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CUSTOMERS PERCEPTION TOWARDS E-VEHICLE

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Abstract:

A comprehensive review of existing literature highlights key determinants such as perceived benefits, range anxiety, charging infrastructure, and social norms. Moreover, the role of marketing strategies in shaping consumer perception is analyzed, emphasizing the importance of education and awareness campaigns.

The study highlights the impact of marketing and brand image on consumer perceptions. Positive portrayals of EVs in media and advertisements have contributed to a more favorable view among consumers. Additionally, the reputation and credibility of the manufacturer play a crucial role, with respondents expressing a preference for established automotive brands known for reliability and innovation. The study provides valuable insights into the complex interplay of factors shaping consumer perceptions towards EVs. By addressing the challenges and leveraging the opportunities identified in this research, stakeholders can better position themselves to capitalize on the growing demand for electric vehicles in the global market.

Keywords: *Electric vehicles, Sustainable transportation, Environmental concerns, Technological advancements, Government incentives, Perceived benefits, Range anxiety, Charging infrastructure, Government policies, Subsidies, Clean energy,*

INTRODUCTION:

The global automotive industry is witnessing a transformative shift towards electric vehicles (EVs) as the world embraces sustainable mobility solutions. This transition is driven by a variety of factors, including environmental concerns, technological advancements, and governmental initiatives promoting clean energy alternatives. As a result, the market for electric vehicles is experiencing significant growth, with a wide range of EV models available to consumers. In this context, understanding customers' perceptions towards electric vehicles is crucial for stakeholders in the automotive industry to effectively target and engage with their target audience.

The perception of electric vehicles among consumers is influenced by several factors,

including their knowledge and awareness of EV technology, their attitudes towards sustainability and environmental conservation, and their perceived benefits and drawbacks of owning an electric vehicle. Additionally, social and cultural factors play a role in shaping consumers' perceptions of electric vehicles, as well as their purchasing decisions. Understanding these factors can provide valuable insights into how to effectively market electric vehicles to different consumer segments.

One of the key factors influencing consumers' perceptions towards electric vehicles is their knowledge and awareness of EV technology. Many consumers may have limited understanding of how electric vehicles work, the range they offer, and the availability of charging infrastructure. Therefore, educating consumers about the benefits and features of electric vehicles is essential for increasing their acceptance and adoption.

In conclusion, understanding customers' perceptions towards electric vehicles is essential for stakeholders in the automotive industry to effectively market and promote EVs to different consumer segments. By addressing consumers' knowledge gaps, promoting the environmental benefits of electric vehicles, and addressing concerns about cost and convenience, stakeholders can help increase the acceptance and adoption of electric vehicles, paving the way for a more sustainable future in the automotive industry.

THEORETICAL BACKGROUND OF THE STUDY:

Electric vehicles (EVs) have emerged as a disruptive innovation in the automotive industry, promising to revolutionize the way people perceive and use transportation. This shift is primarily driven by concerns over environmental sustainability and the need to reduce greenhouse gas emissions. According to Ajzen's Theory of Planned Behavior (1991), individuals' attitudes, subjective norms, and perceived behavioral control influence their intentions, which, in turn, affect their actual behavior. In the context of EV adoption, these factors play a crucial role in understanding customers' perceptions and behaviors towards electric vehicles.

Psychological theories, such as the Theory of Reasoned Action (Fishbein & Ajzen, 1975), suggest that an individual's intention to perform a behavior is influenced by their attitude towards the behavior and subjective norms. When applied to the adoption of EVs, this theory implies that customers' attitudes towards electric vehicles, as well as the influence of social norms, can significantly impact their likelihood of purchasing or using an electric vehicle. Understanding these attitudes and norms is essential for predicting and promoting EV adoption.

The Diffusion of Innovation theory (Rogers, 1962) provides a framework for understanding how new ideas, products, or technologies spread within a society. In the context of EVs, this theory suggests that the adoption of electric vehicles is influenced by the perceived attributes of the innovation, such as its relative advantage, compatibility, complexity, trialability, and observability. Customers' perceptions of these attributes can influence their willingness to adopt EVs, making it

crucial to examine these factors in the context of electric vehicle adoption.

