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Consumers perception and satisfaction towards electric vehicle with special reference to Coimbatore city

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Abstract
In recent years, E-Vehicle have become increasingly popular as a green alternative to conventional modes of transportation, particularly among urban commuters. The purpose of this study is to learn more about how urban commuters use and adopt e--Vehicle. We surveyed 500 urban commuters and conducted in-depth interviews with a subset of them using a mixed-methods approach. According to our findings, e--Vehicle are primarily used for commutes to work or school and provide a convenient and effective mode of transportation for trips of a short to medium length. E--Vehicle adoption is also influenced by costs, infrastructure, and safety concerns, according to our findings. E--Vehicle have the potential to promote environmentally friendly urban transportation, and our research suggests ways to encourage their use and adoption.

Keywords: E-Vehicle, consumer perception, infrastructure.

Introduction
Concerns about energy security and environmental sustainability have sparked a revolutionary transformation in the automotive industry with the adoption of electric vehicles (EVs). At the forefront of this change is Coimbatore, a thriving city in Tamil Nadu, India, known for its dynamic culture and economic strength. Coimbatore provides a unique environment for researching how customers are responding to electric vehicles as awareness of the need for cleaner transportationoptionsgrows. The objective of this study is to examine the factors that influence the Coimbatore region's customer acceptance of electric vehicles. Through an examination of consumer attitudes, perceptions, and preferences about electric vehicles, this research aims to provide light on the variables influencing the adoption of EVs in this urban environment. The automotive environment of Coimbatore, which is defined by a blend of new and classic electric mobility solutions and combustion engine vehicles, provides a rich background for comprehending the prospects and problems related to the adoption of EVs. Consumer behavior and decisions about electric vehicles are expected to be influenced by a variety of factors, including government legislation, infrastructural accessibility, cultural beliefs, economic considerations, and accessibility to charging stations.

Objectives of the study
The following could be the goals of a study on how Coimbatore consumers are responding to electric vehicles:
1. To evaluate respondents perception on the usage of electric vehicles.
2. To assess consumers receptiveness in adopting electric vehicles.
3. To analyze consumers satisfaction towards electrical vehicles in Coimbatore city.

Scope of the study
The scope of a study on consumers' perceptions and adoption of electric vehicle (EVs) is broad and complex, covering a range of factors that influence the shift to sustainable transportation. A crucial component of the study's objectives is to identify the variables affecting consumers' acceptance of electric vehicles. Examining the effects of cost, incentives, range anxiety, charging infrastructure, and the accessibility of various electric vehicle models are all part of this. Data on consumer preferences and willingness to pay for electric vehicles is taken for analysis.

Limitations of the study
1. Only respondents from the specified location are included in the study.
2. The original data forms the entire basis of the investigation. Thus, the outcome and conclusion will be entirely dependent upon them
3. The data was gathered only from 150 respondents.

Statement of problem
The statement of the research work provides a succinct and straightforward explanation of the challenge that are faced in adaptation of electric vehicle. Within the framework of this investigation, the advancements in electric vehicle (EV) technology offer a possible remedy for the environmental issues raised by conventional internal combustion engine automobiles.

Review of literature
1. John E. Anderson, Moritz Bergfeld, Do Minh Nguyen & Felix Steck (2022) Real-world charging behaviour and preferences of electric vehicles users in Germany: The paper and the findings fill the research gap and provide timely and relevant insights on charging behaviour and preferences on electric vehicles.
2. Mr. S. Chandra Sekhar, Dr. J Murthy, Dr. Shaik Karim, Mr. M. Subramanyiam Reddy, Dr.C. Bhupathi (2022) Factors Influencing Customers Buying Behaviour: A Study of Electric Vehicles with reference so Tirupati City: The need for the study is to understand the

consumer attitude and the purchase intention of e-vehicles.

3. Ajex Thomas Varghese, V.S. Abhilash and Sini V. Pillai (2021) The primary purpose of this study is to analyse the consumer perception and purchase intention of electric vehicles in India. Electric vehicles are being looked at by the automotive industry as a potential answer for India's economy and ecology.

Research methodology

The process and methodology for gathering the data required to address the problem are specified in the research design. This research study used a descriptive research design, in which an existing problem is solved.

Primary Data

The primary data are collected through structured questionnaires.

Secondary Data

Secondary data is a data collected from websites and records

Area of study

This study was conducted in Coimbatore city.

Sample Size

150 respondents residing in Coimbatore city were selected for the study.

Tools Used for Analysis

Data analysis tools are simple percentage and chi-square test.

Data analysis and interpretation

Percentage analysis

Table 1: Showing the demographic profile

S.NO	Demographic		No of the respondent	Percentage
1	Gender	Male	81	54%
		Female	56	37.3%
		Transgender	13	8.5%
2	Age	18-25 years	62	41.3%
		26-35 years	45	30%
		36-45 years	34	22.7%
		Above 45	9	6%
3	Educational qualification	School Level	23	15.3%
		UG	46	30.7%
		PG	46	30.7%
		Professional	29	19.3%
		Others	6	4%
4	FamilyMonthly Income	Lessthan Rs.20,000	56	37.3%
		Rs.20,000-30,000	17	11.3%
		Rs.30,000-40,000	62	41.3%
		Above40,000	15	10%
5	Occupation	Private employee	34	22.7%
		Government employee	38	25.3%
		Self employee / Business	33	22%
		Professional	21	14%
		Others	24	16%

Interpretation: Table 1 clearly states the demographic profile of the respondents. most of them are Male. Maximum of them are at the age of 18-25. Majority of them international Journal of Commerce and Management research.

