Electric Vehicle Bikes

Consumer Analytics

Group Members:

Muneeb -ur- Rehman Faheem	25010110
Amina Waheed	25010078
Muhammad Usman	25010023
Gul-e-Daudi	24010016
Syed Shahzaib Munir	25010117

Submitted to: Professor: Dr Gufran Ahmad

Contents

1. Introduction to the EV Bikes Industry in Pakistan

The electric vehicle (EV) industry has achieved global attention as various countries seek to reduce their carbon footprints and transition towards sustainable energy solutions. These changing global dynamics have influenced Pakistan too. Due to the rising fuel costs, and worsening economic and environmental conditions, many tech enthusiasts are showing interest in electric bikes (EV bikes). However, unlike other markets, EV bikes in Pakistan are still considered as a premium product by the general population. Despite the lower operational costs compared to petrol-based bikes, the high upfront costs of EV bikes in Pakistan limit their accessibility to the broader consumer base. According to Business Recorder, young professionals and environmentally conscious consumers are early adopters. (Recorder, 2023)

Electric bikes represent an emerging segment in Pakistan's vehicle industry, driven by the need for efficient, environmentally friendly alternatives to traditional two-wheelers. As the urban population is growing and transportation needs are becoming significant, electric bikes are seen as a solution to Pakistan's mobility challenges. Yet, the adoption rate remains low due to several structural and institutional challenges. The financial burden of buying an EV bike, along with inadequate infrastructure, restricts the potential for massive adoption.

The Pakistani market has conservatively favored low-cost motorcycles that can be bought with minimum financial burden, making it difficult for electric alternatives to compete. The apparent benefits of electric bikes, such as reduced fuel consumption and lower maintenance costs, are overcome by significant upfront investment. These factors have led to the slow adoption of electric bikes, with consumers being hesitant to make the switch despite the long-term advantages of EV technology.

2. Challenges Faced by the EV Industry

- **High Initial Costs**: The primary hindrance to EV bike adoption in Pakistan is the substantial initial cost. Many locally produced or imported electric bikes have a significantly higher price than conventional petrol bikes, making them less attractive for the average consumer. While future savings on fuel and maintenance are clear, the upright financial outlay for an EV bike remains a critical challenge for Pakistan's price-sensitive population. (ProPakistani, 2023)
- **Lack of Charging Infrastructure**: Pakistan's lack of developed charging infrastructure is another barrier to the growth of the electric vehicle sector. Charging stations are scarce, even in major urban centers, which makes owning an EV bike impractical for many consumers. This deficiency in infrastructure exacerbates concerns about the reliability of EV bikes for daily commuting. (Khattak, 2023)
- **Battery Range Anxiety**: A key concern for Pakistani consumers is the restricted range of electric bikes, especially in a country where long-distance travel is often necessary. The short range of EV bikes, coupled with long charging times, diminishes their attractiveness compared to the ICE bikes, which do not need to be charged and are widely available.
- **Low Consumer Awareness and Trust**: Many potential buyers in Pakistan are unaware of the benefits of EV bikes or remain skeptical about their performance. There is a general lack of consumer education and information on electric vehicle technology. Furthermore, with relatively few established EV manufacturers in Pakistan, trust in the quality and durability of available products remains low. (Zubair, 2023)
- **Lack of After-Sales Support**: The restricted availability of spare parts and after-sales services for EV bikes in Pakistan further demotivates consumers. Due to the lack of a strongly developed supply chain for EV components, particularly batteries, users are unsure of investing in a product that may be tough to maintain over time.

3. Government Support and Policy

Government support plays a pivotal role in shaping the growth of the EV industry, but in Pakistan, progress has been slow. While the introduction of the Electric Vehicle Policy 2020-2025 (https://moip.gov.pk/Policies) aims to promote local manufacturing and adoption of electric vehicles, there has been limited action on consumer-focused subsidies or incentives. These incentives are crucial to making EV bikes more affordable, but the lack of financial assistance from the government remains a barrier to mass adoption. (Pakistan, 2021)

Developing infrastructure, especially the expansion of charging stations, is another point where government involvement has been inadequate. Without reachable and dependable charging points, consumers remain hesitant to adopt electric bikes. Although there is a market for growth, governmental support currently has not been enough to significantly accelerate the industry.

4. Project Objectives and Hypothesis

This research aims to explore key factors influencing the adoption of electric bikes in Pakistan, based on discussions with managers from OKLA and Metro.

Research Objectives

- **Identifying Consumer Behaviors and Market Segmentation**: Understand consumer behaviors that affect EV bike adoption and segment the market based on demographics and preferences.
- **Evaluating Product Attributes**: Analyze key product features such as price, battery range, and charging convenience to gauge their impact on consumer acceptance.
- **Developing a Positioning Strategy**: Formulate a marketing mix strategy based on insights from market segments to drive adoption.

Research Hypothesis

Based on interviews with industry experts from OKLA and Metro, the following hypothesis was established:

Individuals with higher levels of planning behavior are more likely to adopt electric bikes than those with lower levels of planning behavior.

This hypothesis aims to identify behavioral traits that influence adoption, providing valuable insights for companies like OKLA and Metro.

5. How the Project May Solve Industry Problems

This project addresses key challenges in Pakistan's electric bike industry by offering actionable insights for EV companies.

- **Improve Consumer Understanding:** The project is going to give detailed insights into consumer preferences, enabling companies to come up with marketing and product strategies that meet specific needs, increasing adoption rates.
- **Boost Product Development:** It will also help find important product attributes like battery life and price, educating manufacturers in creating EV bikes that better match consumer expectations, thus reducing adoption barriers.
- **Better Market Positioning:** The findings will help companies develop significant marketing strategies, positioning EV bikes as attractive substitutes to traditional motorbikes by focusing on their benefits.
- **Identify Market Gaps:** By identifying the consumer needs that are not met, the project will help companies identify new opportunities for growth, such as reasonable pricing or better after-sales support.

This research will enhance industry growth by improving knowledge, product development, positioning, and addressing market gaps.

6. Research Methodology

Research Process and Respondents

The steps followed for research in this project involved both secondary research and primary data collection through interviews, focus groups, and surveys to gather insights on consumer behavior, market potential, and challenges in the electric bike (EV bike) industry in Pakistan.

Secondary Research

The secondary research was targeted on analyzing the growing popularity of EV bikes and its implications on local manufacturing in Pakistan. This phase highlighted the market potential for EV bikes, along with the major difficulties, such as infrastructure limitations and cost hindrances, that influence consumer adoption in the country.

Interviews with Brand Managers

To gain industry-specific insights, interviews were conducted with key representatives from leading companies in the EV bike market:

- OKLA – Assistance Marketing Manager
- Honda – Area Sales Manager
- Metro – EV Bikes Franchise Relationship Manager

These interviews provided valuable insights on market trends, consumer preferences, and strategic initiatives that are being utilized by these companies to grow the EV bike sector.

Focus Group

A focus group session was held with 4-5 participants, representing a mix of current users of EV bikes, potential EV bike buyers and current traditional bike users. The focus group aimed to explore detailed consumer perceptions, concerns, and factors that could drive or hinder the transition to EV bikes.

Surveys

A total of 95 respondents participated in the survey, consisting of a diverse amalgamation of current EV bike owners, potential buyers, and traditional bike users. The survey was designed to gather data and analyze consumer attitudes, preferences, and purchase intentions, helping to better understand the broader market dynamics and potential barriers to EV bike adoption.

Products/Brands and Their Attributes Studied

The research focused on a variety of electric bike (EV bike) brands and traditional internal combustion engine (ICE) bike brands, assessing their design features and key product attributes to compare consumer preferences.

Brands Studied

- **Jolta** – Traditional Design
- **MS Jaguar** – Traditional Design
- **Metro** – New Design
- **OKLA** – New Design
- **Pakzon** – Traditional Design
- **Evee** – New Design
- **Honda** – ICE
- **Suzuki** – ICE

- **Yamaha** – ICE

Attributes Studied

- **Exploratory Research**:

  Focused on key factors influencing purchase decisions, including:

  - Maintenance Costs
  - Battery Life
  - Safety Features

- **Confirmatory Research**:

  Investigated general EV advantages such as:

  - Long Range with Fewer Charges
  - Smooth and Quiet Ride

The comparison of these attributes across both EV and ICE bikes provided a comprehensive view of the factors driving consumer preferences in Pakistan's motorcycle market.

