International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 05 | May - 2023 SJIF 2023: 8.176 ISSN: 2582-3930

FACTORS INFLUENCING POTENTIAL CAR CONSUMERS PURCHASE INTENTION FOR ADOPTION OF EV

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Abstract - Electric Vehicles are different in many aspects compared to normal conventional cars. There are a lot of factors influencing the purchase decision of consumers who are in the market to get a vehicle. There are also many external factors that influence the purchase decision of the consumers like concern towards the environment and incentives given by the government, These factors also play a major role in influencing the purchase decisions of potential car consumers. This paper reviews all the major factors influencing the purchase decision and it was found that most of the people want to get an EV as a secondary vehicle and are not willing to make a big investment in EV, and in a developing country like India the consumers are still in a dilemma of the growth of charging infrastructure in India.

***Key Words*:** EV, Electric Vehicles, Factors affecting buying decisions, EV in India.

1.INTRODUCTION

The adoption of Electric Vehicles (EVs) has gained significant attention in recent years due to climate change, air pollution, and energy security concerns. Several studies have been conducted to understand the factors that influence consumers' decision-making process when it comes to purchasing EVs.

The existing literature on the subject suggests that several factors influence consumers' purchase intention for EVs. These include:

Perceived Benefits: Consumers' perception of EVs' environmental, economic, and social benefits plays a critical role in their purchase intention. The environmental benefits of EVs, such as reducing carbon emissions and air pollution, are particularly important to consumers who are environmentally conscious.

Perceived Barriers: The high upfront cost of EVs, limited range, and lack of charging infrastructure are perceived as significant barriers to the adoption of EVs. Consumers are also concerned about the reliability of EVs and the availability of after-sales service.

Sociodemographic Factors: Sociodemographic factors such as age, income, education, and location also play a significant role in consumers' purchase intention for EVs. Younger consumers, those with higher incomes and education levels, and those living in urban areas are more likely to adopt EVs.

Government Policies: Government policies such as incentives and subsidies for EVs, the availability of charging infrastructure, and regulations to reduce carbon emissions from vehicles can significantly influence consumers' purchase intention for EVs.

Marketing and Communication: Effective marketing and communication strategies that provide information on the benefits of EVs, address consumers' concerns about range anxiety and charging infrastructure, and promote the social status associated with EV ownership can positively influence consumers' purchase intention for EVs.

Overall, the background literature suggests that several factors influence consumers' purchase intention for EVs, and a better understanding of these factors can help promote the adoption of EVs and accelerate the transition to a more sustainable transportation system.

2.1 Need/Importance of the topic:

Reducing Carbon Emissions: The transportation sector is a significant contributor to greenhouse gas emissions, and the adoption of EVs can significantly reduce carbon emissions and mitigate climate change. Understanding the factors that influence consumers' purchase intention for EVs is crucial to accelerating the transition to a more sustainable transportation system.

Energy Security: The dependence on fossil fuels for transportation can lead to energy security concerns, particularly for countries that rely on oil imports. EVs powered by renewable energy sources such as solar and wind can reduce dependence on fossil fuels and enhance energy security.

Air Pollution: Air pollution caused by vehicular emissions can have severe health impacts, particularly in densely populated urban areas. The adoption of EVs can significantly reduce air pollution and improve public health.

Government Policies: Governments worldwide are providing incentives and subsidies for EV adoption to promote sustainable transportation and reduce carbon emissions. Understanding the factors that influence consumers' purchase intention for EVs can help policymakers design effective policies to promote EV adoption.

Economic Opportunities: The adoption of EVs presents significant economic opportunities, including the development of new industries such as EV manufacturing, charging infrastructure, and battery production. Understanding the factors that influence consumers' purchase intention for EVs can help businesses and entrepreneurs identify potential markets and opportunities.

