University for the Creative Arts

BERLIN SCHOOL OF BUSINESS & INNOVATION

Essay / Assignment Title:

Designing a sales Tableau Dashboard for a chosen company

Programme title: Visualization and Story Telling using Tableau

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CONTENTS

Contents

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INTRODUCTION

Problem Explanation: The most important problem this project needs to solve is the ability of retail businesses to make data-driven decisions from their sales data. Retailers like the fictional Superstore deal with voluminous sales, product, region, and customer segment-related information. Such data needs to be distilled into actionable insights of the kind: recognition of high-performing products, comprehension of geographical sales trends, and determination of the effect of discounts on profit. Without strong visualization of this information, it may be difficult for a business to make strategic decisions.

This project tries to address these challenges through the development of an enhanced dashboard in Tableau that would enable stakeholders to have an efficient view and exploration of sales performance, profitability, and trends in general.

Data Source Overview
The Sample Superstore dataset emulates retail data, providing a good understanding of a wide array of variables. The dataset contains the following:

Sales and Profit: Key measures that represent, respectively, the dollar amount of the sale and the profit realized from the sale.
Geographical Data: State-level information useful for regional performance analysis.
Product Attributes: Include product categories, product subcategories, and the actual name of the product.
Temporal Data: Dates of order and shipment allow time-based analysis to be done, such as growth over time or monthly trends.
Strengths
Extensive coverage: The dataset includes sales from various categories of products and from various locations.
Product and Segment Information: Product categories, sub-categories, and customer segmentations provide a number of ways to slice the data.
Date Information: The time-based fields, such as the Order Date, allow historical trend tracking and growth comparisons over time.
Limitations:
Data Quality: Geographical data has some unknown or missing values, which may damage regional analysis.
Limited to Global Scope: It focuses on U.S. sales, hence limiting its usefulness in case one has a business with international scope.

CHAPTER ONE (the number of Chapters could be more depending on the content)

2. Formulation:

Additional Attributes and Metrics:
Several calculated fields and custom metrics have been added to allow for more in-depth analysis:

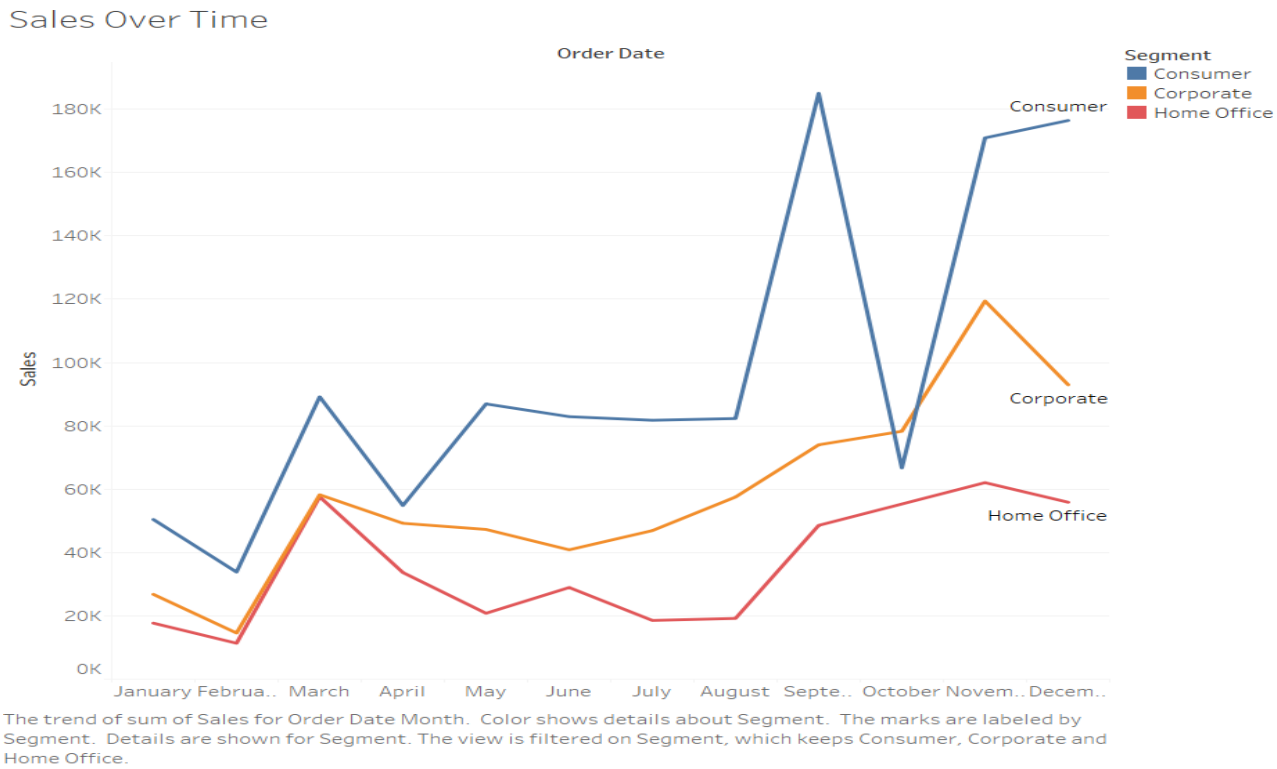
Profit Margin: (Profit / Sales) * 100, a calculated field providing additional information on profitability by showing the percentage of each sale deriving in profit, which is essential to define which products or regions are the most profitable.
Sales per Unit: This is derived by dividing the total sales by the quantity sold. It represents the average sale price of an item and can be useful in understanding product performance beyond total volume alone.
Year: This is derived from the Order Date field to ease the pain in analyzing sales over time. It is critical to determine the trends in sales, such as yearly sales growth and seasonality.
Dashboard Visualization:
This would be done in support of a whole view of business performance through various key visualizations, including:

