Course Title

Marketing Management 2

Submitted To

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Submitted by

Group 1

NMIMS, MBA (Digital Transformation), Division B

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Problem Statement

Electric Vehicles are among the biggest thrust areas for India's efforts at creating a sustainable transportation system and reducing its carbon footprint. Grounds have been covered in the last few years, but Electric Vehicles are adopted in limited numbers for several reasons. Inadequate charging structure, high initial costs, fewer models available, poor battery life, and unawareness about the incentives provided by the Government is the main one.
The study aims to explore these obstacles through a consumer-centric lens and to come up with actionable recommendations that alleviate these problems with the help of both qualitative and quantitative data.

Literature Review

Barriers to EV Adoption

1. **Inadequate Charging Infrastructure**
   The lack of a robust charging network is a significant barrier. India currently has only 300 EV charging stations compared to over 70,000 petrol pumps, making EVs impractical for long-distance travel. This disparity is particularly evident on highways, where the absence of charging stations amplifies consumer range anxiety.
2. **High Initial Costs**
   EVs entail higher upfront costs than their petrol or diesel counterparts, deterring middle-income consumers. The financial burden is further exacerbated by concerns over recurring expenses such as battery replacements every three to four years.
3. **Battery Technology Limitations**
   India's reliance on imported lithium and other EV components, mainly from China, creates concerns about cost stability and supply security. Limited domestic reserves and insufficient local production capabilities contribute to these challenges.
4. **Range Anxiety and Charging Time**
   Current EV ranges (typically 300–500 km) and lengthy charging durations make EVs unsuitable for long-distance or intercity travel. Consumers with diverse mobility needs find these limitations particularly restrictive.
5. **Workforce and Service Infrastructure Gaps**
   The limited availability of EV-specific service centers and skilled technicians inflates maintenance costs and diminishes trust in the reliability of EVs.

Current Government Initiatives

To overcome these barriers, the Indian government has introduced several initiatives:

1. **National Electric Mobility Mission Plan (2013):** Offers financial incentives for EV adoption.
2. **FAME Scheme (2015):** Supports faster adoption of EVs and hybrid vehicles.
3. **Phased Manufacturing Programme (2016):** Encourages local production of EV components.
4. **National Mission on Transformative Mobility (2019):** Focuses on research and development (R&D) in battery technology and large-scale EV adoption.

Methodology

Research Purpose

To analyze consumer attitudes, behaviors, and perceptions about EV adoption and identify actionable solutions to overcome key barriers.

Hypotheses

1.H1: Financial incentives and subsidies greatly affect consumer decisions to buy the EV
2. H2: Environmental benefits awareness is positively related to the adoption of EVs.
3. H3: Infrastructure availability for charging-
availability is a critical determinant in the decision of consumers.
4. H4: Intent to adopt is positively correlated with the lifecycle cost-effectiveness of EVs.
5. H5: Technological advancement of the battery greatly improves customer's confidence abo ut EVs.

Research Design

This study employs a mixed-methods approach to explore consumer perspectives.

1. **Qualitative**: Focus group discussions (FGDs) and interviews to capture nuanced consumer insights.

To gain a comprehensive understanding of the barriers and opportunities in EV adoption, we conducted a multi-pronged qualitative analysis:

1. **Focus Group Discussions (FGDs):**
   We organized focus groups comprising potential EV buyers from different demographic and geographic segments. This approach provided a fresh perspective on consumer attitudes, concerns, and expectations.
2. **Interviews with Stakeholders:**
   To capture a balanced perspective, we conducted detailed interviews with two key groups:

- **Consumers:** These interviews revealed insights into purchase decisions, real-life challenges, and satisfaction levels among current EV users.

- **Manufacturers:** These interviews shed light on the industry's challenges, such as supply chain issues, battery technology advancements, and strategies to align with government policies.