2.2 The theoretical implication of the topic:

Theory of Planned Behavior: The Theory of Planned Behavior (TPB) suggests that an individual's attitude, subjective norm, and perceived behavioral control influence their intention to engage in a particular behavior. In the context of EV adoption, understanding consumers' attitudes towards EVs, the influence of social norms, and perceived control over the adoption of EVs can help predict their purchase intention.
Diffusion of Innovation Theory: The Diffusion of Innovation (DOI) theory suggests that the adoption of new technologies is influenced by the characteristics of the innovation, the adopter, and the communication channels used to promote the innovation. Understanding the characteristics of EVs, the characteristics of potential adopters, and effective communication channels can help promote the adoption of EVs.
Technology Acceptance Model: The Technology Acceptance Model (TAM) suggests that the perceived usefulness and ease of use of a technology influence its adoption. In the context of EV adoption, understanding the perceived benefits and barriers to EV adoption, the perceived ease of use, and the reliability of EVs can influence consumers' purchase intention.
Environmental Attitude: Environmental attitudes are an individual's beliefs and values regarding environmental issues. Understanding consumers' environmental attitudes and the perceived environmental benefits of EVs can influence their purchase intention.
Social Identity Theory: Social Identity Theory (SIT) suggests that an individual's social identity influences their behavior. In the context of EV adoption, understanding the social identity associated with EV ownership and effective marketing and communication strategies can influence consumers' purchase intention.

2.3 STATEMENT OF THE PROBLEM:
Electric vehicles are becoming more popular as environmental and ecological concerns rise, according to the automobile industry (EVs). The adoption rate of EVs is still low, nevertheless, despite government incentives and technological breakthroughs. The challenge is to comprehend the elements that affect potential automobile buyers' intentions to acquire EVs. This study aims to identify and analyze the different elements that affect potential automobile buyers' purchase intentions for EV adoption, including environmental concerns, perceived benefits, perceived barriers, government incentives, and societal norms.

NEED OF THE STUDY:
1. Understanding consumer behavior: By studying the factors that influence consumers' purchase intention for EVs, we can gain a better understanding of consumer behavior and decision-making processes. This information can be used to develop more effective marketing strategies to promote EV adoption.

2. Encouraging sustainable transportation: EVs are seen as an important component of a sustainable transportation system, as they produce fewer emissions than traditional gasoline-powered vehicles. By understanding the factors that influence consumer adoption of EVs, we can encourage more people to choose this more sustainable option.

3.Promoting innovation: The adoption of EVs is still in its early stages, and there is a lot of potential for in novation in this area. By studying the factors that influence consumer adoption of EVs, we can identify areas where innovation is needed to improve the appeal of these vehicles.

4.Policy development: Governments around the world are increasingly implementing policies to encourage the adoption of EVs. By studying the factors that influence consumer adoption of EVs, policymakers can develop more effective policies to promote the uptake of these vehicles.

SCOPE OF THE STUDY:
The scope of the study is to identify the key drivers and barriers to the adoption of EVs among potential car buyers and to provide insights into how these factors can be effectively addressed to accelerate the transition to a more sustainable transportation system.

NATURE OF STUDY:
The nature of the study is to provide a comprehensive understanding of the various factors that influence consumers' decision-making process when it comes to purchasing EVs and to provide insights into how these factors can be effectively addressed to promote the adoption of EVs.

OBJECTIVES OF THE STUDY:
1. Identifying the key factors influencing potential car consumers' purchase intention for EV adoption, including cost, range, charging infrastructure, environmental concerns, and government incentives.

2. Assessing EVs' perceived benefits and drawbacks compared to petroleum-based vehicles, and how these perceptions affect consumers' purchase intention.

LIMITATION OF THE STUDY:

Lack of control over external factors: The study may not account for factors that may influence the purchase intention for EVs, such as government incentives, infrastructure, and technological advancements.
Limited scope: The study may only examine a particular region, demographic, or market segment, limiting the generalizability of the results to other areas or groups.
Lack of comparative analysis: The study may not compare the purchase intention for EVs with other types of vehicles, limiting the ability to draw meaningful conclusions about the factors influencing EV adoption.

RESEARCH METHODOLOGY:
Population – The population for this study will be 73 potential car buyers.
Method of data collection- Primary data
Instrument for data collection – Questionnaire
Drafting of the questionnaire – The questionnaire will be designed in such a way as to understand the factors that influence the purchase decision of the car buyers when it comes to buying an EV

RESEARCH GAP:

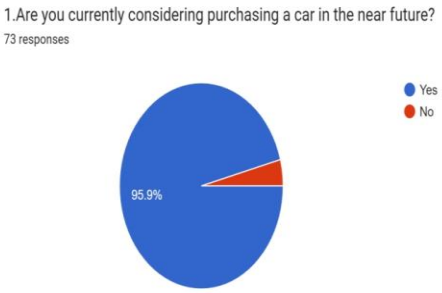
1. There hasn't been much research done on the factors influencing potential automobile buyers' purchase intentions for EV adoption.
2. There is a need to investigate additional aspects, such as perceived advantages, perceived hurdles, and social norms, which may significantly impact potential automobile buyers' decisions to embrace EVs.
3. The majority of current studies have been carried out in wealthy nations, and little research has been done on the variables impacting the adoption of EVs in developing nations.

