# Customer Segmentation Analysis

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## Problem Statement and Introduction

**What is Situation?**

The electric vehicle (EV) company is gearing up to launch a new two-wheeler EV in the market. To ensure a successful launch and effective marketing strategy, the company recognizes the importance of understanding its target audience. Hence, the need for customer segmentation analysis arises.

**What is Market Segmentation Analysis?**

Market segmentation analysis involves dissecting customer data to identify distinct groups based on various factors such as demographics, geography, psychographics, and purchasing behavior. This analysis helps in understanding the diverse preferences and needs of customers, allowing companies to tailor their marketing strategies accordingly.

**Data Overview:**

The company has access to a dataset containing information on 3000 customers, with each entry comprising 14 different attributes. These attributes include customer demographics, vehicle specifications, purchasing behavior, and service ratings.

**Why Customer Segmentation Analysis?**

Customer segmentation analysis is crucial for targeted marketing and product development. By categorizing customers into specific groups, the company can tailor its marketing efforts to suit the preferences of each segment. Additionally, insights gained from segmentation analysis enable the company to make informed decisions regarding product features, pricing, and color availability, thus maximizing customer satisfaction and market penetration.

**Examples for Better Understanding:**

**1.** For instance, through segmentation analysis, the company may discover a segment of young urban professionals who prioritize eco-friendliness and technology in their vehicle purchases. By offering EV models with advanced features and sleek designs, the company can effectively target this segment.

**2.** Alternatively, segmentation analysis might reveal a segment of budget-conscious consumers who prioritize affordability and practicality. In response, the company could develop entry-level EV models with competitive pricing and low maintenance costs to cater to this specific market segment.

# Market Segmentation Analysis Process

**Step 1: Data Preparation**

- First, I created hypothetical data using Python. This involved synthesizing information from real electric vehicles (EVs) obtained from bikedekho.com and generating details for 3000 customers across 14 different attributes.

**Step 2: Data Analysis and Insights**

- Next, we analyzed the data to uncover valuable insights. For example, we observed that urban areas have a higher concentration of EV purchases among individuals aged 18-25. Additionally, we discovered that 95% of customers prefer EV models with EMI facilities, indicating a demand for easy purchase options.

**Step 3: Machine Learning Modeling**

- In this step, we employed machine learning techniques to identify patterns within the data. By providing the dataset to machine learning algorithms, we enabled them to autonomously group customers based on various characteristics. The output of this process is available in the coding section of my GitHub repository.

**Step 4: Result Interpretation**

- Once the machine learning models completed the grouping process, we downloaded the results. These results, available in my GitHub repository, consist of two columns: customer ID and different groups. By examining this data in Google Sheets and plotting graphs, we gained a clear understanding of the segmented customer groups.

# Important Suggestions as per Analysis

**Group 1:**

This segment comprises primarily young urban professionals aged 25-35 who prioritize quick charging times and top-speed performance. They are willing to spend the highest amount, ranging between 140,000 to 145,000 rupees, and prefer EV models with sleek designs and vibrant color options. With 45% good ratings and 30% average ratings, they have a high satisfaction level. Additionally, they have a wide range of color availability, with more than 7 options. The top speed of their preferred EVs is around 80 kmph, and the ratio of urban to rural users is 53:47.

**Group 2:**

Customers in this group are typically middle-aged individuals residing in suburban areas. They prioritize affordability and practicality, spending the least amount on EVs. Their preferred EVs have the lightest weight, around 94 kg, with a top speed ranging between 60 to 65 kmph. Despite the lower spending, this group constitutes the largest segment, with over 620 customers. They prefer EVs with longer battery life, around 80-85 km in single charge, and have access to 6 color variants.

**Group 3:**

This group prefers EVs with extended warranties, lasting 8 years, despite having the longest charging times of 6 to 6.5 hours. They prioritize high top speeds, up to 120 kmph, and have the highest range of around 180 to 195 km in single charge. With a user distribution of 45% rural and 55% urban, they seek practicality and reliability in their EVs.

**Group 4:**

Customers in this group are willing to spend more than 120,000 rupees on EVs, with a focus on aesthetic appeal and practicality. Despite a lower top speed of 70 to 75 kmph, their EVs have a relatively short charging time of around 4 hours. With a range of 120 km in single charge, they find value in the attractive design and suitability for the Indian market.

**Group 5:**

This group prefers EVs with unique transformer-like appearances and practical features. Despite a limited color availability of only 3 variants, they prioritize functionality over aesthetics. Their EVs offer a good balance of top speed (80 kmph) and range (100 km in single charge), albeit with a longer charging time of more than 5 hours. Despite this drawback, the distinctive robotic looks make their EVs stand out in the market.

