ELECTRIC TWO WHELLER (BIKE/SCOOTER) MARKET SEGMENTATION.

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Introduction:

The electric scooter industry has witnessed remarkable growth and innovation in recent years, revolutionizing urban transportation and providing a sustainable and convenient alternative to traditional modes of commuting. With the increasing popularity of electric scooters, manufacturers and marketers have recognized the importance of understanding the diverse needs and preferences of consumers. As a result, the concept of electric scooter segmentation has emerged as a crucial strategy to effectively target and cater to specific customer segments.

Electric scooter segmentation involves dividing the market into distinct groups based on various factors such as demographic characteristics, usage patterns, lifestyle preferences, and purchase motivations. By understanding the unique requirements and preferences of each segment, manufacturers can develop tailored products and marketing strategies that resonate with their target audience.

Segmentation approach:

One common approach to electric scooter segmentation is demographic segmentation, which involves categorizing consumers based on factors such as age, gender, income, and location. For example, younger riders might prefer stylish and nimble scooters for short urban commutes, while older riders might prioritize comfort and safety features for longer trips. Furthermore, segmentation can also consider the specific needs of urban dwellers, suburban residents, or even tourists, as each group may have distinct requirements and preferences.

Usage-based segmentation is another important aspect of electric scooter segmentation. This involves dividing the market based on how consumers utilize electric scooters. Electric scooter segmentation is a crucial tool that enables manufacturers and marketers to better understand and meet the diverse needs and preferences of consumers.

What is an EV Bike/scooter:

The term "electric two-wheeler" refers to any vehicle that operates on two wheels, such as a scooter or a motorcycle, and is powered by electricity instead of traditional internal combustion engines. Electric two-wheelers are vehicles that utilize an electric motor and a rechargeable battery to propel the vehicle forward. Electric two-wheelers offer a sustainable and eco-friendly alternative to conventional gasoline-powered vehicles. They produce zero tailpipe emissions, reducing air pollution and mitigating the impact of transportation on the environment. Electric two-wheelers are often considered a more environmentally friendly mode of transportation, as they help to reduce carbon dioxide and greenhouse gas emissions.

Pros:

- Environmentally Friendly
- Cost-effective.
- Energy Efficiency.
- Noise Reduction.
- Easy Manoeuvrability.

Cons:

- Limited Range.
- Charging Infrastructure.
- Longer Charging Time.
- Initial Cost.
- Battery Life and Replacement.

Dataset collection:

The dataset is collected manually and also with some online references.