SIGNIFICANCE OF THE STUDY:

The Indian government has set ambitious targets to promote the adoption of EVs in the country. The government's Faster Adoption and Manufacturing of (Hybrid and) Electric Vehicles (FAME) scheme aims to accelerate the adoption of EVs and to establish India as a global hub for EV manufacturing.

EV adoption in India faces several challenges, such as the high upfront cost of EVs, limited charging infrastructure, and the lack of awareness among consumers about the benefits of EVs. Understanding the factors that influence consumers' decision-making process when it comes to purchasing EVs is, therefore, crucial to addressing these challenges and promoting the adoption of EVs in the country.

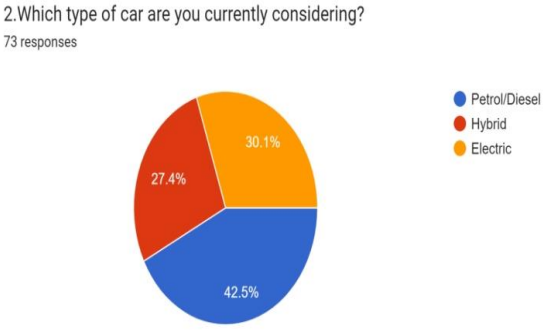
India is the world's fifth-largest auto market, with a rapidly growing middle class and an increasing demand for personal transportation. As a result, there is an urgent need to reduce the country's dependence on fossil fuels and to transition to a more sustainable transportation system.



PARTICULAR	NO. OF RESPONDENTS	PERCENTAGE OF RESPONDENTS
YES	70	95.9%
NO	3	4.1%

INTERPRETATION:

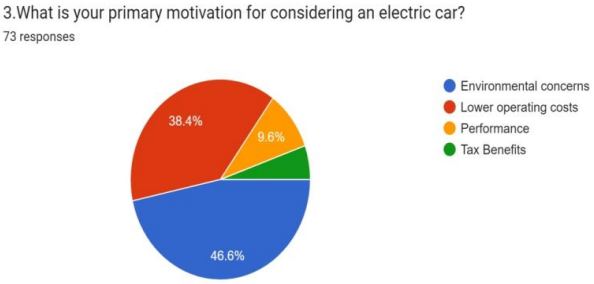
In this response, we can see that the majority of the sample size is in the market to get a car, or in simple words they're potential car buyers in the market looking out to buy cars.



PARTICULARS	NO. OF RESPONDENTS	PERCENTAGE OF RESPONDENTS
Petrol/Diesel	41	42.5%
Hybrid	20	27.4%
Electric	22	30.1%

INTERPRETATION:

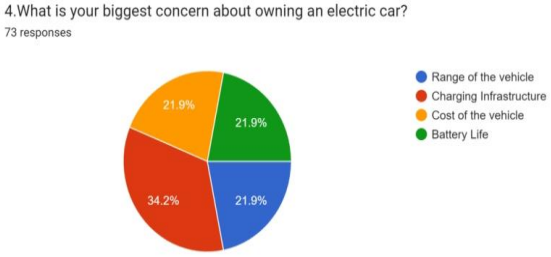
This shows that the majority of the respondents still prefer petrol/diesel-powered cars. There's been a new hike in the sale of hybrid cars which are a mix of fuel and electricity. The proportion of respondents preferring electric cars is the lowest among the other two.



Particulars	No. of Respondents	Percentage of Respondents
Environmental Concerns	34	46.6%
Lower Operating Cost	28	38.4%
Performance	7	9.6%
Tax Benefits	4	5.5%

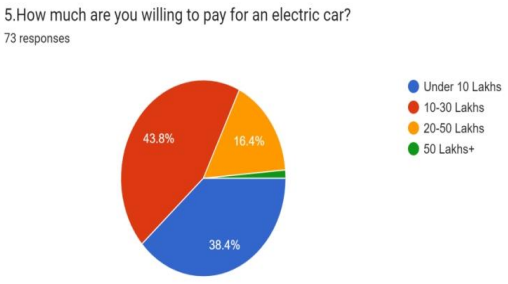
INTERPRETATION:

This chart shows that the majority of the respondents are willing to shift to electric vehicles because of their concern for the environment. There are also a significant number of respondents who are willing to change because of lower operating costs as compared to petroleum-based vehicles.