Sales Over Time: This line chart is important for tracking how sales progress throughout the year and helps facilitate understanding about seasonality.
Top Products by Sales: A bar chart focused on best-selling products will let businesses identify exactly which products are top-performing.
Sales by Region: A map visualization helps analyze geographical sales trends, highlighting high and low-performing regions.
Profit vs. Discount: The scatter plot illustrates how discounting affects profitability, finding that sweet spot for the manager where the gap between sale promotion and profitability is balanced. Sales by Product Category: Pie chart or Bar chart-the contribution of each product category to the total sales. Yearly Sales Growth: Line chart year on year will give a visual impression of growth trends and help to get an idea of how the business has performed over time.

3. Implementation

Key Worksheets:

Sales Over Time (Line Chart):



The trend of sum of Sales for Order Date Month. Color shows details about Segment. The marks are labeled by Segment. Details are shown for Segment. The view is filtered on Segment, which keeps Consumer, Corporate and Home Office.

This graph depicts the trend of monthly sales between the three customer segments: Consumer in blue, Corporate in orange, and Home Office in red.

Consumer Segment:

The top sale of all segments was realized within this category, peaking in March and October.

From a relatively poor start, sales suddenly jump in March to about $100,000, and in October to about $180,000, so these two months are very important.

Corporate Segment:

Semi-similar to the Consumer trend but lower sales.

Peaks reached in March and October but at somewhat lower values of around $120,000.

Home Office Segment:

Lowest sales across the year; modest peakings in March and September.

Key Observations:

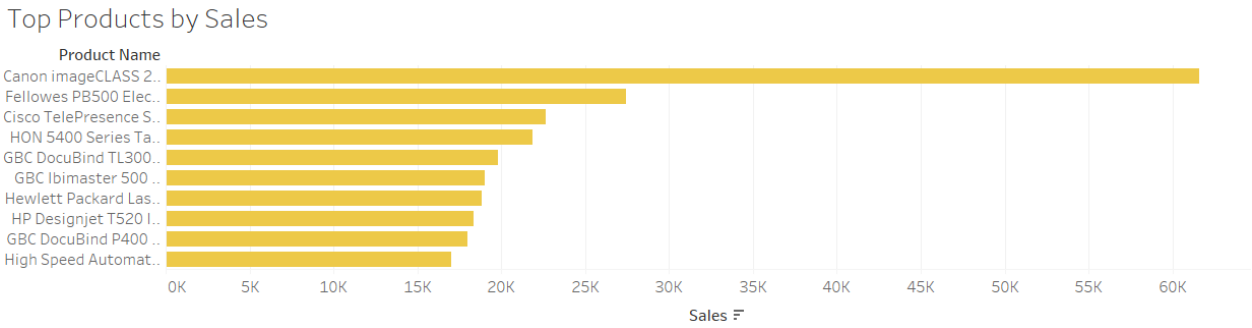
Seasonal Peaks in March and October suggest high-demand periods.