3. **Customer Reviews Analysis:**
   We systematically analyzed reviews from various trusted online platforms where EV users shared their experiences. **JMP software** was used to systematically analyze customer reviews gathered from various trusted online platformsThe integration of qualitative review data into quantifiable insights by using advanced statistical methods and interactive data visualizations.

2. **Quantitative**: Structured surveys to quantify barriers and preferences across diverse demographics. This questionnaire helped to gather quantitative data on the main barriers and pain points that users face regarding EV adoption in India.

Qualitative Analysis

Key Consumer Insights from Interviews

1. **Infrastructure Concerns**:
    - "If I plan a trip to Mumbai, I cannot rely on EVs due to the lack of charging points on the way."
    - Consumers suggested creating government-supported EV garages and introducing a helpline on highways.
2. **Cost and Battery Replacement**:
    - "Every three years, I need to replace the battery. This adds to the overall cost significantly."
    - Recommendations included better battery warranty schemes and incentives for battery recycling.
3. **Awareness of Incentives**:
    - Many consumers are unaware of government subsidies like FAME. Outreach campaigns are necessary to educate potential buyers.
4. **Reliability and Maintenance**:
    - "Battery health and maintenance costs are high. Manufacturers should introduce buy-back schemes for used batteries."
5. **Social Influence and Model Variety**:
    - Adoption within social circles positively impacts perception. Consumers also prefer more options in affordable and family-oriented models.

Quantitative Analysis

Sample Survey Questions

1. Rate the importance of charging infrastructure in your decision to adopt an EV. (1: Not Important, 5: Very Important)
2. Are you willing to adopt an EV if the government provides additional incentives? (Yes/No)
3. How confident are you in the long-term performance of EV batteries? (1: Not Confident, 5: Very Confident)

4. What is your biggest concern regarding EV adoption? (a) Cost (b) Infrastructure (c) Maintenance (d) Others

5. Would you prefer an EV with a longer range even if it costs more? (Yes/No)

Survey link : https://forms.gle/eifroEEnWzazkcqa9

Analysis of Qualitative Results

Customer Reviews Analysis:

1. Consumer Priorities and Positive Attributes

The most frequently mentioned terms and phrases reveal key aspects that consumers value in EVs:

- **Range (73 mentions):** A critical factor in consumer satisfaction is the driving range of EVs. Customers repeatedly highlight the importance of an "impressive range," indicating that EVs with longer mileage per charge resonate more with buyers.
- **Safety Features (42 mentions):** Safety is a top priority, with consumers appreciating advanced safety features and robust designs. Terms like "advanced safety" and "secure experience" suggest that safety plays a vital role in purchasing decisions.
- **Performance and Quality (39 and 33 mentions):** High-quality materials, smooth performance, and reliability are seen as integral aspects that influence consumer trust in EVs.
- **Design and Interior (25 mentions each):** Customers value "stylish interiors" and "exterior design," showcasing the importance of aesthetics in EV selection. Phrases like "spacious interior" and "stylish choice" underline the role of modern, premium design in enhancing the ownership experience.
- **Value for Money (10 mentions):** Affordability is frequently praised, indicating a growing segment of EVs that balance cost-effectiveness with performance.

2. Emerging Trends in EV Preferences

- **Affordability and Compact Electric Models:** Phrases like "affordable electric" and "compact electric" highlight the rising demand for budget-friendly EVs that cater to urban commutes. These terms suggest that compact designs are gaining traction, especially in cities where space and maneuverability are crucial.
- **Technological Advancements:** Consumers appreciate the inclusion of innovative features such as "advanced safety features" and "mileage performance." These reflect a shift in expectations, where customers prioritize cutting-edge technology in their vehicles.
- **Comfortable Experience:** Words like "comfortable" and "amazing experience" underscore a preference for EVs that combine practicality with comfort for daily use.