7. Purchase Process/Customer Journey

This research led to a layout of the customer journey for both electric bike (EV) and traditional internal combustion engine (ICE) bike buyers in Pakistan, focusing on key stages: awareness, consideration, purchase, and post-purchase.

1. **Awareness**
   - **EV Bikes**: Awareness is a result of rising fuel costs, environmental concerns, and promotional campaigns. Social media and word-of-mouth also play significant roles.

- **ICE Bikes**: Traditional bike buyers are mainly driven by brand loyalty, dealership promotions, and the well-established presence of brands like Honda and Suzuki.

2. **Consideration**
    - **EV Bikes**: Buyers evaluate factors like cost, battery range, and charging infrastructure. Extensive research is needed due to the newer technology.
    - **ICE Bikes**: Consideration is faster, focusing on fuel efficiency, resale value, and after-sales service, with less need for research.
3. **Purchase**
    - **EV Bikes**: Price, financing options, and long-term savings influence the decision. Potential problems related to charging and battery life often cause hesitation.
    - **ICE Bikes**: Buyers benefit from straightforward purchasing processes, relying on dealership financing and deeply rooted dealer networks.
4. **Post-Purchase**
    - **EV Bikes**: Owners need to adapt to new technology, with concerns about battery maintenance and charging. Satisfaction is a result of savings on fuel and maintenance.
    - **ICE Bikes**: Maintenance and repairs are less tricky, with sufficient service centers and parts availability, leading to a smoother post-purchase experience.

8. Results from Market Research

8.1. Customer Analysis (Segmentation)

A clustering analysis was performed using K-means clustering. The attributes used for clustering were a combination of psychographic factors of the consumers and product attributes

of EV bikes that they considered important. Various values of K were tested, and an elbow plot (Exhibit D-0) was generated.

According to the elbow plot, there are two elbow points where adding more clusters doesn't improve the model significantly in terms of reducing error. Although there is a more drastic shift at 6, 3 clusters were chosen. The reasons are mentioned below:

- **Data Characteristics:** The data collected from our surveys naturally supported fewer clusters, and while the elbow plot suggested more, these additional clusters did not represent distinct or meaningful groupings. The distribution or size of the dataset indicated that 3 clusters are sufficient.
- **Goal of the Analysis:** The goal of our analysis was to create broader segments of customer profiles. Fewer clusters offered a better balance between detail and actionability. Too many clusters were fragmenting our data unnecessarily.

Once the 3 clusters were established, cross-tabulations were created with demographic and psychographic attributes to examine how consumers in each cluster differed. Exhibit D-5 shows the experience with EV bikes of consumers among these clusters. The encodings are as follows:

- 1: I have never ridden an electric bike but have ridden a regular bike,
- 2: I have tried an electric bike once or twice,
- 3: I occasionally ride an electric bike,
- 4: I regularly ride an electric bike,
- **5: I currently own an electric bike,**
- 6: I have never ridden a bike (electric/regular).

Based on this, the resulting cluster profiles are as follows:

1. **Cluster 0 - Traditional Bike Users**
    - **Demographics:** Mostly, age 18-36, students.

- **Ownership**: Least ownership of vehicles.
- **Decision Making:** Spontaneous.
- **Vehicle Type**: Mainly Traditional bike users.

2. **Cluster 1 - EV Bike Users**
    - **Demographics:** Balanced gender ratio, age 26-35, more employed.
    - **Ownership**: Highest ownership of vehicles.
    - **Decision Making:** Majority are spontaneous but also the most planners
    - **Vehicle Type**: Mainly EV bike users.
    - **Monthly household income:** PKR 100,000 – 200,000
3. **Cluster 2 - Mixed Experience Users**
    - **Demographics:** Balanced gender ratio, age 18-36, none over 40
    - **Decision Making:** Spontaneous.
    - **Vehicle Type**: 50-50 split bike users.

The cross-tab bar chart shown in Exhibit D-4 refers to survey responses to the question: "How do you typically plan your day for activities like commuting, vehicle charging, and other tasks" (where 1 is the highest and 4 is the lowest). Based on that, we can see that Cluster 1 (EV bike users) shows the highest percentage of people who plan in advance among the three clusters (the blue bar, 1, denoting the highest).

This validates the hypothesis mentioned earlier that was established with industry leaders from Okla and Metro, that individuals with higher levels of planning behavior are more likely to adopt electric bikes than those with lower levels of planning behavior. EV bikes align with the lifestyle of those who ensure their vehicle is ready for use, supporting the hypothesis that EV users are more organized and proactive in their commuting decisions.

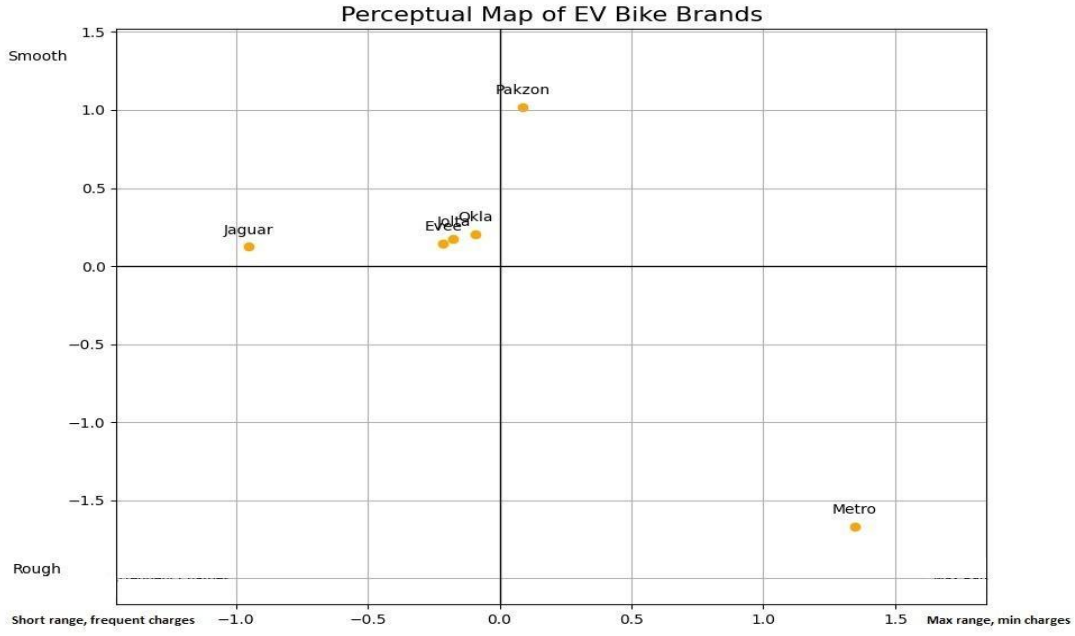
Exhibit D also shows other cross-tabulations of the clusters with attributes such as how important design, aesthetics, and price for an EV bike are to the consumers. The profiling

reveals that traditional bike users consider these features to be very important (Exhibit D-1 and D-2). EV bike users give medium importance to design and aesthetics and don't consider price to be as important. The mixed experience users tend to value these features as well.

8.2. Competitor Analysis

In order to analyze how different EV brands are targeting consumers based on their preferences, a perceptual map was made based on the similarity scores received by EV bike users. In order to do MDS, we collected similarity scores from the EV users to compare different brands of EV bikes. Then, a perceptual map was made along the dimensions (attributes) preferred by EV users (Cluster 1).

Insights from the Perceptual Map:



1. **Pakzon**: This brand has positioned itself at the top of the smoothness scale and a bit to the right on the side for long-range with fewer charges. This means that Pakzon is a smooth ride, decent range, and charge efficiency, but not necessarily the best by range.