Consumer is the strongest segment, and investment here may drive profitability.

Home Office underperforms and needs a strategy reevaluation.

The graph in summary shows important seasonal trends and performance of segments to drive strategy decisions that will help optimize sales efforts and inventory.

Top Products by Sales (Bar Chart):



This is a column chart of the top 10 products by total sales. Each bar depicts the volume of sales for that product, so the longer the bar is, the greater the sales volume.

Canon imageCLASS 2 is the best-seller, with sales over $60K.

The runner-up is Fellowes PB500 with sales at about $50K.

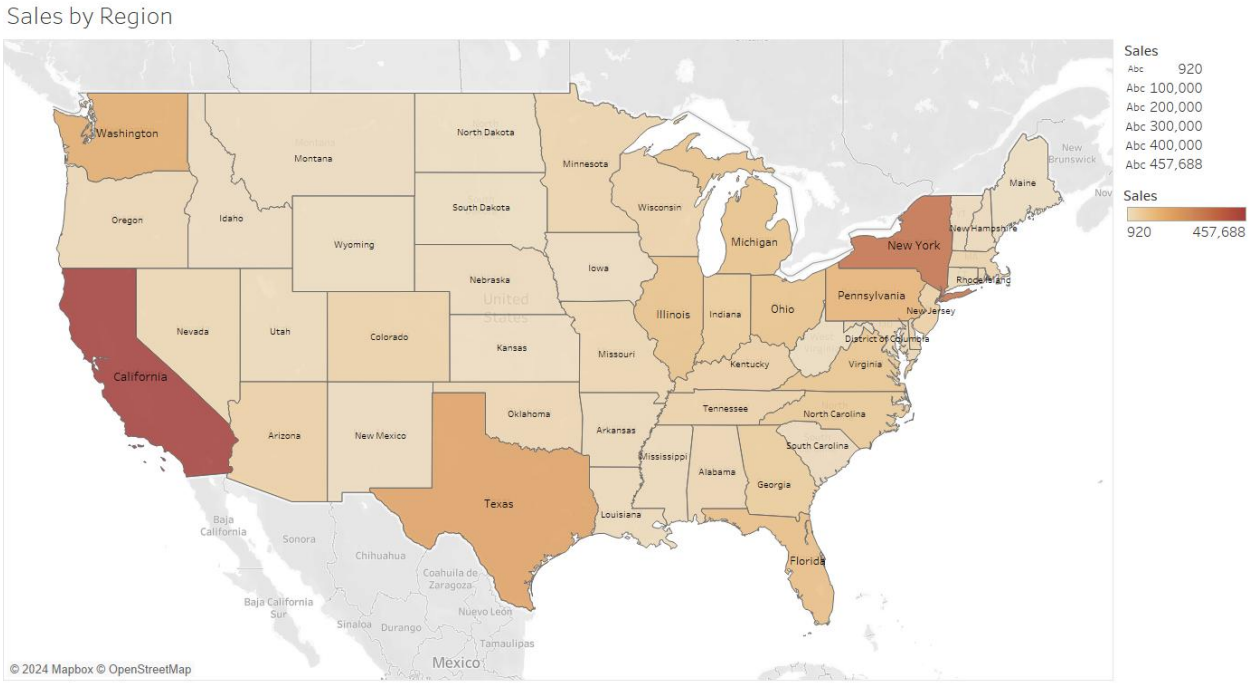
All other products-Cisco TelePresence, HON 5400 Series, and GBC DocuBind-have sales ranging between $20K and $35K.

Observations:

The high-performing products, such as Canon and Fellowes, significantly drive overall sales.

Increasing the investment either in the promotion or expansion of these top lines of products could further drive the growth in revenues. A chart like this will help in identifying key, revenue-driving products to target for strategic focus.

Sales by Region (Map):



Map based on Longitude (generated) and Latitude (generated). Color shows sum of Sales. Size shows sum of Sales. The marks are labeled by State. Details are shown for State. The data is filtered on Segment, which keeps Consumer, Corporate and Home Office. The view is filtered on sum of Sales and State. The sum of Sales filter includes everything. The State filter keeps 49 of 49 members.

