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Consumer Perception Towards E-Vehicles

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Abstract: The study titled consumer perception towards Electric Vehicles explores consumer awareness regarding Electric Vehicles (EVs) and its impact on the adoption of sustainable transportation solutions. With the global push for reducing carbon emissions and transitioning towards greener alternatives, understanding consumer behavior and knowledge is crucial for promoting EV adoption. The study investigates key factors influencing consumer awareness, including environmental benefits, economic incentives, technological advancements, and infrastructure availability. This research contributes to identify the factors considered while purchasing the Electric Vehicles, satisfaction towards various features of E -Vehicles and the association between age group and attitude towards E-Vehicles.

Index Terms - Consumer awareness, Electric Vehicles, Adoption of Electric Vehicles, Consumer behaviour.

I. INTRODUCTION

One of the most important factors that decide the future of Indian economy is the price of petroleum products. After all a small increase the price of this has got widespread impact on the Indian Economy. If the price of petrol increases, it increases the transportation cost of various products, thereby making the companies to increase the price of these products. This causes inflation in the Indian market and the performance of the economy is affected.

In today's competitive and fast paced world, automobiles play a very pivotal role in any individuals overall life. Be it the productivity, performance or coping with livelihood issues, vehicles save a significant amount of time and efforts aiding as a bridge between different commuting points. The global shift towards sustainable transportation has gained significant momentum as a response to the pressing challenges of climate change, environmental degradation, and fossil fuel dependency. Among the various alternatives to traditional internal combustion engine vehicles, Electric Vehicles (EVs) have emerged as a key solution to reduce carbon emissions and promote cleaner air. Despite their potential, the widespread adoption of EVs remains hindered by several factors, with consumer awareness being one of the most critical barriers

Statement of the problem:

The depletion of fossil fuels and constant hike in fuel prices, there is a need for energy transition in vehicles in India. Govt has taken initiative to fight pollution levels by promoting EVs and giving subsidies on purchase. The Government and manufacturers should join their hands to build the infrastructure and create positive environment for EVs. The consumers are aware of global climate conditions and are ready to change their preference from conventional to eco-friendly vehicles. Cost is an important factor while considering the purchase of EV. Consumers are willing to consider EVs as their future purchase option, if proper infrastructure is available. Initial cost of purchase, a smaller number of charging stations and the time required to recharge the battery is creating limitation in boosting consumer confidence. In this study we intend to study the factors that influence the customers in purchasing the e vehicles. We are trying to analyses the satisfaction level of

the customers and the level of awareness regarding the initiative or schemes provided by the government for promoting E-Vehicles in the economy.

Objectives of the study:

- To study the awareness of consumers about the E-vehicles ·
- To identify the factors influencing consumers to purchase E- vehicles.
- To know the level of satisfaction of consumers towards E-vehicles

Statistical hypothesis of the study:

- Ho: there is no significant association between age group and attitude towards Electric vehicles.
- H1: there is a significant association between age group and attitude towards Electric vehicles.

Research methodology:

Research methodology is the way to solve the problem systematically. It includes the design survey, population, sample size, source of data, tools and methods of data collection etc.

Research design:

A research design is the set of methods and procedures used in collecting and analysing measures of the variables specified in research problem. The Research design undertaken for this study is analytical research.

Sampling technique:

Convenience sampling is used for collecting sample. Convenience sampling or accidental sampling is a non-probability sampling method where the researcher selects sample members from only available and easily accessible participants.

Sample size:

The sample size is 100 respondents forming part of users of electric vehicles

Tools of analysis:

Weighted average mean, Chi square.

II. REVIEW OF LITERATURE

- **1. Lucy Maybury (2022)** *"A Study on Mathematical modelling of electric vehicle adoption"*. This article describes a systematic literature review of existing works which perform mathematical modelling of the adoption of electric motor vehicles. In this study, 53 articles containing mathematical models of electric vehicle adoption are reviewed systematically to answer 6 research questions regarding the process of modelling transitions to electric vehicles. The mathematical modelling techniques observed in existing literature are discussed, along with the main barriers to electric vehicle adoption, and future research directions are suggested.
- **2. Singh Sharma (2021)** "*A Study on the benefits and drawbacks of marketing electric vehicles in India***".** The following are some of the benefits: When compared to internal combustion engines, electric vehicles are more environmentally friendly. Electricity is less expensive than fuel. In comparison to internal combustion engines, electric vehicles require less maintenance. Electric car challenges include electricity supply, electric vehicle cost is higher than regular vehicles, unavailability of charging stations, and shorter range after charging causes consumers to be afraid of long driving. The high cost of electric vehicles is one issue that deters consumers from purchasing them. To address this, the government has promoted the use of electric vehicles in commercial vehicles by offering incentives. However, electric automobiles are still at least 30% more expensive due to imported batteries.
- **3. Parmar and Pradhan (2021)** *"A Study on Customer Perception of Electric Vehicles"* researchers identify consumer knowledge and decision criteria for purchasing an electric vehicle. According to their research, the majority of customers are aware of the internet as a key source of information in addition to television and newspapers. Consumers are motivated by a variety of considerations, including environmental awareness, minimal noise, pricing, and new trends. Electric vehicles should

be provided at a lower cost to consumers. Because consumers are less aware of government subsidies, they must be advertised more.

