ANALYTICAL REPORT

[AUTOMOBILE INDUSTRY: EXPLORATORY DATA ANALYSIS]

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1. EXECUTIVE SUMMARY

This analysis is primarily targeted at answering the following questions about Light-Vehicle Sales of 2021-22 in the US Automotive Industry:

1. Which segment is the most popular in terms of units sold?
2. What was the sales trend from 2021 to 2022?
3. How well did the competition perform?

To answer these questions we will explore the COX AUTOMOTIVE SALES REPORT and use it as our dataset to generate insights. The analysis will look at the sales figures of all major automobile manufacturers in the USA and the vehicles under our purview will be divided into segments and further into sub-segments.

This report will show that SUV is the highest selling segment amounting to over half of the total. We will also be able to conclude that the overall sales have declined between 2021 & 2022 with the majority of cars sold are in the non-lux category. Finally, we will see that in a period of declining automobile sales electric cars show a nearly 2x growth.

2. INTRODUCTION

a. Purpose:

This report looks at sales of light-vehicles in the USA and generates insights into the leading choice of segment, sub-segment and brand based on the number of units sold.

The analysis and its results can help dealerships determine the segment to stock up their inventory. It can also be used as an exploratory analysis for an Automobile Manufacturer looking to enter the US Car Market.

b. Background:

The automobile industry grosses around $100 billion each year. The companies that manufacture automobiles spend millions of dollars on research and development to create better technology for their cars and launch vehicles of various segments to fit the consumer's ever-changing needs.

These segments are basically classified into: Car, SUV, Truck, Van. The distinction is made based on the body-type(Figure 2.1).

Figure 2.1

There also exists a number of sub-segments and the distinction there can be made depending on various parameters like size, body-type, price and, so on(Figure 2.2).
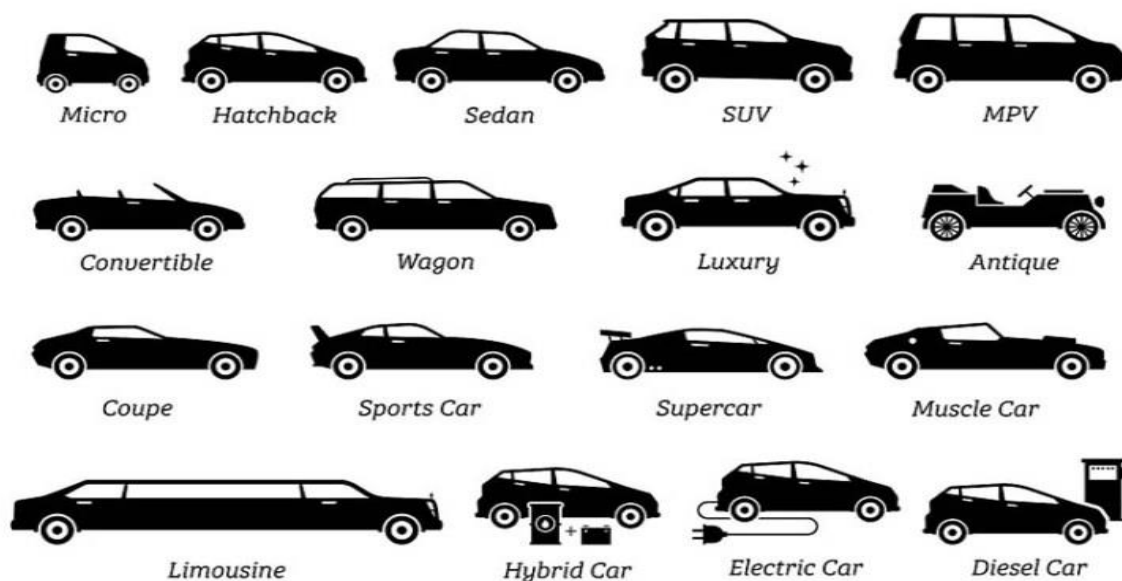

Figure 2.2

The automobile market in the USA is saturated with a lot of car brands, hence for the purpose of generating valuable insights looking at the major manufacturers is better. The difference between brands and manufacturers is that a manufacturer can own several brands, like Toyota Motor Corp. is a manufacturer that owns both Toyota and Lexus brands.

