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A STUDY ON CUSTOMER SATISFACTION TOWARDS ELECTRIC CAR, COIMBATORE.

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ABSTRACT: The present study focuses on customer satisfaction of the electric car users at Coimbatore city. With the current depletion of the fossil fuels and the price hike of the fuels there is a need for another source to run the vehicles. Customers are the real owners. So, each and every expectations and satisfaction level of Customers have to be studied. Hence it is necessary to study the satisfaction level of the electric car users. In this study we understood that the customer satisfaction of electric cars which helps to understand the customer behavior and the reasons for the satisfaction as well as the dissatisfaction of the product.
KEYWORDS: Electric cars, Customer satisfaction, Incentives

INTRODUCTION

Recent years, driven by national policies, new energy automotive market is growing explosively, in which battery electric cars becomes the main force because of their low emission and high energy efficiency. Customer delight studies of electrical automobiles aren't like the conventional automobiles. This paper analyses the customer satisfaction towards the electric cars with the special reference to Coimbatore city. Those who are satisfied with electric cars have the intention to repurchase and recommend electric cars to others. Because this study was conducted based on actual experience of electric car users, it could enhance understanding of the electric car driving environment and, thus, pave the wayto provision of better service for electriccar users.

SCOPE OF STUDY

- The scope of the study is restricted to Coimbatore city.
- It is focused on the satisfaction and preference of the customers towards electric cars.
- The study analyses the customer perception towards price, quality, safety and performance of electriccars.

STATEMENTOF THE PROBLEM

Customer spends much time in the selection of durable products, especially four wheelers. This is because of the cost and longevity. The marketing strategies also play a vital role in the selection of a particular brand and to get more satisfied. In this study, it has made an attempt to identify the customer satisfaction of electric car with special reference to Coimbatore. In this study the following areas need to be examined:

- What is the level of satisfaction towards the electric cars in Coimbatore?
- What are the problems faced bythe electric car users in Coimbatore?

OBJECTIVESOFTHESTUDY

- To measure the incentives provided bygovt. for the use and manufacture of electric cars.
- To analyze the level of satisfaction and the problems faced by the electric car users.
- To identify the reason to prefer the electric cars.

SAMPLE SIZE

Samples of 149 respondents were selected on the basis of sampling method with the point of view of customer's howthey are aware of theelectric cars in Coimbatore city.

STATISTICAL TOOLS USED FOR DATA ANALYSIS

The tools used are

- Percentage Analysis.
- Rank analysis.
- Chi-square Test.

- Correlation.
- Regression.

METHODSOFDATACOLLLECTION

In this study both the primaryand secondarydata are used for analysis.

PRIMARY DATA

Primary data or raw data is a type of information that is obtained directly from the first-hand source through experiments, surveys or observations.

SECONDARY DATA

Secondary data is data collected by someone other than the actual user. It is a method that the facts is already available, and a person analyses it. The secondary data consist of magazines, newspapers, books, journals, etc. It can be either posted statistics or unpublished statistics.

LIMITATIONSOFTHESTUDY

- The studyhas been carried out within a period of 4 months.
- The area of the study covers only Coimbatore city.
- The data has been collected from only 149 respondents.
- Findings and suggestions given on the basis of the study cannot be extrapolated to entire population.