This heat map signifies the sales data across various states in the United States, with darker shades showing the highest sales.

California has the best sales record, above $450K, reflecting dark red.

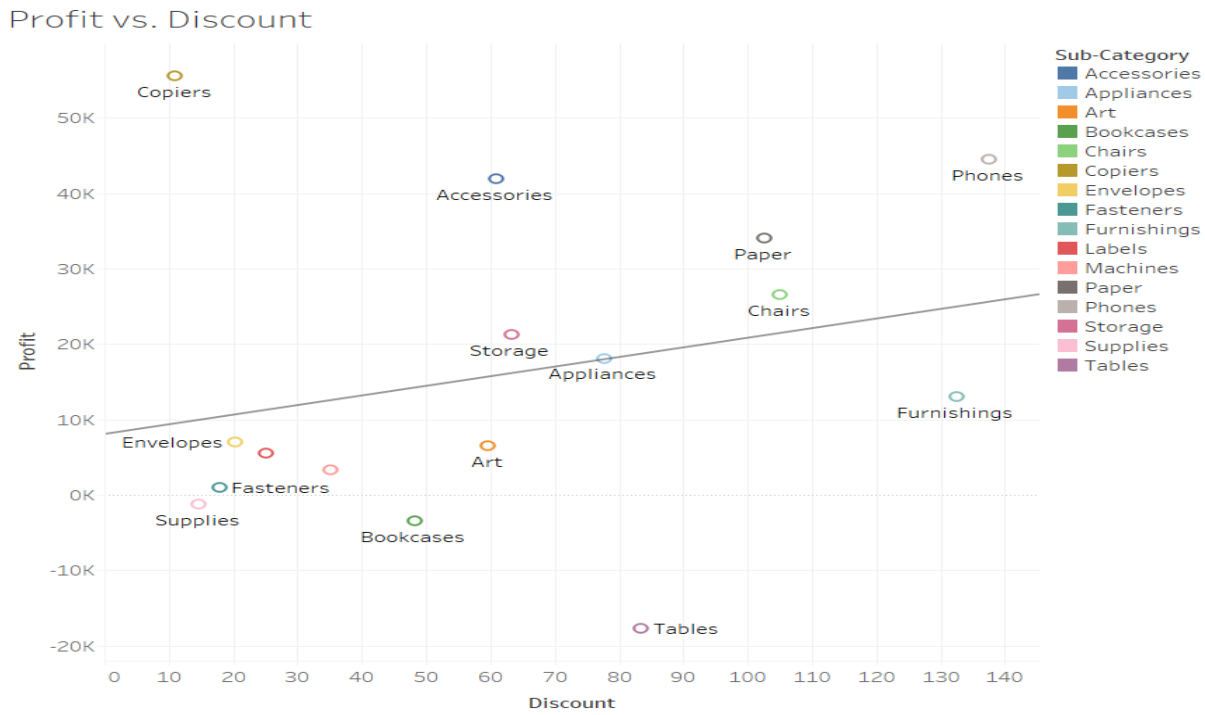
New York, Texas, and Washington are other states in the good-books, showing sales between $200K and $300K.

The light-colored states, such as Montana and North Dakota, show sales much below $100K.

Insights:

California is the dominant region for sales, although other populous states like New York and Texas are also among the top in large amounts. Some states reflect underperformance, which could indicate potential market areas that may need expansion or targeted marketing efforts. This map visually represents the regional distribution of sales and serves to indicate areas of high performance and opportunities for further growth.

Profit vs. Discount (Scatter Plot):



Sum of Discount vs. sum of Profit. Color shows details about Sub-Category. The marks are labeled by Sub-Category. The data is filtered on Segment, which keeps Consumer, Corporate and Home Office. The view is filtered on Sub-Category, which excludes Binders.

