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A Study on Customer Preferences and Satisfaction towards Electric Vehicles with Special Reference to Coimbatore District

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ABSTRACT: The Study investigates on Customer preferences and Satisfaction towards Electric Vehicles. 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. I have taken 100 respondents with this study. 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. The main objectives are to find the consumer preference towards the electric vehicle and also to determine the factors influencing consumers choice regarding the electric vehicle. The result show that Majority of the people like to switch from regular vehicle to E -Vehicle.

KEYWORDS: Electric Vehicles, Topologies, Sustainability

I. INTRODUCTION

The two-wheeler sales have witnessed a spectacular growth trend since the mid-nineties. India is the second largest producer and manufacturer of two-wheelers in the world. Indian two-wheeler industry has got spectacular growth in the last few years. Indian two-wheeler industry had a small beginning in the early 50's. The Automobile Products of India (API) started manufacturing scooters in the country. Bikes are a major segment of Indian two's wheeler industry, the other two being scooters and mopeds. Indian companies are among the largest two-wheeler manufacturers in the world. Hero Honda Motors Ltd. and Bajaj Auto Ltd. are two of the Indian companies that top the list of world companies manufacturing two wheelers. 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.

Scope of the Study

The scope of the study on customer preference and satisfaction towards electric vehicles in Coimbatore district encompasses a comprehensive examination of various factors influencing consumers' attitudes and behaviors towards electric vehicles. This includes investigating demographic characteristics, such as age, income, and education level, which may impact preferences and satisfaction levels. Additionally, the study aims to analyze the awareness and perception of electric vehicles among consumers in Coimbatore district, exploring factors such as environmental

concerns, technological advancements, and government incentives. Furthermore, the scope extends to examining the availability and accessibility of electric vehicle infrastructure, including charging stations and maintenance services, and their influence on customer satisfaction and adoption rates. By delving into these areas, the study seeks to provide valuable insights into the opportunities and challenges associated with the widespread adoption of electric vehicles in Coimbatore district, thereby contributing to the development of effective strategies to promote sustainable transportation solutions.

Objectives of the Study

- To determine the respondent awareness on selection of electric vehicle.
- To find the consumer preference towards the electric vehicle.
- To determine the factors influencing consumers choice regarding the electric vehicle.
- To examine the opinion of the respondents and satisfaction level on their purchase.

II. REVIEW OF LITERATURE

- **Swaraj Jape, Archana Thosar, 2018** based on specific parameters which ought to be thought about for choosing specific motor compose for EV application. Examination has been classified on a few parameters.
- **Santha Kumari, 2019** has shown the outline, investigation and usage of a proposed consolidated 3-phase induction motor and its drive framework to take care of the demand of low-voltage electrical framework for electric vehicles, staying away from the high voltage human dangers, costly and complex prerequisites of the higher voltage protection and power electronic gadgets.
- **X.D. Xue et. Al., 2022** has presented criteria to assess motoring operation of in-wheel switched reluctance motor drives for electric vehicles viz., torque, the average torque per rms current, and torque smoothness factor. Motoring torque, copper loss and torque swell are shown separately.

III. RESEARCH METHODOLOGY

Haphazard execution of the study will end up itself in chaotic result, so to evade such happenings, the scholar is also required to plan well before he can start his work. The researcher is required to prepare a system operating procedure of action which is known as research design. It ensures that

- (1) the study will be germane to the problem and
- (2) the study will employ economical procedures

Descriptive research design

The descriptive research is secondhand for this study. The main objective of consuming descriptive research is to pronounce the state of affairs as it exists at present. It mainly involves surveys and fact verdict enquiries of different classes.

Statistical Tools and Techniques

The collected data were edited and then consolidated by using simple statistical tools. The simple statistical tools are employed for the analyses of data are,

- Percentage analysis
- Chi-square test
- Weighted Average Method

IV. DATA ANALYSIS AND INTERPRETATION

The collected data has been analyzed through simple percentage analysis and Chi Square Test. The inferences given below in the table make the reader to understand the problem as well as solution to the problem.

Percentage Analysis Method

Gender of Respondent

GENDER	NO OF RESPONDENT	PERCENTAGE
Male	40	40
Female	60	60
Total	100	100

Inference

The above table conforms that 40% of the respondents are Male 60% of the respondents are female.

Aware About Electric Bike

DESCRIPTION	NO OF RESPONDENTS	PERCENTAGE
Newspaper	20	20%
Television	25	25 %
Magazines	25	25 %
Friends/Relatives	30	30%
TOTAL	100	100%

Interpretation

The above table conforms that 20% of respondents are News paper, 25% of respondents are television, 25% of respondents are magazines, 30% of respondents are friends and relatives. Majority 30% of respondents are friends and family.