CHI-Square Analysis

A chi-square test is a statistical test used to compare observed value with expected value. The purpose of this test is to determine if a difference between observed data and expected data is due to chance, or if it is due to a relationship between the variables are studied. H1 =H1 is the alternative hypothesis. There is relationship between the independent variable and the dependent variable.

Chi square analysis formula

$\chi 2 = \sum (Oi - Ei)2 / Ei$ The two variables are gender and the level of satisfaction of the respondents towards electric vehicle.

H1: There is significant difference between the gender of the respondents and their level of satisfaction with the use of electric vehicle.

Table 2

Overall satisfaction	Government employee	Others	Private employee	Professional	Self employee/ Business	Grand total
Satisfied	7	11	7	2	4	31
Neutral	1	4	4	5	8	22
Highly satisfied	15	4	14	10	11	54
Highly dissatisfied	4	2	4	2	6	18
Dissatisfied	11	3	5	2	4	25
Grand Total	38	24	34	21	33	150

H1 =H1 is the alternative hypothesis. There is relationship between the independent variable and the dependent variable.

Table 3

Variable	Degree of free dom	Calculated value	Table value	Accepted / Rejected
Occupation & over all satisfaction	16	23.542	**27.190**	Accepted

Result

The calculated value (23.542) is less than the table value (27.190).

The calculated value is greater than table value (23.542<27.190), so the hypothesis is accepted. there is a significant relationship between the occupation and the have of satisfaction of the respondents towards electric vehicle.

Findings

Percentage analysis

1. The majority (41.3%) of the respondents are in the groups of 18-25years.
2. The majority (54%) of the respondents are Male.
3. The majority (30.7%) of the responded are UG.
4. The majority (41.3%) of the respondents are Rs.30,000-40,000.
5. It is found that the majority (80.7%) of respondents are owned or used an yes electric vehicle.
6. The majority 48.1% of the respondents have main influencing factor as cost savings for purchase decision of electric vehicle.
7. The majority 55.7% of the respondents have main influencing factor as cost savings for purchase decision of electric vehicle.
8. The majority 44.7% of the respondents have somewhat concerned about the limited range of Electric Vehicle compared to traditional cars.
9. The majority 78% of the respondents have test drive the electric vehicle.
10. The majority 43’3% of the respondents have well about the perception on charging infrastructure for electric vehicles.
11. Majority 63.3% of the respondents have not likely to adopt electric vehicle if there is more public charging stations.
12. Majority 47.3% of the respondents have somewhat important in availability of financial incentives or rebates for purchasing an electric vehicle.
13. Majority 41.3% of the respondents have source of information from online search.
14. Majority 46.7% of the respondents are somewhat concerned about the environmental impact of your current vehicle.
15. Majority 40% of the respondents have perceived the maintenance costs of electric vehicle are about the same.
16. Majority 82% of the respondents have access to a dedicated parking space could install a home charging station.
17. Majority 81.3% of the respondents have aware of different types of electric vehicles.
18. Majority 46% of the respondents got range in between 20-30 km.
19. Majority 25.3% of the respondents have somewhat concerned about the resale value of electric vehicle.
20. Majority 33% of the respondents have safty used or new one.
21. Majority 35% of the respondents are somewhat important to check the availability of fast charging options.
22. Majority 31% of the respondents have interested in a subscription based service for electric vehicles.
23. Majority 41% of the respondents have range of Electric Vehicle prices are willing to consider.
24. The Majority 27.3% of the respondents are Highly satisfied Respondents Level of Satisfaction towards the Price of the Electric vehicle.
25. The Majority 31.3% of the respondents are Satisfied. Respondents Level of Satisfaction towards the mileage of the Electric vehicle.
26. The Majority 32.6%% of the respondents are Neutral. Respondents Level of Satisfaction towards the charging station of the Electric vehicle.
27. The Majority 32.6%% of the respondents are Highly satisfied. Respondents Level of Satisfaction towards the safety of the Electric vehicle.
28. The Majority 31.3%% of the respondents are Satisfied. Respondents Level of Satisfaction towards the Maintenance chargre of the Electric vehicle.
29. The Majority 23.3% of the respondents are Neutral.Respondents Level of Satisfaction towards the Maintenance Resale valueof the Electric vehicle.
30. The Majority 23.3% of the respondents are Dissatisfied. Respondents Level of Satisfaction towards the Maintenance Over all satisfaction of the Electric vehicle.

Suggestions

Increasing perception and awareness of electric vehicles (ELECTRICALVEHICLES) is crucial for accelerating their acceptance and achieving sustainability goals. Launch public awareness campaigns that highlight the benefits of Electrical vehicle, such as lower operating costs, reduced emissions, and convenience. Provide clear and concise information about charging infrastructure, range, and incentives for Electrical vehicle acceptance.

Conclusion

The current state of the EV Industry is in a great position with future prospects and a huge market share as the quality of products has evolved a lot since the beginning of the EV in India. The perceptions of the Indian consumers have started to adopt technological improvements where Electric vehicles gain an upper hand over Traditional vehicle. The findings of the study established that there is good perception towards buying an electric vehicle. One of the factors limit the buying of an EV was lack of knowledge of customers towards electric vehicles. In this research. It was found that the uses of electric vehicle in Coimbatore city are neutral opinion have satisfied. With the use of electric vehicle.

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