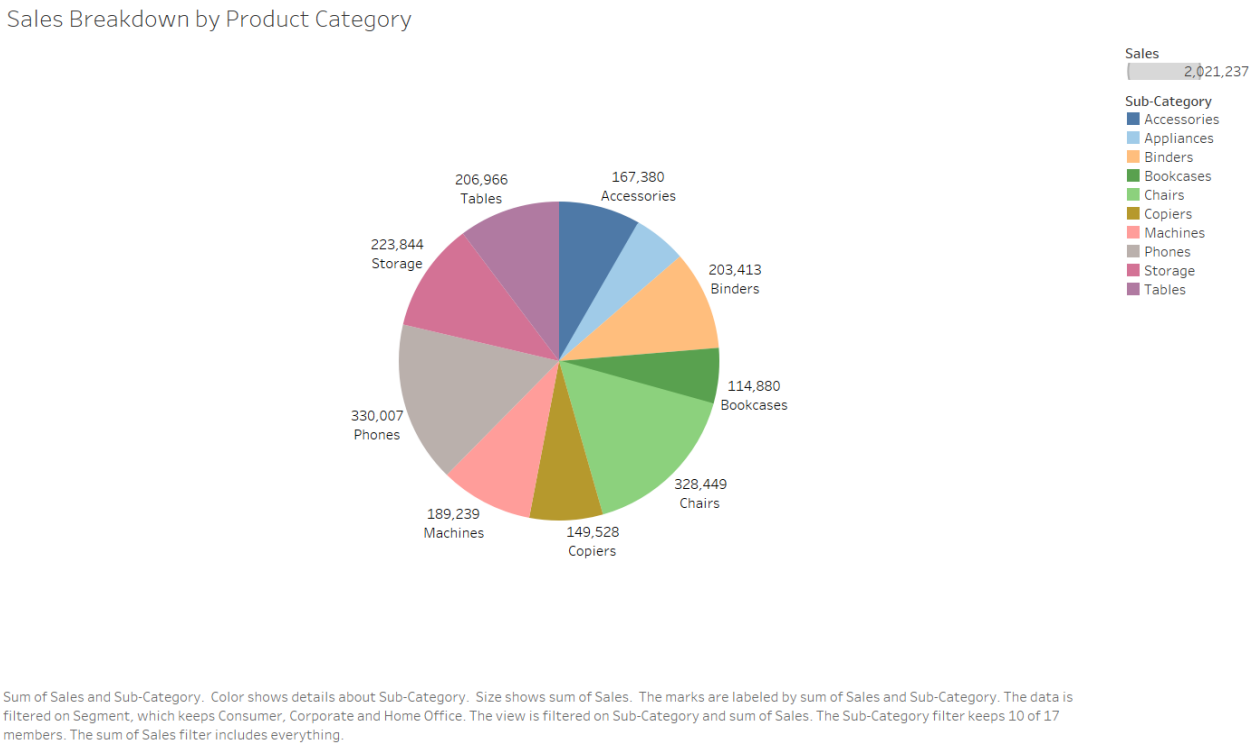
This scatter plot analyzes the relationship between profit and discount across different product sub-categories. Each point represents a sub-category, while the x-axis reflects the total discount and the y-axis reflects the total profit.

Maximum discounts can be given on Tables up to 130%, but the profit comes out to be negative, -20K. On the other hand, Copiers and Accessories result in high profitability with less discounting.

Whereas sub-categories such as Envelopes, Fasteners, and Supplies have small discounts with modest profits, the categories Furnishings and Phones have higher profits at moderate discount levels.

The overall trend line would show that profits decrease with an increase in the discount.

Sales Breakdown by Product Category (Pie/Bar Chart):



Sum of Sales and Sub-Category. Color shows details about Sub-Category. Size shows sum of Sales. The marks are labeled by sum of Sales and Sub-Category. The data is filtered on Segment, which keeps Consumer, Corporate and Home Office. The view is filtered on Sub-Category and sum of Sales. The Sub-Category filter keeps 10 of 17 members. The sum of Sales filter includes everything.

