicates: Ensure no duplicate records.
- Handling Inconsistent Data: Correct data entry errors.

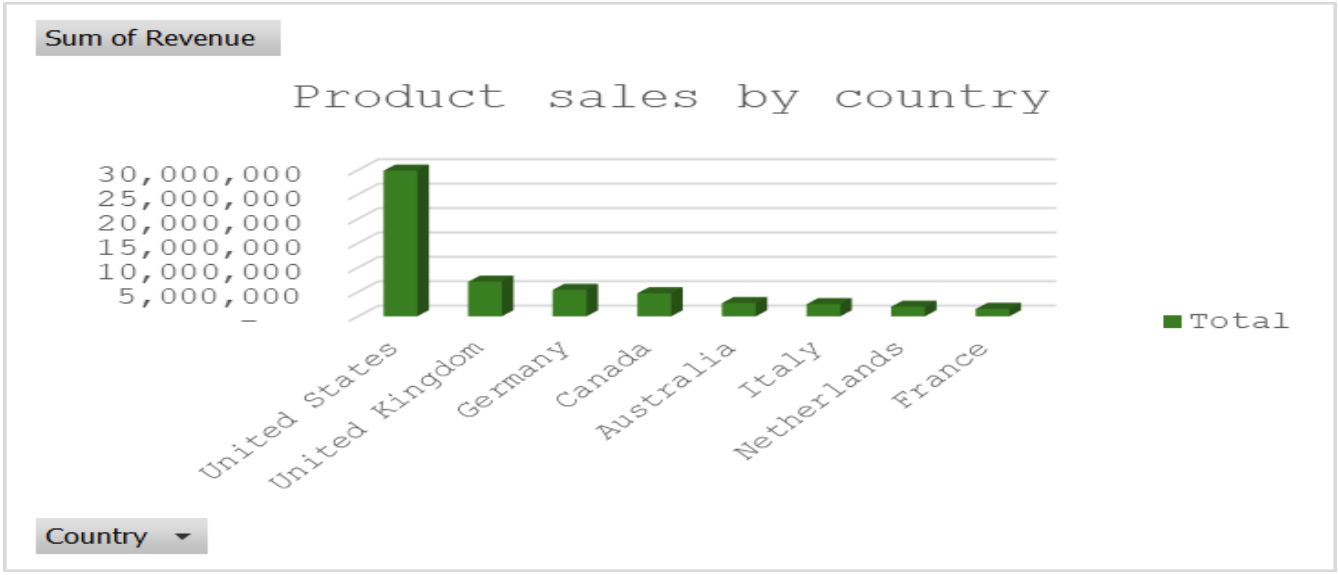
2- Analysis and Insights :

- Highest Sales and Revenue are recorded in the holiday season of Dec- Feb, contributing 40% of the Total Sales and decline during the summer months.
- Offline Sales drive 80% of the revenue.
- Products falling in the Music/Movies/Audio category have the highest Profit Margin of 60%
- Over 5 years, the Average Delivery Time is reduced by 50% (8 days to 4 days).
- The US contributes to 55% of Online Orders.
- The rate of acquiring New Customers has reduced by 65% between 2019 - 2021.
- The rate of Returning Customers increased by 50% between 2018-2021.

April records the highest churn rate over 400%, each year.


Sesonal Trend
30,000
25,000
20,000
15,000
10,000
5,000
-
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Qtr1
Qtr2
Qtr3
Qtr4
Total


Average of Revenue
Total
1,400
1,200
1,000
800
600
400
200
-
1821 4 3034 5 382426665655436416535457502327198 29494559616520 6 28154240 0 634162313944 9 37 2 3214473351 1 104813122236 17
Total
StoreKey


Sum of Revenue
Product sales by country
30,000,000
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
-
United States
United Kingdom
Germany
Canada
Australia
Italy
Netherlands
France
Total
Country