2. **Metro**: Situated strongly on the side of maximum range and fewer charges but quite low in terms of smoothness. This means that Metro is perceived as a bike that can go long distances with fewer charges but compromises significantly on ride quality, being associated with a rough or noisy ride.
3. **Jaguar**: Jaguar is placed beside the rough and short range/frequent charges portion of the map. Therefore, it shows that it is perceived to have a relatively less smooth ride quality (harsh and noisy) and also not so good with respect to the range and charging efficiency.
4. **Joltaa, Evee, and Okla**: They are clumped towards the center with a slight deviation to the long-end but are still within the neutral band. They might just be balanced options without unique outstanding attributes but have an average score for both smoothness and range without raising big concerns.

Key Takeaways:

- Metro carries off the range and charging efficiency at the expense of ride comfort.
- Pakzon is balanced between comfort and range, and is perceived as a premium brand where users opt for comfort.
- Jaguar would be the brand that the consumers consider the least good, struggling on both fronts-the range and ride comfort.
- Voltka, Evee, and Evolve are in the middle ground.

8.3. Attributes Study

Our research involved comprehensive analysis, combining both secondary and primary research methods to gain insights into different user clusters. Through primary research, we conducted focus groups comprising representatives from each identified cluster: Traditional Bike Users, EV Bike Users, and All-Rounders. This approach allowed us to gather firsthand

feedback and understand the unique preferences and priorities of each group. From these discussions, three emerging features were highlighted as critical across the clusters:

Maintenance Cost: Participants emphasized the importance of affordable maintenance, particularly Traditional Bike Users and All-Rounders, who are keen on minimizing long-term expenses associated with bike upkeep.

Battery: For EV Bike Users and All-Rounders, battery performance was a crucial factor. Insights revealed a strong preference for bikes with long-range capabilities and fewer charging requirements, reflecting a desire for convenience and reliability.

Safety Features: Safety was a significant concern for all clusters. Users expressed a need for enhanced safety features, underscoring the importance of feeling secure while riding, regardless of the bike type. This rich qualitative data gathered from our focus groups has been instrumental in shaping our understanding of user needs and guiding our product development strategies to better align with market expectations.

Given that **safety features** and **comfort** are considered synonymous in our context, the findings in the graph do support your research conclusions. (Exhibit D6)

1. **Maintenance Cost**: As mentioned earlier, maintenance is rated highly across all clusters, particularly for Traditional Bike Users and All-Rounders. This aligns perfectly with your qualitative data, where minimizing long-term expenses was emphasized.
2. **Battery**: The importance of "Long range and fewer charges" is rated highly by EV Bike Users and All-Rounders, which correlates with the feedback from these groups in your research, highlighting battery performance as a key factor.
3. **Safety/Comfort**: Since **safety features** are treated the same as **comfort**, the high importance ratings for "Comfort" across all clusters align with your focus group data.

Users across all groups emphasized the need for safety and feeling secure while riding, which is represented by this high rating for "Comfort."

9. Recommendations

Positioning Strategy (EV Bike Users)

Based on the clustering shown in the section above, EV bike users are mostly in Cluster 1. Therefore, to determine the positioning strategy and target audience for a new entrant in the EV bike market, Cluster 1 was compared with the remaining two clusters based on price, product, and promotion. (Exhibits D-1, D-2, D-3)

1. Price - EV Users Do Not Give Significant Preference to Price:

In the case of EV bikes, users tend to care more about the quality of the vehicle along with its performance rather than the price. For brand owners, this implication is that depending solely on price competitiveness cannot work well. On the other hand, they may spend it on additional features or performance upgrades and get priced at that. On the other hand, traditional bike users are extremely price-sensitive. They are not ready to pay the premium price of an EV bike.

2. Product - Long Range, Fewer Charges, Smooth Ride, Durability, and New Design:

Long Range & Fewer Charges: The longer range in distance without too many recharges is a product attribute preferred by EV users. This is especially relevant in Pakistan, where charging infrastructure is still in its infancy.

Smooth Ride & Durability: These features speak for comfort and durability which shows that EV users buy the product with a long-term view of dependable transport.

New Design: According to the perceptual map results, brands like Pakzon are focusing on new designs for EVs which are preferred by EV users. On the other hand, traditional bike users also place significant importance on their traditional bike design and are not yet ready to adopt the modern bike design for EVs.

Therefore, based on the attributes of price and design, new brands entering the EV market should start by focusing on the existing EV users as their target audience, rather than directly penetrating into the vast traditional bike user market.

3. Promotion - Word of Mouth

This is an important insight for the marketing mix. Based on our survey results, Word of mouth (WOM) promotion implies that satisfied customers are likely to refer the product to their friends. Hence, it is imperative that EV bike brands focus on creating a delightful user experience so that customers have the tendency to recommend it naturally.

Positioning strategy (Traditional Bike Users)

1. Price - Introducing Flexible Ownership Models to Appeal to Price-Sensitive Consumers:

From Exhibit D-7, we can see that traditional bike users are extremely price-sensitive, making it difficult to directly convert them to EV bikes that are typically priced higher. To overcome this, the strategy will focus on leasing and rental models. By offering these consumers the option to lease or rent EV bikes, they can experience the product without the heavy upfront cost. This will provide a more accessible entry point for price-sensitive consumers, while also increasing their exposure to the benefits of EV bikes.

Leasing

A leasing option could make EV bikes more attractive as it spreads out the cost over time, reducing the financial burden. This also allows consumers to upgrade their bikes in the future as new models are released.

Rental Model

In areas like universities or city centers, a rental model can offer short-term, affordable access to EV bikes. This could also help improve the resale value of EV bikes, which currently lacks market demand.

By offering these flexible ownership models, the brand can meet traditional users' price expectations while gradually familiarizing them with EV technology.

2. Product - Focus on Battery Life and Range:

Also from Exhibit D-7, we see that traditional bike users prioritize battery life and range when considering EV bikes. Since they rely heavily on spontaneous decision-making, they need assurance that their bike won’t run out of charge during longer commutes.

Battery life and long-range performance should be central to product development and communication. Educating traditional bike users on how EV bikes can match or even exceed traditional bikes in terms of range will be crucial in shifting perceptions. We would like to leave this area open for future research.

3. Promotion - Leveraging Social Media, Online Newsletters, and Campus Campaigns:

To effectively reach traditional bike users, the promotion strategy needs to focus on the channels where they typically gather information: social media and online newsletters. Exhibit

D-3 shows that these are already key information sources for this group, so EV bike brands should increase their digital marketing presence on platforms like Facebook, Instagram, and YouTube, targeting this demographic with engaging content that highlights the affordability and long-term benefits of EV bikes.

University Campaigns

Since traditional bike users are largely students and the Exhibit D-3 shows that university campaigns are not yet a source of information for them on EV bikes, organizing promotional campaigns on university campuses will be essential. These campaigns could include hands-on experiences, test rides, and educational seminars on EV bikes. This will increase visibility and engagement with this key demographic, who are more likely to be influenced by direct experiences and peer recommendations.

4. Targeting Traditional Users for Long-Term Adoption:

While traditional bike users may be more hesitant to adopt new technology, positioning EV bikes as a cost-effective, long-range, and reliable alternative can bridge the gap. By focusing on practical concerns like battery life and affordability through innovative pricing models, traditional users will be more inclined to switch to EV bikes over time.

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11. Appendices

a. List of Brand Managers Interviewed

IN DEPTH INTERVIEW NO.1

INTERVIEWEE: HASEEB QAISER (AREA SALES MANAGER HONDA ATLAS).

COMPANY: HONDA ATLAS PAKISTAN LIMITED.

Q1: Describe how you segment the market for the brand, the number of customer segments, and their brief characteristics (e.g., psychographics and demographics)?

Answer: We segment by income and product use. The CD70 is for lower-income buyers looking for a bike with good resale value. The CD100 targets people in their 30s with steady jobs who value comfort and fuel efficiency. The CD125 is for rural users needing a powerful bike, though it's also used in cities. The CD150 is our premium model, aimed at higher-income customers who want a luxury, eco-friendly bike.

Q2: Describe which customer segments you prioritize and target, and what characteristics (e.g., size, purchasing power, and lifestyle) make a segment attractive?

