

Sales Insights and Forecasting Dashboard: A Power BI Project

This project involves the development of a comprehensive **Sales Insights and Forecasting Dashboard** using Power BI. The dashboard provides a detailed analysis of sales data, allowing business stakeholders to monitor performance across various key metrics such as total sales, profit, sales by region, category, and payment mode. Additionally, the project incorporates time series analysis to forecast sales for the next 30 days, helping the business plan for future growth. The KPIs and visualizations are designed to offer actionable insights, aiding in data-driven decision-making.

About Power BI

Power BI is a powerful business analytics tool developed by Microsoft that enables users to visualize data and share insights across an organization. It connects to a wide range of data sources, enabling users to create real-time dashboards and interactive reports. Power BI's key strengths include its user-friendly interface, data modeling capabilities, and its integration with various advanced analytical tools, such as **DAX** (Data Analysis Expressions) for creating custom calculations, and built-in features for **data forecasting** and **trend analysis**. These capabilities make Power BI a popular choice for business intelligence and data visualization projects, as it empowers users to transform raw data into meaningful insights.

In this project, Power BI has been leveraged to deliver a clean and intuitive dashboard, utilizing its robust visualization tools and forecasting functions to provide valuable insights into sales performance and future trends.

- **Objective:** To contribute to the success of a business by utilizing data analysis techniques, particularly time series analysis, to provide valuable insights and accurate sales forecasting.
- **Data Source:** SuperStore Sales Dataset
- **Tools Used:** Power BI Desktop

1. Key Performance Indicators (KPIs)

The dashboard features the following KPIs to analyze and monitor business performance:

- **Sales by Segment:** Breakdown of total sales into Consumer, Corporate, and Home Office segments.
- **Sales by Payment Mode:** Distribution of sales based on different payment methods (Online, Cards, COD).
- **Sales by Region:** Analysis of sales contribution from East, South, West, and Central regions.
- **Total Sales:** The overall sales amount.
- **Total Profit:** The total profit earned from sales.
- **Total Quantity Sold:** The total number of units sold.
- **Average Days for Shipment:** Average time taken for shipments to be delivered.
- **Sales by Ship Mode:** Breakdown of sales based on shipment modes (Standard Class, Second Class, First Class, Same Day).
- **Sales by Category and Sub-Category:** Distribution of sales among different product categories (Technology, Furniture, Office Supplies) and their sub-categories (e.g., Phones, Chairs, Binders).
- **Monthly Sales and Profit Comparison:** Year-over-year comparison of monthly sales and profits, highlighting trends and performance.
- **Sales Forecasting:** 30-day sales forecast based on historical data, using time series analysis techniques.

2. Data Cleaning Process

- **Missing Values:** Handled missing or incomplete data to ensure clean and usable datasets.
- **Data Types:** Standardized data types (dates, numeric, categorical) for consistent analysis.
- **Duplicates:** Removed any duplicate records to maintain data integrity.
- **Outliers:** Detected and handled outliers in the sales and profit data that could skew results.

3. DAX Queries

- **Calculated Columns:** New columns were created for metrics such as *Total Sales*, *Profit Margins*, and *Shipment Days* using Data Analysis Expressions (DAX).
- **Calculated Tables:** Created tables to aggregate data, such as *Monthly Sales* and *Year-over-Year Comparisons*.
- **Time Intelligence Functions:** Used DAX functions like `TOTALYTD()`, `SAMEPERIODLASTYEAR()`, and `DATEADD()` to enable time-based comparisons.

4. Dashboard Design

The dashboard was designed with the following key elements:

- **Sales by Category and Sub-Category:** Provides a breakdown of sales by product categories.
- **Sales by Region:** Visualizes sales distribution across different geographical regions.
- **Monthly Sales and Profit Trends:** A line chart comparing monthly sales and profit for 2019 and 2020, offering year-over-year insights(dash-board).
- **Sales by Ship Mode and Payment Mode:** Helps to identify customer preferences regarding shipping and payment methods.
- **Sales Forecasting:** A time series chart forecasting sales for the next 30 days, helping the business to plan inventory and marketing strategies accordingly.

5. Sales Forecasting

- **Time Series Analysis:** A forecast model was built using historical sales data to predict future sales for the next 30 days. This predictive analysis helps in decision-making for inventory management and sales strategies.
- **Trend and Seasonality:** Identified key trends, seasonality, and cyclic patterns that affect sales performance.
- **Methodology:** Power BI's built-in forecasting algorithm was used to generate projections with a 95% confidence interval, based on the past 2 years of sales data.

6. Key Insights

- **Sales Concentration:** The East region contributed the most to overall sales, while the West region had the lowest share.
- **Top Performing Categories:** Technology and Office Supplies had the highest sales, with Phones being the top sub-category(dash-board).