The manufacturers looked at in this analysis have had some sales on US soil in the year 2021 or 2022. The main ones that we will look at are namely- Ford Motor Company, General Motors, Honda and Toyota. We will also draw insights from sales of electric car manufacturers to see the growth in that sub-segment.

c. Scope:

This analysis has been completed with the following considerations:

- Sales are seen by the number of units sold.
- Automobiles have been classified into segments and sub-segments.
- Years: 2021 – 2022
- Sales only in the USA.
- Competition is segregated as Manufacturers rather than individual Brands.

3. DISCUSSION

a. Segment Analysis:

This part of the analysis will look at the sales divided into the various segments and sub-segments. The segments include car, SUV, truck, and van. The sub-segments are created using distinctions like price, comfort, size, body-type, etc. Some of them are Crossover SUV, Electric Car, Pick-up Truck, etc.

Figure 3.1 shows that in both the years SUV remained the leading choice of segment with over 50% of the sales coming from them.
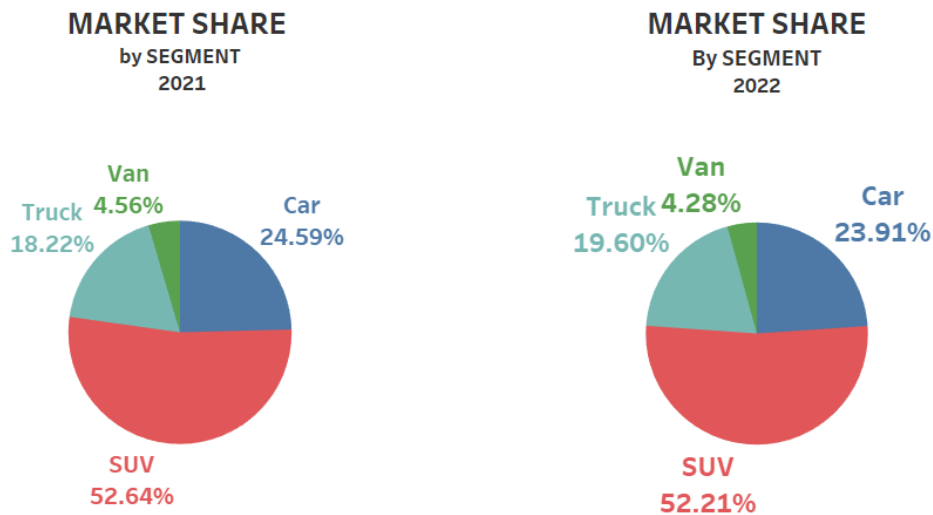