Answer: We prioritize the CD70 and CD125 segments. The CD70 is popular because it's affordable and has strong resale value, making it a good entry-level bike. The CD125 is key in rural areas where power and reliability are crucial. Both segments show high brand loyalty. The CD150 is also a focus for affluent customers who want more luxury.

Q3: Describe how you position your brand, which product features are highlighted for each customer segment, and what features differentiate your brand from the competition? (Here you may also elaborate on how brand features overlap with product characteristics.)

Answer: We position Honda as a reliable, durable brand. For the CD70, resale value is the key feature. The CD100 highlights comfort and fuel efficiency, while the CD125 focuses on power. The CD150 is all about luxury and fuel efficiency. Compared to Yamaha's YBR, we cater to decision-makers and back it up with a strong brand image and after-sales service.

Q4: Describe which market research tools and techniques you use, for example, focus groups, in-depth interviews, cluster analysis, perceptual maps, conjoint analysis, A/B product testing, and demand forecasting?

Answer: We use customer surveys, in-depth interviews, and observational research at our dealerships. We also analyze competitors and do feasibility and cost-benefit analysis before launching products. This helps us understand trends and customer needs.

Q5: Describe how you conduct market research in-house and which market research firms you use? What criteria do you use to outsource market research?

Answer: Most of our research is done in-house through dealerships and customer feedback. We're also testing EV bikes at places like LUMS. If we outsource, we choose firms with strong automotive experience, but we prefer managing research internally for better control over data.

Q6: What are the unique selling points for your bikes, and what would you say are the reasons for Honda's dominance in the bike market of Pakistan?

Answer: Our bikes have clear USPs: the CD70 for resale value, the CD100 for comfort, the CD125 for power, and the CD150 for luxury. Honda's dominance comes from our reliability,

strong after sales service, and wide availability of spare parts. People trust Honda, and our well-trained technicians ensure customers get quick solutions.

Q7: What are you currently doing for EV bikes research and development? What challenges are you facing? And which segments do you want to target in the EV bikes market?

Answer: We're testing EV bikes with employees and at places like LUMS. The main challenge is figuring out the after sales service—we want to make sure any issues can be resolved quickly. We're targeting eco-conscious customers and urban professionals who care about fuel efficiency and environmental impact.

IN DEPTH INTERVIEW NO.2

INTERVIEWEE: MR. ALI BOKHARI (ASSISTANCE MARKETING MANAGER)

COMPANY: OKLA, RAVI AUTO SUNDAR

Q1: What are the consumer preferences when buying your product?

Answer: We cater to energetic individuals, bike enthusiasts, and recreational riders. Our key demographics include daily commuters (students, professionals), people with higher incomes, and older individuals for activities like going to Salah.

Q2: Why did you choose to place your experience store in Defense Housing Authority Phase 8?

Answer: We chose Defense to differentiate ourselves from the competition and position OKLA as a premium brand in the e-bike industry. We also plan to introduce new models and expand with more experience stores.

Q3: How satisfied are you with the sales at your experience store?

Answer: Sales haven’t met our initial expectations, but we’re confident we’ll capture a significant market share as awareness grows.

Q4: How do you communicate your brand?

Answer: Right now, we’re focused on building brand equity and establishing OKLA as a trusted brand in consumers' minds.

IN DEPTH INTERVIEW NO.3

INTERVIEWEE: MR. ASAD BUTT – (EV BIKES FRANCHISE RELATIONSHIP MANAGER)

COMPANY: METRO

Q1: How do you target consumers based on demographics?

Answer: We focus on societies and towns, schools, and colleges to reach our key demographic segments.

Q2: How do you target consumers based on behaviors?

Answer: We target individuals interested in new technology, eco-friendly solutions, and those seeking low-maintenance vehicles. Additionally, we appeal to tech-savvy users who value IoT features and prioritize safety through speed control.

Q3: How many models does Metro Bikes have?

Answer: We currently offer 9 models and are working on launching new variants.

Q4: What channels do you use to sell your products?

Answer: We use Daraz (with a 96% rating), e-commerce, and franchise networks.

Q5: How do you build brand awareness?

Answer: We focus on campaign designs, displays, educational institutes, social media, and offer free test drives.

Q6: How are strategic decisions made about product development for EV bikes?

Answer: The executive board monitors the pace and stages of trends to ensure we align product development with consumer preferences.

b. Focus Group Details

FOCUS GROUP TRANSCRIPT

Q1. What do you think is the main difference between normal bikes and EV bikes?

Male Student 1: Bike power for EVs is 20-30 km and is capped at that. For normal petrol bikes, 60-80 km is possible.

Q2. Can the EV market take advantage of surging fuel prices?

Male Student 1: It can't. The upfront cost is too high. Battery needs to be replaced often. While in Honda bikes batteries last longer. Just like with Solar panel. EV bikes initial prices can go very high as compared to petrol bikes. So, a comparison can't be made.

Male Student 2: They can make batteries longer lasting for EV bikes.

Female Student 1: They can convince the masses because it is not a risky investment. Can market them in a way explaining that they are good in the long run.

Q3. Do your families know about EV?

Male Student 2: They know but not many people have used it.

Female Student 2: Due to less marketing. Change in the market takes time. One time an incident occurred of my female friend, the EV bike tire burst, and it started burning.

Male Student 1: Honda branding is also a big reason. It has the most sales despite high prices. It's the branding in the consumers' minds.

Q4. So, what do EV companies need to do to compete with Honda?

Male Student 1: If the bike doesn't have resale value, they can't compete. Middle class people buy bikes.

Male Student 2: They are like assets for them. Without resale value, they can't sell it ahead.

Q5. What would attract you to buy them?

Female Student 2: To move to green products after covid. To use sustainable means. As somebody who is very conscious of the environment, and since I have the purchasing power, I would buy.

Female Student 1: Target market must be upper middle class to upper class, as they can afford it.

Q6. What shape would you prefer for the EV bike (Traditional ones or the new ones)?

Male Student 1: Traditional. Only 2 people can sit on an EV bike. But in Pakistan the whole family needs to sit, and space is needed for storing stuff.

Female Student 2: From a personal point of view, it's for my leisure, so I would go with new designs.

Female Student 1: Can also target a shape for the female market as they would prefer the new shape.

Q7. How big of a factor is ‘range anxiety’ for you?

Male Student 1: I once got a bike when I was in China to move about from my hotel. At one point I struggled to get back as its ‘battery points’ ran out and I had to drag it back part of the way. So, I would keep checking its battery and if it were less than 30%, I’d start coming back. Plus, the charging time is too much.

Q8. What does a company need to do to compete with this decades-old market? They are very common in India.

Male Student 1: I don’t think government involvement is necessary. Reliability is needed and price to be improved. They need to have better batteries. Otherwise, people would not go for it as their only vehicle, rather they would use it for leisure. If there's a long charging time, then its battery life should also be long.

Female Student 1: We must look at our culture. We have a phobia for new things, despite them being for our benefit. 10 years is a good enough time for it to become more common. Government assistance can influence the masses just like they do farmers. If they push ads on TV and radio, then it can influence them more than if it comes from a private market. Marketing is very important as well. Your target market needs to be clearly involved. Government involvement and good marketing.

Female Student 2: Also, if we can have them in theme parks etc. then their exposure will become more.

c. Finalized/Formatted Survey

Demographics

Age group? *

- ○ under 18 years
- ○ 18 years to 25 years
- ○ 26 years to 35 years
- ○ 36 years to 45 years
- ○ 46 years and above

Gender? *

- ○ Male
- ◉ Female
- ○ Other: .....

Occupation *

- ○ student
- ○ employed
- ○ self-employed
- ○ homemaker
- ○ retired

Would you like to share your income level? If yes, please answer the following question. I not, please proceed to the next section

- ○ Yes
- ◉ No

Monthly household income?

- ○ under PKR 50,000
- ○ PKR 50,000 – PKR 100,000
- ○ PKR 100,001 – PKR 200,000
- ○ PKR 200,001 – PKR 300,000
- ○ Above PKR 300,000

Daily Routines and Bike Use

How comfortable are you in adopting new technologies? *

	1	2	3	4	5	
Not at all	○	○	○	○	◉	Very Comfortable

How do you typically plan your day for activities like commuting, vehicle charging, and other tasks?

