

A Study on Customer Satisfaction towards Electric Vehicle Buying in Tiruchirappalli City

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Abstract

The rapid adoption of electric vehicles (EVs) has transformed the global automotive industry. Electric vehicles (EVs) are a promising technology for achieving a sustainable transport sector in the future, due to their very low to zero carbon emissions, low noise, high efficiency, and flexibility in grid operation and integration. This chapter includes an overview of electric vehicle technologies as well as associated energy storage systems and charging mechanisms. Different types of electric-drive vehicles are presented. These include battery electric vehicles, plug-in hybrid electric vehicles, hybrid electric vehicles and fuel cell electric vehicles. The topologies for each category and the enabling technologies are discussed. Various power train configurations, new battery technologies, and different charger converter topologies are introduced. Electrifying transportation not only facilitates a clean energy transition, but also enables the diversification of transportation's sector fuel mix and addresses energy security concerns. In addition, this can be also seen as a viable solution, in order to alleviate issues associated with climate change.

Furthermore, charging standards and mechanisms and relative impacts to the grid from charging vehicles are also presented.

Keywords: Electric vehicles, Battery Capacity, Energy Usage, Range (mileage), Development power, Customers Satisfaction.

I. INTRODUCTION

Electric vehicles are increasingly seen as a sustainable alternative to conventional internal combustion engine vehicles. Governments worldwide are incentivizing EV adoption to reduce carbon emissions and combat climate change. India is one of the top ten automotive markets in the world and given its burgeoning middle class population with buying potential and the steady economic growth, acceleration automotive sales is expected to continue. In the last couple of years, there has been a lot of discussion around the prices of fuel – apart from the deregulation of petrol prices. Moreover the threat of disruption of supplies from the middle east has heightened the debate on energy security and brought the focus onto alternate drive train technologies. The potential for alternative technologies in automobiles such as electric vehicles (EV) in India, as in the case of many other comparable markets, depends on improved battery technologies, driving ranges, government incentives, regulations, lower prices and better charging infrastructure. There seems to be a lot of interest on the part of Internal Combustion Engine (ICE) based manufacturers to adopt electric technology, not just supplemental to the ICE, but as a stand-alone offering. There are also specialized EV manufacturers that have come up all over the world. While many of the factors that influence the EV market are understood intellectually, we carried out a consumer survey to study perceptions and expectations of potential for alternative technologies in automobiles such as electric vehicles (EV) and hybrid EV. Assessing future demand for electric vehicles was somewhat challenging since it meant testing consumer preferences for a product with which they are largely unfamiliar. For this reason we focused on uncovering consumers familiarity with EV technologies and products; with their opinions around price, brand, range, charging, the infrastructure, and the cost of ownership; and with the consumer's imagined – fit of an EV in his or her lifestyle given a range of demographic parameters.

Objectives of the study Primary Objective

- To study the perceptions and expectations of potential, for alternative technologies in automobiles, such as Electric Vehicles.
- To assess customer satisfaction levels with EVs.

Secondary Objective

- To know why electric vehicle couldn't get enough consumer attraction.
- To study the willingness of buyers of considering Electric Vehicles as a practical commuting option and at when.
- To study the maximum price consumers can afford for buying an Electric Vehicle.

Scope of the Study

As electric vehicle manufacturing is **becoming popular every day**, its market share is also expected to rise greatly. India's GDP is expected to grow by an amazing 25% by 2022. The best part is that, apart from reducing environmental pollution, EVs can lower oil import by about \$60 Billion by 2030.

Limitation of study

- Due to efficiency of electric engines as compared to combustion engines, even when the electricity used to charge electric vehicles comes from a CO₂-emitting source, such as a coal- or gas-fired power plant, the net CO₂ production from an electric car is typically one-half to one-third of that from a comparable combustion vehicle.
- Electric vehicles release almost no air pollutants at the place where they are operated.
- In addition, it is generally easier to build pollution-control systems into centralised power stations than retrofit enormous numbers of cars.

Research Methodology

Research Design

The descriptive research design is used in this study.

Sources of Data Primary Data

Primary Data is collected from the people in Tiruchirappalli City.

Secondary Data

Secondary Data is collected from books, websites, articles and internet.

Sample Design

Population

Peoples in Tiruchirappalli City.

Sample Size

Sample size of 50 respondents from Tiruchirappalli.

Sampling Method

Convenience Sampling Method has been used for this study.

Method of Data Collection

Data is collected through Structured Questionnaire.