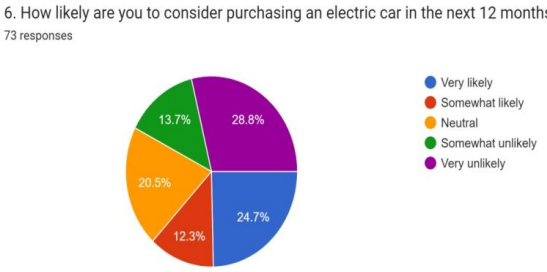
Particulars	No. Of Respondents	Percentage Of Respondents
Range of the vehicle	25	21.9%
Charging Infrastructure	16	34.2%
Cost of the vehicle	16	21.9%
Battery Life	16	21.9%

INTERPRETATION:
In this response, most respondents are concerned about the charging infrastructure since India is a developing country and the charging infrastructure is poor compared to the developed countries.



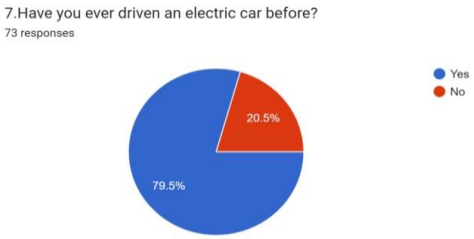
Particulars	No. of Respondents	Percentage of Respondents
Under 10 lakhs	28	38.4%
10-30 lakhs	32	43.8%
20-50 lakhs	12	16.4%
50+ lakhs	1	1.4%

INTERPRETATION:
This chart shows that the majority of the respondents are willing to pay below 10 lakhs for an electric vehicle as most of the respondents are not willing to spend more money as they want to use the vehicle for short commutes.



Particulars	No. of Respondents	Percentage of Respondents
Very Likely	18	24.7%
Somewhat Likely	9	12.3%
Neutral	10	20.5%
Somewhat Unlikely	15	13.7%
Very Unlikely	21	28.8%

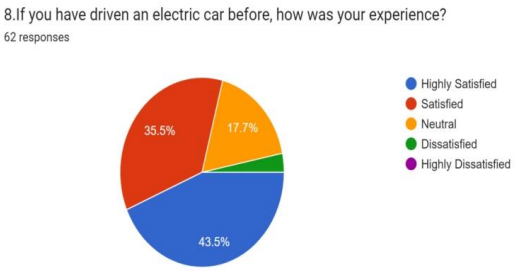
INTERPRETATION:
One-third of the respondents are likely to purchase an EV within the next year and the other one-third is still in a dilemma.



Particulars	No. of Respondents	Percentage of Respondents
Yes	58	79.5%
No	15	20.5%

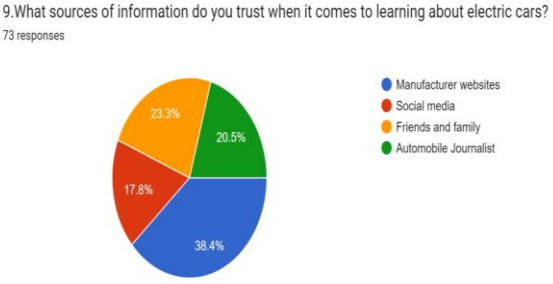
INTERPRETATION:

The majority of the respondents have experienced electric vehicles but still one-third of the respondents have not driven an electric vehicle.



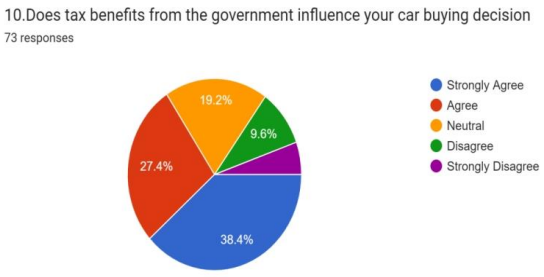
Particulars	No. of Respondents	Percentage of Respondents
Highly Satisfied	27	43.5%
Satisfied	22	35.5%
Neutral	11	17.7%
Dissatisfied	2	3.2%
Highly Dissatisfied	0	0%

INTERPRETATION:
Among all the respondents who have driven an electric vehicle no one has a negative experience and majority of the respondents were satisfied with their experience.