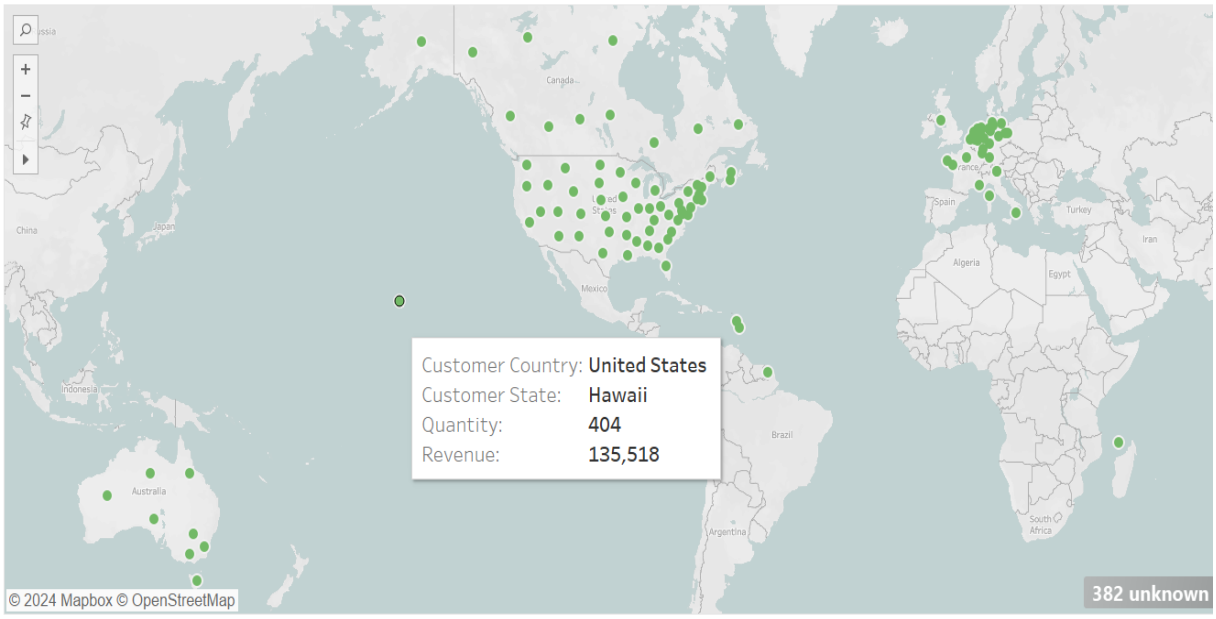
Customer Analysis :

- Demographic Distribution: Analyzed customer demographics by gender, age, and location.
- Purchase Patterns: Identified average order value, frequency of purchases, and preferred products.
- Customer Segmentation: Segmented customers based on demographics and purchasing behaviours to identify key customer groups.

Sales Analysis :

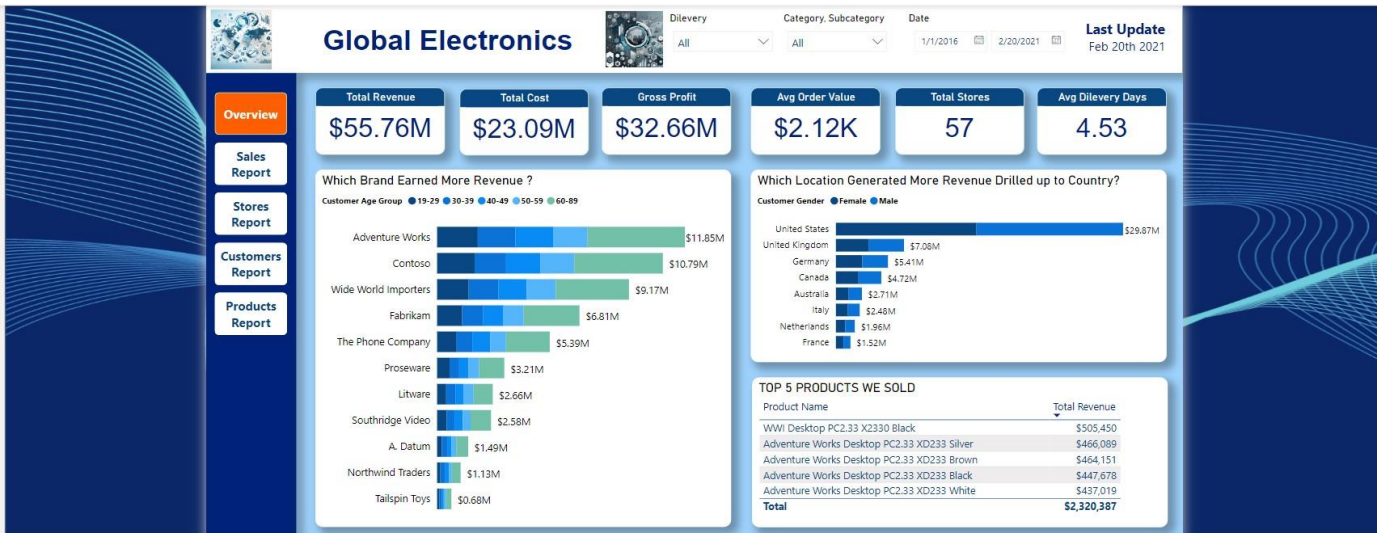
- Overall Sales Performance: Analyzed total sales over time to identify trends and seasonality.
- Sales by Product: Evaluated top-performing products in terms of quantity sold and revenue generated.
- Sales by Store: Assessed the performance of different stores based on sales data.
- Sales by Currency: Examined the impact of different currencies on sales, considering exchange rates.

