Car Model Sales Analysis

Project Overview

This report presents a comprehensive analysis of car model sales using Excel. The dataset for this project was sourced from Kaggle and is a temporary dataset created for analysis purposes in a similar sector. The primary objective was to clean, analyze, and visualize the data to gain insights and solve specific business problems. This report details each step of the process, from data cleaning to creating an interactive dashboard, and highlights the key findings and insights derived from the analysis.

Dataset Source

The dataset used in this project was sourced from Kaggle. It contains information on car model sales, including dealer IDs, quantities sold, profits, and dates of sales. The dataset is structured to facilitate analysis and visualization of sales performance across different dealers and car models.

Data Cleaning and Preparation

The initial dataset required several cleaning and preparation steps to ensure accuracy and usability:

1. **Handling Missing Values:** Missing values were identified and appropriately handled by either imputing them with relevant statistics (mean, median) or removing incomplete records.
2. **Removing Duplicates:** Duplicate entries were detected and removed to prevent skewing the analysis.
3. **Standardizing Data Formats:** Ensuring consistency in data formats, such as date and numerical formats, to enable accurate analysis.
4. **Creating New Variables:** Additional variables were created to facilitate deeper analysis, such as calculating the total profit per sale and categorizing sales by year and model.

The cleaned and prepared data was then used to create various pivot tables and visualizations for analysis.

Analysis and Visualization in Excel

Using Excel, various analyses were performed to explore the data and answer key business questions. Pivot tables were created to summarize data and derive insights on sales performance by different dimensions such as dealer ID, car model, and date.

Key Analyses Included

1. **Quantity Sold by Dealer ID:** A pivot table and bar chart were created to show the quantity of cars sold by each dealer. This helped identify top-performing dealers.
2. **Profit Analysis:** Several pivot tables and charts were created to analyze profits by dealer ID, car model, and date. This included:
   - **Sum of Profits for Hudson Model Cars by Dealer ID:** A line chart visualizing the total profits for Hudson model cars across different dealers.
   - **Profit by Year and Dealer ID:** A bar chart showing yearly profit distribution across dealers.
   - **Profit by Date and Model:** A line chart comparing profits for Champlain and Labrador models over time.

Interactive Dashboard
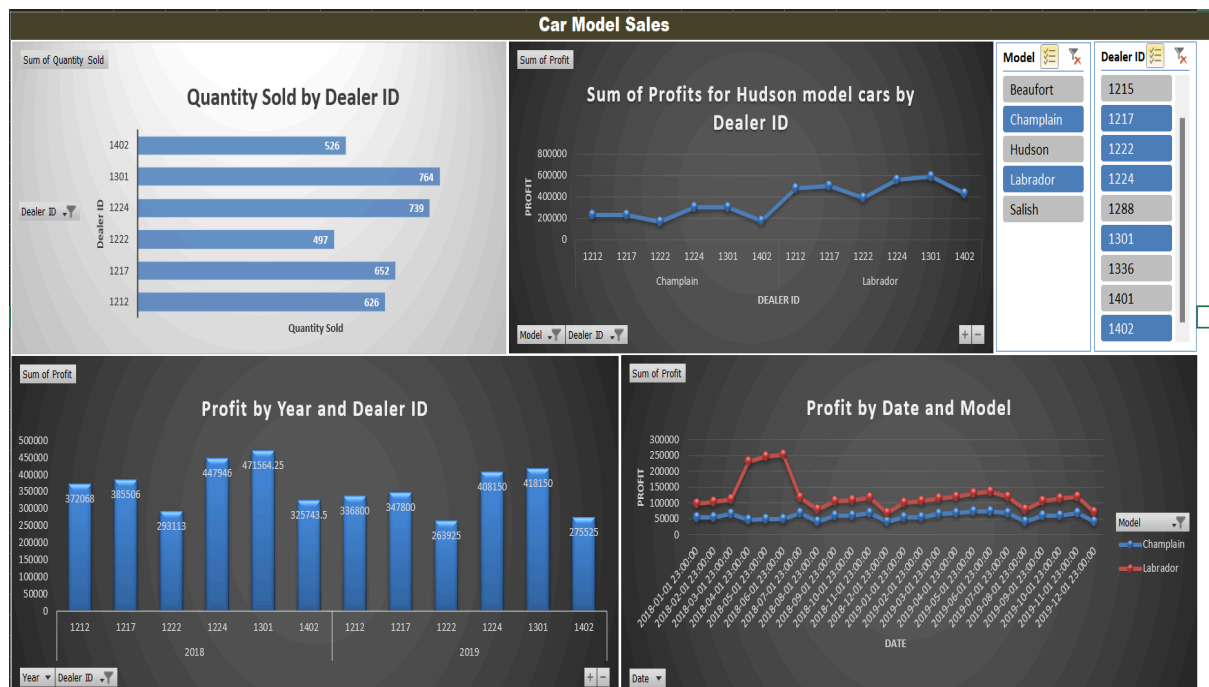
An interactive dashboard was created in Excel to provide a dynamic and user-friendly way to explore the data. The dashboard includes filters for selecting different car models and dealer IDs, allowing users to drill down into specific subsets of the data. Key components of the dashboard include:

1. **Quantity Sold by Dealer ID**
2. **Sum of Profits for Hudson Model Cars by Dealer ID**
3. **Profit by Year and Dealer ID**
4. **Profit by Date and Model**

These visualizations are designed to provide a comprehensive view of the sales performance and help in making informed business decisions.

Questions and Problems Solved

The analysis addressed several key questions and problems:

1. **Which dealer had the highest sales volume?**
   - Analysis revealed that dealer 1301 had the highest quantity sold.
2. **Which car model generated the most profit?**
   - The dashboard helped identify the Hudson model as a high-profit generator.
3. **How did sales and profits vary over time?**
   - Time series analysis showed trends in sales and profits, highlighting peak periods and potential seasonal effects.
4. **Which dealers were most profitable?**
   - Profit analysis by dealer ID highlighted the top-performing dealers in terms of profit.

Final Insights

From the dashboard and analyses, several key insights were derived:

1. **Top-Performing Dealers:** Dealers 1301 and 1224 consistently showed high sales volumes and profits, indicating strong performance.
2. **Profitable Car Models:** The Hudson model stood out as a significant profit contributor.
3. **Sales Trends:** The analysis identified specific time periods with higher sales and profits, which could be leveraged for future marketing strategies.
4. **Performance Discrepancies:** Variations in performance across dealers and models were highlighted, suggesting areas for potential improvement.

Excel Tools and Techniques Used

To accomplish the analysis and visualization, various Excel tools and techniques were utilized:

1. **Pivot Tables:** For summarizing and analyzing large datasets efficiently. Pivot tables were used to create various summaries and breakdowns of the sales data.
2. **Charts and Graphs:** Bar charts, line charts, and other visual tools were used to create clear and insightful visualizations of the data.
3. **Data Validation and Filters:** Data validation techniques and filters were applied to create an interactive and user-friendly dashboard.

Recommendations for Future Analysis

Based on the insights and findings from this analysis, the following recommendations are made for future analysis:

1. **Expand Dataset Scope:** Incorporate additional variables such as customer demographics, marketing spend, and geographic locations to gain a deeper understanding of sales drivers.
2. **Advanced Analytics:** Apply advanced analytical techniques such as regression analysis, clustering, or machine learning to uncover more complex patterns and insights.
3. **Continuous Monitoring:** Set up regular updates and monitoring of the dashboard to keep track of sales performance and quickly respond to any changes or trends.
4. **Integration with Other Tools:** Consider integrating Excel with other data tools and platforms such as SQL databases, Power BI, or Tableau for enhanced analysis and visualization capabilities.

Conclusion

This project successfully demonstrated the power of Excel in data analysis and visualization. By cleaning and preparing the dataset, performing detailed analysis, and creating an interactive dashboard, valuable insights were uncovered. These insights can inform strategic decisions and drive business success. The approach and techniques used in this project can be applied to similar datasets and business scenarios, showcasing the versatility and effectiveness of Excel as an analytical tool.