REVIEW OFLITERATURE

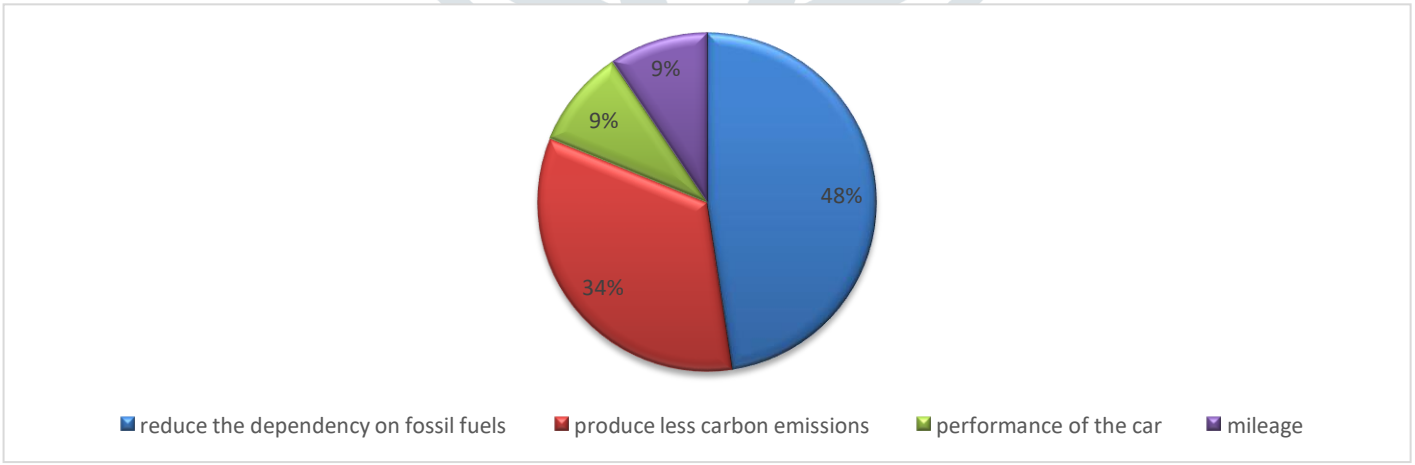
- **Lingzhi Jin, (2017)** the early market growth for electric vehicles continues, but a number of barriers prevent their widespread uptake. These barriers include the additional cost of the new technology, relative inconvenience of technology considering range and charge times, and customer understanding about the availability and viability of the technology. This last point, typically referred to as "customer awareness," is crucial.
- **Yogesh Aggarwal, Vivek Gedda and Kushan Parikh, 2019** Users of scooters, who need only to travel short distances, may consider an Electric Vehicle, but those, who need to travel longer distances and already own bikes like a Hero Splendor, may find it difficult to move to an e2W. For cars, it is relatively simple to improve the range with increased battery size. For electric 2Ws though, every increase in kWh may provide an extra 30kmin range, but the increase in weight is around 10kg, approximately a 10% increase in the total weight of the bike. This weight issue is even more pronounced in smaller bikes (less than 150cc).
- **Bennett, R., & Vijaygopal, R. (2018).** Based on the posited influences of a specific stereotype of EV owners possibly held by people without experience with EVs, and the latter's self-image congruence regarding EV ownership, this research developed an integrated model of potential determinants of customer attitude toward electric vehicles. Both product user SIC and stereotype negativity were proposed as determinants of both product user SIC and stereotype negativity, as well as exerting direct impacts on customer attitude. The association between attitude and willingness to purchase, as well as interrelationships among the variables, were investigated. Before and after study participants played a game in which they took the position of an electric vehicle driver,the model was estimated.
- **Kumar, Jha, Damodaran, Bangwal, & Dwivedi, 2020,** As per the research to investigate the challenges in front of India for Electric vehicle adoption by 2030 and tells us about the measure taken by Government of India (GOI) to promote research and development in Electric Vehicle sector. They have founded from their study the challenges which will be faced by the general public as well by the government like creating a full fledge infrastructure for running Electric Vehicle smoothly and other challenges like high cost of Electric Vehicle and poor purchasingpower of Indian customers.
- **Praveen Kumar and Kalyan Dash (2013),** India should invest in small scale reinforcements to manage the load issues locally rather than going for an enormous change. Home charging should be encouraged. Proper planningof place, population, traffic density and safety should be considered before implementing the massive scale charging infrastructure. The integration of activities within the energy and transport fields is important. Development goals through different innovative policies and programs, for instance, drivers of electrical cars are offered a financial customer incentive, like tax credits, purchase subsidies, discounted tolls, free parking, and access to restricted highway lanes will help the market to grow.
- **Marcello Contestabile, Dr Gregory Offer, Dr Robin North, 2012** A research concludes that the longer term uptake of Electric Vehicle s will depend heavily on progress in battery technology, to bring down costs and increase energy density, and on the provision of a suitable recharging infrastructure.
- **Pretty Bhalla, 2018,** Choice of cars depends upon environmental concern, cost, comfort, trust, technology, social acceptance, infrastructure availability. These arguments 11 have been tested for both conventional cars and Evs. They assume that these factors have direct influence on individual choice of vehicle. They found that EV manufacturers and government have to invest more in social acceptance of the vehicle by creating more infrastructural facilities, putting more thrust on technology to create trust. The responsibility lies on the shoulders of the Government and manufacturers to investing in the manufacturing of vehicles.
- **Dhar, Pathak, & Shukla, 2016,** the main objective of electric vehicle is to reduce the carbon emission which is very dangerous for our environment. Electric Two wheelers will achieve a 6 alient part by 2050. In Delhi NCR, the number of two-wheeler owner is greater than the owner of four-wheeler owner. In current situation of pandemic every person wants to travel alone if he/she use Electric Vehicle that would be helpful for environment. Government of Delhi also makes a policy regarding Electric Vehicle.
- **Henry Lee, Alex Clark 2018,** the most important aspect of electric vehicle is battery. Battery is the life of Electric Vehicle so the company now focusing on improving battery. There is an impressive improvement in battery over the past six years. As the batteryare improving. Theyhave higher energydensities and are less expensive.