- ◉ I plan my day in advance, ensuring my vehicle is charged and ready for my commute.
- ○ I plan most activities but leave some flexibility.
- ○ I handle tasks as they come, without strict planning.
- ○ I prefer to be spontaneous and don't usually schedule these activities.

How far do you typically travel in a single trip on your bike? *

- (●) Less than 20 km
- ( ) 20 km to 30 km
- ( ) 30 km to 40 km
- ( ) 40 km to 50 km
- ( ) 50 km or more
- ( ) Other: .....

How do you primarily envision using a bike in your daily life? *

- [x] Commuting to work or school
- [x] Leisure and entertainment
- [x] Family transportation
- [x] Running errands around town
- [x] Long-distance travel

Current Vehicle Experience

What type of vehicle do you currently own or primarily use? *

- (●) Car
- ( ) Motorcycle/Bike
- ( ) Electric Vehicle (EV)
- ( ) Public transportation
- ( ) None

How satisfied are you with your current vehicle's performance? *

- (●) Very satisfied
- ( ) Satisfied
- ( ) Neutral
- ( ) Dissatisfied
- ( ) Very dissatisfied

What do you like most about your current vehicle? (Select up to 3) *

- [x] Fuel efficiency
- [ ] Performance (acceleration, handling, etc.)
- [x] Maintenance cost
- [x] Comfort and design
- [ ] Reliability
- [ ] Brand reputation
- [ ] Environmental impact
- [ ] After Sale Service
- [ ] Resale Value
- [ ] Other: .....

How often do you use your vehicle? *

- ◯ daily
- ◯ one to three times a week
- ◯ three to four times a week
- ◯ four to five times a week
- ◯ more than five times a week

On average, how much do you spend on fuel/charging per month? *

- ◯ Rs.10,000 to Rs. 20,000
- ◯ Rs.20,000 to Rs.30,000
- ◯ Rs. 30,000 to Rs. 40,000
- ◯ Rs. 40,000 to Rs. 50,000
- ◯ Rs. 50,000 or more
- ◯ Other: .....

How much do you spend on maintenance/repairs for your vehicle annually? *

- ◯ Rs.5000 to Rs.10000
- ◯ Rs.10000 to Rs.20000
- ◯ Rs.20000 to Rs.30000
- ◯ Rs.30000 to Rs.40000
- ◯ Rs. 50,000 or above.

Would you consider replacing your current vehicle in the next 1-2 years? *

- ○ Yes
- ○ No
- ◉ Maybe

If yes, what factors would influence your decision to replace your vehicle? (Select all that apply) *

- ☐ Lower running costs
- ☑ Better performance
- ☐ Environmental benefits
- ☑ Newer technology
- ☑ Brand reputation
- ☑ Incentives (rebates, subsidies, etc.)
- ☐ Test Drive
- ☐ Other: .....

Awareness

How familiar are you with EV bikes? *

- ◉ Very familiar
- ○ Somewhat familiar
- ○ Heard of them, but not familiar
- ○ Not familiar at all

Have you ever considered purchasing or using an EV bike? *

- ○ 1 (never)
- ○ 2 (seldom)
- ○ 3 (sometimes)
- ○ 4 (often)
- ○ 5 (almost always)

Where do you primarily get your information about EV bikes? (Select all that apply) *

- ☐ Online news articles
- ☑ Social media
- ☐ TV/Radio
- ☐ Friends/Family
- ☐ Auto or bike dealerships
- ☐ Government advertisements/incentives
- ☐ Other: .....

Understanding User Psychology for an EV Bike

Which of the following best describes your experience with electric bikes? *

- ◯ I have never ridden an electric bike but have ridden a regular bike.
- ◯ I have tried an electric bike once or twice.
- ◯ I occasionally ride an electric bike.
- ◯ I regularly ride an electric bike.
- ◯ I currently own an electric bike.
- ◯ I have never ridden a bike (electric/regular).

If you have an Electric Bike, what brand and model of bike do you own? (Optional)

How important are following features in an EV bike to you? *

	1 (Not Important at All)	2 (Slightly Important)	3 (Moderately Important)	4 (Very Important)	5 (Extremely Important)
Battery life/range	○	○	◉	○	○
Charging time	○	○	◉	○	○
Safety features (e.g., ABS, traction control)	○	○	◉	○	○
Price	○	○	◉	○	○
Design and aesthetics	○	○	◉	○	○
Connectivity features (e.g., smart dashboard, app integration)	○	○	◉	○	○

When thinking about your ideal experience with an EV bike, how important are the following factors for you? *

	1 (Not Important at All)	2 (Slightly Important)	3 (Moderately Important)	4 (Very Important)	5 (Extremely Important)
Long range and fewer charges	○	○	◉	○	○
Durability	○	○	◉	○	○
Smooth and quiet ride	○	○	◉	○	○
High performance (e.g., speed, acceleration)	○	○	◉	○	○
Comfort	○	○	◉	○	○
Maintenance cost	○	○	◉	○	○
Brand	○	○	◉	○	○

Comparing EV and Traditional Bikes

What are two words that comes to mind when you think of **EV bikes** in general? *

No fuel

What are two words that comes to mind when you think of **HONDA** in general? *

Comfort

What are two words that comes to mind when you think of **Yamaha** in general? *

Comfort

What is two word that comes to mind when you think of **Suzuki** in general? *

Moderate

How familiar are you with the following EV bike brands? *

	1 (Not Aware at All)	2 (Slightly Aware)	3 (Somewhat Aware)	4 (Aware)	5 (Very Aware)
OKLA	◉	○	○	○	○
MS Jaguar	◉	○	○	○	○
Evee	◉	○	○	○	○
Metro	◉	○	○	○	○
Jolta	◉	○	○	○	○
Pakzon	◉	○	○	○	○

:::

As an EV bike user, how similar do you think the following EV bike brands are in terms of their product?
Rate from 1(Not similar) to 10 (Very similar)

	Okla	MS Jaguar	Evee	Metro	Jolta	Pakzon
Okla	☐	☐	☐	☐	☐	☐
MS Jaguar	☐	☐	☐	☐	☐	☐
Evee	☐	☐	☐	☐	☐	☐
Metro	☐	☐	☐	☐	☐	☐
Jolta	☐	☐	☐	☐	☐	☐
Pakzon	☐	☐	☐	☐	☐	☐

