# UNDERSTANDING CONSUMER PREFERENCES IN ELECTRIC VEHICALS: A STUDY ON FEATURE PRIORITIZATION

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**ABSTRACT**

The transition to electric vehicles (Electric Vehicles) represents a pivotal moment in the automotive industry, driven by environmental concerns, technological advancements, and shifting consumer preferences. As EV offerings continue to expand, it becomes increasingly crucial for automakers to discern and prioritize features that resonate with target consumers. This study endeavors to explore the nuanced landscape of consumer preferences in Electric Vehicles, aiming to uncover the underlying factors that influence purchasing decisions and shape market demand.

**1.INTRODUCTION**

As the automotive industry undergoes a significant shift towards electric vehicles (Electric Vehicles), understanding consumer preferences becomes essential for manufacturers seeking to meet market demand effectively. This study delves into the prioritization of features in Electric Vehicles, aiming to provide insights into the factors influencing consumer decision-making processes. Through surveys, interviews, and statistical analysis, key features such as range, charging infrastructure, performance, price, and sustainability are examined for their relative importance to consumers across different demographic segments and market contexts. The findings offer valuable guidance for automakers in designing and marketing electric vehicles that align with consumer expectations, thus facilitating the widespread adoption of Electric Vehicles and fostering sustainable transportation practices.

**2. METHODOLOGY**

Data Collection:

**Surveys:**

* A structured survey instrument is designed to quantify the importance of various features and attributes associated with Electric Vehicles, such as range, charging infrastructure, performance, price, and sustainability.
* The survey captures demographic information and measures consumer perceptions, attitudes, and preferences regarding Electric Vehicles.

## Interviews:

* Interviews are conducted to gather qualitative insights into consumer motivations, concerns, and decision-making processes related to EV consideration and adoption.
* The interviews provide a deeper understanding of the factors influencing consumer behavior and complement the quantitative survey data.

## Data Analysis:

**Quantitative Analysis:**

* Statistical techniques, including regression analysis and factor analysis, are employed to identify significant correlations and patterns within the survey data.
* Chi-square tests for independence are conducted to examine associations between variables, such as consideration of Electric Vehicles, perception of ownership cost, and likelihood of purchase.
* Analysis of Variance (ANOVA) is used to compare means of the "Likelihood of Purchasing an Electric Vehicle" across different levels of demographic variables (age, gender, income, familiarity with Electric Vehicles).

## Qualitative Analysis:

* Interviews are analyzed using qualitative methods, such as thematic analysis or content analysis, to identify recurring themes, patterns, and insights related to consumer preferences and decision-making processes.

A mixed-method approach comprising surveys, interviews, and statistical analysis is employed to investigate consumer preferences in electric vehicles. A structured survey instrument is designed to quantify the importance of various features and attributes associated with Electric Vehicles, while interviews provide qualitative insights into consumer motivations, concerns, and decision-making processes. Statistical techniques such as regression analysis and factor analysis are utilized to identify significant correlations and patterns within the data, facilitating a deeper understanding of consumer preferences and market dynamics.

**3.MODELLING**

The document does not explicitly mention the research design employed in this study. However, based on the information provided about the research methodology, we can infer that it likely follows a mixed-methods research design, which combines both quantitative and qualitative approaches.

The quantitative component of the research design appears to be based on a survey method, where a structured survey instrument is used to collect data on consumer preferences, perceptions, and attitudes towards electric vehicles (Electric Vehicles). The survey likely includes questions related to various features and attributes of Electric Vehicles, such as range, charging infrastructure, performance, price, and sustainability, as well as demographic information.

The qualitative component of the research design involves conducting interviews with consumers. These interviews aim to gather in-depth insights into consumer motivations, concerns, and decision-making processes regarding the consideration and adoption of Electric Vehicles. The interviews provide rich, contextual data that can complement and enhance the understanding gained from the quantitative survey data.

The mixed-methods research design allows for the integration of both quantitative and qualitative data, providing a more comprehensive understanding of consumer preferences and behavior in the context of electric vehicles. The quantitative data from the surveys enables statistical analysis, such as regression analysis, factor analysis, chi-square tests, and ANOVA, to identify significant relationships, patterns, and differences among variables. The qualitative data from the interviews can provide deeper insights into the underlying reasons, motivations, and contextual factors influencing consumer preferences and decision-making processes.

Although the specific details of the research design are not provided, the combination of surveys and interviews, along with the described quantitative and qualitative analysis methods, suggests that the study follows a mixed-methods research design. This approach allows for the triangulation of data from multiple sources, enhancing the validity and reliability of the research findings.

# 4.DATA ANALYSIS AND INTERPRETATION

The objective of this study was to understand the buying behaviour of consumers towards electronic vehicles. This was done keeping in mind the basic characteristics of respondents, over certain parameters. The study identifies 65 respondents for this study. This chapter highlights the major findings and conclusion of the study.

