



A Study on Consumer's Perception towards Electric Vehicles in Coimbatore

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ABSTRACT

This study highlights the consumer's perception and customer behaviour towards Electric Vehicles. The main objective of this project is to know the customer awareness and attitude towards Electric Vehicles. The study was conducted in Coimbatore district with sample size of 110 respondents through random sampling method. The method used for the study is simple percentage, rank analysis and chi-square test. In recent years EV companies have taken major step towards economic and environmental factors while producing their vehicles. This research shows the consumer preference, positive and negative factors which affect the consumer's perception when approaching electric vehicles in India.

INTRODUCTION:

An electric vehicle (EV) is one that operates on an electric motor, instead of an internal-combustion engine that generates power by burning a mix of fuel and gases. Therefore, such as vehicle is seen as a possible replacement for current-generation automobile, in order to address the issue of rising pollution, global warming, depleting natural resources, etc. Though the concept of electric vehicles has been around for a long time, it has drawn a considerable amount of interest in the past decade amid a rising carbon footprint and other environmental impacts of fuel-based vehicles. This study is conducted to determine how people feel about electric automobiles and to find which factors restricting customers from purchasing Electric vehicles. The goal is to reduce vehicular pollution by switching to electric vehicles. The increasing popularity and use of electric vehicles.

STATEMENT OF THE PROBLEM:

An Environmental issues are recorded high in India, people or starting to think about saving the environment as much as possible. It is common knowledge that petrol diesel vehicles cause most of the environmental damage due to which people are shifting to electric vehicles. Although the electronic vehicle concept is well proven nowadays, people still lack the knowledge or trust in it. They are skeptical about the safety and reliability of electric vehicles. Therefore this research has been conducted to analyse people's perception as per the negatives and positives for Electric vehicles and the technology included within.

OBJECTIVES OF THE STUDY:

- To Find out the awareness of consumer about the Electric vehicles.
- To Determine the factors influencing the purchase and use of Electric vehicles.
- To Understand the experience of using Electric
- To Study the factors restricting customers from purchasing Electric vehicles

SCOPE OF THE STUDY:

- The study aims at finding the customer satisfaction towards e-vehicles with respect to Coimbatore district.
- The study also aims to find out the customer's perception towards electric vehicles.
- The study by ascertaining the factors that motivate end users to purchase electric vehicles is expected to enable respective Companies to improve their services, sales promotions etc.

- The study also aims at analyzing the level of customer Satisfaction with respect to the e-vehicles and their dealers

RESEARCH METHODOLOGY:

Research Methodology is a way to systematically solve the research problem. The science of method is termed as research methodology. The study is conducted to infer their attitude towards electric vehicles. Study is conducted through distribution of questionnaires online and a total of 110 responses were collected. It

includes MPTc techniques that have been used for conducting research.

This Methodology includes the following details:

Data collection

Data are raw facts may be derived from several source. Data was collected using both Primary and Secondary data collection methods.

Primary data:

The primary data has been collected through random sampling, from the sample respondents through the schedule with the help of the questionnaire which was distributed online.

Secondary data:

The secondary data has been collected from standard reference book and various websites.

Area of Study:

The Area of study is confined to Coimbatore District.

Nature of Data:

Nature of data are from peoples in all type of areas.

Sample design:

Stratified sampling technique is used to select the sample.

Sample size:

Sample size used for the study is 110. Online survey was carried out using a structured questionnaire using Google forms among users around Coimbatore District.

Tools of data collection:

Data collection tools refer to the devices/instruments used to collect data. The success of any research depends solely on the data which drives it. In this study, data is collected through well-defined structured questionnaire through Google forms.

Statistical tools used:

The following Statistical tools have been applied for the study.

1. Simple percentage
2. Ranking Analysis
3. Chi-square Analysis

LIMITATIONS OF THE STUDY:

- Study is limited to 110 respondents. So findings and suggestions given on the basis of the study cannot be extrapolated to the entire population.
- The primary data collected may be biased.
- The primary data collected may or may not be accurate.
- The study pertains to a limited time period.

