Empower Your Business Decisions with Data Insights at Global Electronics

Agenda/Overview ___

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1. Introduction

1.1 Objective: The purpose of this analysis is to understand the key drivers of sales, customer behavior, product performance, and store distribution.

1.2 Data Overview: The dataset consists of **62,884 records** related to sales, customers, products, and stores.

1.3 Tools Used:

1 SQLite

Reliable data storage and SQL query powerhouse

Pandas & Matplotlib

Dynamic data analysis and captivating visualizations

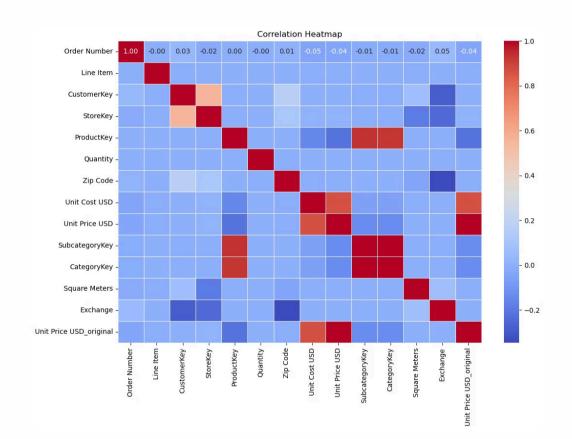
Power BI/Tableau

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Unlock stunning insights with these data visualization tools

2. Data Preparation

- **2.1 Data Cleaning**: The dataset was cleaned by handling missing values, converting date columns to datetime format, adjusting data types for numerical and categorical consistency, and applying categorical encoding to text-based columns.
- **2.2 Merging Datasets:** Sales data was merged with customer, product, and store information to analyze customer behavior, product popularity, and store performance.
- 2.3 Outlier Detection: Outliers were detected using Tukey's method, revealing 184 outliers in Square Meters and 5940 outliers in Unit Price.
- 2.4 Handling Outliers: I used Capping method to handle the outliers in Square meters and Unit price



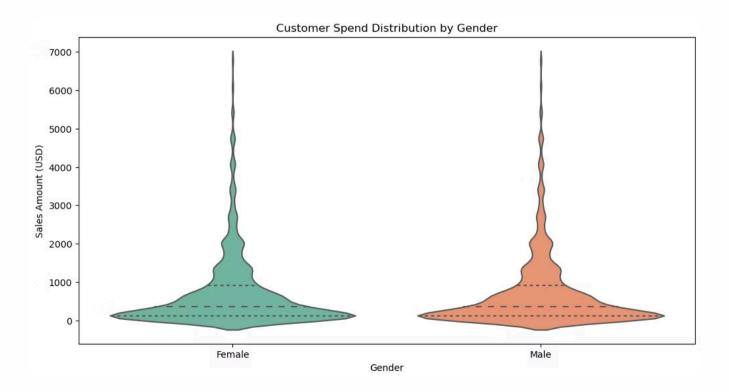
3.Exploratory Data Analysis (EDA)

Key activities in EDA include

The goal of EDA is to understand the data's underlying patterns, detect anomalies, test hypotheses, and check assumptions. It helps identify relationships, trends, and areas that require further analysis.

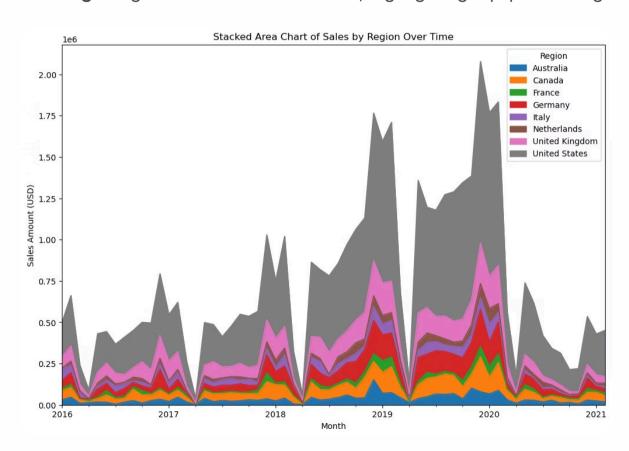
3.1 Customer Spend Distribution with Violin Plot

- Purpose: This plot shows the distribution of customer spending, helping to identify the spread of spending amounts and the concentration of customers in different spending brackets.
- **insights**: A violin plot can show the distribution of customer spend across different categories, such as age groups, gender, or location.