Figure 3.1

Figure 3.2 shows that over 6 million SUVs were sold in 2021. Also, the second highest sales were seen in the car segment amounting to only half of SUVs at nearly 3 million units sold. Trucks had a total of 2 million while less than 1 million vans were sold. It also shows that there is a trend of decline in sales from 2021 to 2022. This is evident as all 4 segments have lower sales than 2021 where SUVs have reduced to nearly 5.5 million units while car has reduced to 2.5 million.
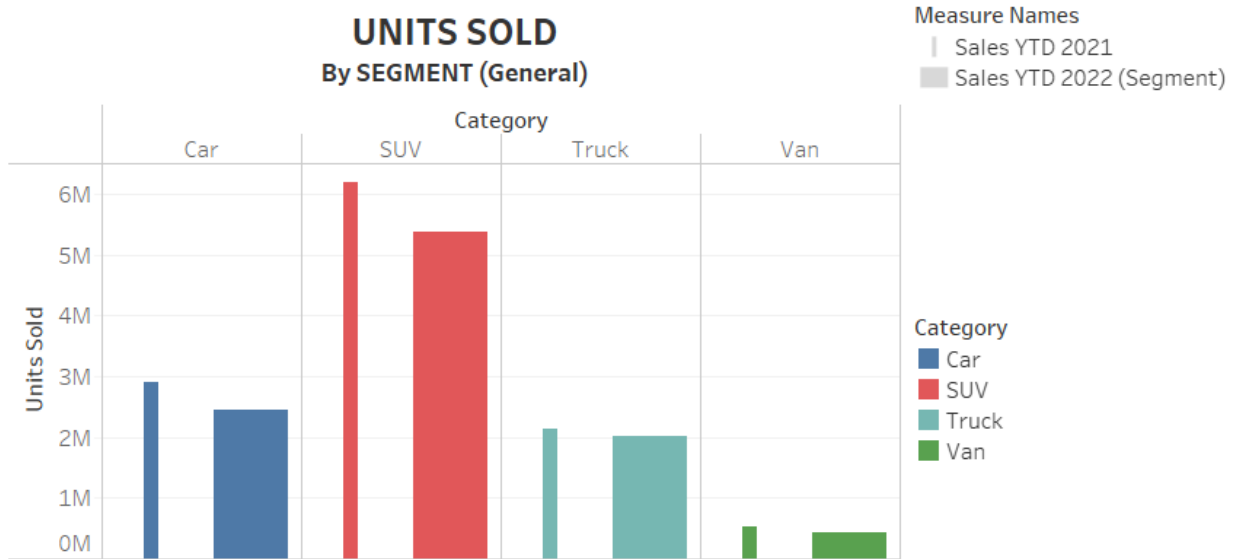
Figure 3.2

From Figure 3.3 we can infer that in the SUV segment, the leading sub-segment is Mid-size SUV/Crossover with 2 million units in2021 and nearly 1.75 million in 2022. Compact SUV was a close second in both the years. The third highest selling sub-segment was the full-size pickup truck with close to 1.5 million units sold in both years.(Figure 3.4)
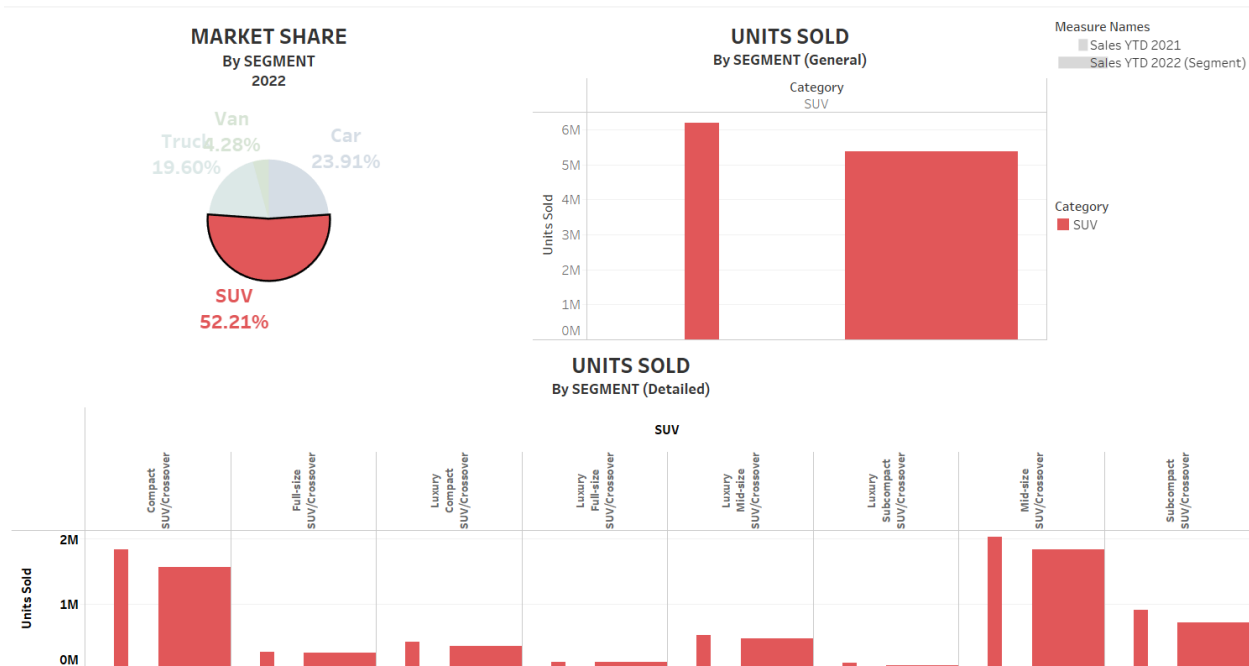