III. DATA ANALYSIS AND INTERPRETATIONS

FACTORS CONSIDERED WHILE PURCHASING ELECTRIC VEHICLES

Particulars	Weight	SA	A	N	D	SD	Total	Mean	Rank
Price	F	30	31	24	6	9	100	367/100 = 3.67	2
	FX	150	124	72	12	9	367		
Durability	F	5	18	55	19	3	100	303/100 = 3.03	5
	FX	25	72	165	38	3	303		
Vehicle performance	F	22	34	38	4	2	100	370/100 = 3.70	1
	FX	110	136	114	8	2	370		
Charging stations	F	12	37	28	18	5	100	333/100 = 3.33	4
	FX	60	148	84	36	5	333		
Environment friendly	F	20	13	52	11	4	100	334/100 = 3.34	3
	FX	100	52	156	22	4	334		

Source: primary data

LEVEL OF SATISFACTION

Particulars	Weight	SA	A	N	D	SD	Total	Mean	Rank
Price	F	30	31	24	6	9	100	367/100 = 3.67	2
	FX	150	124	72	12	9	367		
Environment Friendly	F	5	18	55	19	3	100	303/100 = 3.03	5
	FX	25	72	165	38	3	303		
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	FX	100	52	156	22	4	334		

Source: primary data

Chi-square test is a non-parametric test used to find out whether two attributes are associated or not. In this study chi-square is used to test the independence of two variables.

Association between Age group and attitude towards electric vehicles

H0: There is no association between age group and attitude towards electric vehicles.

H1: There is an association between age group and attitude towards electric vehicles.

CHI-SQUARE TEST

Observed frequency(O)	**Expected frequency (E)**	**(O-E)**	**(O-E)2**	**(O-E)/E**
21	18	3	9	0.5
14	15	1	1	0.06
5	7	2	4	0.57
18	17	1	1	0.05
16	14	2	4	0.28
5	7	2	4	0.57
6	9	3	9	1
7	8	1	1	0.125
8	5	3	9	1.8
			Calculated value	4.955

X^2=(O-E) ^2/E=4.955

Degree of freedom=(C-1) (R-1) =2*2=4

Level of significance=0.05

Table value=9.488

4.955<9.488

IV. FINDINGS

- While considering the factors for buying electric vehicles first rank is given to vehicle performance, second rank is given for price, third rank is given to environment friendly, fourth rank is given to charging stations and fifth rank is given to durability.
- Respondents are more satisfied with vehicle performance, second rank is given for price, third rank is given to durability, fourth rank is given to charging stations and fifth rank is given to environment friendly.
- Chi-square value for the association between age group and attitude towards electric vehicle is 4.955. calculated value is less than table value. So, we accept null hypothesis(H0). There is a significant association between age group and attitude towards electric vehicle.

V. SUGGESTIONS

- By increasing the number of charging stations, more people will be interested in purchasing electric vehicles.
- Petrol prices are steadily rising, the problem of rising petrol prices can be addressed with electric vehicles. The government promotion of electric vehicles will aid the country's future progress.
- People should place a greater emphasis on electric vehicles in order to reduce pollution and greenhouse emissions.

VI. CONCLUSION

In India, there is a need for energy transition in automobiles due to the depletion of fossil resources and the steady rise in fuel prices. The government has taken steps to reduce pollution levels by promoting electric vehicles and providing purchasing subsidies. The government has relaxed FDI rules in order to promote output. EVs are being introduced in India by a number of new brands. Governments and manufacturers should work together to construct the infrastructure and create a favourable climate for electric vehicles. If sufficient infrastructure is available, respondents are willing to accept EVs as a future buying option. The initial cost of purchasing, the limited number of charging stations, and the time it takes to recharge the battery are all factors that limit consumer confidence. The study helped in analysing the awareness of the consumers about E-vehicles. Its provided information regarding the consumer preferences, the factors driving the consumers to purchase e-vehicles, Government schemes and incentives for e-vehicles. It helped in analysing the satisfaction level of e-vehicle users.

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