

Electric Vehicle Market Segmentation Analysis

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ABSTRACT

The electric vehicles(EV) market is rapidly growing in India with advancements in technology and environmental concerns. The report gives an analysis of the market segmentation of electrical vehicles, the report gives a clear understanding of the factors like which Geographic locations or States where most EV used, the type of vehicles used ,the buyer salaries and gas stations available, and many factors considered.

This market segment analysis of EVs in India informs manufacturers clear picture of consumers' needs and preferences used to make Strategies and target customers for a better market for EVs in India,the report shows bar graphs and Pie Charts to understand the consumer's behavior.

Fermi Estimation

Problem Statement

The Indian electric vehicle (EV) market is at a crucial juncture, facing significant challenges that hinder its growth and adoption. Despite a surge in awareness regarding environmental sustainability and supportive government initiatives, the market remains largely underdeveloped. A major issue is the lack of comprehensive segmentation analysis, which leaves manufacturers and policymakers without critical insights into consumer preferences, demographics, and behaviors. India's diverse population exhibits varying attitudes toward EV adoption, influenced by factors such as income, geographic location, and cultural perceptions. Without a clear understanding of these segments, efforts to promote EV adoption risk being misaligned, potentially exacerbating existing barriers.

Additionally, the Indian EV market grapples with infrastructural limitations, such as insufficient charging stations, which deter potential buyers. This infrastructure deficit is compounded by range anxiety, particularly among consumers in rural areas or those reliant on their vehicles for long-distance travel. Furthermore, competition from conventional vehicles remains strong, as many consumers prioritize cost and convenience over sustainability. As a result, there is an urgent need for targeted market segmentation analysis to inform strategies that can effectively address these challenges. By identifying specific consumer needs and preferences, stakeholders can develop tailored marketing approaches, improve infrastructure planning, and enhance overall market penetration, ultimately facilitating a smoother transition to electric mobility in India.

Data Sources

Data Collection

The data is collected manually, and the sources used for this process are listed below:

- <https://www.kaggle.com/datasets>
- <https://data.gov.in/>
- <https://www.data.gov.in/>
- <https://data.worldbank.org/>
- <https://datasetsearch.research.google.com/>

Data Sets Used:

- Electric vehicles Type used In India-dataset
- Electric Vehicles Usage State-wise dataset
- Vehicle consumer's data set
- Electric vehicle Gas Station in India-data set

Data Pre-Processing

Libraries used for Implementation

- Pandas
- Numpy
- Matplotlib
- Sklearn

Profiling and Describing potential segments

Geographic Segments :

Focused on the Electric vehicles used in India state-wise to analysis market analysis

Demographic Segments :

High-income individuals & families, age groups are considered to evaluate price

Psychographic Segments :

Usage of Evs can result better environmentally

Behavioral Segments :

Frequent travelers who use electric vehicles are analyzed

Selection of Target Segments

Based on segmentation analysis, we recommend targeting cities like Uttar Pradesh, Delhi, and Karnataka in which people adopt electric vehicles and also producing more 2-wheelers can be recommended as consumers are more for those vehicles.

Customizing the Market Mix

Product :

The company should focus on producing SUV, Baleno, and Creta as more people adopting them and implementing more features like rapid charge and long-range capabilities can be very helpful

Price :

The price should be minimal as many middle-class people can be adoptable. A price range of INR 20-50 lakhs for cars and 5-15 lakhs for 2 wheelers is recommended to attract both average to high income customers

Place :