d. Descriptive Statistics and Cross-tabs

Exhibit D-0: Elbow plot from clustering analysis

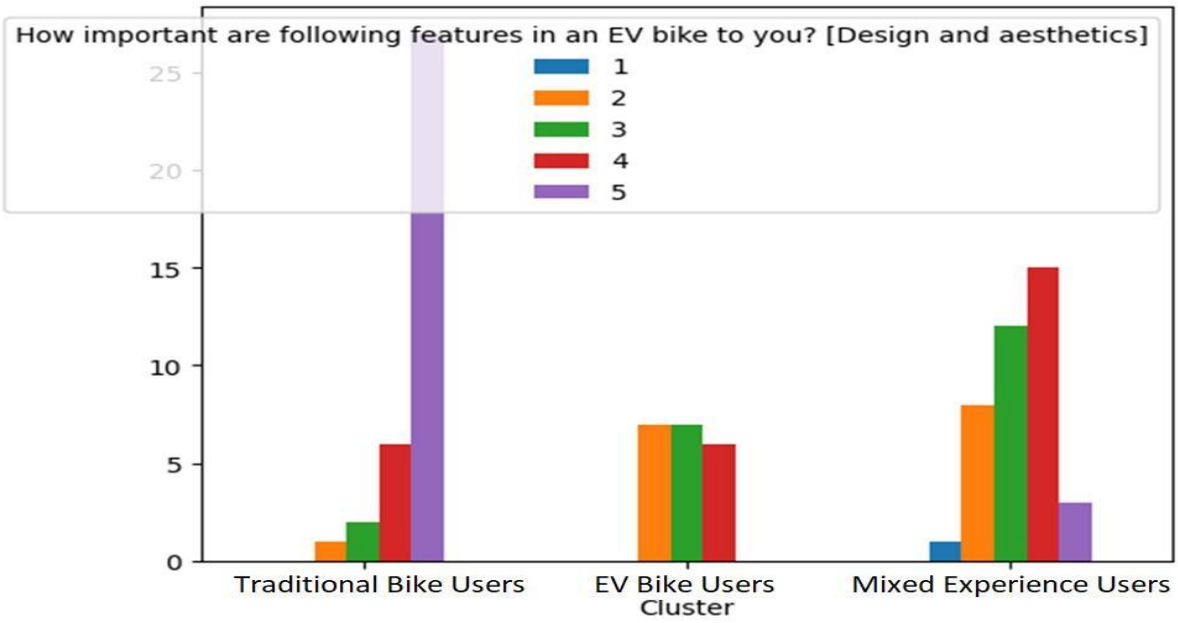

Exhibit D-1: Design preference for EV Users vs Traditional Users

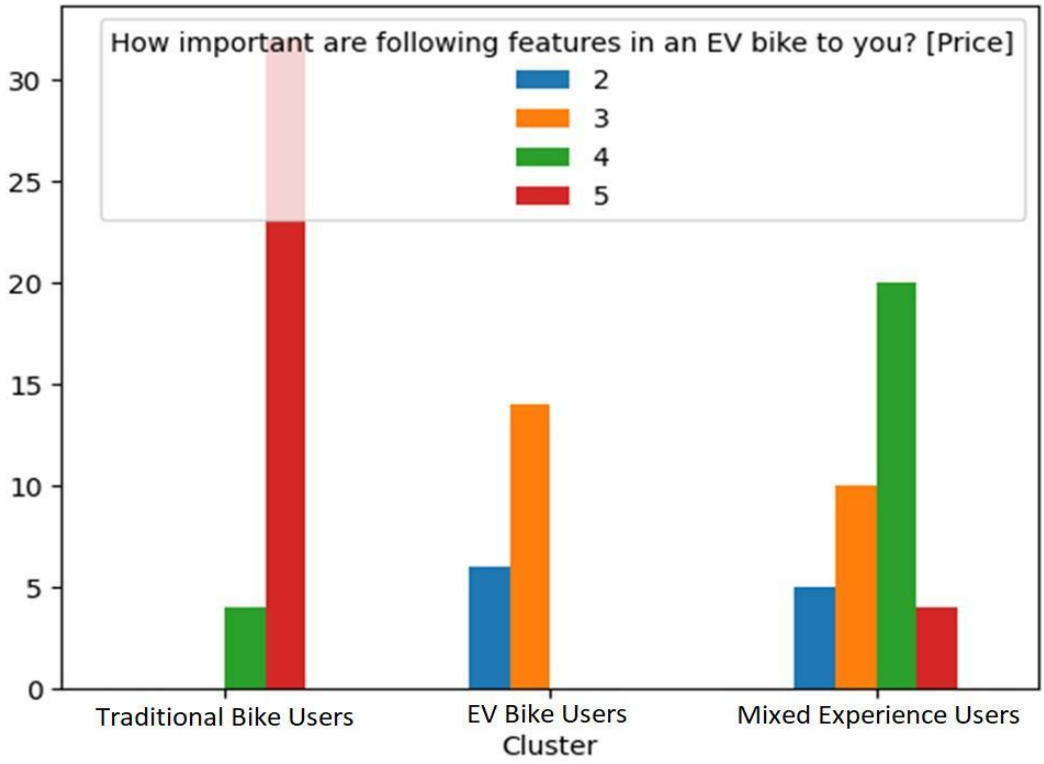

Exhibit D-2: Price preference for EV Users vs Traditional Users

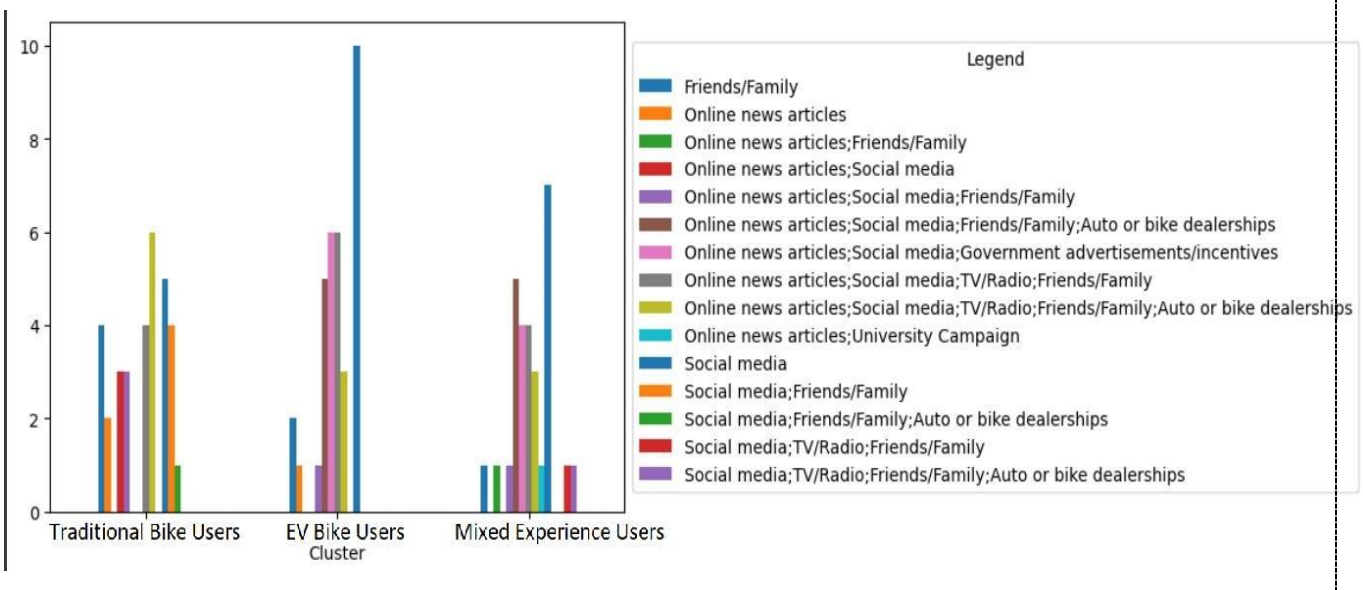

Exhibit D-3: Sources of EV awareness

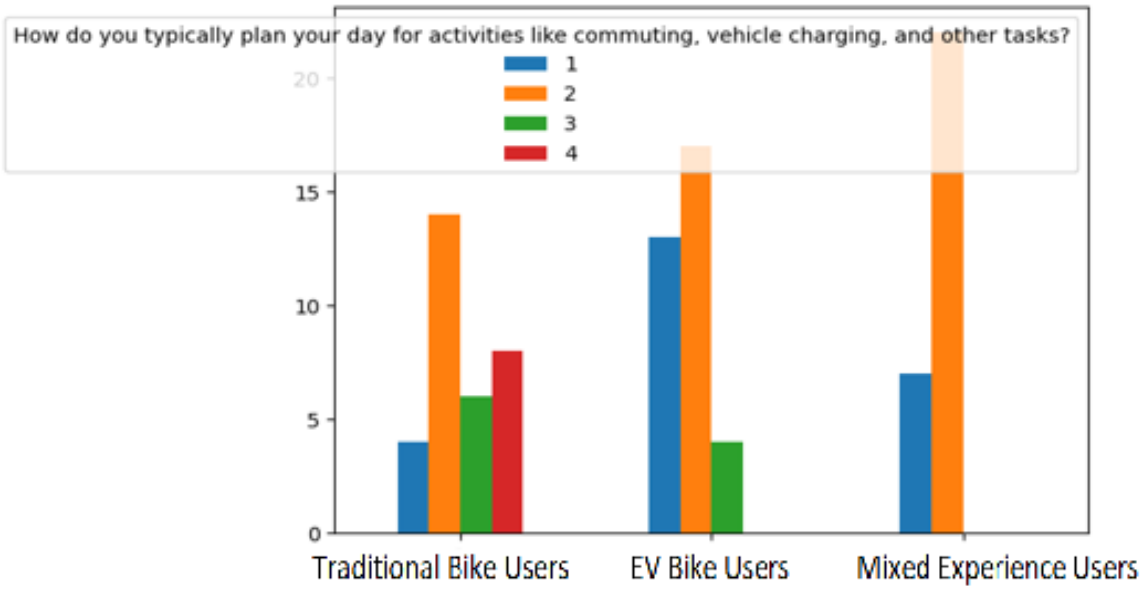

Exhibit D-4: How much consumers plan out their activities

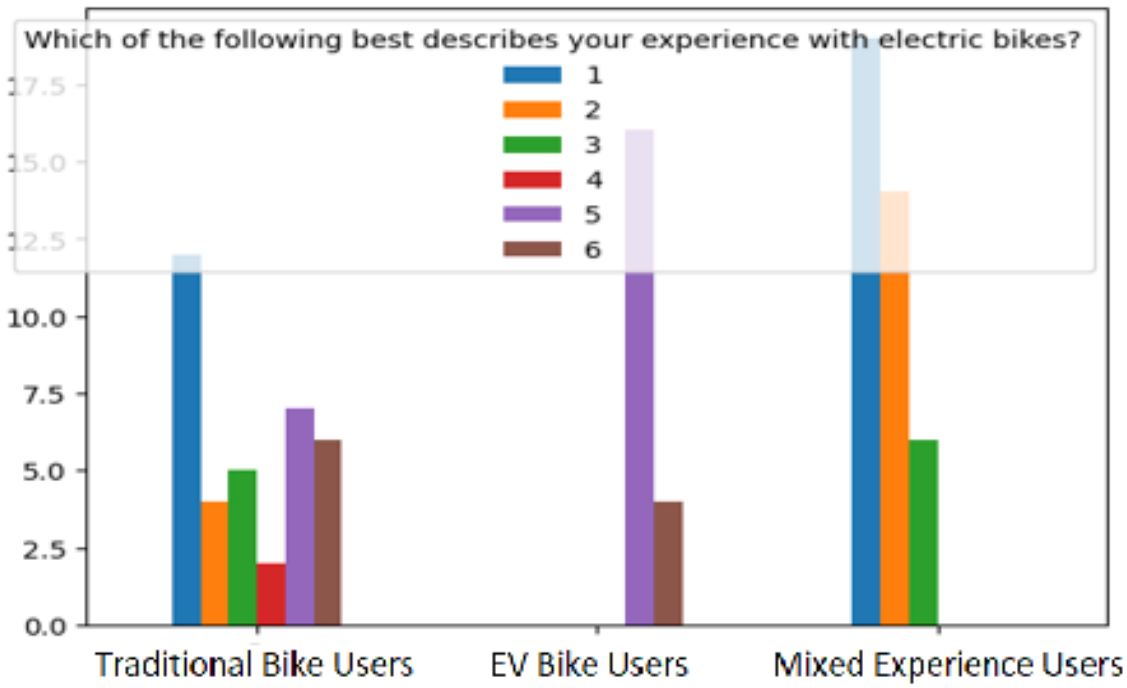

Exhibit D-5: Experience with EV bikes

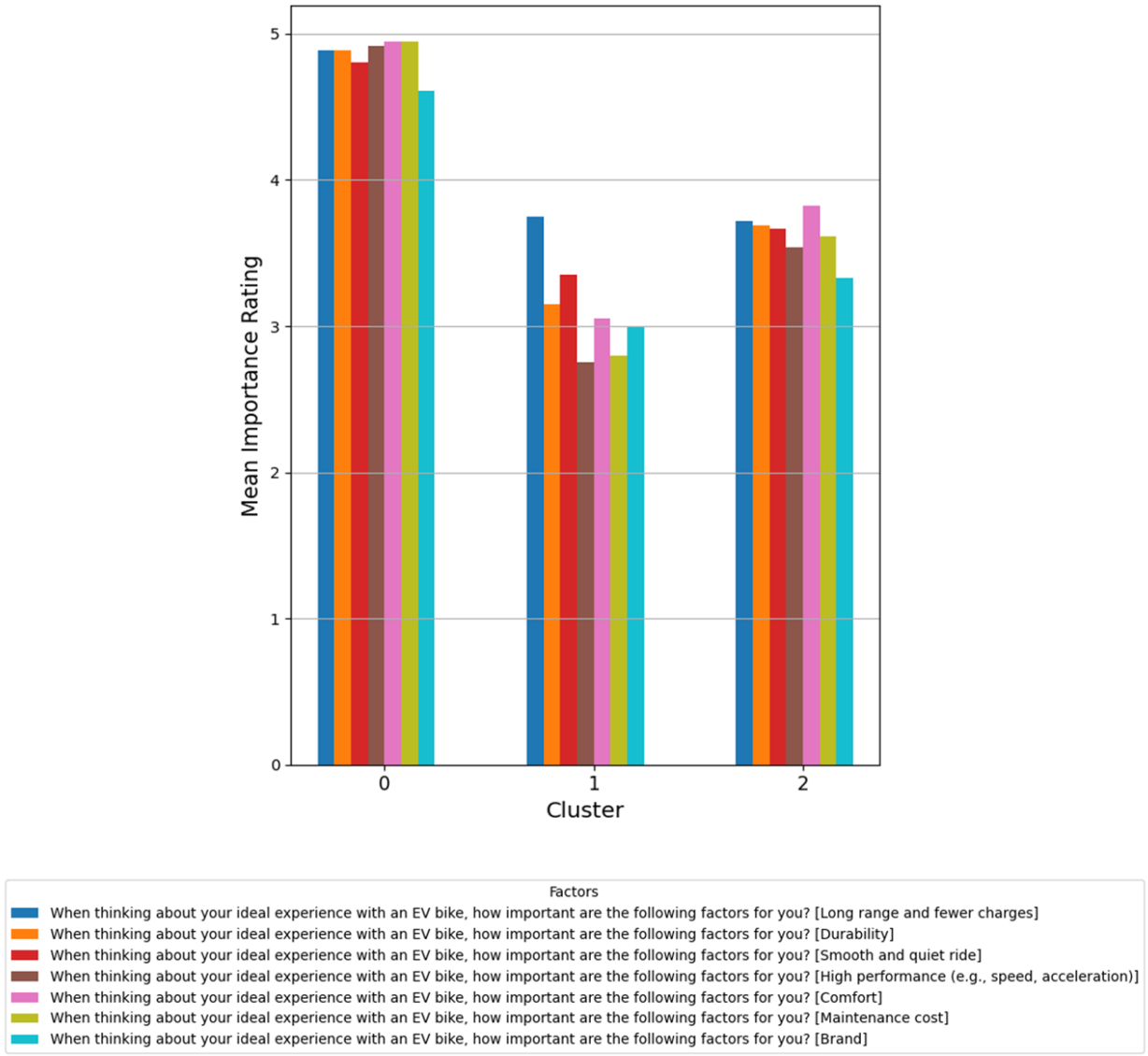

Exhibit D-6: Attributes Preferences within the clusters

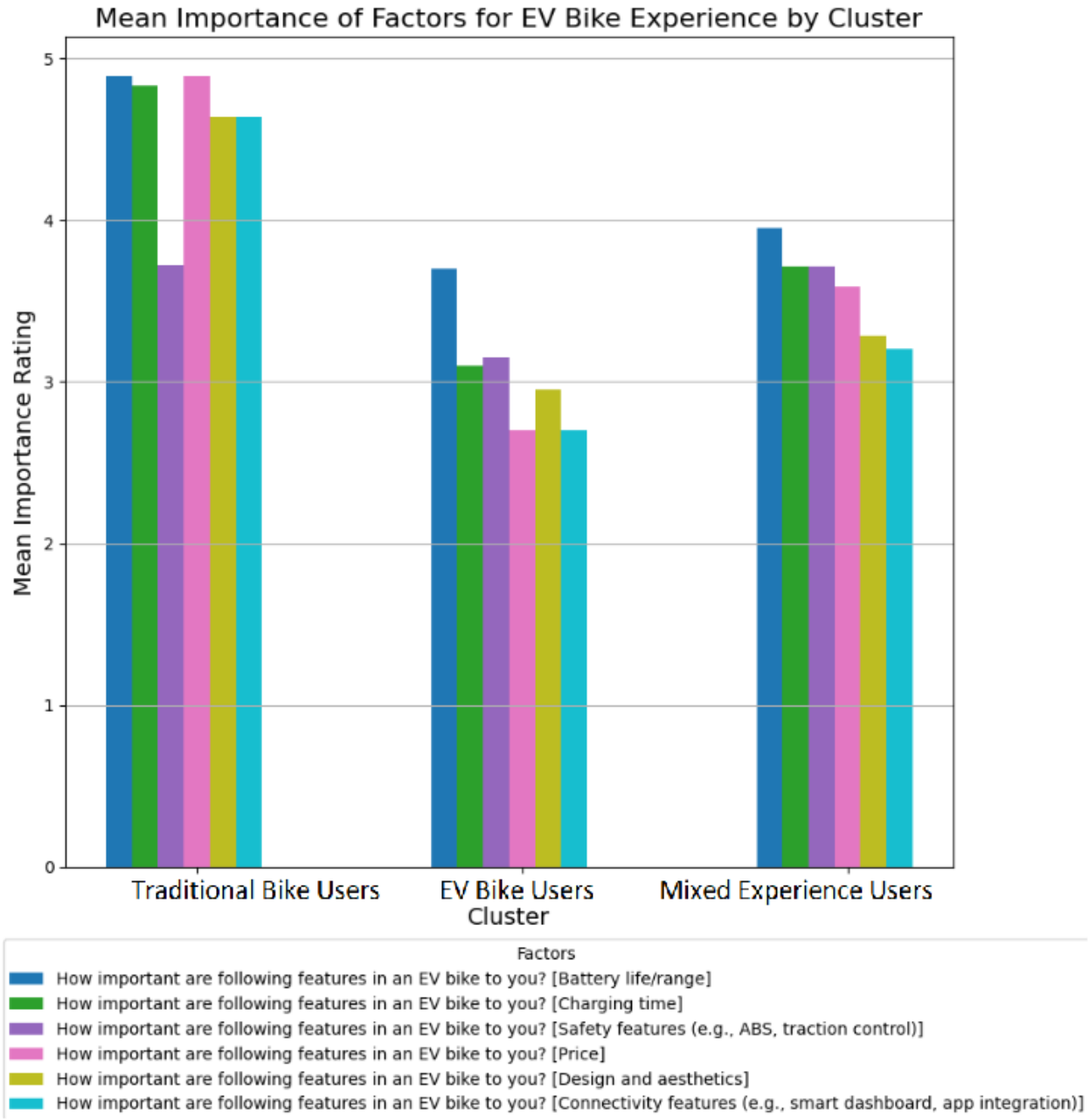

Exhibit D-7: Importance of factors for EV Bike experience by cluster

e. Reproducible Python Code

https://colab.research.google.com/drive/1YN3l0l2FumhOw7onkM-LOR9PVwlRqGAw

https://colab.research.google.com/drive/13ESBOLt9pLEpYfJWktN01WQpIHA4jak6

f. Dataset of the Survey (Coding Scheme)

Q#	Questions	Code
Q1	Age	
	Under 18	3
	18-25	1
	26-35	2
	36-45	4
	46 and Above	0
Q2	Gender	
	Male	0
	Female	1
Q3	Occupation	
	Student	1
	Employed	3
	Unemployed	4
	Self Employed	2
	Homemaker	5
Q4	Income	
	under PKR 50,000	1
	PKR 50,000 – PKR 100,000	2
	PKR 100,001 – PKR 200,000	3
	PKR 200,001 – PKR 300,000	4
	Above PKR 300,000	5
Q5	How comfortable are u in adopting new tech?	
	Not at all	1
	Somewhat Comfortable	2
	Comfortable	3
	Moderately Comfortable	4
	Very Comfortable	5
Q6	How do you typically plan your day for activities like commuting, vehicle charging, and other tasks?	
	I plan my day in advance, ensuring my vehicle is charged and ready for my commute.	1
	I plan most activities but leave some flexibility.	2
	I handle tasks as they come, without strict planning.	3
	I prefer to be spontaneous and don't usually schedule these activities.	4