Particulars	No. of Respondents	Percentage of Respondents
Manufacturer Website	28	38.4%
Social Media	13	17.8%
Friends and Family	17	23.3%
Automobile Journalist	15	20.5%

INTERPRETATION:
The respondents majorly rely on the manufacturer's website to get information and specifications about the vehicle. There are a bunch of respondents who trust automobile journalists for a more accurate information on the range and other specifications of the vehicle.



Particulars	No. of Respondents	Percentage of Respondents
Strongly Agree	28	38.4%
Agree	20	27.4%
Neutral	14	19.2%
Disagree	7	9.6%
Strongly Disagree	4	5.5%

INTERPRETATION:
The majority of the respondents believe that tax benefits from the government encourages them to buy an electric vehicle.

2.4 SUMMARY OF FINDINGS

Environmental awareness and concerns about climate change: Many consumers are willing to switch to EVs to reduce their carbon footprint and help mitigate climate change.
•Cost of ownership: EVs are generally more expensive upfront, but they have lower maintenance and fuel costs over time. Consumers consider the long-term cost savings of an EV when making a purchasing decision.
•Government incentives: Government incentives such as tax credits and rebates can significantly reduce the cost of owning an EV, making it more attractive to consumers.
•Range anxiety: The fear of running out of battery charge and being stranded on the road is a major concern for many consumers. The availability of charging infrastructure and the range of the vehicle are critical factors in the decision to purchase an EV.
•Perceived performance: EVs are generally perceived as having lower performance compared to gasoline-powered vehicles. However, advances in battery technology have improved the performance of EVs, and many consumers are beginning to recognize this.
•Social norms and peer influence: The adoption of EVs is influenced by social norms and peer pressure. If EVs become more accepted and popular, consumers may be more likely to adopt them.
Overall, the factors that influence the adoption of EVs are complex and multifaceted. However, as technology improves, prices come down, and charging infrastructure becomes more widespread, it is likely that more consumers will choose to adopt EVs in the coming years.
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2.5 SUGGESTIONS:

There are several suggestions for future research on the factors influencing potential car consumers' purchase intention for the adoption of EVs. These include:
Longitudinal studies: Conducting longitudinal studies that track consumers' attitudes and intentions towards EVs over time can provide insights into the factors that influence their decision-making processes.
Cross-cultural studies: Conducting cross-cultural studies can help identify how cultural and societal factors influence consumers' attitudes towards EVs. Such studies can also help determine the factors that are universal across different cultures and those that are unique to specific cultures.
Experimental studies: Conducting experimental studies that manipulate different factors, such as price, range, and charging infrastructure, can help determine the relative importance of these factors in consumers' decision-making processes.
Qualitative studies: Conducting qualitative studies, such as focus groups and in-depth interviews, can help identify the underlying motivations and attitudes that influence consumers' decision-making processes.
Comparative studies: Comparing the factors that influence the adoption of EVs to those that influence the adoption of other types of vehicles, such as hybrids and gasoline-powered vehicles, can provide insights into the unique factors that influence the adoption of EVs.
Predictive modeling: Developing predictive models that incorporate the various factors that influence the adoption of EVs can help identify the most effective strategies for increasing EV adoption rates.
Overall, future research on the factors that influence the adoption of EVs should take a multidisciplinary approach and use a variety of methods to gain a comprehensive understanding of consumers' decision-making processes.

3. CONCLUSIONS

Awareness and knowledge of EVs play a crucial role in influencing the purchase intention of potential car consumers. A lack of information and understanding about EVs and their benefits can create barriers to adoption.The perceived benefits of EVs such as lower operating costs, reduced environmental impact, and government incentives positively influence purchase intention. However, the higher upfront cost of EVs remains a major concern for potential consumers.
Infrastructure availability, including charging infrastructure, is an essential factor in influencing the adoption of EVs. The lack of charging infrastructure and range anxiety can deter potential consumers from considering EVs.
Demographic factors such as income, education, and age influence the purchase intention of potential EV consumers. Younger, more educated, and higher-income individuals are more likely to consider EVs.
The brand image of EVs and their perceived performance and reliability also play a significant role in influencing purchase intention.
Overall, to encourage the adoption of EVs in India, policymakers and manufacturers need to focus on creating awareness about EVs, providing incentives to reduce the upfront cost, and investing in the development of charging infrastructure. Additionally, EV manufacturers need to focus on improving the performance and reliability of their vehicles to attract potential consumers.

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