- **Hoyer (2008),** Electric car technology has been around for over a century. Electric driving, on the other hand, has been put on hold due to the availability and convenience of use of combustion engines. Various (pushing and pulling) elements are currently rekindling interest in electric automobiles. On the one hand, a limited supply of oil and growing awareness of the environmental impact of traditional combustion engine vehicles push people toward cleaner electric vehicles. In terms of pulling power, recent Advancements in battery technology and electric motors have made the electric vehicle a viable competitor to traditional automobiles.
- **Tahmasseby et al., 2021,** When it comes to Vehicle Restraint Systems (VRS), researchers have found that including elements like guardrails, terminals, transitions, and crash cushions in the planning stages of road and highway construction can boost VRS's overall performance.
- **Fanchao Liao, (2017),** widespread adoption of Evs may contribute to lessening of problems like environmental pollution, global warming and oil dependency. However, this penetration of EV is comparatively low in spite of governments implementing strong promotion policies. They presented a comprehensive review of studies on customer preferences for EV aiming to convey policy-makers and give direction to further research. They compared the economic and psychological approach towards customer preference for Electric vehicle. The impact of financial and technical attributes of EV on its utility is generally found to be significant, including its purchase and operating cost, driving range, charging duration, vehicle performance and brand diversity on the market. The density of charging stations also positively affects the utility and promotion of EV. The impact of incentive policies, tax reduction is effective.

ANALYSISANDINTREPRETATION
SIMPLEPERCENTAGEANALYSIS
REASON FOR SELECTING
ELECTRIC CAR

S.NO	FACTORS	NO.OF RESPONDENTS	PERCENTAGE
1	Reduce the dependency on fossil fuels	71	47.57%
2	Produce less carbon emissions	50	33.56%
3	Performance of the car	14	9.40%
4	Mileage	14	9.40%
	TOTAL	**149**	**100**

SOURCE: Primary Data
INTERPRETATION
The above table shows the reason for selecting the electric cars. 47.57% of respondents have chose reduce the dependency on fossil fuels. 33.56% of the respondents chose produce less carbon emissions. 9.40% of the respondents chose performance of the car. 9.40% of the respondents chose mileage.



RANK ANALYSIS

RANK THE SATISFACTORY LEVEL OF ELECTRIC CARS

ASPECTS	1(4)	2(3)	3(2)	4(1)	TOTAL	MEAN VALUE	RANK
PERFORMANCE	60 240	78 234	9 18	2 2	149 294	3.32	I
FEATURES	40 160	79 237	29 58	1 1	149 456	3.06	II
MILEAGE	30 120	99 297	15 30	5 5	149 452	3.03	III
QUALITY OF SERVICE	35 140	86 258	15 30	13 13	149 441	2.96	IV
PRICE	35 140	75 225	27 54	12 12	149 431	2.89	V

SOURCE: Primary data

INTERPRETATION

From this ranking analysis, it is found that performance ranks the first, followed by features which rank the second,mileage ranks thethird, quality of service ranks the fourth, price ranks the fifth.

CHI-SQUAREANALYSIS

CHI-SQUARE ON EDUCATIONAL QUALIFICATION AND SOURCES THATPEOPLE GOT KNOWLEDGE ABOUTELECTRIC CARS

EDUCATIONAL QUALIFICATION	1	2	3	4	TOTAL
1	4	0	2	0	6
2	32	48	11	7	98
3	11	9	3	3	26
4	8	5	3	3	19
TOTAL	55	62	19	13	149

SOURCE: Primary data

To find out the association between educational qualification and sources that people got knowledge, chi square test is usedand result isgiven below.

HYPOTHESIS

H_0: There no association between educational qualification and sources that people got knowledge.

H_1: There is an association between educational qualification and sources that people got knowledge.

CHI–SQUARE TEST

Factor	Calculation value	Degree of freedom	Table value	Result
Pearson chi – square	11.881[a]	9	15.51	Accepted

SOURCE: Primary data

INTERPRETATION

It is clear from the above table show that, the calculated value of chi-square at (0.05) level is lesser than the table value. Hence the null hypothesis is accepted. So it can be concluded that, there is no association between educational qualification and sources that people got knowledge.

CORRELATIONANALYSIS

RELATIONSHIPBETWEEN AGE AND INCENTIVES PROVIDED BY THE GOVERNMENT

HYPOTHESIS

H_0: There is no relationship between age and incentives provided bythe government.

H_1: There is a relationship between age and incentives provided bythe government.