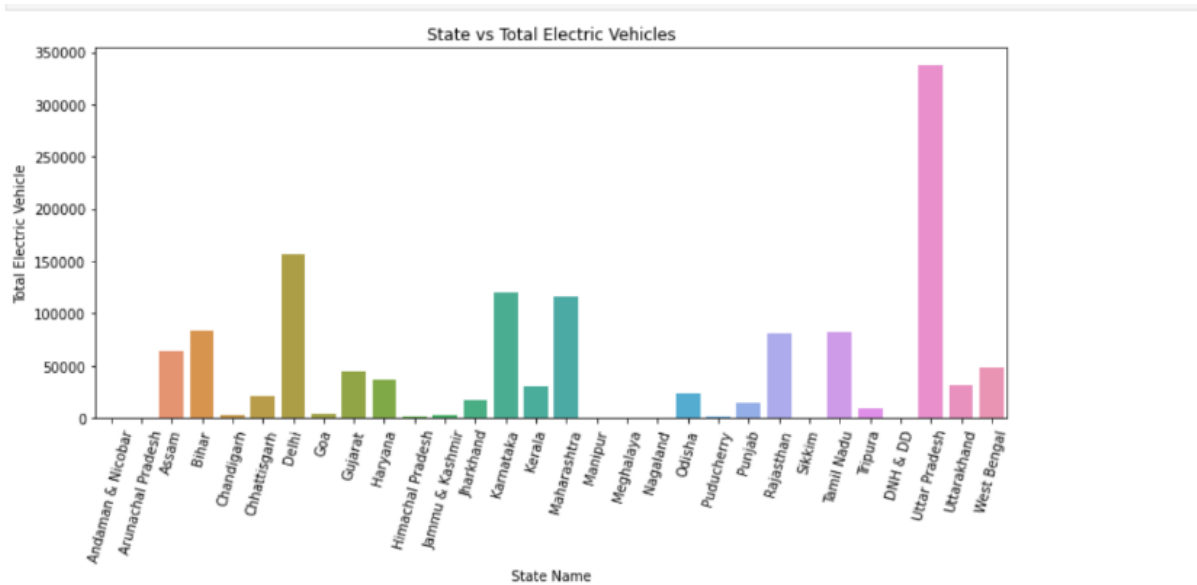
The initial market entry should focus on cities like Uttar Pradesh, Delhi, Mumbai where many people supports EV adoption after it should be promoted to other cities

Promotions :

The market campaigns should highlight vehicles brand and performance and also highlight environmental concerns can be very helpful that can attract many people

Analysis of Electric Vehicles in India

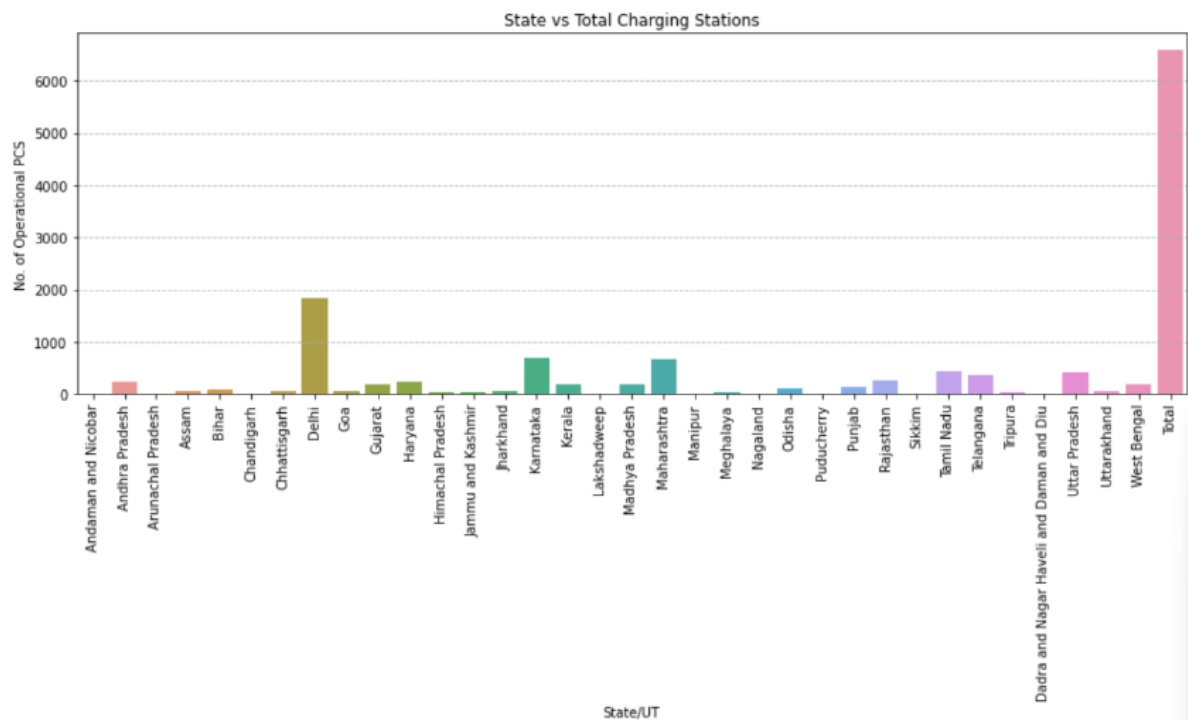
The below implementation used to give a visualization of bar chart for number of electric vehicles used in India state-wise