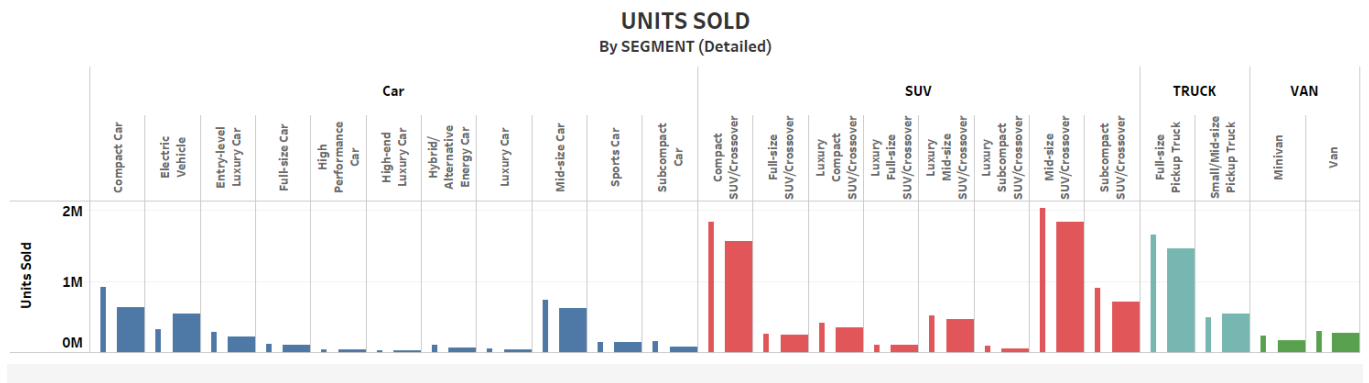*Figure 3.3*

UNITS SOLD
By SEGMENT (Detailed)

Figure 3.4

Finally, Figure 3.5 shows an interesting anomaly from the overall trend seen from the data. We see the sales decline between the two years. This is the overall trend and can be seen in nearly all the segments. In contrast, if we take a closer look at the sales for electric cars in the car segment, we see that the sales have increased to almost double the 2021 volume(from close to 300K units in 2021 to nearly 600K units in 2022). This clearly shows an increasing demand for EV in the market.
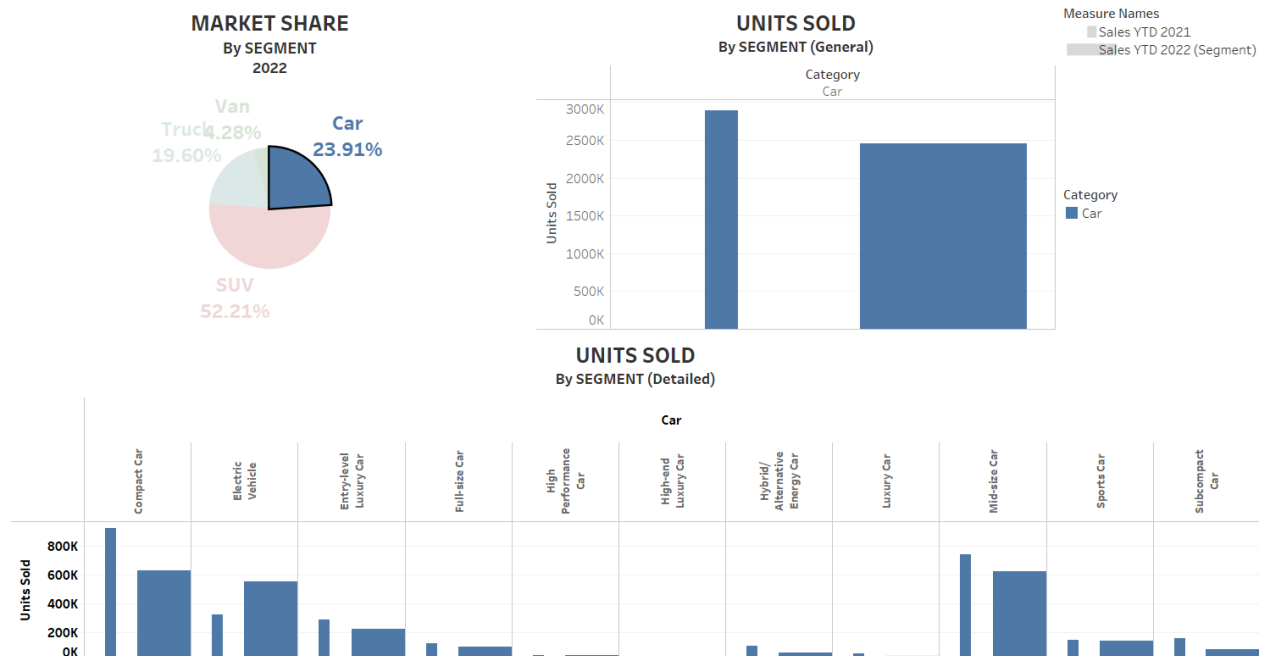