Chi-Square Test

Gender * how do you come to aware about this electric vehicle

Hypothesis Statement:

H0: There is no difference between the gender and aware about this electric vehicle

H1: There is a difference between gender and aware about this electric vehicle

1) GENDER * How do you come to aware about this electric vehicle? Crosstabulation

		How do you come to aware about this electric vehicle?				Total	
		Newspaper	Television	Magazines	Friends/Relatives		
GENDER	FEMALE	Count	6	8	23	16	53
		Expected Count	5.3	8.5	27.6	11.7	53.0
	MALE	Count	4	8	29	6	47
		Expected Count	4.7	7.5	24.4	10.3	47.0
Total		Count	10	16	52	22	100
		Expected Count	10.0	16.0	52.0	22.0	100.0

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.297 ^a	3	.151
Likelihood Ratio	5.453	3	.141
Linear-by-Linear Association	.611	1	.434
N of Valid Cases	100		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.70.

Inference:

Since the p value is more than 0.05,, so we reject the null hypothesis H0 and accepted at 5% level of significance. Hence it is concluded that there is no significant difference between gender and aware about this electric vehicle.

Weighted Average Method

Weighted average method for E- vehicles performance

S.No	Attributes	Gear shifting of vehicles	Brake conditions of vehicles	Tire mileage of vehicles
1	Agree	30	5	30
2	Strongly agree	50	5	40
3	Neutral	10	10	10
4	Disagree	5	50	10
5	Strongly disagree	5	30	10
6	Total	100	100	100

Formula

$$X = \frac{WX}{W}$$

W = Number of respondents

X = Rating given by the respondent

Factors		Gear shifting of vehicles		Brake conditions of vehicles		Tire mileage of vehicles	
X	W	X1	Wx1	X2	Wx2	X3	Wx3
1	5	30	150	5	25	30	150
2	4	50	200	5	20	40	200
3	3	10	30	10	30	10	30
4	2	5	10	50	100	10	20
5	1	5	5	30	30	10	10
Total		100	395	100	205	100	410
CW		0.25		0.49		0.24	
Rank		2		1		2	

INFERENCE

From the above table it infers that most of the respondents would like gear shifting of vehicles, brake conditions of vehicles, and tire mileage of vehicles.

V. FINDINGS

Preference for Electric Vehicles (EVs): There is a growing preference for electric vehicles among consumers in Coimbatore District. Factors such as environmental concerns, lower operating costs, and government incentives are driving this preference.

Awareness and Knowledge: There is a moderate level of awareness and knowledge about electric vehicles among consumers. However, there is room for improvement, particularly in terms of understanding the technology, charging infrastructure, and range limitations.

Charging Infrastructure: The availability and accessibility of charging infrastructure are key factors influencing consumer adoption of electric vehicles. There is a need for more charging stations in convenient locations to address range anxiety among consumers.

Brand Perception: Consumers have varying perceptions of different electric vehicle brands. Factors such as brand reputation, product features, and pricing play a significant role in shaping these perceptions.

Driving Experience: Consumers who have experienced driving electric vehicles generally have a positive perception of their performance, including acceleration, noise levels, and overall driving experience.

Range Anxiety: Range anxiety remains a significant concern among consumers, particularly regarding long-distance travel. Educating consumers about the range capabilities of electric vehicles and expanding the charging infrastructure can help alleviate this concern.

Government Incentives: Government incentives and policies, such as subsidies, tax benefits, and registration fee waivers, are important factors influencing consumer decisions to purchase electric vehicles.

Barriers to Adoption: Cost, lack of charging infrastructure, limited vehicle options, and concerns about battery life are key barriers to the widespread adoption of electric vehicles in Coimbatore District.

Future Outlook: Despite current challenges, there is optimism about the future of electric vehicles in Coimbatore District. Continued government support, technological advancements, and increasing consumer awareness are expected to drive growth in the electric vehicle market.

VI. SUGGESTION

- 1. Increase Awareness:** Launch awareness campaigns to educate consumers about the benefits of electric vehicles, including environmental advantages, lower operating costs, and government incentives.
- 2. Expand Charging Infrastructure:** Work with government agencies and private partners to expand the charging infrastructure in Coimbatore District.
- 3. Promote Test Drives:** Organize test drive events to allow consumers to experience electric vehicles firsthand.
- 4. Offer Incentives:** Provide incentives such as discounts, rebates, or special financing options to encourage consumers to purchase electric vehicles.
- 5. Enhance Product Offerings:** Work with manufacturers to introduce a wider range of electric vehicle models with varying price points and features. Offer options that cater to different consumer needs and preferences.
- 6. Engage with Government:** Advocate for policies that support the adoption of electric vehicles, such as increased subsidies, tax incentives, and infrastructure development. Collaborate with government agencies to streamline the approval process for installing charging stations.
- 7. Provide Customer Support:** Offer dedicated customer support for electric vehicle owners, including assistance with charging, maintenance, and troubleshooting.

VII. CONCLUSION

The study on customer preferences and satisfaction towards electric vehicles in Coimbatore District provides valuable insights into the factors influencing the adoption of electric vehicles in the region. The findings indicate that while there is a growing interest in electric vehicles, several challenges need to be addressed to accelerate their adoption. Another important finding is the need to improve the charging infrastructure in Coimbatore District. Range anxiety is a significant concern for potential electric vehicle buyers, and a robust charging network can help alleviate this fear. Collaborating with government agencies and private partners to install more charging stations in strategic locations can encourage more people to consider electric vehicles.

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