Sales Analysis & Visualization

Using Python (Jupyter) + Power BI

Year: 2019 (12 Months Data)

Unlocking Insights from 12 Months of Data

This presentation delves into the comprehensive sales data of 2019, showcasing our methodology for data preparation, analysis, and visualisation using powerful tools like Jupyter Notebook and Power BI.

Introduction: Our Sales Analysis Journey

This presentation outlines our comprehensive sales analysis for 2019, leveraging Python's Jupyter Notebook for data processing and Power BI for interactive visualization.

Data Collection

Collected 12 months of sales data (January - December 2019).

Data Cleaning

Systematically identified and removed anomalies, including null and NaN values.

Data Consolidation

Combined all monthly data into a single, unified table for consistent analysis.

Tool Integration

Utilized Jupyter Notebook for initial processing and Power BI for advanced insights.

Robust Data Preparation for Insightful Analysis

Rigorous data preparation was crucial to ensure the accuracy and reliability of our sales insights.

Initial Data Cleaning

We began by meticulously removing all null and NaN (Not a Number) values to ensure data integrity. This step is fundamental for accurate calculations and visualizations.

Feature Engineering

New, derived columns such as **Month**, **Hour**, and **City** were created from the raw date and address fields, enriching our dataset for deeper analysis.

Final Export & Readiness

The processed and cleaned data was exported as `twelve_months_data.csv`, making it perfectly structured and ready for seamless import into Power BI for visualization.

Key Performance Measures in Power BI

To gain comprehensive insights into sales performance, we defined several critical measures within Power BI.

Total Orders

The cumulative count of all unique transactions.

Total Quantity

The aggregate number of all products sold.

Total Sales

The sum of all revenue generated from sales.

Profit

Calculated as Total Sales minus Cost of Goods Sold.

Average Order Value

Total Sales divided by Total Orders, indicating typical transaction size.

Calculated Columns for Enhanced Analysis

To provide detailed segmentation and context for our data, we extracted and calculated specific columns within Power BI.

- **Month**

  Extracted directly from the **Order Date** column, allowing for monthly trend analysis and seasonal patterns.

- **Hour**

  Parsed from the **Order Date** timestamp, enabling us to identify peak sales hours and optimize operational efficiency.

- **Sales**

  A crucial calculation derived from multiplying **Price** by **Quantity** for each transaction, providing immediate revenue per item.

- **City**

  Derived from the **Purchase Address**, allowing for geographical sales performance comparisons and targeted marketing strategies.

Key Visualizations from Jupyter Notebook

Initial explorations in Jupyter Notebook provided foundational insights into our sales data through various chart types.

Monthly Sales Trends

Bar chart visualizing **Month vs Sales**, highlighting seasonal peaks and troughs throughout 2019.

Geographic Sales Performance

Bar chart illustrating **City vs Sales**, identifying top-performing urban markets.

Hourly Sales Activity

Line chart mapping **Sales vs Hours**, revealing optimal times for customer engagement.

Product Performance Analysis

Combo chart displaying **Product vs Quantity Ordered and Price**, offering insights into product popularity and revenue contribution.

Interactive Visualizations in Power BI (Part 1)

Power BI dashboards offer dynamic and interactive views, allowing for deeper exploration of sales data.

Total Sales by Month

A bar chart comparing total sales across each month of 2019, clearly identifying high-performing periods.

Product vs Quantity Ordered

A treemap providing a hierarchical view of products, sized by the quantity ordered, visually emphasizing best-selling items.

Interactive Visualizations in Power BI (Part 2)

Continuing our Power BI exploration, these visualizations provide further granular insights into product and geographical sales.

Total Quantity by Product

A bar chart showcasing the total quantity of each product sold, complementing the treemap by providing a direct comparison.

Total Sales by City

Another bar chart that ranks cities by their total sales, offering a straightforward view of top revenue-generating locations.

Geographical Sales Map: A bubble map illustrating sales by city, where bubble size correlates with total sales, providing an intuitive visual of market presence.

Enhancing Interactivity & Navigation

Our Power BI dashboard is designed for maximum usability and dynamic data exploration.

Product & Month Slicers

Interactive slicers allow users to filter data by specific products or months, instantly updating all visuals for focused analysis.

Icon & Background

Several icons and a background image is strategically is used in dashboard for intuitive recognition and quick navigation across the report’s analytical views..

Key Performance Indicators Indicators (KPIs)

Prominently displayed KPIs for **Total Sales**, **Profit**, and **Average Order Value (AOV)** provide at-a-glance performance tracking.

Key Insights & Strategic Observations

Our comprehensive analysis of the 2019 sales data yielded several critical insights for strategic decision-making.

Peak Sales Hours

Identified specific hourly windows with highest sales volumes, informing staffing and marketing campaign timing.

Top Cities & Products

Pinpointed the highest-performing cities and products, guiding resource allocation and inventory management.

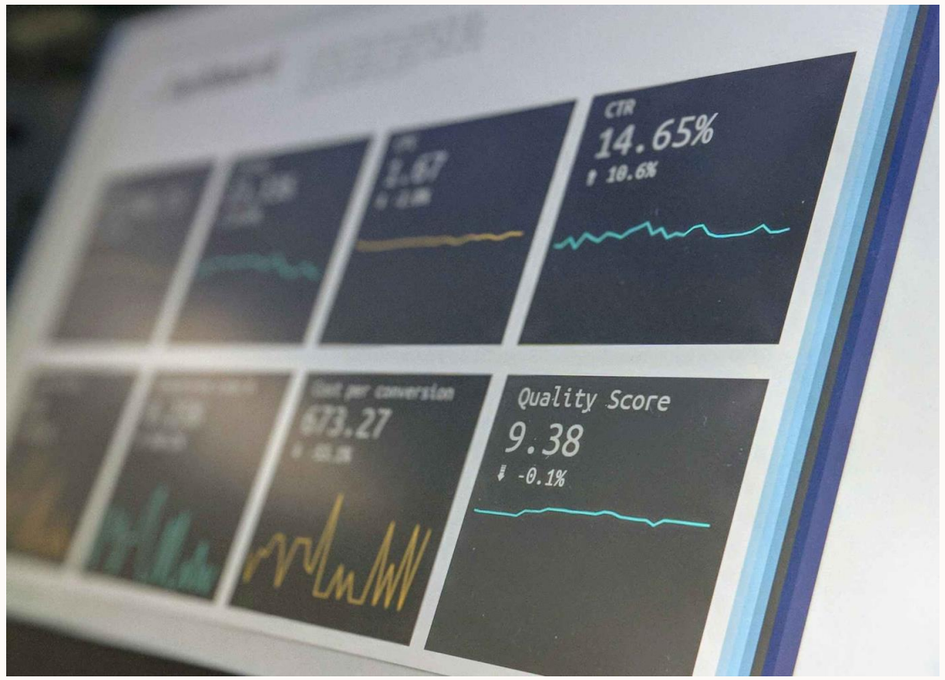
Seasonal & Monthly Trends

Understood cyclical patterns in sales, enabling proactive planning for promotions and demand forecasting.

Profitability Deep Dive

Utilized the 'Profit' measure to assess the financial health of various product lines and regions.

Thank You for Your Attention!



Links:

Email: richasingh19072003@email.com

GitHub: github.com/richasingh157