Figure 3.5

b. Competition Analysis:

This section of the analysis will draw insights from the market share figures of the various brands while looking at total YTD sales bifurcated into Luxury and Non-Luxury categories.

Figure3.6 shows the manufacturers with respect to the units sold in 2022(YTD). The bigger the bubble the higher the sales for that particular manufacturer.

From Figure 3.6, we can see that the top 5 major competitors in this market are:

1. General Motors – Sold over 1.6 million units and has almost 16% market share.

2. Toyota Motor Corporation – Sold nearly 1.6 million units and has 15.3% market share.

3. Ford Motor Company – Sold nearly 1.6 million units and has 13.5% market share.

4. Stellantis – Sold nearly 1.2 million units and has 11.7% market share.

5. Hyundai Motor Group – Sold slightly over a million units and has 10.6% market share.
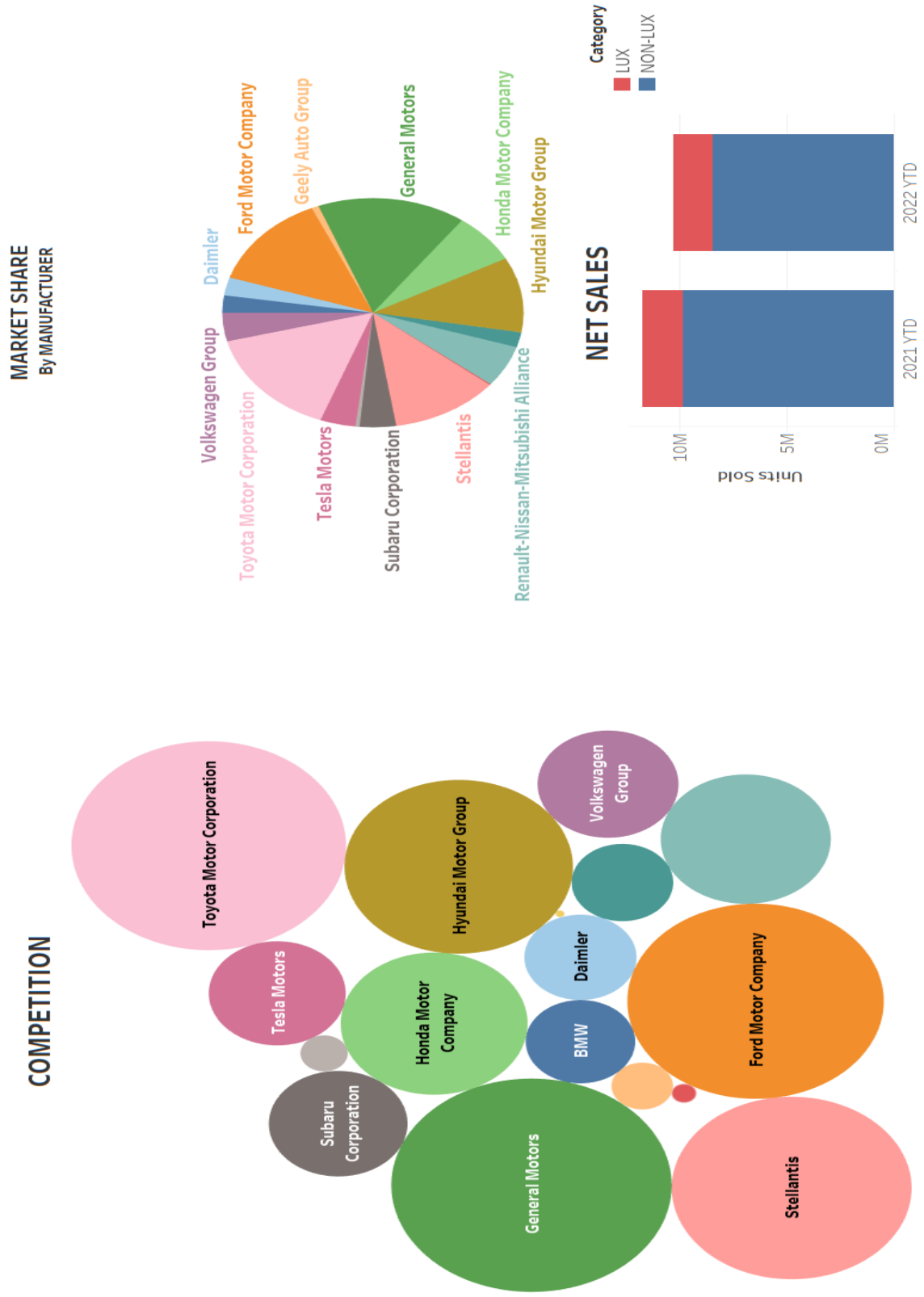
MARKET SHARE
By MANUFACTURER