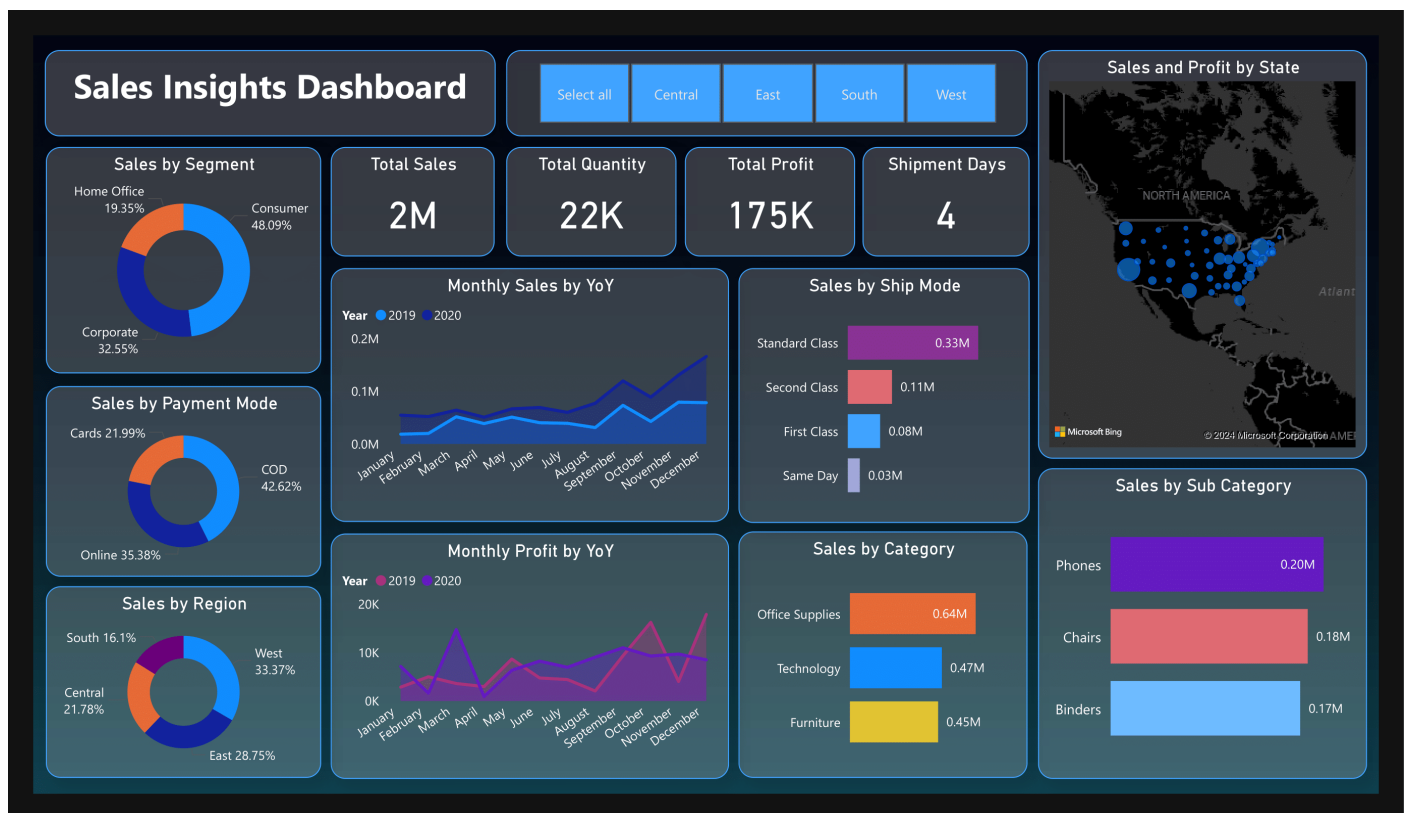
- **Shipment and Payment Modes:** Standard Class shipping and Online payments were the most preferred among customers.
- **Seasonal Sales:** Monthly sales trends showed significant peaks in Q4 (October to December), aligning with holiday seasons.

7. Project Highlights

- **Objective Understanding:** The project focuses on providing actionable insights for business improvement and future sales forecasting.
- **Data Cleaning:** Cleaned the dataset by addressing missing values and ensuring accurate reporting.
- **DAX Queries:** Used DAX functions for complex calculations, enhancing the dashboard's interactivity.
- **Dashboard Design:** A well-organized and visually intuitive dashboard that helps in data-driven decision-making.
- **Sales Forecasting:** The forecast model predicts sales trends, helping the business plan ahead.
- **Exporting Capabilities:** The dashboard can be easily exported as a PDF for sharing with stakeholders.

8. Conclusion

The Sales Insights and Forecasting Dashboard successfully demonstrates the power of Power BI in analysing sales data, identifying trends, and forecasting future sales. The clean design and insightful KPIs enable stakeholders to make informed business decisions.



Sales Forecast of 30 Days

Select
all

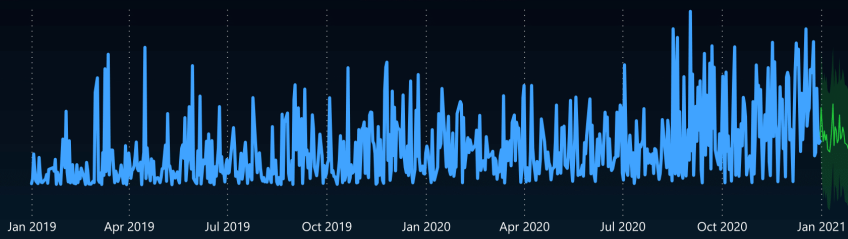
Central

East

South

West

Sales by Order Date



Sales by Order Date

Focused on forecast



Sales by States

Top 7

Washington

Virginia

Wisconsin

Utah

Vermont

Wyoming

West Virginia