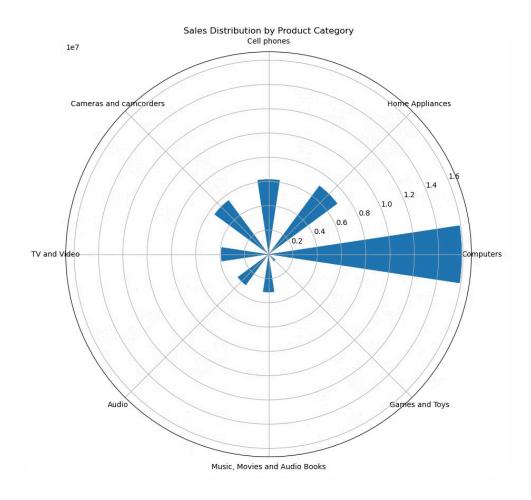
3.2 Stacked Area Chart of Sales by Region Over Time

- **Purpose**: The chart visualizes how sales vary by region over time, allowing us to track trends and identify seasonal patterns or regional performance differences.
- Insights: generate the most revenue, highlighting top-performing categories.



3.3 Circular Bar Plot of Product Category Sales

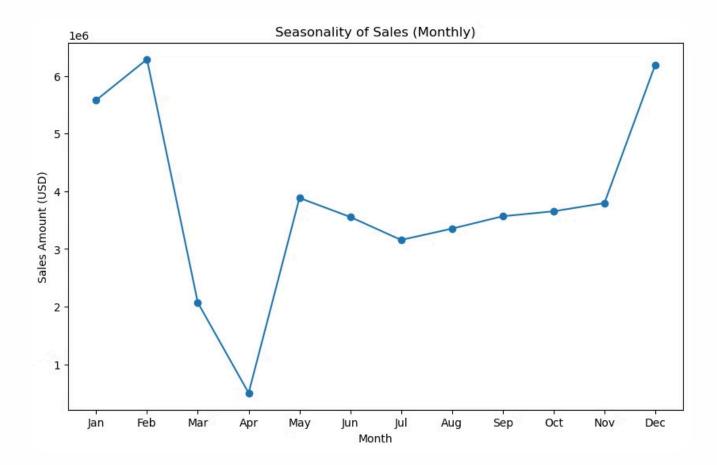
- **Purpose:** This plot provides a clear, circular view of the sales distribution across different product categories, making it easy to identify which categories perform the best.
- **Insights:** The circular bar plot visually represents the sales distribution by product category, highlighting that Computer products have the highest demand and perform the best in terms of sales.



3.4 Seasonality of Sales

Purpose: The purpose of this plot is to analyze the seasonal variations in sales by plotting sales data over time, such as monthly or quarterly, to identify trends and patterns that recur at specific times of the year.

Insights: The seasonality plot highlights periods of high and low sales throughout the year, allowing businesses to identify peak sales periods (such as holidays or end-of-year spikes) and slow periods. This helps in planning promotions, inventory, and resource allocation more effectively.



4.SQL Queries for Data Extraction and Analysis

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Customer Purchase Distribution

SQL Query:

SELECT CustomerKey,
COUNT(OrderNumber) AS
PurchaseCount FROM Sales
GROUP BY CustomerKey
Use Case: Identify the

most frequent buyers and analyze customer behavior.

Top-Selling Products

SQL Query:

SELECT ProductKey,
SUM(Quantity) AS
TotalSales FROM Sales
GROUP BY ProductKey
ORDER BY TotalSales DESC

LIMIT 10

Use Case: Discover the best-performing products based on sales volume.

Sales by Region

SQL Query:

SELECT Region,

SUM(SalesAmount) AS

TotalSales FROM Sales

GROUP BY Region

Use Case: Analyze sales performance by region to identify geographical

strengths.

Average Basket Size (Number of Products per Order)

SQL Query:

SELECT OrderNumber,

COUNT(ProductKey) AS

BasketSize FROM Sales

GROUP BY OrderNumber

Use Case: Understand the average number of products per order, which can inform marketing strategies.

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Discounted vs. Non-Discounted Sales Performance

SQL Query:

SELECT DiscountFlag, SUM(SalesAmount) AS

TotalSales FROM Sales
GROUP BY DiscountFlag

Use Case: Compare sales performance between discounted and non-discounted products.