REVIEW OF LITERATURE:

1. **Vibhuti Pareek (2022)**, Perception towards electric Vehicles in the Indian market: The researcher observed that manufacturers of EVs need to work on their Research and development to improve price range, cost of product, design, style, and branding to create a Positive perception about electric vehicles in the Indian Market.
2. **Ajaysinh Parmar and Prof. Tushar Pradhan (2021)**, A study on consumers perception towards electric Vehicles in Vadodara city: The researchers observed that consumers are not much inclined toward electric Vehicles.
3. **Ajex Thomas Varghese, V.S. Abhilash, and Sini V.Pillai (2021)**, A study on consumer perception and Purchase intention of electric vehicles in India: The Researchers observed how the Government must play an important role in developing infrastructures for EVs.
4. **Prateek Bansal, Rajeev Ranjan Kumar, Alok Raj, Subodh Dubey, and Daniel J. Graham (2021)**, Willingness to Pay and attitudinal preferences of Indian consumers For electric vehicles: The researchers observed that Using the data of 1000 respondents, the willingness to spend on electric vehicles has been studied here. Also, different attributes are considered to know the Preferences of the consumer.
5. **Ankita Nagpal (2020)**, Consumers perception towards Electric vehicles in India: The researcher observed to Reduce the level of pollution and carbon emissions, ev's must be a regular medium across the country.

ANALYSIS AND INTERPRETATION OF DATA:

Analysis and interpretation of data is the process of assigning meaning to the collected information and determining the conclusions, significance and implications of the findings.

PERCENTAGE ANALYSIS

In the percentage analysis Percentage is calculated by multiplying the no of respondents divided by the sample size.

$$\text{Simple Percentage} = \frac{\text{No. of Respondents}}{\text{Sample Size}} \times 100$$

1. Table showing the brands preferred by Respondents

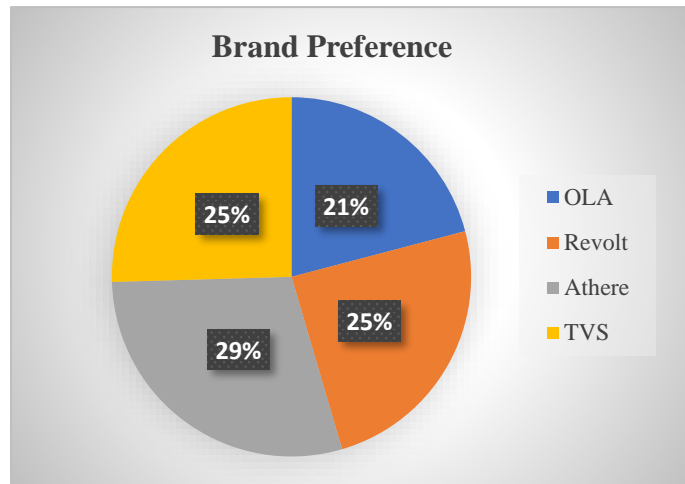
S.No	Brand	No. of Respondents	Percentage
1	OLA	23	21
2	Revolt	27	25
3	Athere	32	29
4	TVS	28	25
	Total	110	100

SOURCE: Primary data

INTERPRETATION

21% of the respondents prefers OLA brand, 25% of the respondents prefers to Revolt brand, 29% of the respondents prefers Athere brand, 25% of the respondents prefers TVS brand.

