WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Study on Customer Perception toward Electrical Vehicle

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ABSTRACT

The aim of this study is to investigate the customer perception towards electric vehicles (EVs) in the Indian market. The study focuses on understanding the factors that influence the adoption of EVs and identifying the barriers that hinder their uptake. A survey questionnaire was designed and distributed to a sample of 114 respondents who were selected randomly from different regions of India. The data collected was analyzed using descriptive statistics and inferential statistics such as factor analysis and regression analysis. The findings of the study revealed that the major factors influencing the adoption of EVs were environmental concerns, fuel cost savings, and government incentives. On the other hand, the major barriers hindering the uptake of EVs were high purchase costs, lack of charging infrastructure, and range anxiety. The study concludes that there is a need for more awareness campaigns and government policies to promote the adoption of EVs in India. The data amassed was meticulously organized, coded, and subsequently subjected to thorough analysis using statistical tools like regression, weight average, and chi-square test.

INTRODUCTION

India is a country with the 3rd road network in the world. Road travel seemed to be a preferred choice in India with over 60 % of the population using personal or shared vehicles to commute. All kind of vehicles produce dust from brakes, tires, and road wear. The diesel vehicle has a worse effect on air quality than the average gasoline vehicle. But both gasoline and diesel vehicles pollute more than electric vehicle. Governments started using fiscal policies, such as road tax, to discourage the purchase and use of more polluting vehicle. Green tax is imposed while re-registering the vehicle after fifteen years of use to make people discontinue the use of polluting vehicles and encourage more than fuel-efficient and less polluting vehicles. Fuel taxes can serve as a motivating factor to encourage the creation of vehicles that are more efficient, produce fewer emissions, and promote the advancement of alternative fuels. Elevated fuel taxes or a shift in cultural norms can serve as potent drivers for consumers to adopt lighter, more compact, fuel-efficient vehicles, or to reduce their reliance on driving altogether. (Transport policy) The India Scheme stands as an incentivizing program aimed at fostering the adoption of electric and hybrid vehicles. The primary goal is to advance the use of electric mobility by offering financial incentives to support the expansion of EV production and the development of infrastructure for electric transportation. Introduced in 2015 by the Ministry of Heavy Industries and Public Enterprises, the initiative was launched to encourage the manufacturing and promotion of environmentally-conscious vehicles, encompassing both EVs and hybrid models. The plan also includes provisions for the establishment of charging infrastructure (Jose, 2018). Serving as a comprehensive national directive, the National Electric Mobility Mission Plan (NEMMP) 2020 outlines the vision and strategic pathway to expedite the widespread adoption and manufacturing of EVs.

REVIEW OF LITERATURE

Its objective is to stimulate electric mobility while providing economic incentives to bolster the manufacturing of EVs and the development of electric transportation infrastructure. Launched in 2015 by the Ministry of Heavy Industries and Public Enterprises, the initiative was introduced to provide motivation for manufacturing and endorsing environmentally conscious vehicles, encompassing both EVs and hybrid models. The scheme also includes provisions for the establishment of charging infrastructure (Jose, 2018). The National Electric Mobility Mission Plan (NEMMP) 2020 serves as a strategic national directive, delineating the vision and route to expedite the widespread adoption and manufacturing of EVs.

METHODOLOGY

The investigation targets individuals aged 21-25, predominantly students, with the aim of eliciting their perceptions regarding electric vehicles. The methodology involves the distribution of online questionnaires, yielding a total of 114 responses. This research incorporates both primary and secondary data sources. The analysis centers on comprehending the influence of electric vehicles on the preferences of young consumers. The research approach entails the amalgamation of primary data derived from a specialized Google questionnaire, directed at the youth demographic. However, participant demographics were not strictly delimited. The sampling technique employed was convenience sampling, a form of non-probability sampling, which

utilized random selection within its scope. Notably, the survey did not exclusively focus on youthful consumers. Participants were encouraged to autonomously complete a Google form, preceded by clear explanations of the survey's components. The survey encompassed predetermined questions, comprising a combination of open and closed-ended inquiries, with a predominantly qualitative interpretation, complemented by a select few quantitatively framed questions. The subsequent analysis exclusively considers the data gleaned from the Google Forms survey. The secondary data collection approach entails sourcing information from an array of materials such as books, articles, research papers, journals, case studies, and websites.

Objective of the study

- To know the customer awareness level and customer satisfaction towards the Electric vehicles
- To understand main challenges faced by customers while using Electric Vehicles
- To understand most preferred company of Electric vehicles.