Store Performance

SQL Query:

SELECT StoreKey,
SUM(SalesAmount) AS
TotalSales FROM Sales
GROUP BY StoreKey
Use Case: Evaluate the
performance of individual
stores and identify areas

for improvement.

Product Category
Performance

SQL Query:

SELECT Category,

SUM(SalesAmount) AS

TotalSales FROM Sales JOIN

Products ON

Sales.ProductKey =

Products.ProductKey

GROUP BY Category

Use Case: Analyze the sales contribution by each product category.

Customer Age Distribution

SQL Query:

SELECT

FLOOR(DATEDIFF(CURDATE

(), Birthday)/365) AS

AgeRange,

COUNT(CustomerKey) AS

CustomerCount FROM

Customers GROUP BY

AgeRange

Use Case: Segment customers based on age groups to target marketing efforts effectively.

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Product Return Rate

SQL Query:

SELECT ProductKey, COUNT(DISTINCT OrderNumber) AS TotalReturns FROM Returns GROUP BY ProductKey

Use Case: Identify products with a high return rate and assess product quality or satisfaction issues.

Customer Retention

SQL Query:

SELECT CustomerKey,

COUNT(DISTINCT OrderNumber) AS

RepeatPurchases FROM Sales GROUP

BY CustomerKey HAVING

Use Case: Identify repeat customers to measure customer retention and loyalty.

COUNT(DISTINCT OrderNumber) > 1

Relationship Between Store Size and Total Sales

SQL Query:

SELECT StoreSize, SUM(SalesAmount)
AS TotalSales FROM Sales JOIN Stores
ON Sales.StoreKey = Stores.StoreKey

GROUP BY StoreSize

Use Case: Analyze how store size correlates with sales performance to plan for future expansions.

5. Recommendations for Enhanced Performance

Win Over Loyal Customers

Insight: The Customer Purchase Distribution reveals your most loyal buyers and popular products.

Recommendation: Delight your top customers with personalized loyalty programs and tailored marketing.

Smart Pricing for Better Sales

Insight: The Discounted vs. Non-Discounted Sales analysis shows the impact of promotions on volume.

Recommendation: Experiment with pricing, using discounts for slower movers and premium pricing for high-demand products.

Keep Your Best Sellers in Stock

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Insight: The Top-Selling Products and Regional Sales data pinpoint your high-demand items and best-performing regions.

Recommendation: Strategically stock up on your hottestselling products and distribute inventory based on regional demand.

Improved Customer Segmentation

Insight: Customer Age Distribution helps target marketing by age groups.

Recommendation: Tailor promotions and advertisements based on age demographics to maximize engagement and sales.

Regions Optimization

Insight: Top-Selling Products and Sales by Region identify high-demand items and best-performing regions.

Recommendation: Allocate inventory based on regional demand and prioritize stock for high-demand products to reduce stockouts.

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Make Every Store a Top Performer

Insight: The Store Productivity and Optimal Store Size data reveal the blueprint for your high-performing locations.

Recommendation: Focus your expansion efforts on stores that match the winning formula, and optimize layouts for efficiency.

Get Ready for Busy Seasons

Insight: The Seasonality of Sales data highlights your peak and off-peak times.

Recommendation: Ramp up marketing and inventory ahead of high-demand seasons to maximize sales.

Dynamic Currency Adjustment

Insight:Currency exchange rates impact international sales profitability.

Recommendation: Implement a real-time pricing adjustment strategy based on currency fluctuations to protect profit margins in international markets.

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Offer Product Packs to Increase Sales

Insight: The Average Basket Size reveals your commonly purchased products together.

Recommendation: Offer bundled deals for frequently bought-together items to boost average order value.

6. Conclusion

Our analysis of Global Electronics' sales, customer behavior, and product performance reveals valuable insights that can drive smarter business decisions. By targeting high-demand products, optimizing store performance, and refining marketing strategies, we can effectively enhance customer satisfaction and sales. Implementing these data-driven recommendations—like creating product packs, adjusting pricing, and preparing for seasonal demand—positions us to increase profitability, streamline operations, and deliver greater value to our customers.

Thank you for your attention, and let's discuss how we can start implementing these strategies for maximum impact!

Connect with me:



