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A STUDY ON CONSUMER PERCEPTION OF E-VEHICLES

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ABSTRACT :

Purpose - This paper aims to investigate consumer perceptions of e-vehicles in Bangalore City. With increasing awareness about the negative impact of fossil fuels on the environment, governments worldwide are promoting the adoption of e-vehicles to reduce reliance on oil, lower greenhouse gas emissions, and improve air quality. Metropolitan cities, in particular, are major contributors to air pollution, making it crucial for city dwellers to play their part in reducing harmful emissions. This study aims to gather insights into consumer awareness, attitudes, and the likelihood of purchasing e-vehicles to promote environmental sustainability.

Methodology - - The research papers are analyzed on the basis of searching the keywords
related to the topic on various published journals.

Findings -   From the research, we can conclude here that we fail to reject null hypothesis, in chi-square test. It means that we have to accept the null hypothesis. Null hypothesis is that the significant are not more prefer as an E-vehicle. It means consumers are not more prefer as an E-vehicle. Overall, we can say that consumers are more prefer other than E-vehicle.

Originality - In this research we have applied descriptive research design. We used primary data to
collect the data through Questionnaire. To conduct hypothesis testing we put statistical tool like Chi-square test
to analyze the data effectively.

Keywords – Bangalore city, Consumer perception, E-Vehicle.

Paper type - Research Paper

1. INTRODUCTION

The growing air pollution in Indian urban areas has raised concerns for manufacturers, as more than 25 major Indian cities are among the 100 most polluted urban areas in the world. While various sources contribute to the production of air pollution, the transportation sector is a crucial contributor. The detrimental effects of air pollution on human health and the economy are widely known, and therefore, producers are exploring options to reduce their impact on the environment. Electric vehicles are seen as a potential solution, and many national governments, including India, are actively promoting them as a green alternative for transportation. Examples from other countries, such as China and the UK, provide valuable insights into best practices for tackling similar challenges. With the right incentives and infrastructure, electric vehicles can be a financially feasible and environmentally friendly option for the future.

2. OBJECTIVES

- To test consumer awareness about e-vehicles.
- To spread awareness about e-vehicles.
- To research the factors driving customers to buy electric vehicles.
- To understand the various government e-transportation initiatives in India.

3. LITERATURE REVIEW

Shweta Kishore (2020)

The Indian government's initiatives to promote the adoption of electric vehicles (EVs) and ease foreign direct investment norms to boost production The government and manufacturers need to work together to build infrastructure and create a positive environment for EVs. The respondents are aware of global climate conditions and willing to switch to eco-friendly vehicles, but cost remains a crucial factor in their purchasing decisions. Overall, the conclusion emphasizes the need for continued efforts to promote EVs in India to combat pollution and reduce dependence on fossil fuels.

Pretty Bhalla (2018)

The need for electric vehicle manufacturers and the Indian government to invest in the social acceptance of EVs by creating more infrastructure and technology to build consumer trust. The environmental benefits of EVs are well known, and now it is important to focus on creating a positive perception of EVs among consumers by providing the necessary facilities. By doing so, people will be more likely to adopt EVs and help safeguard the future of India from respiratory problems caused by pollution.

Mifzala Ansar (2019)

Both EVs and HEVs have their own set of opportunities and obstacles. However, it ultimately depends on the consumer's perception and willingness to maintain a sustainable environment. The study aims to understand the thought process of consumers and determine whether they are willing to contribute towards environmental sustainability by adopting EVs or HEVs. It highlights the importance of consumer behavior in the success of sustainable transportation and emphasizes the need for more research in this area.

Mrinal pandey (2014)

The factors that impact the purchase decision of electric cars including government incentives, infrastructure requirements, and charging facilities. The study found that perceived monetary benefits and personal innovativeness significantly influence the intention to purchase electric cars, while factors such as perceived cost, perceived risk, and perceived environmental benefit do not have a significant impact. The study also investigated the influence of gender on the intention to purchase electric cars and found no significant impact. Consumers with higher personal innovativeness and perceived monetary benefits are more likely to purchase electric cars. The findings emphasize the importance of understanding consumer perceptions and motivations to promote the adoption of electric cars.