Ford Motor Company
Geely Auto Group
Daimler
General Motors
Honda Motor Company
Hyundai Motor Group
Renault-Nissan-Mitsubishi Alliance
Stellantis
Subaru Corporation
Tesla Motors
Toyota Motor Corporation
Volkswagen Group

NET SALES

Units Sold
10M
5M
0M

2021 YTD
2022 YTD

Category
LUX
NON-LUX

COMPETITION

Toyota Motor Corporation
Hyundai Motor Group
Volkswagen Group
Tesla Motors
Subaru Corporation
Honda Motor Company
Daimler
BMW
General Motors
Ford Motor Company
Stellantis

Figure 3.6

The Competition analysis also shows that sales dropped from nearly 12 million units to 10 million units in the span of a year. It also shows that the volume of non-luxury vehicles is nearly 8 times that of luxury vehicles.(Figure 3.6).

4. CONCLUSION

a. Challenges:

The 4 main challenges that I faced while doing this project were:

- Cleaning the Data.
- Determining the Scope of the Analysis.
- Sorting through the data.
- Acclimatizing to the Tableau Interface.

b. Key Takeaways:

The most critical pieces of insights that we gained from this report are:

1. SUV is the leading segment in terms of units sold, with over 50% of vehicles sold being SUV.

2. Top competitors with highest market share are:
    - General Motors
    - Toyota Motor Corporation
    - Ford Motor Company

3. Most units sold fall in the Non-Lux category.

4. A decline in sales compared to 2021 likely points to the reduced demand for vehicles likely due to the recession.

5. In contrast to other segments, Electric Vehicles sales significantly increased, nearly doubling in number of units sold.

c. Build Recommendations:

As I conclude my study, I have to acknowledge that this analysis has its set of limitations. However, one can build on this analysis by obtaining the right Dataset and consider the following while generating visualizations:

1. Sales for years 2018 – 2020 : To account for Covid-19.

2. Sales in Dollar($) figures.

3. Monthly & Quarterly Sales Reports by Region.

4. Manufacturer Segment-wise Reports.

5. Sales by Brands rather than Manufacturers.

6. A deeper dive by looking at individual models.