TEST THE CONDITIONS (R VALUE =+1) (+1 TO -1)

If R values +1 accept H_1 and reject H_0, If P value -1 accept H_0 and reject H_1. The following tablegives age and incentivesprovided by thegovernment.

CORRELATION

FACTORS	MEASURES	AGE	INCENTIVES PROVIDED
AGE	Pearson correlation	1	.078*
	Sig. (2- tailed)		.345
	No. of. Response	149	149
INCENTIVES PROVIDED	Pearson correlation	.078*	1
	Sig. (2- tailed)	.345	
	No. of. Response	149	149

SOURCE: Primary data

INTREPRETATION

There is a relationship between age and incentives provided by the government, because the P value greater than 1, so the Null hypothesisis rejected.

REGRESSION ANALYSIS

REGRESSION ON GENDER AND THE FACTORS THAT DISCOURAGE THE BUYING OF ELECTRIC CARSHYPOTHESIS

H_0: There is no relationship between the gender and the factors that discourage the buying of electric cars.

H_1: There is relationship between the gender and the factors that discourage the buying of electric cars.

REGRESSION

	Un standardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
Constant	2.028	.351		5.771	.000
Gender	.012	.090	.011	.133	.894

SOURCE: Primary data

INTREPRETATION

It is clear from the above table the significance F value 0.894 is greater than P-value 0.05. Hence null hypothesis is accepted. So it can be concluded as there is no impact on gender and the factors that discourage the buying of electric cars.

FINDINGS

- Majority47.57% of respondents have chose reduce the dependency on fossil fuels.
- There is no association between educational qualification and sources that people got knowledge.
- There is a relationship between age and incentives provided bythe government.

SUGGESTIONS

Based at the findings of the examine the subsequent guidelines are drawn:

- For reducing environmental pollution, reducing greenhouse gases etc., people should give more importance toelectric cars.
- The government should provide incentives and subsidies for buying electric cars.
- Reducing tax prices can attract customers to an certain extent for purchasing electric cars.
- Increasing the number of charging stations can attract more customers for buying electric cars.
- Promoting electric cars also help the government to say goodbye to crude oil and high price.

CONCLUSION

The present study covered the attributes that influence the people to select electric cars and satisfaction level at Coimbatore. The various promotional activities need to be taken in order to increase the awareness level & thereby increase the sales. Study concluded that the factors i.e., price difference, charging infrastructure, environmental concern, speed are significantly influence on the purchase of e-cars. Respondents are willing to consider E-cars as their future purchase option, if proper infrastructure is available. Initial cost of purchase, less number of charging stations and the time required to recharge the battery is creating limitation in boosting customer confidence.

REFRENCE

- LingzhiJin, Peter Slowik(2017), International Council on Clean Transportation.
- Yogesh Aggarwal, V. G. (2019). Indian Electric Vehicles Storm in a teacup. HSBC Global Research, p. 13.
- Bennett, R., &Vijaygopal, R. (2018). Customer attitudes towards electric vehicles: Effects of product user stereotypes and self-image congruence. European Journal of Marketing.
- Kumar, R., Jha, A., Damodaran, A., Bangwal, D., & Dwivedi, A. (2020, June 29). Addressing the challenges to electric vehicle adoption via sharingeconomy: an Indian perspective. 1-18. Retrieved from https://www.emerald.com/insight/1477-7835.htm.Praveen Kumar and Kalyan Dash,(2013) Potential Need for Electric Vehicles, ChargingStation Infrastructure and its Challenges for the Indian Market.
- Marcello Contestabile, Dr Gregory Offer, Dr Robin North (2012), A Synthesis of theCurrent Literature with a Focus on Economic and Environmental Viability.
- Pretty Bhalla,I.S.(2018).A Study of Customer Perception and Purchase Intention ofElectric Vehicles, European Journal of Scientific Research,362- 368.
- Dhar, Subash & Pathak, Minal & Shukla, Priyadarshi R., 2020. "Transformation ofIndia's steel and cementindustry ina sustainable 1.5 °C world," Energy Policy, Elsevier, vol. 137(C).
- Lee, H., & Clark, A. (September 2018). Charging the Future: Challenges and Opportunities for Electric Vehicle.HKS Faculty Research Working Paper Series at:, 77.
- Høyer, K. G. (2008). The history of alternative fuels in transportation: The case of electric and hybrid cars. UtilitiesPolicy, 16(2), 63-71.
- Tahmasseby, S., Muley, D., & Wink, B. W. (2021). Performance evaluation of vehicle restraint systems in the contextof design and installation. Civil Engineering Journal, 7(3), 449–460. https://doi.org/10. 28991/cej-2021- 03091665.
- Fanchao Liao, Eric Molin & Bert van Wee (2017), Customer preferences for electric vehicles.