As from above bar-chart we can observe the more people in Uttar Pradesh, Delhi and Karnataka were more adopted Electric-Vehicles. So entry to that states will be adoptable.

Analysis of Total electric charge Stations

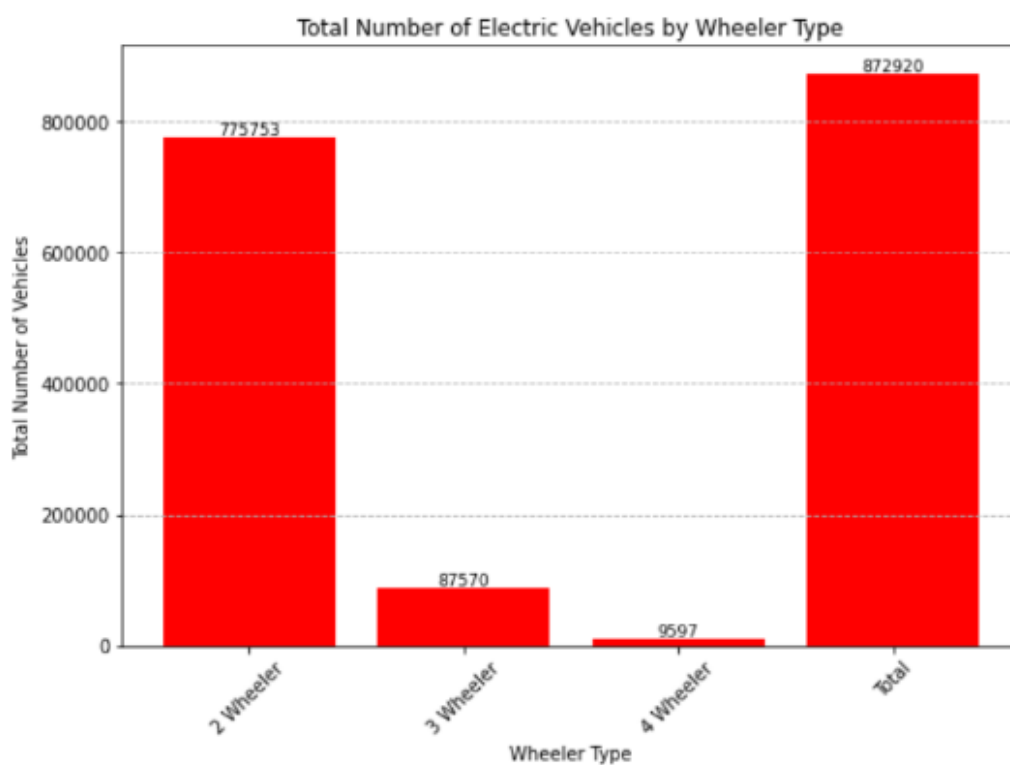
Before producing the product into the state the company should consider weather there are stations at locations or not. Below chart gives number of stations available in every state



As we can see there are more gas stations at states Delhi, Uttar Pradesh and Karnataka so entering to those states can be helpful and also there people are also adopted to electric vechiles