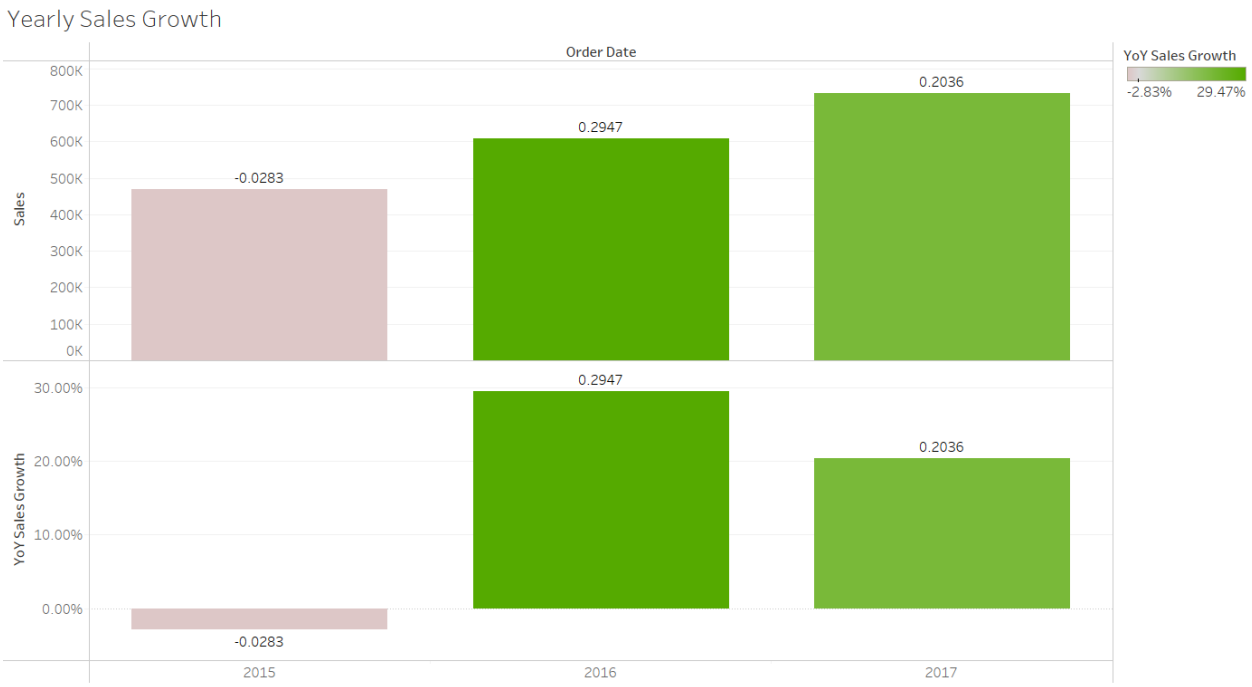
This pie chart also shows a segmentation of total sales across different sub-categories. It is observed from the pie that the size of each segment represents the proportion of sales contributed by that particular sub-category.

As can be seen, Phones, which are at 330K, and Chairs at 328K comprise the largest portions of the chart in terms of sales. Other significant contributors include Copiers, with 149K, and Binders at 203K.

Tables, Accessories, Bookcases show lower comparative sales figures of about 100-200K.

This chart helps in identifying which product category generates the highest revenue for the company.

Yearly Sales Growth (Line Chart):



Sum of Sales and YoY Sales Growth for each Order Date Year. Color shows YoY Sales Growth. The marks are labeled by YoY Sales Growth. The data is filtered on Segment, which keeps Consumer, Corporate and Home Office. The view is filtered on YoY Sales Growth, which keeps non-Null values only.

