

RECENT TRENDS OF CUSTOMER SATISFACTION AND PERCEPTION TOWARDS ELECTRIC VEHICLES IN INDIA

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Abstract

Nowadays Electric vehicles (EVs) are the most revolutionary technology for achieving a sustainable transport sector in the future, because of their very low to zero carbon emissions, low noise pollution, high efficiency, and flexibility in automobile domain. It consists of an overview of electric vehicle technologies as well as associated energy storage systems and charging mechanisms. Different types of electric operated vehicles are presented which include battery electric vehicles, plug-in hybrid electric vehicles, hybrid electric vehicles and fuel cell electric vehicles. The mechanism for each category and the enabling technologies are discussed. Various power train configurations, new battery technologies, and different charger converter topologies are introduced. Nowadays its essential for electrical vehicles for healthy atmosphere which always keeps climate clean. In this paper E-vehicles become the roadmap for promising clean, low cost and most economical factor in the daily budget of customers. Customer satisfaction and perception regarding E-Vehicles are expressed in this paper.

Keywords: E-Vehicle, Customer Satisfaction, Perception, Green Energy, Carbon Emission.

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Introduction

Electric vehicles (EVs) run by electricity as their primary fuel or to improve the efficiency of conventional vehicle designs. EVs include all-electric vehicles, also referred to as battery electric vehicles (BEVs), and plug-in hybrid electric vehicles (PHEVs). Other types of electric-drive vehicles not covered here include hybrid electric vehicles, which are powered by a conventional engine and an electric motor that uses energy stored in a battery that is charged by regenerative braking, not by plugging in, and fuel cell electric vehicles, which use a propulsion system similar to electric vehicles, where energy stored as hydrogen is converted to electricity by the fuel cell.

All-electric vehicles do not have conventional engines but are driven solely by one or more electric motors powered by energy stored in batteries. The batteries are charged by plugging the vehicle into an electric power source and can also be charged through regenerative braking. All-electric vehicles produce no tail pipe emissions, although there are "life cycle" emissions associated with the electricity production. All-electric vehicles typically have shorter driving ranges per charge than conventional vehicles have per tank of gasoline. The word electric vehicle is an umbrella term for cars that run entirely or partially on electricity are known as electric cars. Because they require

less maintenance due to their fewer moving parts, electric vehicles are less expensive to operate and have a low environmental impact because they consume little to no fossil fuels (diesel or petrol). Although lead acid and nickel metal hydride batteries were once often employed in electric vehicles, lithium ion batteries are currently the industry standard for electric vehicles. They self discharge at a rate of only 5% per month, which means they are far more durable and have exceptional energy retention. Although attempts have been made to improve the safety of these batteries, problems still exist with them despite their increased efficiency. One such problem is that they are susceptible to thermal runaway, who has resulted in explosions or fires in Tesla model S vehicles, among other incidents. There are four different kinds of electric cars on the market:

Types of E-Vehicles

Electric vehicles (EVs) are mainly classified into four types based on their power source and powertrain

- 1) **Battery Electric Vehicle (BEV)**-They are fully powered by electricity. These are more efficient compared to hybrid and plug-in hybrids.
- 2) **Hybrid Electric Vehicle (HEV)**-It uses both the internal combustion (usually petrol) engine and the battery-powered motor power train. The petrol engine is used both to drive and charge when the battery is empty. These vehicles are not as efficient as fully electric or plug-in hybrid vehicles
- 3) **Plug-in Hybrid Electric Vehicle (PHEV)**-It Uses both an internal combustion engine and a battery charged from an external socket (they have a plug). This means the vehicle's battery can be charged with electricity rather than the engine. PHEVs are more efficient than HEVs but less efficient than BEVs.
- 4) **Fuel Cell Electric Vehicle (FCEV)**-Electric energy is produced from chemical energy. For example: a hydrogen FCEV.III



2.1 Electric scooter



2.2 MG ZS Electric Four wheeler

Literature Review

I) Dr.V. Vidhya, RenugaDevi.R(2023)

This paper titled “**A study on Consumer Preference and Satisfaction towards Electric vehicles with Reference to Coimbatore City**” Presents that Nowadays the electric vehicle industry development has seen in recent years welcomed, but highly necessary in light of the increasing global green house gas levels. As demonstrated within the economic, social, and environmental analysis sections of this webpage, the benefits of electric vehicles far surpass the costs. The major obstacle to the widespread adoption of electric-powered transportation is cost related, because gasoline and the vehicles that run on it are readily available, convenient, and less costly. The study

helps to find that the quality of the Electric Vehicles needs to improve because of quality. The study has been carried out with 163 respondents and Chi Square tool was used for analyzing the data. The finding of the study found that there exists a significant awareness and knowledge gap among consumers in Coimbatore regarding electric vehicles (EVs).