4. RESEARCH METHODOLOGY

Research Design:
Secondary Research and Primary research will be descriptive survey research.

Sources of Data:
Secondary data sources from google scholar, google websites, government sites, company sites, magazines, textbooks, newspapers etc.
Primary survey from online digital survey through google form, or through offline survey by approaching target consumer

Data Collection Method:
Primary survey method.

Population:
Bangalore city target consumers age group 18 to 55.

Sampling Method:
Random Sampling, Convenience sampling, quota sampling.

Sampling Frame:
Bangalore City or GIBS Business school is sampling frame through google forms.

Data Collection Instrument:
Questionnaire having dichotomous, Likert scale, open ended, close ended quantifiable questions like rating scale and ranking scale.

5. <u>SUMMARY OF DATA COLLECTION</u>

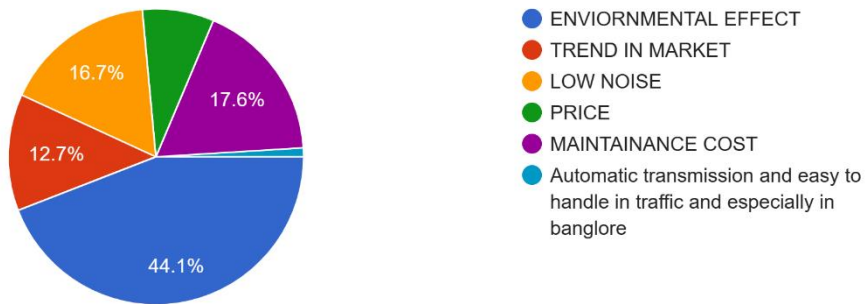| Gender	Responses
Male	58
FemaleOther	44
	0
Grand Total	**102**

Age	Responses
18 - 23	89
24 - 29	13
30 - 34	0
35 - 39	0
40 Above	0
Total	**102**

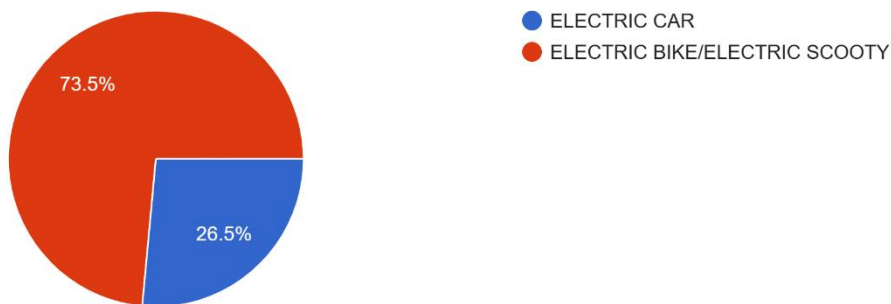| Occupation	Responses
Business	10
Employee	30
Student	52
Household	8
Freelancer	2
Total	**102**

6. DATA ANALYSIS

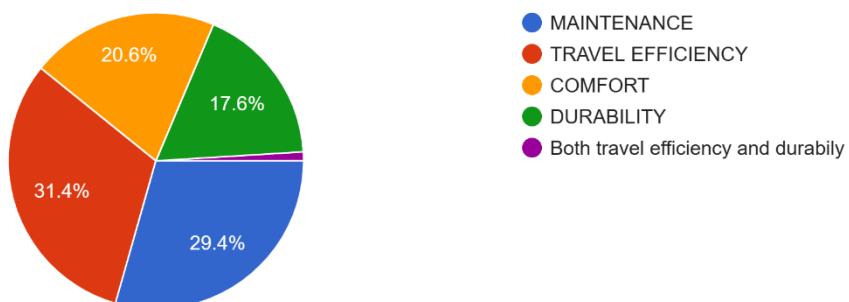Which factors encourage you to buy E-vehicle?