Chart showing the brands preferred by Respondents



2. Table showing the E-Vehicles are Environment friendly or not

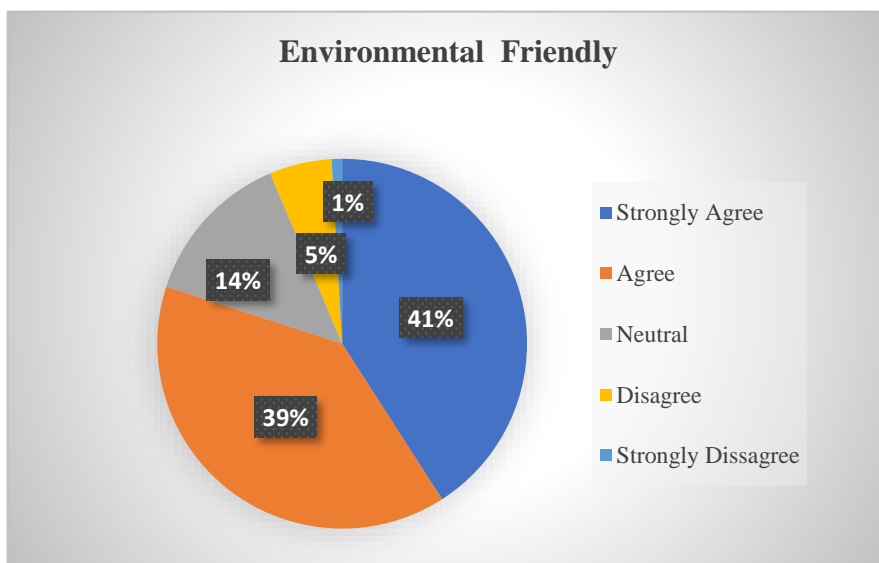
S. No	Eco - friendly	No. of Respondents	Percentage
1	Strongly Agree	45	41
2	Agree	43	39
3	Neutral	15	14
4	Disagree	6	5
5	Strongly Disagree	1	1
	Total	110	100

SOURCE: Primary data

INTERPRETATION

The above table shows that 41% of the respondents are Strongly Agreed that E-Vehicles are Eco-friendly, 39% of the respondents are Agreed that E-Vehicles are Eco-friendly, 14% of the respondents are stated Neutral that E-Vehicles are Eco-friendly, 5% of the respondents are Disagreed that E-Vehicles are Eco-friendly, 1% of the respondents are Strongly Disagreed that E-Vehicles are Eco-friendly.

Chart showing the E-Vehicles are Environment friendly or not



3. Table showing the disadvantages of Electric Vehicle

S. No	Disadvantages	No. of Respondents	Percentage
1	Expensive	31	28
2	Travel less distance	61	56
3	Long time to Recharge	18	16
	Total	110	100

SOURCE: Primary data

INTERPRETATION

The above table shows that 28% of the respondents said the main disadvantage of EV is Expensive, 56% of the respondents said the main disadvantage of EV is Travel less distance, 16% of the respondents said the main disadvantage of EV is Long time to recharge.