II) Ms. Bindhu R, Ms. Shwetha R (2023)

This paper “ **A Study on Customer Satisfaction towards Electric Vehicles with Special Reference to Tumkur District**” presents the number of consumers increasing in Tumkur city which improves positive attitudes of customers for purchasing EV vehicles. As no. of charging stations increasing in Tumkur city, the purchasing and consumer interest enhanced. Also, the consumers from Tumkur city keep their purchasing EV vehicles due to environmental issues. They find comfort satisfaction for purchasing it. The author presented findings according to age group, brand, and income level etc. in which mostly customers are in positive satisfaction for purchasing EV Vehicles.

III) Jiji.P. (2025)

The Research article “ **customer satisfaction towards electric vehicles in Kollam District** ” study shows that electric vehicle users in Kollam district having a high level of satisfaction, particularly in terms of comfort, convenience, and maintenance costs. However, challenges facing by customers like long charging time and limited charging infrastructure remain key concerns affecting the overall user experience. It shows that economic factors, like low running and maintenance costs, are primary motivators for electric vehicle adoption. These findings can help relevant stakeholders in improving infrastructure and services, thereby promoting wider acceptance of electric vehicles in the region. Its results in there is no significant relationship between gender and satisfaction with overall performance of electric vehicle.

IV) Prof. Vaibhav Bankar, Prof. Dinesh Nichit (2025)

The paper titled “ **A Comparative Study of level of Consumer Satisfaction towards Fuel and Electric Vehicles with special reference to Amravati City**” presents increasing consumer awareness and interest in electric vehicles (EVs), because of social media information source. While most respondents own fuel-powered vehicles, key factors driving EV adoption include lower emissions and reduced fuel dependency. However, limited charging infrastructure becoming a major issue for purchasing EV vehicles. Most of consumers preferred for purchasing lower cost EV (2-5 Lakhs). For motivating customers for EV adoption, charging infrastructure improvement, affordability, and battery performance are important that ensures more consumer-friendly and sustainable EV market in India.

These paper results that respondents are highly aware of and receptive to electric vehicles, and factors like price, accessibility of infrastructure, and social impact are crucial in their decision making. Additionally, respondents indicated a preference for companies like Tata and Mahindra as well as characteristics like larger battery capacity. However, obstacles to the broader use of electric vehicles still exist, including the scarcity of charging stations and worries about their pricing and longevity.

V) Dr. Kotigari Reddi Swaroop, Dr. K.V.V. Murali Someswararao, Dr. N. Gurunatha Naidu, Dr. K.V. Nagaraj (2022)

These paper present study research paper “ **A Study On Factors Influencing On Purchase Of EVehicles With Reference To South India**” covered factors influencing on purchase of e-vehicles in South India. The model which the researcher had taken in the present study is taken with literature support. It found that there is positive correlation between the variables. From the

study it was observed that maximum number of respondents are aware of e-vehicles but still they are not convinced.

This study employed SPSS 28 to conduct ANOVA, Pearson Correlation and Cronbach's Alpha to test the determining factors. The first section of the questionnaire focuses on the respondents' demographic characteristics. The second section of the questionnaire includes questions about the price difference, charging infrastructure, environmental concerns speed and purchase Decisions. Present research was conducted using a questionnaire amongst 130 individuals.