Q7	How far do you typically travel in a single trip on your bike?	
	Less than 20 km	1
	20 km to 30 km	2
	30 km to 40 km	3
	40 km to 50 km	3
	50 km or more	4
Q8	How do you primarily envision using a bike in daily life? (Select Multiple Options)	
	Commuting to work or school	
	Leisure and entertainment	

	Family transportation	
	Running errands around town	
	Long-distance travel	
Q9	What type of vehicle do you currently own or primarily use?	
	Car	1
	Motorcycle/Bike	2
	Electric Vehicle (EV)	3
	Public transportation	4
	None	5
Q10	How Satisfied are you with your current's vehicle?	
	Very satisfied	1
	Satisfied	2
	Neutral	3
	Dissatisfied	4
	Very dissatisfied	5
Q11	What do you like most about your current vehicle? (Select up to 3)	
	Fuel efficiency	
	Performance (acceleration, handling, etc.)	
	Maintenance cost	
	Comfort and design	
	Reliability	
	Brand reputation	
	Environmental impact	
	After Sale Service	
	Resale Value	
Q12	How often do you use your vehicle?	
	daily	1
	one to three times a week	2
	three to four times a week	3
	four to five times a week	4
	more than five times a week	5
Q13	On average, how much do you spend on fuel/charging per month?	
	Rs.10,000 to Rs. 20,000	1
	Rs.20,000 to Rs.30,000	2
	Rs. 30,000 to Rs. 40,000	3
	Rs. 40,000 to Rs. 50,000	4
	Rs. 50,000 or more	5
Q14	How much do you spend on maintenance/repairs for your vehicle annually?	
	Rs.5000 to Rs.10000	1
	Rs.10000 to Rs.20000	2
	Rs.20000 to Rs.30000	3
	Rs.30000 to Rs.40000	4
	Rs. 50,000 or above.	5
Q15	Would you consider replacing your current vehicle in the next 1-2 years?	
	Yes	1

	No	2
	Maybe	3
Q16	If yes, what factors would influence your decision to replace your vehicle? (Select all that apply)	
	Lower running costs	
	Better performance	
	Environmental benefits	
	Newer technology	
	Brand reputation	