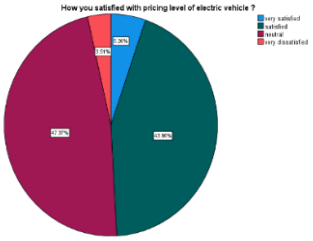
ANALYSIS:

1. Satisfied with the pricing level of electric vehicle:

Table 1

		Frequency	Percent	Valid percent	Cumulative percent
valid	very satisfied	6	5.3	5.3	5.3
	satisfied	50	43.9	43.9	49.1
	neutral	54	47.4	47.4	96.5
	very dissatisfied	4	3.5	3.5	100.0
	Total	114	100.0	100.0	

Chart 1



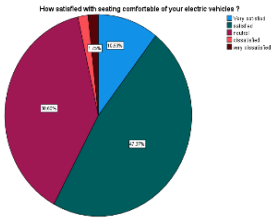
INTERPRETATION: From the above table , it is interpreted that 6 %of people are very satisfied with pricing level of electric vehicle,50% of people had satisfied,54 % people are neutral on their satisfaction and 4% of people are very dissatisfied.

2. Seating the comfort of your electric vehicles?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very satisfied	12	10.5	10.5	10.5
	Satisfied	54	47.4	47.4	57.9
	Neutral	44	38.6	38.6	96.5
	Dissatisfied	2	1.8	1.8	98.2
	very dissatisfied	2	1.8	1.8	100.0
	Total	114	100.0	100.0	

Table 2

Chart 2



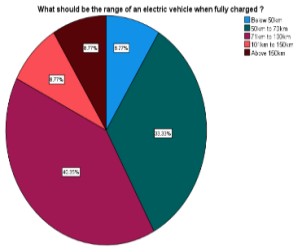
INTERPRETATION: From the above table, it is interpreted that 54% of respondents are satisfied with the seating comfort of electric vehicles, 12% of respondents are very satisfied, 44% of respondents are neutral with seating comfort, 2% are dissatisfied and 2% of respondents are very dissatisfied.

3. Range of an electric vehicle when fully charged ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 50km	10	8.8	8.8	8.8
	50km to 70km	38	33.3	33.3	42.1
	71km to 100km	46	40.4	40.4	82.5
	101km to 150km	10	8.8	8.8	91.2
	Above 150km	10	8.8	8.8	100.0
	Total	114	100.0	100.0	

Table 3

Chart 3



INTERPRETATION:

From the above table, it is interpreted that 54% of respondents are satisfied with the seating comfort of electric vehicle,12% of respondents are very satisfied,44% of respondents are neutral with the seating comfortable, 2% are dissatisfied and 2% of respondents are very dissatisfied.

4. Affordability of electricity in your area ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very satisfied	16	14.0	14.0	14.0
	Satisfied	50	43.9	43.9	57.9
	Neutral	38	33.3	33.3	91.2
	Dissatisfied	10	8.8	8.8	100.0
	Total	114	100.0	100.0	

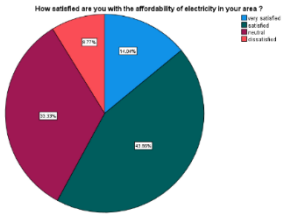


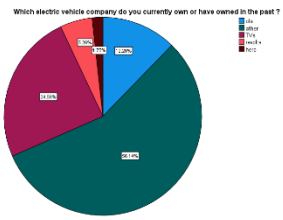
Table 4 **Chart 4**

INTERPRETATION: From the above table, it is interpreted that 16 % of respondents are very satisfied with the affordability of electric vehicles,50% of respondents are satisfied,38% of respondents are in neutral and 10 % of respondents are dissatisfied.

5. Which electric vehicle company do you currently own or have owned in the past

Table 5 **Chart 5**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ola	14	12.3	12.3	12.3
	ather	64	56.1	56.1	68.4
	TVs	28	24.6	24.6	93.0
	revolte	6	5.3	5.3	98.2
	Hero	2	1.8	1.8	100.0
	Total	114	100.0	100.0	

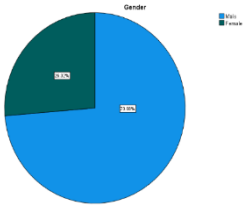


INTERPRETATION: From the above table, it is interpreted that 14 % of respondents are Ola company, 64% of respondents are ather. 28% of respondents are TVs, 6% of respondents are revolte and remaining 2% of respondents are Hero.

6. **Gender**

Table 6 **Chart 6**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	84	73.7	73.7	73.7
	Female	30	26.3	26.3	100.0
	Total	114	100.0	100.0	



INFERENCE: From the above table, it is interpreted that 73.68% of respondents are having their gender of male, and 26.32% of respondents are having their gender of female.

1) REGRESSION:

To find out the pricing level, range, battery performance, affordability and overall performance of an electric vehicle.