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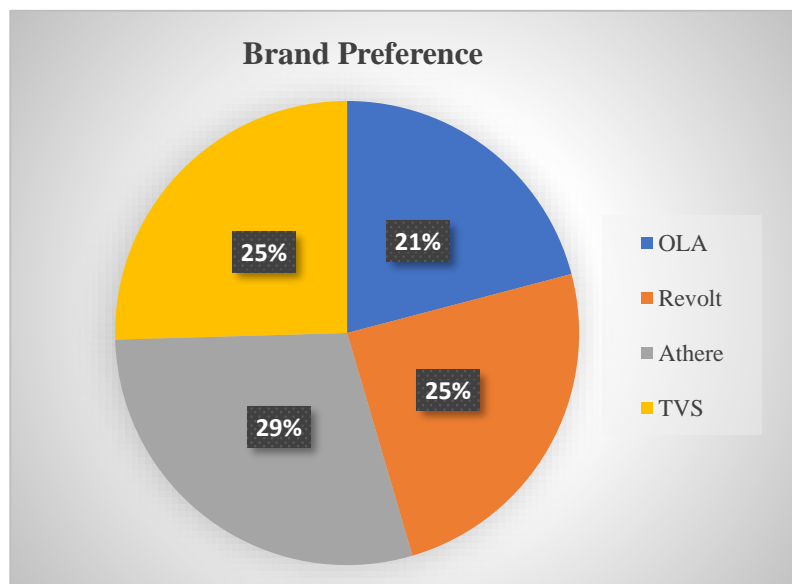
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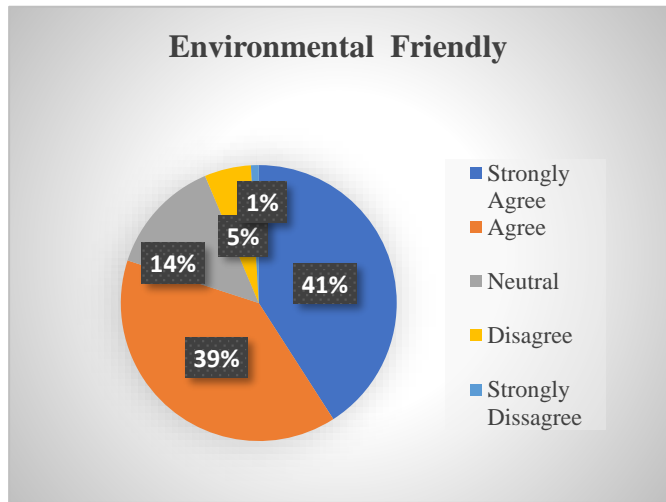
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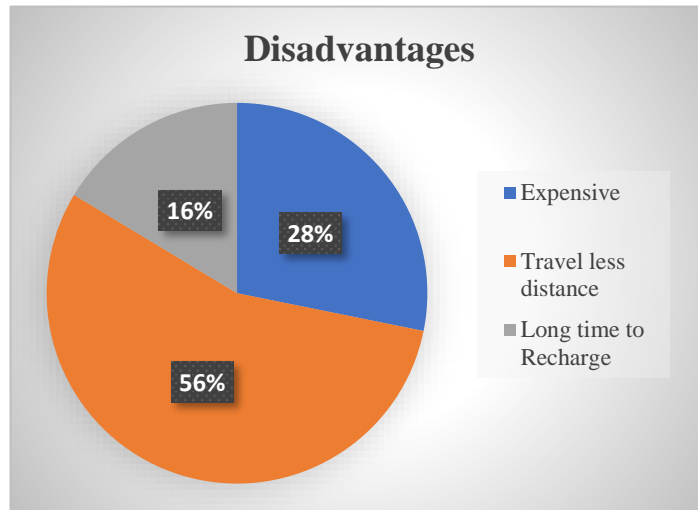
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RANK ANALYSIS

A ranking is a relationship between a set of items such that, for any two items, the first is either 'ranking higher than', 'ranked lower than' or 'ranked equal to' the second.

Table showing Ranking Analysis for Attributes in E-Vehicles

Attributes in E-Vehicle	1	2	3	4	5	Total	Rank
Style	21	25	23	28	13	317	2
Price	18	26	30	22	14	318	1
Performance	20	19	39	22	10	313	3
Easy to Use	19	25	31	25	10	312	4
Eco Friendly	26	21	22	28	13	311	5

SOURCE: Primary data

INTERPRETATION

The above table shows that the attributes of E-Vehicle that the highest rank towards the Price of the vehicle, Second rank towards Style, Third rank towards Performance, Fourth towards Easy to use, Fifth towards Environmental friendly.

CHI - SQUARE ANALYSIS

A chi-square test is a statistical test that is used to compare observed and expected results. The goal of this test is to identify whether a disparity between actual and predicted data is due to chance or to a link between the variables under consideration. A chi-square test or comparable nonparametric test is required to test a hypothesis regarding the distribution of a categorical variable.

Formula Used = $X^2 = \sum (O - E)^2$

X^2 = Chi square

- O = Observed value (actual value)
- E = Expected value

Table showing the Comparison of Maintenance Cost (one of the factors in E-Vehicle) with Occupation

Occupation / Maintenance cost	S. A G R E E	A G R E E	N E U T R A L	D I S A R E E	S. D I S A R E E	T O T A L
Agriculture	1	1	0	0	0	2
Employee	10	15	4	0	0	29
Self Employed	0	9	2	0	0	11
Student	9	23	23	4	1	60
Others	2	4	2	0	0	8
Total	22	52	31	4	1	110