	Incentives (rebates, subsidies, etc.)	
	Test Drive	
Q17	How familiar are you with EV bikes?	
	Very familiar	1
	Somewhat familiar	2
	Heard of them, but not familiar	3
	Not familiar at all	4
Q18	Have you ever considered purchasing or using an EV bike?	
	1 (never)	1
	2 (seldom)	2
	3 (sometimes)	3
	4 (often)	4
	5 (almost always)	5
Q19	Where do you primarily get your information about EV bikes? (Select all that apply)	
	Online news articles	
	Social media	
	TV/Radio	
	Friends/Family	
	Auto or bike dealerships	
	Government advertisements/incentives	
Q20	Which of the following best describes your experience with electric bikes?	
	I have never ridden an electric bike but have ridden a regular bike.	1
	I have tried an electric bike once or twice.	2
	I occasionally ride an electric bike.	3
	I regularly ride an electric bike.	4
	I currently own an electric bike.	5
	I have never ridden a bike (electric/regular).	6
Q21	If you have an Electric Bike, what brand and model of bike do you own? (Optional)	
Q22	How important are following features in an EV bike to you?	
	Battery Life (1-5)	
	Charging Time (1-5)	
	Safety Features (1-5)	
	Price (1-5)	
	Design (1-5)	
	Connectivity (1-5)	
Q23	When thinking about your ideal experience with an EV bike, how important are the following factors for you?	

	Long Range (1-5) Durability(1-5) Smooth and Quite (1-5) High Performance (1-5) Comfort (1-5) Maintenance Cost (1-5) Brand (1-5)	
Q24	What are two words that comes to mind when you think of EV bikes in general?	
Q25	What are two words that comes to mind when you think of HONDA in general?	
Q26	What are two words that comes to mind when you think of Yamaha in general?	
Q27	What is two word that comes to mind when you think of Suzuki in general?	
Q28	How familiar are you with the following EV bike brands? OKLA MS Jaguar EVEE Metro Jolta Pakzon	