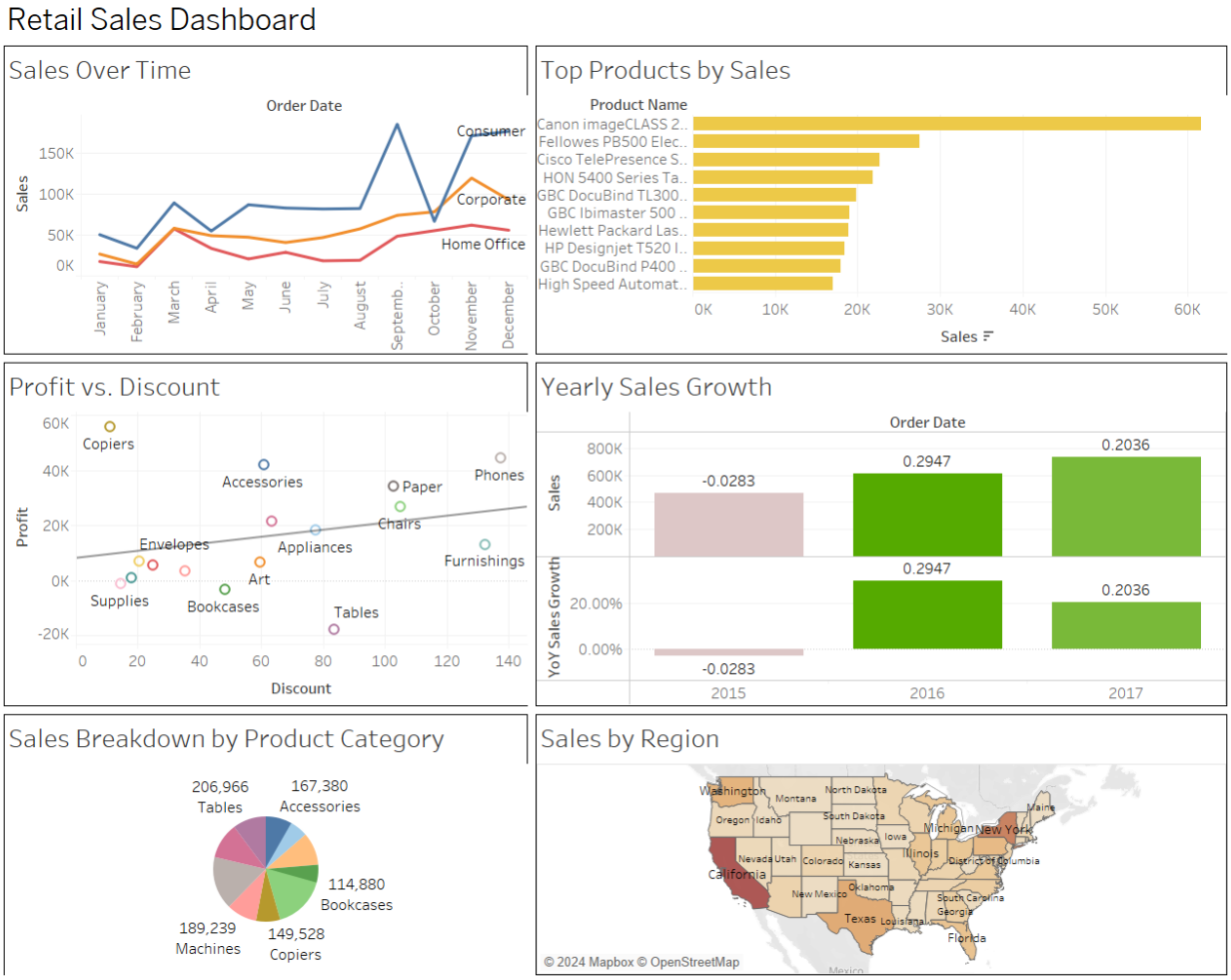
This bar chart depicts the YoY sales growth from 2015 to 2017. Bars have been drawn up to the height of overall sales in each year, and the percentage growth is labeled at the top of each bar.

Starting with 2015, the volume of sales was about 500K; sales have declined a little due to the -2.83% growth rate. However, the company witnessed a strong rebound in 2016 because the increase in growth rate was 29.47%, pushing the sales to over 700K.

The growth in 2017 kept the trend upwards but on a slower pace at 20.36% YoY. What that means is that although still positive, growth is decelerating after the sharp V-shaped recovery in 2016.

This chart shows that after the fall in 2015, the company's growth and recovery have been continuing smoothly.

Dashboard Design:



1. **Sales Over Time Top Left Graph Graph Type:** Line Chart Description: This chart depicts a trend of sales over time, from January to December, for three customer segments: Consumer, Corporate, and Home Office. Takeaway:

   Consumer sales are generally the highest throughout the year and peak sharply in the months of September and October.

   Corporate sales are generally stable but ramp up slightly towards the end of the year, peaking in November.

   Home Office has the lowest sales and has a consistent trend throughout the year. It gradually increases in October and November.

   Conclusion: Sales seem to increase in the latter part of the year; this may be due to seasonal effects, such as holiday sales.

2. **Top Products by Sales (Top Right Bar Chart)**

   Graph Type: Horizontal Bar Chart

   Description: The chart lists products by their performance and sales.

   Insights: Canon imageCLASS has, by far and away, the leading number of sales amongst those six products, while Fellowes PB500 Electric Punch takes second, trailed by Cisco TelePresence.