Reference Link: https://data.mendeley.com/

Dataset: Electric scooter - dataset.xlsx

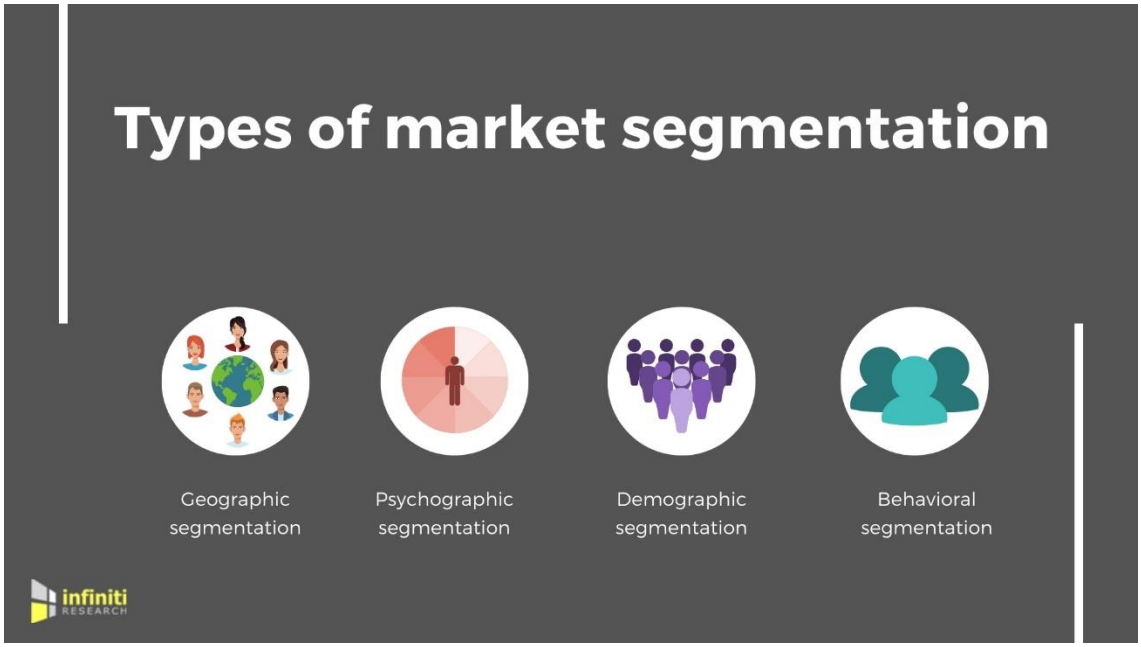
Electric scooter - dataset.xlsx

Market segmentation:

Market segmentation is the process of dividing a heterogeneous market into distinct segments based on various factors such as demographics, psychographics, behaviour, geographic location, or specific product-related variables.

Target market:

A target market refers to the specific group of customers that a company focuses its marketing efforts on. It is the segment of the market that the company aims to reach and serve with its products or services. By identifying and targeting a specific market segment, companies can tailor their marketing strategies to better meet the needs and preferences of that particular group, increasing their chances of success.



Geographical Segmentation:

Geographical segmentation in the context of electric scooters involves dividing the market based on geographic factors such as location, region, or country. This segmentation approach recognizes that consumer preferences, needs, and market dynamics can vary across different geographical areas.

The electric bikes also account factors such as infrastructure, regulations, climate, and cultural preferences that can influence the demand and adoption of electric scooters in specific regions.

Psychographic segmentation:

Psychographic segmentation for electric two-wheelers involves dividing the market based on psychological and lifestyle characteristics of consumers. This segmentation approach goes beyond demographic factors and focuses on understanding consumers' attitudes, values, interests, and behaviours.

Understanding the psychographic characteristics of potential consumers allows manufacturers and marketers to tailor their product features, branding, and marketing messages to resonate with specific segments.

Demographic Segmentation:

Demographic segmentation in the context of electric bikes involves dividing the market based on demographic characteristics of consumers. This segmentation approach focuses on factors such as age, gender, income, education, occupation, and location to understand the preferences, needs, and buying behaviours of different consumer groups.

Behavioral Segmentation:

Behavioral segmentation in the context of electric bikes involves dividing the market based on consumers' behaviours, usage patterns, and decision-making processes. This segmentation approach focuses on understanding how consumers interact with electric bikes and the underlying motivations driving their purchase and usage decisions.

Questions Formulation:

Demographic Segmentation:

a. What age groups are most likely to adopt EV scooters?

b. Are there any gender preferences when it comes to using EV scooters?

c. Does income level impact the willingness to purchase an EV scooter?

d. How does educational background influence the interest in EV scooters?

e. Are there any regional or cultural factors that affect the adoption of EV scooters?

Psychographic Segmentation:

a. What are the lifestyle characteristics of individuals who are interested in EV scooters?

b. Do environmental concerns and sustainability play a role in the decision to purchase an EV scooter?

c. Are their specific personality traits or values associated with potential EV scooter owners?

d. What are the motivations and aspirations of individuals considering EV scooters?

Behavioral Segmentation:

a. How frequently would potential customers use an EV scooter?

b. Are their specific usage patterns or preferences, such as daily commuting or recreational use?

c. What are the key factors influencing the decision to switch from traditional scooters to EV scooters?

d. How important are factors like range, charging infrastructure, and battery life in the purchase decision?

Geographic Segmentation:

a. Are there specific regions or cities where the demand for EV scooters is higher?

b. How does the availability of charging infrastructure impact the adoption of EV scooters in different areas?

c. Are there any regulatory or policy differences across regions that affect the market for EV scooters?