Sales and Revenue By Customer City



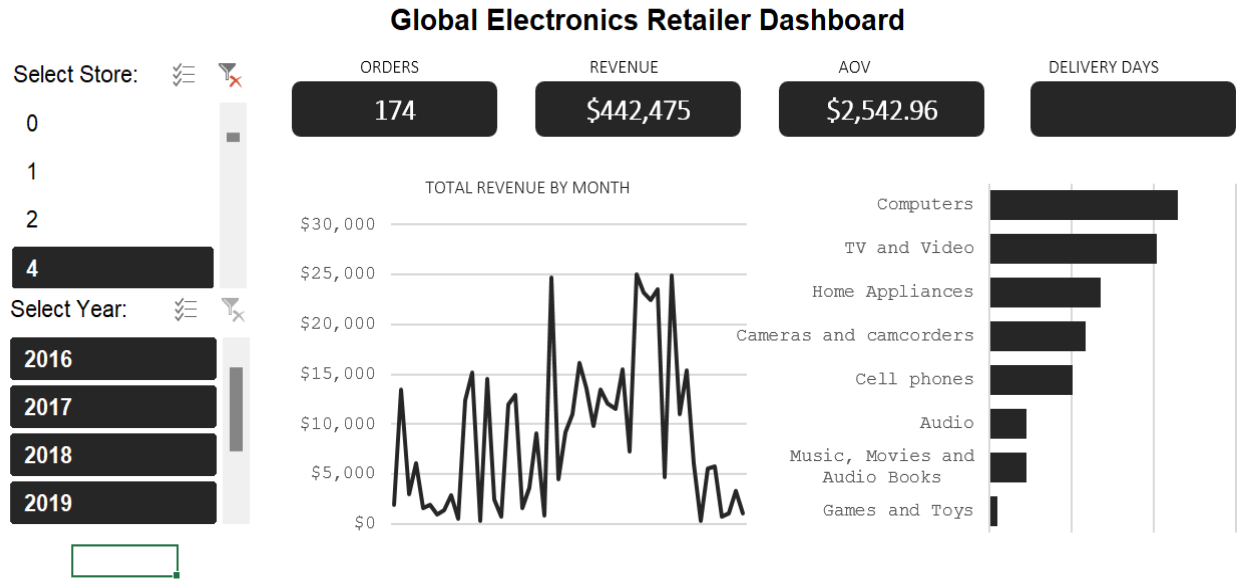
Product Analysis :

- Product Popularity: Identified the most and least popular products based on sales data.
- Profitability Analysis: Calculated profit margins for products by comparing unit cost and unit price.
- Category Analysis: Analyzed sales performance across different product categories and subcategories.



Store Analysis :

- Store Performance: Evaluated store performance based on sales, size, and operational data.
- Geographical Analysis: Analyzed sales by store location to identify high-performing regions.



3- <u>Actionable Recommendations :</u>

Marketing Strategies :

- Targeted Campaigns: Develop campaigns tailored to specific customer segments based on demographics and purchasing behaviour.
- Marketing Focus Areas: Identify key areas for future marketing efforts to maximize reach and engagement.