Analysis of Vechile Type

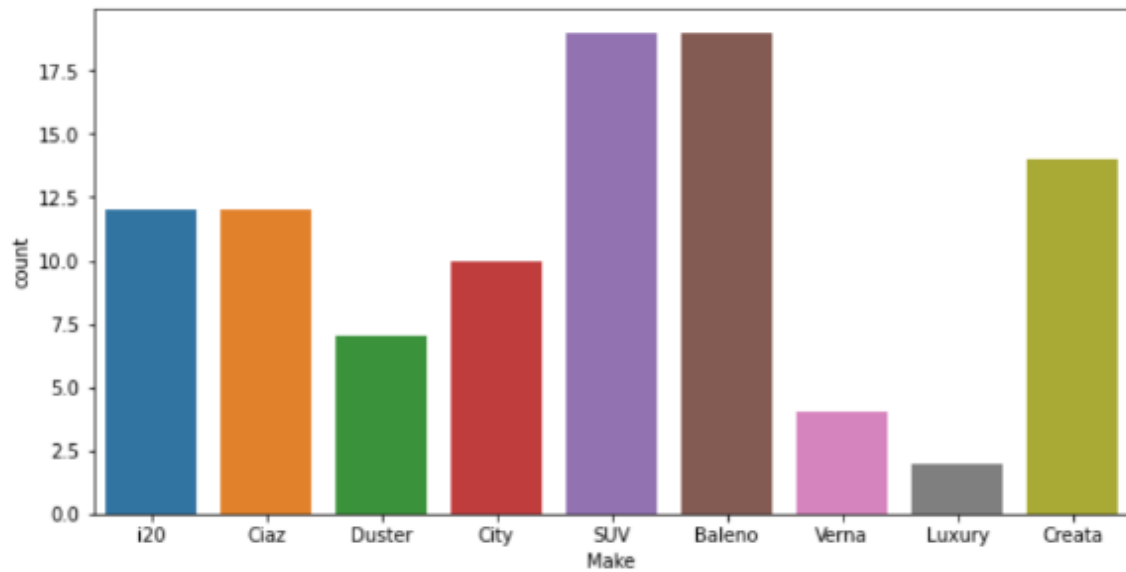
The below fig show the wheeler types most used in electric vechiles as it can be very helpful to produce those for better profit and market



The most used where 2 wheelers as scooties or bikes are more of them before entring producing 2 wheeler types can be a good strategy for a good market

Analysis of Brand

The most used brand in India can be analysed as producing those brand vehicles can be helpful to increase the market and attract customers



So from above graph we observe that the most people are customers for the brands like SUV, Baleno and Creta

Price and Salary analysis

The analysis of buyers salary can be very helpful to analyse and set the price to attract more people from average salaried to high

	Age	No of Dependents	Salary	Wife Salary	Total Salary	Price
count	99.000000	99.000000	9.900000e+01	9.900000e+01	9.900000e+01	9.900000e+01
mean	36.313131	2.181818	1.736364e+06	5.343434e+05	2.270707e+06	1.194040e+06
std	6.246054	1.335265	6.736217e+05	6.054450e+05	1.050777e+06	4.376955e+05
min	26.000000	0.000000	2.000000e+05	0.000000e+00	2.000000e+05	1.100000e+05
25%	31.000000	2.000000	1.300000e+06	0.000000e+00	1.550000e+06	8.000000e+05
50%	36.000000	2.000000	1.600000e+06	5.000000e+05	2.100000e+06	1.200000e+06
75%	41.000000	3.000000	2.200000e+06	9.000000e+05	2.700000e+06	1.500000e+06
max	51.000000	4.000000	3.800000e+06	2.100000e+06	5.200000e+06	3.000000e+06

Conclusion

From the Electric Vehicle analysis from different datasets we can consider that before producing the Electric Vehicle the company should focus on the cities where the Evs are adoptable and further investigating the gas stations and the brand and vechle type can be very helpful for good strategic plan. And also company should also consider buyers salary to analyze the price distributions to attract more people for good marketing.

Link To Github Profile:

[https://github.com/Abhireddy05/EV-Market Segmentation](https://github.com/Abhireddy05/EV-Market_Segmentation)