Competitive Segmentation:

a. Who are the main competitors in the EV scooter market?

b. How do different EV scooter brands position themselves in terms of features, pricing, and target market?

c. What are the unique selling propositions of different EV scooter models?

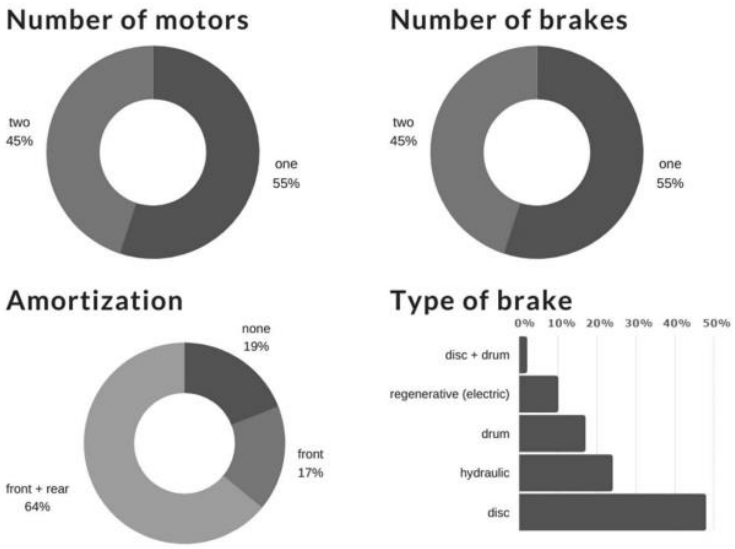
d. Are there any untapped market segments or niche markets within the EV scooter industry?

- The dataset above I have attached will be accordingly answers the question under the category of **Competitive Segmentation,** also my dataset includes the age and gender parameters from the **Demographic Segmentation.** (Refer the dataset attached above).

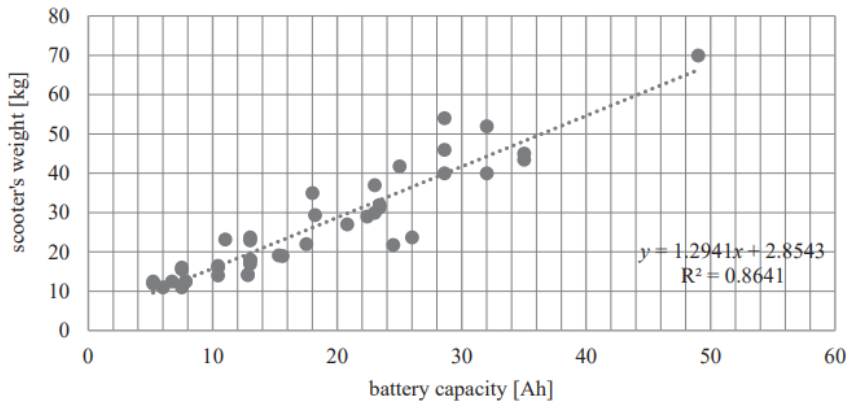
Descriptive Statistics for electric scooter: (Competitive segmentation parameters):

		Price (gross) [PLN]	Total nominal power [W]	Battery capacity [Ah]	Range [km]	Maximum speed [kph]	Weight [kg]
Mean		5569.24	1723.10	18.07	62.90	51.00	26.24
Median		4094.00	900.00	15.45	52.50	50.00	22.50
Mode		4499	350	13.00	30	25	12.50
Standard deviation		4863.51	1758.43	10.01	33.07	22.54	13.94
Coefficient of variation		87.33%	102.05%	55.40%	52.58%	44.20%	53.13%
Skewness		2.02	1.32	0.869	1.01	0.441	1.14
Kurtosis		5.25	0.92	0.623	0.597	–0.752	0.984
Minimum		1059	250	5.2	20	20	11.00
Maximum		24999	6720	49.0	150	100	70.00
Percentiles	25	1986.50	350	10.40	34.25	28.75	15.25
	50	4094.00	900	15.45	52.50	50.00	22.50
	75	7999.00	2400	24.63	80.00	66.25	35.50

Visualizations:



Relationship between the weight of the scooter and battery capacity:



Libraries Used:

Pandas: To read the dataset

NumPy: To calculate various calculations related to arrays.