   In other product groups, including HON S400 Series Task Chair and GBC DocuBind TL3000, their sale figures are quite close with each other. This hints that after the top product, the rest are performing relatively balanced.

   Therefore, it is assumed that the portfolio is dominated by a few key items, mostly Canon imageCLASS, which might be the best-selling item or the most critical product for the company.

3. **Profit vs. Discount Middle Left Scatter Plot**

   Graph Type: Scatter Plot

   Description: The following scatter plot graph illustrates a relationship between discounts of products and their profitability.

   Insights: The highest profit of Copiers is realized with lower discounts.

   Accessories, Paper, and Phones are also positively correlated with the profit at a moderate discount level.

   Whereas Supplies group, Bookcases, and Art are in the lowest profit zone, even after increasing the discount on those items also, which shows the increment in discount on those categories doesn't help increase the profit of those.

   Some products, like Envelopes and Supplies have negative profit at all levels of discounts.

   Conclusion: Higher discount doesn't give higher profit for the items in categories like Supplies, Envelopes, and Bookcases. Copier and all those related categories generate more profit without huge discounts.

4. **Annual Sales Growth Middle Right Bar Chart Graph Type: Bar Chart Description:** The graph compares three years of growth in sales from 2015 to 2017. Insights: Sales growth decreased for the year 2015 when this negative growth reached -0.0283. Then there was a remarkable increase in 2016, with a positive value amounting to 0.2947. In 2017, the sales increased positively but at a lower rate compared to 2016, standing at 0.2036.

Conclusion: The business rebounded after the decline in 2015 and had a steady growth afterward; 2016 was the best in terms of growth. It is probable that the efforts of 2016 resulted in a sustained improvement.

5. **Sales Breakdown by Product Category (Bottom Left Pie Chart)**

Graph Type: Pie Chart

Description: This pie chart chart will be an overall sales breakdown against different product categories.

Insights to be gained:

This translates to mean that Tables is the highest contributor to sales with 206,966 sales, followed by Machines at 189,239 sales, Copiers at 149,528 sales, and Bookcases with 114,880 sales.

The tiniest is Accessories, which has 167,380 sales.

Conclusion: More often than not, larger product categories, especially tables and machines, are leading contributors to overall sales; thus, much more effort directed towards these product categories would likely result in higher revenues. 6. Sales by Region (Bottom Right Map)

Graph Type: Choropleth Map

Description: The map shows the geographic distribution of sales across the United States.

Observations:

California is the leading state in sales across the country, represented by the darkest color.

Other states with higher sales include New York, Texas, and Washington, represented through medium dark shades.

Central and some northern states, which include Montana and North Dakota, have the smallest sales, represented by light shades.

It follows that sales are higher in high-population states like California, New York, and Texas. Increasing marketing efforts in lower-performing states should eventually balance sales across the board.

Discussion

Risks:

Data Inaccuracy: Lack of geographical data would include records marked by their "unknown" region. This will provide faulty insight in the mapping of data. This is something that has to be fixed either by data cleaning or removing irrelevant records.

Over-Reliance on Discounts: Profit vs. Discount Scatter Plot shows that discounting drives sales but usually at the cost of profitability. It may be very risky to focus too much on the volume of sales without consideration for the long-term dynamics on profit margins.

Effectiveness:

It was able to make complex sales data easy and usable. The information is arranged in well-defined sections-sales performance, product performance, and regional analysis-so the dashboard will allow holistic business decision-making. One can immediately see from the dashboard which products and regions bring in the most revenue and profit and quickly adjust strategies accordingly.

Future Improvements:

Deeper customer segmentation: this might include more detailed customer-level information around age, gender, and purchase history to better target marketing and sales efforts.

More detailed profitability metrics: additional calculated fields, such as CLV or COGS, will provide greater depth in profitability analysis and will help a business to focus on the value of customers in the long run.

Forecasting: The predictive analytics integration will enable forecasting on certain resources, such as sales, which is derived from historical data. This would be useful to the management for strategic purposes.

BIBLIOGRAPHY

1. Dataset Source:

   https://www.kaggle.com/datasets/vivek468/superstore-dataset-final?resource=download

APPENDIX (if necessary)