102 responses

- ENVIORNMENTAL EFFECT
- TREND IN MARKET
- LOW NOISE
- PRICE
- MAINTAINANCE COST
- Automatic transmission and easy to handle in traffic and especially in banglore

16.7% · 12.7% · 44.1% · 17.6%

Which vehicle will you prefer as an E-vehicle?

102 responses

- ELECTRIC CAR
- ELECTRIC BIKE/ELECTRIC SCOOTY

73.5% · 26.5%

According to you, which changes do you expect from E-vehicle rather than regular vehicle?

102 responses

- MAINTENANCE
- TRAVEL EFFICIENCY
- COMFORT
- DURABILITY
- Both travel efficiency and durabily

20.6% · 17.6% · 31.4% · 29.4%

How likely will you consider buying an electric vehicle in next two years?
102 responses

- YES
- NO
- MAYBE

47.1%
15.7%
37.3%
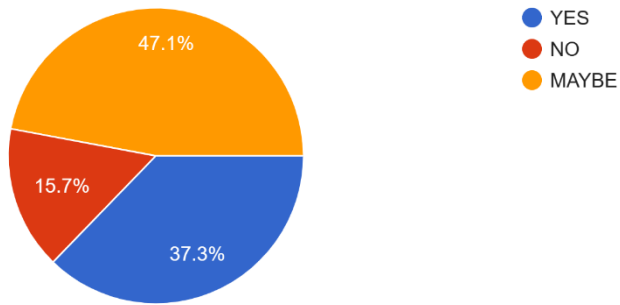
what do you think about following statement?   "Electric cars can protect from global warming"
102 responses
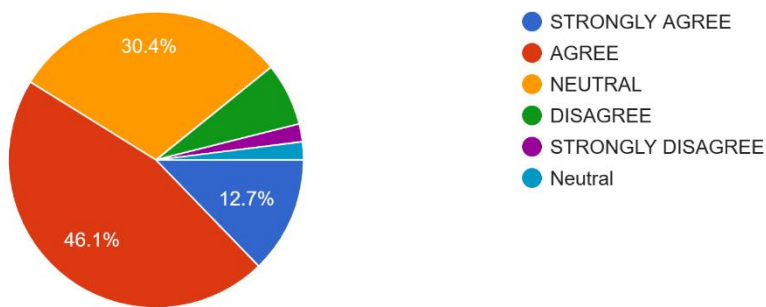
- STRONGLY AGREE
- AGREE
- NEUTRAL
- DISAGREE
- STRONGLY DISAGREE
- Neutral

30.4%
12.7%
46.1%

According to you, which changes do you expect from E-vehicle rather than regular vehicle?
102 responses

- MAINTENANCE
- TRAVEL EFFICIENCY
- COMFORT
- DURABILITY
- Both travel efficiency and durabily

20.6%
17.6%
31.4%
29.4%

How likely will you consider buying an electric vehicle in next two years?
102 responses

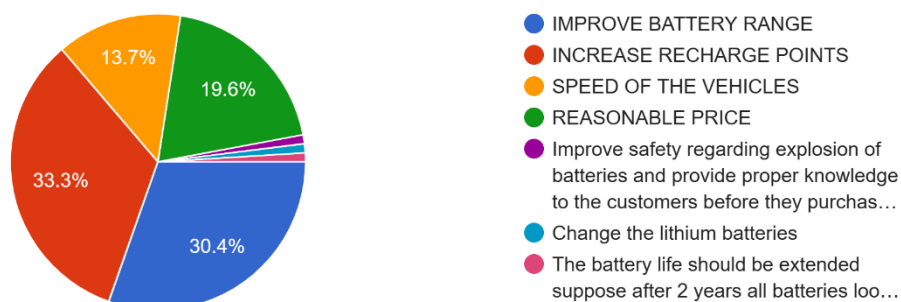- YES
- NO
- MAYBE

47.1%
15.7%
37.3%
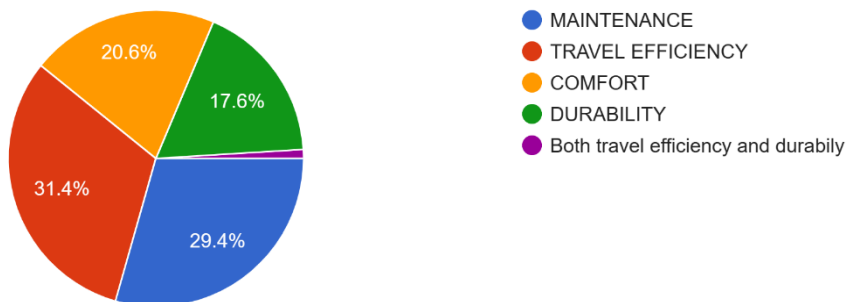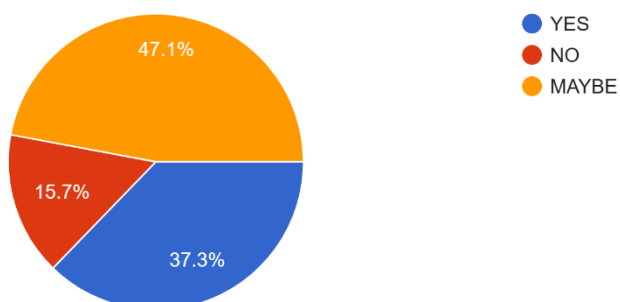
Are you aware about the subsidies provided by the government on purchase of E-vehicle?
102 responses

- YES
- NO
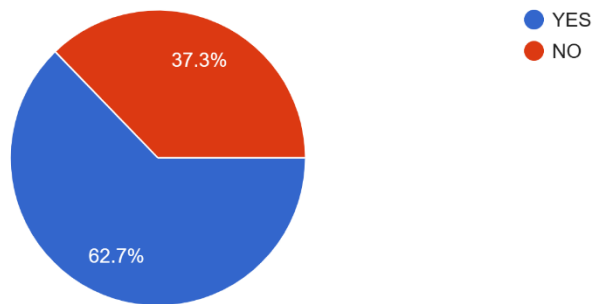
Suggestions for E- vehicles
102 responses

- IMPROVE BATTERY RANGE
- INCREASE RECHARGE POINTS
- SPEED OF THE VEHICLES
- REASONABLE PRICE
- Improve safety regarding explosion of batteries and provide proper knowledge to the customers before they purchas…
- Change the lithium batteries
- The battery life should be extended suppose after 2 years all batteries loo…

7. HYPOTHESIS TESTING

For the research we have conducted Chi-square test.

Chi-square test

The Chi-square test aims to verify the probability that an observed distribution is due to chance. It is also known as the "goodness of fit" statistic because it measures how well the observed distribution of the data fits the expected distribution if the variables are independent. The chi-square statistic is determined by the level of significance.

H0: Significant are not more prefer as an E-vehicle.
H1: Significant are more prefer as an E-vehicle.

Table 1 Calculation of observed data

Observed (fo)	Maruti Suzuki	Hyundai	Tata	MG	Other	Total
Electric Car	06	16	21	10	13	66
Electric Bike	07	08	07	05	07	34
Total	13	24	28	15	20	100

Table 2 *Calculation of Expected data*

Expected (fe)	Maruti Suzuki	Hyundai	Tata	MG	Other	Total
Electric Car	8.58	15.84	18.48	9.9	13.2	66
Electric Bike	4.42	8.16	9.52	5.1	6.8	34
Total	13	24	28	15	20	100

Table 3 *Calculation of Observed & Expected data*

Chi-square	Maruti Suzuki	Hyundai	Tata	MG	Other	Total
Electric Car	0.775804196	0.001616162	0.34363636	0.0010101	0.003030303	1.125097125
Electric Bike	1.505972851	0.003137255	0.66705882	0.0019608	0.005882353	2.184012066
Total						3.309109191

Table 4 *Cal. of Df, CV, P-value*

Df = (r-1)(c-1)	CV →	9.487729037
Df = 4	P-value →	0.507490283

Conclusion

Here Chi-Square value < Critical Value. Hence, we fail to reject H0. OR p value is 0.507490283 & alpha is 0.05. Since p value > 0.05. Hence, we fail to reject H0. So, the conclusion is that Significant are not more prefer as an E-vehicle.