Seaborn: To visualization of Data.

SkLearn: Use for Feature Engineering

- Data pre-processing – Data cleaning.
- EDA - Exploratory data analysis.

EDA, or Exploratory Data Analysis, can be a valuable tool in the market segmentation of electric scooters. It involves analysing and visualizing data to gain insights into the characteristics and behaviors of the target market. Here are some key steps and techniques for conducting EDA in the market segmentation of electric scooters:

1. **Data Collection**: Gather relevant data related to electric scooters and the target market. This can include demographic data, usage patterns, purchasing behaviours, geographic information, and other relevant variables.

2. **Data Cleaning and Preparation**: Clean the data by removing duplicates, handling missing values, and ensuring consistency. Transform and pre-process the data as needed for analysis.

3. **Descriptive Statistics**: Calculate descriptive statistics such as mean, median, mode, standard deviation, and range to understand the central tendencies and variations in the data. This helps in getting a basic overview of the market characteristics.

4. **Visualization:** Create visualizations such as histograms, bar charts, scatter plots, and pie charts to explore relationships and patterns in the data. Visualizations can provide insights into factors like age distribution, gender distribution, geographic distribution, and usage patterns of electric scooters.

5. **Segment Profiling**: Analyse the data to identify distinct segments within the market. Cluster analysis techniques such as K-means clustering or hierarchical clustering can help group similar customers based on their characteristics and behaviours. By examining the profiles of different segments, companies can gain insights into the unique needs, preferences, and behaviours of each segment.

6. **Segment Comparison**: Compare the identified segments to understand how they differ in terms of demographics, usage patterns, purchasing behaviours, and other relevant factors. This analysis can help in developing targeted marketing strategies and tailoring product offerings to specific segments.

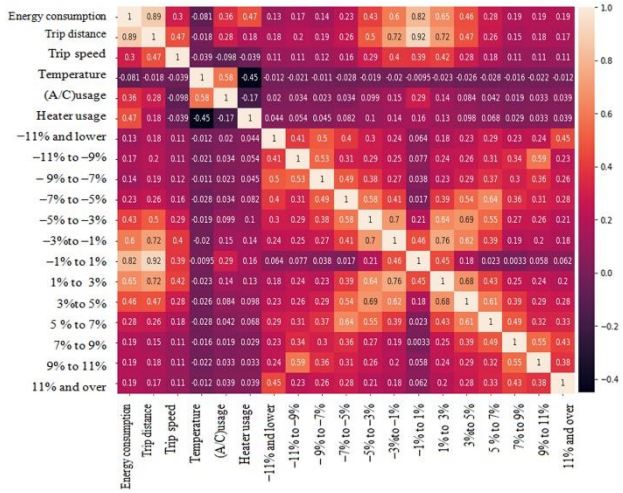
7. **Hypothesis** Testing: Conduct hypothesis tests to examine relationships and associations between variables. For example, test whether there are significant differences in electric scooter usage between different age groups or geographical regions.

8. **Insights and Recommendations**: Summarize the findings from the EDA and derive actionable insights. These insights can guide marketing efforts, product development, pricing strategies, and communication tactics specific to each market segment.

EDA in market segmentation of electric scooters enables companies to uncover meaningful patterns and trends in the data, identify target segments, and make informed business decisions. It provides a foundation for developing effective marketing strategies and delivering personalized experiences to different customer groups.

Correlation matrix:

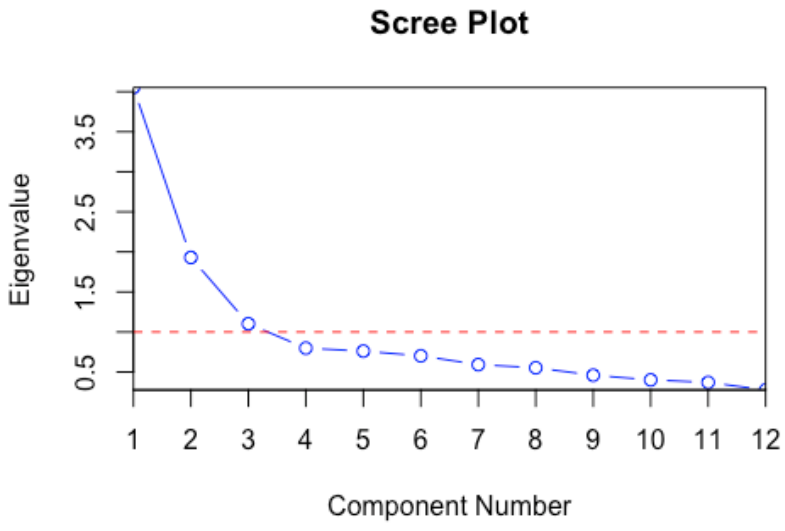
A correlation matrix is a table that shows the relationships between multiple variables in a dataset. It displays the correlation coefficients, ranging from -1 to +1, which indicate the strength and direction of the linear relationship between each pair of variables. A positive correlation means the variables move together, a negative correlation means they move in opposite directions, and a correlation of zero means no relationship. The correlation matrix helps analyses patterns and dependencies between variables, aiding in understanding their interplay and guiding further analysis or modelling. However, it's important to note that correlation does not imply causation.



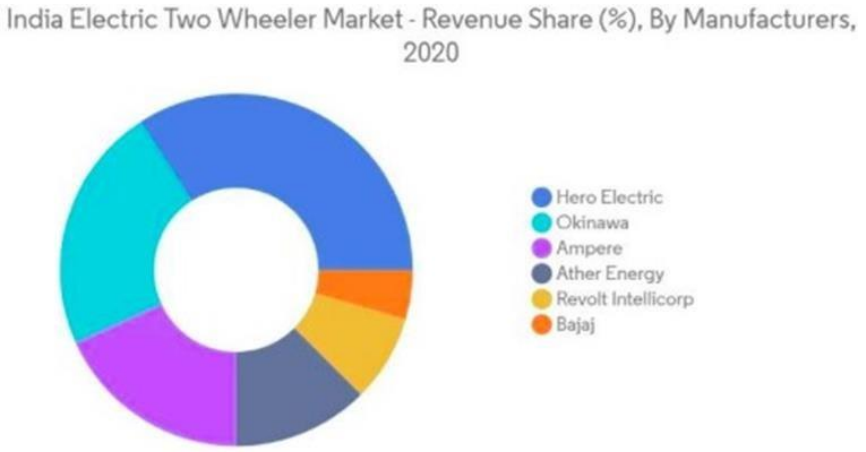
Screen Plot:

A scree plot is a graphical representation of the eigenvalues associated with each principal component in a principal component analysis (PCA) or factor analysis. It helps determine the number of meaningful components or factors to retain from the analysis. The scree plot helps in identifying a point called the "elbow," where the eigenvalues level off and become relatively small. This point indicates the number of components or factors that should be retained for further analysis.

By examining the scree plot, analysts can make informed decisions on the appropriate number of components or factors to retain for subsequent analysis or interpretation. It aids in finding a balance between retaining enough information to explain the data's variability while avoiding overfitting or including redundant components or factors.



Market revenue share:



CALCULATIONS:

Let's see how long it will take for EVs to produce 80% of vehicles in each category.