# What Specific Electric Vehicle Details Align with the Requirements of Different Groups?

| Group-1 | | |
|---|---|---|
| **Features** | **Specification-1** | **Specification-2** |
| Range | 145 km/charge | 145 km/charge |
| Motor Power | 4.4 kW | 4.4 kW |
| Motor Type | BLDC | BLDC |
| Front Brake | Disc | Disc |
| Rear Brake | Drum | possible |
| Body Type | Electric Scooters | Electric Scooters |
| Braking Type | Combi Brake System | Combi Brake System |
| Charging Point | Yes | Yes |
| Fast Charging | Yes | Yes |
| Mobile Connectivity | Bluetooth, WiFi | Bluetooth, WiFi |
| Clock | Yes | Yes |
| LED Tail Light | Yes | Yes |
| Speedometer | Digital | Digital |
| Tripmeter | Digital | Digital |
| Mobile Application | Yes | Yes |
| Geo-fencing | Yes | possible |
| Anti Theft Alarm | Yes | Yes |
| Calls & Messaging | Yes | Yes |
| Navigation assist | Yes | Yes |
| Low battery alert | Yes | Yes |

| Group-2 | | |
|---|---|---|
| **Features** | **Specification-1** | **Specification-2** |
| Range | 85 km/charge | 85 km/charge |
| Motor Power | 1.5 kW | 1.5 kW |
| Motor Type | BLDC | BLDC |
| Front Brake | Disc | Disc |
| Rear Brake | Disc | Disc |
| Body Type | Electric Scooters | Electric Scooters |
| Braking Type | Combi Brake System | Combi Brake System |
| Charging Point | Yes | Yes |
| Mobile Connectivity | Bluetooth | Bluetooth |
| Clock | Digital | Digital |
| Speedometer | Digital | Digital |
| Tripmeter | Digital | Digital |
| Mobile Application | Yes | Yes |
| Geo-fencing | Yes | Yes |
| Anti Theft Alarm | Yes | possible |
| Low battery alert | Yes | available |

| Group-3 | | |
|---|---|---|
| **Features** | **Specification-1** | **Specification-2** |
| Feature | Ola S1 Pro Specifications | Ola Specifications |
| Range | 195 km/charge | 195 km/charge |
| Motor Power | 11 kW | 11 kW |
| Motor Type | Mid Drive IPM | Mid Drive IPM |
| Front Brake | Disc | Disc |
| Rear Brake | Disc | Disc |
| Body Type | Electric Scooters | Electric Scooters |
| Braking Type | Combine Braking System | Combine Braking System |
| Charging Point | Yes | Yes |
| Fast Charging | Yes | Yes |
| Mobile Connectivity | Bluetooth, WiFi | Bluetooth, WiFi |
| Clock | Yes | Yes |
| Speedometer | Digital | Digital |
| Tripmeter | Digital | Digital |
| Mobile Application | Yes | Yes |
| Geo-fencing | Yes | available |
| Anti Theft Alarm | Yes | Yes |
| Calls & Messaging | Yes | Yes |
| Navigation assist | Yes | possible |
| Low battery alert | Yes | Yes |

| Group-4 | | |
|---|---|---|
| **Features** | **Specification-1** | **Specification-2** |
| Range | 113-127 km/charge | 113-127 km/charge |
| Motor Power | 4.2 kW | 4.2 kW |
| Motor Type | BLDC | BLDC |
| Front Brake | Drum | Drum |
| Rear Brake | Drum | Drum |
| Body Type | Electric Scooters | Electric Scooters |
| Braking Type | Combine Braking System | Combine Braking System |
| Charging Point | Yes | Yes |
| DRLs | Yes | Yes |
| Mobile Connectivity | Bluetooth | Bluetooth |
| Clock | Yes | Yes |
| LED Tail Light | Yes | Yes |
| Speedometer | Digital | Digital |
| Odometer | Digital | Digital |
| Tripmeter | Digital | Digital |
| Mobile Application | Yes | Yes |
| Geo-fencing | Yes | available |
| Calls & Messaging | Yes | Yes |
| Navigation assist | Yes | Yes |
| Low battery alert | Yes | Yes |
| Roadside Assistance | Yes | Yes |

| Group-5 | | |
|---|---|---|
| **Features** | **Specification-1** | **Specification-2** |
| Range | 100 km/charge | 100 km/charge |
| Motor Power | 6 kW | 6 kW |
| Motor Type | PMSM | PMSM |
| Front Brake | Disc | Disc |
| Rear Brake | Drum | Drum |
| Body Type | Electric Bikes | Electric Bikes |
| Braking Type | Combi Brake System | Combi Brake System |
| Charging Point | Yes | Yes |
| Fast Charging | Yes | Yes |
| Mobile Connectivity | Bluetooth, WiFi | Bluetooth, WiFi |
| Riding Modes | Yes | Yes |
| Cruise Control | Yes | possible |
| Navigation | Yes | Yes |
| LED Tail Light | Yes | available |
| Speedometer | Digital | Digital |
| Odometer | Digital | Digital |
| Battery Warranty | 3 Years or 30,000 Km | 3 Years or 30,000 Km |
| Vehicle Warranty | 5 Years or 50,000 Km | 5 Years or 50,000 Km |
| Portable Home Charger | 5 Hr 15 Min (0-80%) | 5 Hr 15 Min (0-80%) |
| Roadside Assistance | Yes | Yes |
| Mobile Application | Yes | Yes |
| Geo-fencing | Yes | Yes |
| Charging Station Locator | Yes | Yes |
| Anti Theft Alarm | Yes | Yes |
| Calls & Messaging | Yes | Yes |
| Low battery alert | Yes | Yes |

Git-Hub : Click Here

Data-Set Link : Click Here

My Linkedin Link : Click Here

Grouping Result Link : Click Here

Information Source(All Specification) : Click Here

**Conclusion:**

In this report, I address the problem statement, outline our chosen method for solving it, and provide answers to two key questions: first, the details of the groupings targeted; and second, the necessary inclusions, additions, or modifications for our upcoming electric vehicle.