8.FINDINGS

➤ Most of the respondents whose age under 20-30 years are interested towards E-vehicle.

➤ Out of 102 people, 58 are male, 44 are female and 0 are others. That's mean the male have more knowledge about E-vehicles & only working ladies having the knowledge about E-vehicles.

➤ Most of the respondents are employee & students.

➤ Based on analysis we find that 80% individuals are environmental conscious.

➤ The analysis shows that 73.5% peoples are prefers electronic bike or electronic scooty and 26.5% peoples are prefers electronic car.

➤ Most of the respondents prefers positive environmental effect, price, low noise level and new trends for buyingE-vehicle.

➤ Based on analysis if consumer wants to buy E-vehicle, 28% consumers prefer Tata, 24% consumers prefer Hyundai, 20% consumers prefer other, 15% consumers prefer MG, and 13% consumers prefer Maruti Suzuki.

➤ Out of 102 respondents, 37.3% people will consider buying an electric vehicle, 47.1% people may buy and remaining 15.7% people will not consider buying an electric vehicle in next two years.

➤ Most of the respondents thinks that electric cars are very expensive.

➤ Most of the respondents are agree that electric cars can replace regular cars in terms of satisfying consumer needs.

➤ Most of the consumers expect changes like travel efficiency, comfort, maintenance, average and durability from E-vehicle rather than regular vehicle.

➤ Out of 102 respondents, 62.7% people are aware and 37.3% people are not aware about the subsidies provided by the government on purchase of E-vehicle in the coming future.

➤ Based on analysis most of the people are not more prefer as an E-vehicle.

➤ By applying statistical tool, we found that chi-square test is fail to reject null hypothesis. It means that we have to accept the null hypothesis. Null hypothesis is that the significant are not more prefer as an E-vehicle. It means consumers are not more prefer as an E-vehicle. Overall, we can say that consumers are more prefer other than E-vehicle.

9.PROBLEM STATEMENT

In past covid-19 scenario, lots of automobile company faced declining sales and we will try to address the problem – whether their preferences have changed for e-vehicles or they changed their mode of conveyance or transport? Or they are not still aware about e-vehicles and its benefits. We will try to spread awareness through this study.

10.LIMITATIONS

• Data was collected only from Bangalore and GIBS Business school campus, result represents only small part of population.

• There was limitation of time.

• In future further research should be done with more varied samples and in detail with more geographically spread.

• As the data is collected through the questionnaire on online mode there may be possibility of they may not fully loyal in answering the questions.

11.CONCLUSION

From the above chi-square test and above research, we can conclude here that we fail to reject null hypothesis. It means that we have to accept the null hypothesis. Null hypothesis is that the significant are not more prefer as an E-vehicle. It means consumers are not more prefer as an E-vehicle. Overall, we can say that consumers are more prefer other than E-vehicle. From the questionnaire's question we can also conclude that people more prefer electric car as compared with electric bike or electric scooty. People consider positive environmental effect, price, low noise level and new trends for buying E-vehicle. Most of the respondents thinks that electric cars are very expensive. Most of the respondents are agree that electric cars can replace regular cars in terms of satisfying consumer needs. Most of the consumers expect changes like travel efficiency, comfort, maintenance, average and durability from E-vehicle rather than regular vehicle. Overall, based on analysis we can say that the most of the people are not more prefer as an E-vehicle, they prefer other than E-vehicle.

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