# Consumer Behaviour supporting Electric

To protect the environment, Less pollution and less noisy 1

Am likely to buIywoilnl edefinitely buy one

To protect the environment 1

Petrol price hikes, To protect the environment, Less pollution and less…

2

Petrol price hikes, Less pollution and less noisy 1

Petrol price hikes 1

Increased price of bikes, Petrol price hikes, To protect the environment 4

Increased price of bikes 6

To protect the environment 3

2

Petrol price hikes, To protect the environment, Less pollution and less… 1

3

Petrol price hikes, To protect the environment

1

**Chart 5.1**

rol price hikes, increasing prices of bikes are the major concerns of consumers who are wi

 Petrol price hikes

0 1 2 3 4 5 6 7

Pet lling to

switch to electric vehicles. Electric vehicles causing less pollution and noise is also a major reason why consumers are wanting to switch, which in a way they believe will protect the environment.

Unlikely to buy one

0.5 1.5 2.5

**Consumer behavior against EV purchase**

Electric

1

Vehicles are costly Charging Electric

2

Vehicles are hectic, Electric Vehicles 1

are costly

Charging Electric Vehicles are hectic

Can manage petrol price hike 1

Already own a vehicle, Charging Electric Vehicles are hectic, 2

Electric Vehicles are costly Already own a vehicle, Can manage 1

petrol price hike, Electric Vehicles are costly

Charging Electric Vehicles are hectic, Electric Vehicles are costly

Charging Electric Vehicles are hectic Already own a vehicle, Electric Vehicles are costly 0

Already own a vehicle

1

1

1 1

1

2

Definitely won't

## Chart 5.2

The major reasons consumers are against EV purchases are they feel that charging electric vehicles are costly and charging electric vehicle on a daily basis is hectic. The ones who already own a vehicle are not willing to switch to an electric vehicle as there is a switching cost involved in this process. Some consumers also find petrol prices manageable hence, not wanting to switch.

**Cost to charge an electric vehicle is much less than the fuel**

5

5

10

4

1

5

I will definitely buy one

3

2

5

Am likely to buy one

1

1

0

2

4

6

8

10

12

**1=STRONGLY ISAGREE - 5=STRONGLY AGREE**

## Chart 5.3

The majority of consumers strongly agree that the cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle and hence they are willing to buy an electric vehicle or switch to one.

**Switch to an electric vehicle i f the company offers an exchange**

I will definitely buy one

7

Definitely won't buy one

2

Yes

Am likely to buy one

13

2

No

Am considering buying one but need convincing

10

0

2

4

6

8

10

12

14

**Chart 5.4**

#  5.RESULTS AND DISCUSSION

* 1. Improve charging infrastructure: The lack of sufficient charging infrastructure is cited as a major barrier for consumers in adopting electric vehicles. Investing in developing a robust charging network with widespread availability can alleviate consumer concerns about charging inconvenience and range anxiety.
	2. Increase awareness and promotional campaigns: The document highlights the lack of awareness among consumers regarding electric vehicles as a challenge. Launching targeted awareness campaigns and promotional activities can help educate consumers about the benefits of Electric Vehicles, address misconceptions, and potentially influence their purchasing decisions.
	3. Provide incentives and exchange programs: Many consumers expressed interest in purchasing Electric Vehicles if offered incentives or exchange/buyback options for their existing vehicles. Implementing such programs can encourage adoption by reducing the initial cost burden and facilitating the transition to electric vehicles.
	4. Address cost concerns: The perceived high cost of electric vehicles is a deterrent for some consumers. Exploring strategies to reduce the upfront costs, such as subsidies, tax incentives, or innovative financing options, could make Electric Vehicles more accessible and appealing to a broader consumer base.

**6. CONCLUSION**

Majority of the ones who are inclined towards buying an electric vehicle are concerned about the pollution caused by internal combustion engines and want to protect the environment. Petrol price hikes are also an alarming situation to them and that is a significant reason for them wanting to shift to Electric Vehicles.

The ones who are likely to buy an EV are also interested in buying if the company offers an exchange value on their owned vehicle to buy an electronic vehicle. They also believe that the cost to charge an electric vehicle is much less than the fuel costs for a petrol or diesel vehicle. But also feel charging an EV is hectic.

The major reason behind the slow growth of the EV industry in India is the lack of infrastructure and lack of charging pumps which is why a majority of consumers are against EV purchases. Also, there lack of awareness among consumers towards Electric Vehicles. Better infrastructure, awareness campaigns, promotional activities of electric vehicles will surely help this industry penetrate the Indian automobile market.

In summary, the key points in the conclusion are:

* Environmental concerns and petrol price hikes are major drivers for consumers inclined to buy Electric Vehicles.
* Consumers are interested if companies offer exchange/buyback value for their current vehicles.
* Charging costs are seen as lower than petrol/diesel costs, but charging itself is viewed as hectic.
* Lack of charging infrastructure and awareness are major barriers to EV adoption in India.
* Better infrastructure, awareness campaigns and promotions can help boost EV adoption in the Indian market.

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