O	E	(O - E)	(O - E) ²	(O - E) ² / E
1	0.4	0.6	0.36	0.9
10	5.8	4.2	17.64	3.041
0	2.2	-2.2	4.84	2.2
9	12	-3	9	0.75
2	1.6	0.4	0.16	0.1
1	0.94	0.06	0.003	0.003
15	13.709	1.294	1.674	0.122
9	5.2	1.8	3.24	0.623
23	28.363	-5.363	28.761	0.014
4	3.781	0.219	0.047	0.012
0	0.563	-0.563	0.316	0.561
4	8.172	-4.172	17.405	2.129
2	3.1	-1.7	2.89	0.932
23	16.909	6.091	37.100	2.194
2	2.254	-0.254	0.064	0.028
0	0.072	-0.072	0.005	0.069
0	1.054	-1.054	1.110	1.053
0	0.4	-0.4	0.16	0.4
4	2.181	1.819	3.308	1.516
0	0.290	-0.29	0.084	0.289
0	0.018	-0.018	0.0003	0.016
0	0.263	-0.263	0.069	0.262
0	0.1	-0.1	0.11	1.1
1	0.545	0.455	0.207	0.379
0	0.072	-0.072	0.005	0.069
TOTAL	110			18.762

$$\text{Chi-Square Value } \chi^2 = \sum (\text{O} - \text{E})^2 / \text{E}$$

$$= 18.762 / 110$$

$$= 0.17056$$

$$\text{Degree of freedom} = (\text{row}-1) (\text{column}-1)$$

$$= (5-1) (5-1)$$

$$= (4) (4)$$

$$= 16$$

Significance Level = 0.05

Table Value= 26.296

X^2 Calculated Value < X^2 Tabular Value

HYPOTHESIS

H₀ There is no significant relationship between Occupation and Maintenance Cost in E-Vehicle.

H₁ There is significant relationship between Occupation and Maintenance Cost in E-Vehicle.

INTERPRETATION

In the above analysis the calculated value (0.17056) is lower than the table value (26.296) at the level of 0.05 significance. Hence there is no significant relationship between Occupation and Maintenance Cost in E-Vehicle.

FINDINGS:

PERCENTAGE ANALYSIS

1. Majority of 64 % of the respondents are Male.
2. Majority of 49 % of the respondents are from Urban Area.
3. Majority of both 29 % of the respondents preferred Ather brand.
4. Majority of 41 % of the respondents are Strongly Agreed that the Electric Vehicle is Environmental friendly.
5. Majority of 56 % of the respondents stated that Travelling less Distance is the main Disadvantage in E-Vehicle.

RANK ANALYSIS

The level of the attributes of E-Vehicle is clarified that the highest rank towards the Price of the vehicle, Second rank towards Style, Third rank towards Performance, Fourth rank towards Easy to use, Fifth rank towards Environmental friendly.

CHI-SQUARE TEST

Occupation has no significant relationship between the Important factors (Maintenance Cost) when considering buying an Electric Vehicle.

SUGGESTIONS:

On the basis of the study, the following are the Suggestions

- ❖ By increasing in number of charging stations, more people will be interested in purchasing Electric Vehicles.
- ❖ Petrol prices are steadily rising. The problem of rising petrol prices can be addressed with Electric Vehicles. The government's promotion of Electric Vehicles will aid the country's future progress.
- ❖ People should place a greater emphasis on Electric Vehicles in order to reduce pollution and greenhouse gas emissions.
- ❖ By lowering an initial cost of Electric Vehicles, there will be a growing market in future.
- ❖ There should be free, fair, justified and honest competition amongst the various electric Vehicles.

CONCLUSION:

The current state of E-Vehicle Industry is in a great position with future prospects and an enormous market share as the quality of products has evolved a lot since the beginning of the EV revolution in India.

In India, there is a need for energy transition in automobiles due to the depletion of fossil resources and the steady rise in fuel prices. The government has taken steps to reduce pollution levels by promoting electric vehicles and providing purchasing subsidies. The government has relaxed FDI (Foreign Direct Investment) rules in order to promote output. Electric Vehicles are being introduced in India by a number of new brands. Governments and Manufacturers should work together to construct the infrastructure and create a favourable climate for Electric Vehicles.

The respondents are aware of global climate conditions, Environmental friendliness and are ready to change their cost is an important factor while considering the purchase of Electric Vehicle. If sufficient infrastructure is available, respondents are willing to accept Electric Vehicles as a future buying option.

The initial cost of purchasing, the limited number of charging stations, and the time it takes to recharge the battery are all factors that limit consumer confidence.

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