Insights from the Customer Interview and FGD :

1. Familiarity with EVs:

- The respondent is aware of EV benefits and drawbacks, mainly from experience and direct interaction with owners of EVs. Key noted positive factors include saving on fuel and a lower running cost.
- Disadvantages such as dependence on coal-based electricity for charging kills the gory feeling of EVs as earth-friendly, thus reducing motivation from a sustainability perspective.

2. Key Purchase Factors:

- Environmental Concerns: Influence is moderate. While they accept the environmental point, usage of coal electricity douses the benefit in their opinion. Government Incentives:
- A strong influencer because they feel that EVs are too expensive at the outset, but there are very few who know about the schemes available in the government. They suggested greater publicity for the schemes
- Cost Issues: Costly than the petrol/diesel variants is an issue; added to this is the fear of a replacement cost of the batteries within 3-4 years.
- Fuel Savings: The primary motivator for adopting EVs, since charging is relatively cheaper than traditional fuel costs.

3. Perceptions of EVs:

- Seen as ideal for city commutes but not really fitted for intercity or long-distance travel.
- Regarded as a secondary vehicle and not a primary one for most families.
- By certain segments, especially with luxury models, is considered as a status symbol or style statement.

Conclusion

The analysis of barriers to electric vehicle adoption in India indicates a number of significant challenges that prevent nationwide switching. These include charging infrastructure inadequacy, higher upfront costs, reliability over concerns regarding batteries, and lack of awareness about government incentives. However, the study also uncovers significant opportunities for improvement that can significantly boost the adoption of EVs.

Strategic Implications and Recommendations:

Based on the consumer feedback and market analysis, the following recommendations would be made to manufacturers, policymakers, and other stakeholders:

1. Infrastructure and Range: Manufacturers should strengthen the range of EVs while policymakers should focus on installing charging infrastructure, especially in the underserved areas.

2. Sustainability Messaging: The campaigns would clarify the environmental benefits of EVs and counter such myths that EVs run on a lot of coal-based electricity.

3. Affordability: Ongoing subsidies and changes in battery technology can help make EVs affordable for the large masses.

4. Design and After-Sales Service: Focus on stylish designs and practicality and expand service networks to gain credibility on EVs.
5. Resale Value Education: Educating customers on their long-term value instead of just the short-term depreciation would help alleviate these concerns.
6. Integration of Renewable Sources: Promote solar powered charging stations and housebased solar-based installations to strengthen the environmental logic of EVs.

References

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4. KPMG. (2021). "The Road to Electric Vehicles in India". KPMG Research.
5. Indian Electric Vehicle Ecosystem: Challenges & Opportunities. (2020). Indian Council for Research on International Economic Relations (ICRIER).
6. McKinsey & Company. (2022). "The Future of Electric Mobility in India". McKinsey Insights.
7. Electric Vehicle Adoption in India: Trends and Barriers. (2020). Energy Policy Institute at the University of Chicago (EPIC India).
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Appendix

Number of Terms	Number of Cases	Total Tokens	Tokens per Case	Number of Non-Empty Cases	Portion of Non-Empty Cases
57	171	9367	54.7778	155	0.9064

Term and Phrase Lists

Term	Count
ev	73
range	73
experience	48
features	42
electric	40
service	39
performance	33
quality	28
drive	27
vehicle	27
amazing	25
interior	25
safety	25
charge	19
comfortable	19
design	19
money	18
issue	17
mileage	17
fantastic	14
awesome	13
choice	13
impressive	13
look	13
stylish	13

Phrase	Count	N
value for money	10	3
electric vehicle	7	2
safety features	7	2
electric suv	4	2
affordable electric	3	2
impressive range	3	2
stylish interior	3	2
choice in the electric	2	4
ev is a fantastic	2	4
exterior and looking awesome	2	4
advanced safety features	2	3
features are amazing	2	3
interior is spacious	2	3
mileage and performance	2	3
advanced safety	2	2
compact electric	2	2
electric vehicles	2	2
fantastic choice	2	2
interior design	2	2
stylish choice	2	2
stylish design	2	2