NULL HYPOTHESIS (H0): There is no satisfaction with the overall performance of an electric vehicle.

ALTERNATE HYPOTHESIS (H1): There is satisfaction with the overall performance of an electric vehicle.

ANOVA [a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	31.089	4	7.772	21.713	.000[b]
	Residual	39.016	109	.358		
	Total	70.105	113			

a. Dependent Variable: How satisfied are you with the overall performance of your electric vehicle?

b. Predictors: (Constant), How satisfied are you with the affordability of electricity in your area?, How satisfied with the seating comfort of your electric vehicles ?, What should be the range of an electric vehicle when fully charged ?, How are you satisfied with the pricing level of an electric vehicle?

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.577	.264		2.185	.031
	How are you satisfied with the pricing level of electric vehicles?	.447	.085	.429	5.268	.000
	How satisfied with the seating of your electric vehicles?	.460	.078	.448	5.926	.000
	What should be the range of an electric vehicle when fully charged?	-.161	.059	-.212	-2.726	.007
	How satisfied are you with the affordability of electricity in your area?	-.037	.075	-.039	-.493	.623

a. Dependent Variable: How satisfied are you with the overall performance of your electric vehicle?

INFERENCE: The significant value is 0.05 is greater than the table value of 0.000 (0.05>0.000). Hence H1 is accepted and H0 is rejected. Therefore, there is satisfaction with the overall performance of an electric vehicle.

2)CHI-SQUARE TEST

To find out the association between the preferred brand of ev and Gander of the respondents.

NULL HYPOTHESIS (H0): There is no significant association between the electric vehicle company currently owned and the gender of the people.

ALTERNATE HYPOTHESIS (H1): There is a significant association between the electric vehicle company currently owned and the gender of the people.

Which electric vehicle company do you currently own or have owned in the past? * Gender Crosstabulation

Count

		Gender		
		Male	Female	Total
Which electric vehicle company do you currently own or have owned in the past?	Ola	8	6	14
	Ather	52	12	64
	TVs	16	12	28
	revolted	6	0	6
	hero	2	0	2
Total		84	30	114

Chi-Square Tests

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.673[a]	4	.030
Likelihood Ratio	12.270	4	.015
Linear-by-Linear Association	.399	1	.527
N of Valid Cases	114		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .53.

INFERENCE:

The significant value is 0.05 is lesser than the table value of 0.527 (0.05 < 0.527). Hence H1 is rejected and H0 is accepted. Therefore, there is no electric vehicle company currently owned.

FINDINGS

As the table shows 85.96% of respondents are at the age between 21-25years. The table shows that most of the respondents are male with 73.68% as shown in the pie chart. As the table shows that most that 52.63% of respondents are postgraduate. As the table shows most of the respondents are students with 71.93 %. As the table shows 82.46% of most of the respondents have income below 25000. As the table shows most of the respondents are neutral in pricing level with 47.37%. As the table shows 43.37 % of respondents are satisfied with seating comfortably. As the table shows 50.88

% of respondents are satisfied with overall performance. As the table shows 40.35 % of respondents had the range 71km to 100km. As the table shows 43.86 % of respondents are satisfied with the affordability of electricity. As the table shows 56.14 % of respondents agree that electric vehicle is very expensive. As the table shows 49.12 % of respondents agree on the maintenance infrastructure. As the table shows that most that 68.42% of respondents agreed the charging time for electric vehicles is too long. As the table shows 43.86% of respondents faced mileage issues. As the table shows 57.89 % are not satisfied with the public charging points. As the table shows 56.14 % of respondents have another company vehicle. As the table shows 47.37% of respondents are neutral in their current electric vehicle company. As the table shows 42.11 % of respondents are likely and also neutral to recommend their current electric vehicle company to others. As the table shows 36.84% of respondents are influenced by the performance of their current electric vehicle company. As the table shows 49.12 % of respondents are considering another company to purchase in the future.in regression Hence H1 is accepted and H0 is rejected. Therefore, there is satisfaction with the overall performance of an electric vehicle. In Chi-Square Tests Hence H1 is rejected and H0 is accepted. Therefore, there is no electric vehicle company currently owned.

SUGGESTIONS

The survey findings recommend that manufacturers of electric vehicles should prioritize raising awareness regarding the advantages of such vehicles, which include diminished maintenance expenses and decreased carbon emissions. Furthermore, tackling apprehensions associated with range anxiety and charging infrastructure could contribute to enhancing consumer attitudes towards electric vehicles. Equally significant is the provision of competitive pricing and financing alternatives by manufacturers to broaden the accessibility of electric vehicles to a more extensive clientele. Ultimately, collaborating with governmental bodies to provide incentives and subsidies can serve as an additional impetus for the adoption of electric vehicles.

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