VI) Dr.K. Kathirvell, A. Geethamani (2024)

This paper titled “**A Study On Customer Satisfaction on Electric Vehicles With Special Reference To Pollachi Taluka**” presents the electric vehicle industry has seen in recent years is highly necessary in light of the increasing global greenhouse gas levels. This gives the emphasis the benefits of electric vehicles far reducing the costs. The biggest obstacle to the widespread adoption of electric-powered transportation is cost related, as gasoline and the vehicles that run on it are readily available. convenient, and less costly. Availability and accessibility of charging stations play a crucial role in determining customer satisfaction with EVs. If there was an increase in the number of charging stations and their ease of use, it improves higher satisfaction levels. If Pollachi Taluk residents were increasingly concerned about environmental issues and were choosing EVs as an eco-friendlier option, it might indicate a higher level of satisfaction with EVs. Positive feedback about the range of EVs and their overall performance, including factors like acceleration, handling, and comfort, could contribute to customer satisfaction. The Pollachi Taluka will also promote the use of e-autos in the city. Grants given by international agencies for reducing carbon emission will be allotted to a society formed by auto rickshaw owners. E-cargo vehicles launched in Pollachi. Electric cargo vehicles will now be used to deliver goods, including vegetables, food, and cooking gas in the city. Eighteen vehicles, including 12 pick-up auto rickshaws, were launched at a function organized by the Pollachi Taluk. The sample of the study is collected from customers focused mainly in Pollachi Taluk.

Research Methodology

Research methodology is a way to systematically solving a research problem. Research methodology deals with the research design used and methods used to present the study..

- Research Design.
- Sampling Plan & Data Collection.
- Data Analysis & Interpretation.
- Research Report Preparation.

4.1 Research Design

This study is intended to analyze consumer's preference and satisfaction towards Electric vehicles in India. The study is Quantitative in nature.

i) Sample size

500 Questionnaire will be distributed out from different respondents in the india

ii) Data Collection

The data will be collected from both primary and secondary data.

a) Primary Data: Primary data will be collected directly from the people with the help of the questionnaire for the first time and that are original in nature.

b) Secondary Data: Secondary data is to be collected from various sources such as books, journals, articles, newspapers, websites etc

iii) Sampling Method

The method used for collecting sample is to be stratified sampling.

iv) Data Analysis Approach

This section explains how the collected responses (survey/questionnaire/interview) will be analyzed to assess:

- Customer satisfaction levels
- Customer perception toward electric two-wheelers
- Relationships between demographic variables and satisfaction/perception

Different testing such as Regression analysis, chi-square test, correlation analysis, hypothesis testing reliability testing is to be used for quantitative data analysis validation.

Conclusion

The Evs vehicle industry has a very promising future in india.the customer satisfaction and perception in india has a high level regarding low carbon emission,high efficiency,low air pollution etc.but the charging stations availablity is the major obstacles in customer satisfaction survey.It becomes a green energy alternative to conventional mode of transporation petrol or diesel vehicles. The improving the performance of electric two wheelers ensuring competative pricing,and avaliability of charging infrastructures are most important startegies that can be used to promote the adoption of electric vehicles among customers

References

1. Dr.V. Vidhya,RenugaDevi.R (2023) “A study on Consumer Preference and Satisfaction towards Electric vehicles with Reference to Coimbatore City”International Journal of Research Journal Review,4(5), 2382-2389.
2. Ms.Bindhu R,Ms.Shwetha R(2023)“ A Study on Customer Satisfaction towards Electric Vehicles with Special Reference to Tumkur District” International Journal of Research Journal Review,4(9,)209-211.
3. Jiji.P(2025) “Customer satisfaction towards electric vehicles in kollam District”International Joirnal of Advanced Research 13(09), 857-863.
4. Prof.Vaibhav Bankar,Prof. Dinesh Nichit(2025) “A Comparative Study of level of Consumer Satisfaction towards Fuel and Electric Vehicles with specialreference to Amravati City”Journal of Emerging technologies and Innovative Research(JETIR) ISSN2349-5162-2014,12(2) 568-577.
5. Dr.Kotigari Reddi Swaroop,Dr.K.V.V.Murali Someswararao,Dr.N.Gurunatha Naidu, Dr. K.V. Nagaraj(2022) “A Study On Factors Influencing On Purchase Of E-Vehicles With Reference To South India”Journal of positive school psychology,6(11),200-208.
6. Dr.K. Kathirvel ,A. Geethamani (2024)“A Study On Customer Satisfactionon Electric Vehicles With Special Reference To Pollachi Taluka”International journal of Progressove research Engineering management and science ,4(10),1086-1090.
7. Dr.Abhishek and Sumit Bhardwaj (2023) A Review On Consumer Perception And Satisfaction Towards E-Vehicles In Haryana,ISSN 2454-308X,Vol 9(5).