Tools for Analysis

Percentage Analysis

Data Analysis and Discussion

Profession of the respondents

S.No.	Profession	No of Respondents	Percent
1	Student	21	42
2	Self Employed	8	16
3	Government Job	1	2
4	Private Job	20	40
Total		50	100

Interpretation

According to the table 4.1.1, 42% of the respondents was under the student, 16% of the respondents was under the Self Employed, 40% of the respondents was under the Private job and 2% of the respondents was under the Government job.

Gender of the Respondents

S.NO	Gender	No of Respondents	Percent
1	Male	35	70
2	Female	15	30
Total		50	100

Interpretation

According to the 4.1.2, 70 percentage of the respondents were Male and 30 percentage of the respondents were Female.

Mode of Transportation of Respondents

S. No	Mode of Transportation	No of Respondents	Percent
1	Own vehicle	32	77.6
2	Taxi/Auto	3	4.2
3	Public bus	6	7
4	Train	8	10.2
Total		49	100

Interpretation

According to the table 4.1.6, 77.6% of the respondents using own vehicle, 4.2% of the respondents using Taxi/Auto, 7% of the respondents using public bus and 10.2% of the respondents using Train.

Review of literature

Numerous studies have explored various dimensions of customer satisfaction with EVs. According to Smith and Brown (2022), performance reliability, environmental impact, and operational cost are primary drivers of satisfaction among EV users. Their study emphasizes that consumers value the reduced carbon footprint and lower fuel costs associated with EVs, but infrastructure limitations pose significant challenges.

Miller et al. (2021) highlight the importance of charging infrastructure in shaping customer experiences. Their research indicates that insufficient and unevenly distributed charging stations exacerbate range anxiety, a critical barrier to satisfaction. Similarly, the International Energy Agency (2023) reports that advancements in battery technology and extended range capabilities significantly enhance customer perceptions of EV reliability.

Many governments have initiated and implemented policies to stimulate and encourage electric vehicle (EV) production and adoption (Sierzechula, Bakker, Maat, & Van Wee, 2014).

The expectation is that better knowledge of consumer preferences for EV can make these policies more effective and efficient. Many empirical studies on consumer preferences for EV have been published over the last decades, and a comprehensive literature review would be helpful to synthesise the findings and facilitate a more well-rounded understanding of this topic. Rezvani, Jansson, and Bodin (2015)

Findings

1. Majority of the respondents 42% are students.
2. Majority of the respondents 70% were Male.
3. Majority of the respondents 90% have vehicle.
4. Majority of the respondents 95.9% have two wheeler.
5. Majority of the respondents 95.9% using their vehicle in City.
6. Majority of the respondents 77.6 % of people using their own vehicle.
7. Majority of the respondents 82 % of the people hear about Electric Vehicle.
8. Majority of the respondents 58 % interest to owning EV.
9. Majority of the respondents 45.7 % choice level of price 50,000.
10. Majority of the respondents 32.7 % purchasing Electric Vehicle.
11. Majority of the respondents 46% using batteries charge at home.
12. Majority of the respondents 46.9 % want the EV range up to 50-100 km.
13. Majority of the respondents 46.9 % using their EV speed of 100km.
14. Majority of the respondents 50 % want to change batteries their cost want at 5000.
15. Majority of the respondents 37.5 % of the people want 30% of government subsidies.

Suggestions

- Drives smoothly. Simply put, lead-footed driving will drain your EV's battery at an accelerated rate.
- Slow Down. Try to keep your speed under 60mph whenever possible.
- Reduce or even eliminate your fuel costs. Weekly trips to the gas station to fuel up your car are expensive, especially when the ever-fluctuating price of gasoline is high.
- Reduce emission to help the environment
- It's better to let the capacity run down to 10 or 20%, then recharge to around 80%.
- Current electric vehicles travel about 250 miles on a charge, though there are some, such as Tesla, that can do about 350 miles on a charge.

II. CONCLUSION

The process that the electric vehicle industry has seen in recent years is not only extremely welcomed, But highly necessary in light of the increasing global greenhouse gas levels.

As and environment analysis sections of this webpage, the benefits of electric vehicles far surpass 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. As is demonstrated in our timeline, we hope that over the course of the next decade technological advancements and policy changes will help ease the transition from traditional fuel-powered vehicles. Additionally, the realization and success of this industry relies heavily on the global population, and it is our hope that through mass marketing and environmental education programs people will feel incentivized and empowered to drive an electric-powered vehicle. Each person can make a difference, so go electric and help make a difference.

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