Inventory Management:

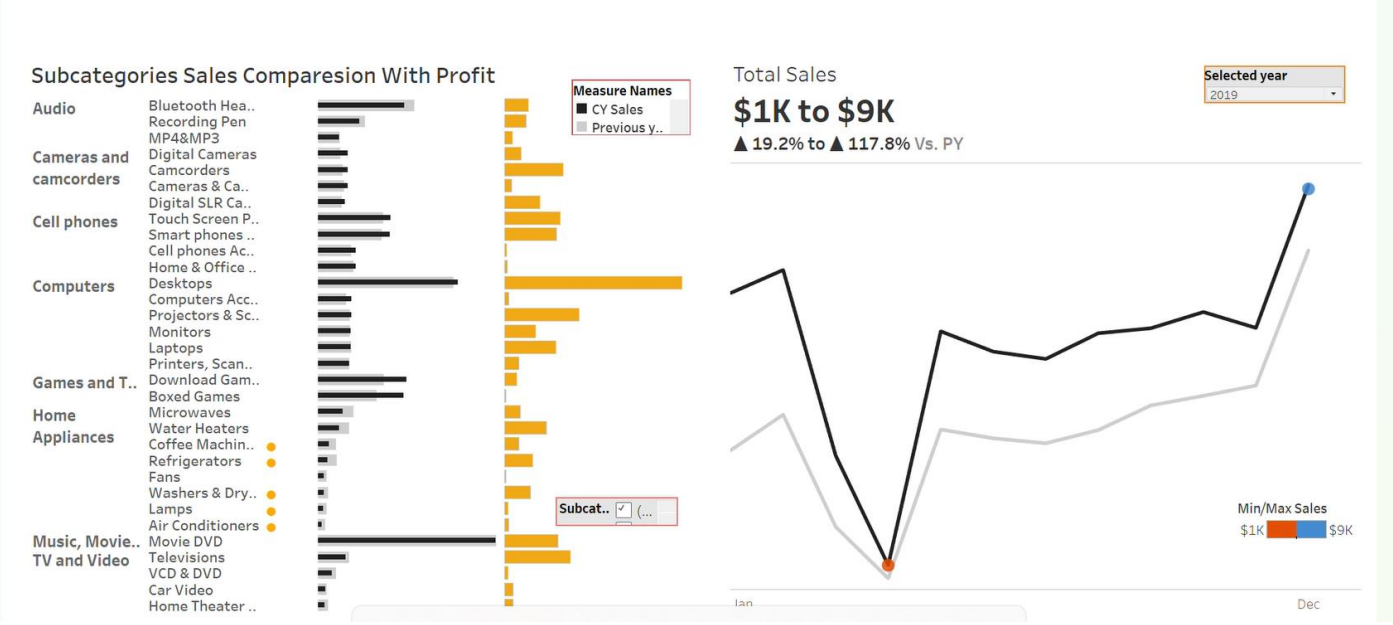
- Stock Management: Implement strategies to optimize inventory levels based on sales trends and forecasts.
- Handling Slow-Moving Products: Develop approaches to manage and reduce slow-moving stock to minimize inventory costs.

Product Development :

- Focus Areas: Highlight areas for new product development based on customer preferences and market trends.
- Bundling Strategies: Implement effective bundling offers to boost sales and enhance product value.

Store Operations :

- Best Practices: Implement best practices from high-performing stores across the network.
- Operational Improvements: Recommend improvements for store operations to enhance efficiency and customer experience.



4- Areas for Improvement:

- Data Quality: Enhance data collection and storage processes to improve data quality and reliability.
- Optimize inventory based on sales trends.

- Customer Feedback: Implement a robust system for collecting and analyzing customer feedback to drive continuous improvement.

5- Conclusion :

The comprehensive analysis of Global Electronics' customer, product, sales, and store data has provided valuable insights into key customer segments, top-performing products, and stores. This analysis has highlighted the significant impact of currency exchange rates on sales and provided actionable recommendations for tailored marketing campaigns, optimized inventory management, enhanced international pricing strategies, and improved store operations. By implementing these recommendations, Global Electronics can enhance customer satisfaction, streamline operations, and drive business growth. The strategic focus on data analytics and sustainable practices will ensure the company remains competitive and responsive to market trends and customer needs.

6- References :

1. Global Electronics Customer Data
2. Global Electronics Sales Data
3. Global Electronics Product Data
4. Global Electronics Store Data
5. Global Electronics Exchange Rates Data
6. Python Libraries
7. Tableau and Power Bi Documentation