- For two-wheelers,

  $18 = 0.054 \times (1 + 0.75)^{t}$

  $t = 10.38$ years

- For four-wheelers,

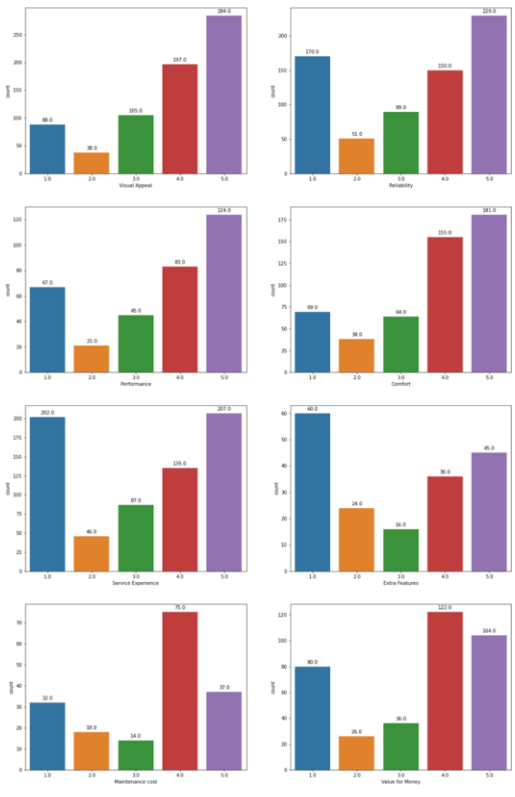
  $8 = 0.006 \times (1 + 0.25)^{t}$

  $t = 32$ years

Psychographic analysis

Here we can analyse all the preferences and reviews of the customers on variousaspects.

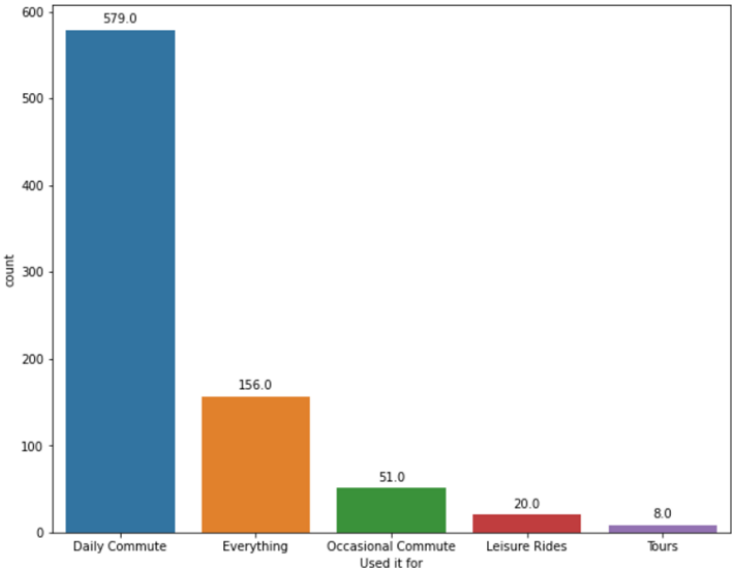
For E2Ws:

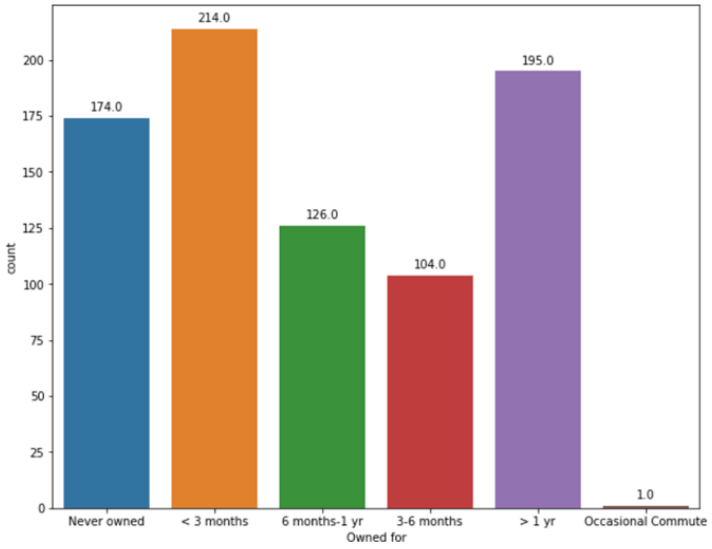


Behavioral Analysis:

We can look into the behavioural aspect of users.

For E2w's:





- We can see that most users use E2Ws for daily commute only and many people who haven't owned an E2W also posted reviews, shows the interest of people towards EVs.

GITHUB REPOSITORY:

https://github.com/Deivaprakash56/Feynn-lab-internship/blob/b35a2a2d425d5677ccccff8be7ee4fb7a715be25/Electric_vehicle(2_wheller).ipynb