The Technology Acceptance Model (Davis, 1989) proposes that perceived usefulness and perceived ease of use are key determinants of an individual's intention to use a technology. When applied to EV adoption, this model suggests that customers' perceptions of the usefulness and ease of use of electric vehicles can influence their intentions to adopt them. Factors such as the availability of charging infrastructure, range anxiety, and the cost of ownership can all impact customers' perceptions of EVs' usefulness and ease of use, thereby influencing their adoption decisions.

STATEMENT OF THE PROBLEM:

The statement of the problem for the topic "Customers Perception Towards E-Vehicles" would focus on identifying and understanding the key factors influencing consumer perceptions and attitudes towards electric vehicles (E-Vehicles). This includes investigating factors such as range anxiety, charging infrastructure availability, cost considerations, environmental concerns, and perceptions of performance and reliability. The goal is to gain insights into how these factors impact the adoption and acceptance of E-Vehicles among consumers, which is crucial for the development and implementation of effective marketing strategies and policies to promote the uptake of E-Vehicles in the market.

NEED FOR THE STUDY:

The need for studying customers' perceptions towards e-vehicles is paramount in today's rapidly evolving automotive landscape. With the world increasingly gravitating towards sustainable transportation solutions to combat climate change and reduce carbon emissions, e-vehicles have emerged as a promising alternative to traditional internal combustion engine vehicles. However, despite their potential environmental benefits, the widespread adoption of e-vehicles hinges on consumers' attitudes, preferences, and perceptions towards these vehicles. Understanding the factors that influence consumers' perceptions towards e-vehicles is essential for automakers, policymakers, and other stakeholders to effectively promote their acceptance and uptake.

Firstly, the transition to e-vehicles represents a significant shift in consumer behavior and purchasing patterns. Consumers' perceptions towards e-vehicles are influenced by a multitude of factors, including their perceived environmental friendliness, driving range, charging infrastructure, cost-effectiveness, and performance compared to conventional vehicles. Exploring these perceptions through empirical research can provide invaluable insights into the drivers and barriers affecting consumers' willingness to adopt e-vehicles. Moreover, as the e-vehicle market continues to evolve with advancements in technology and changes in consumer preferences, understanding these perceptions becomes even more critical for guiding strategic decisions related to product development, marketing strategies, and policy interventions aimed at promoting e-mobility. By addressing the need for this study, we can bridge the gap between consumer expectations and the

realities of e-vehicle technology, ultimately accelerating the transition towards a more sustainable transportation future.

OBJECTIVE OF THE STUDY:

The objective of the study on "Customers' Perception Towards E-Vehicles" is to:

1. Understand the factors influencing consumers' perceptions towards electric vehicles.
2. Analyze the level of awareness among consumers regarding electric vehicles.
3. Investigate the perceived benefits and drawbacks associated with electric vehicles.
4. Examine the influence of environmental concerns on consumers' preferences for e-vehicles.
5. Explore the potential barriers hindering the adoption of electric vehicles among consumers.
6. Provide insights and recommendations for marketers and policymakers to promote the adoption of electric vehicles based on consumer perceptions and preferences.

RESEARCH METHODOLOGY:

STUDY METHODOLOGY:

The research is both descriptive in nature and quantitative in nature, and it is carried out using the questionnaire method with participants from various locations and age groups. This instructs the researchers on what information to gather and how to use it to address their study questions. 108 respondents made up the sample size.

SOURCES OF DATA COLLECTION:

The primary data for the study was gathered through a standardized questionnaire that was designed to cover all of the study's objectives. The first primary source is an interview.

SECONDARY DATA:

Secondary data is information that has been gathered without the user's knowledge. Censuses, organizational records, and data gathered through qualitative techniques or qualitative research are typical sources of secondary data for social science. Contrarily, primary data are gathered by the researcher who is performing the study.

Other sources-

1. Diary
2. Books
3. Periodicals
4. Online resource

STATISTICAL TOOLS:

The following statistical techniques were utilized in the study:

1. A tabulation technique
2. A straightforward percentage analysis.
3. A method for Simple percentage calculations are as follows: = Number of respondents for the

specific factor X 85

Number of respondents overall

PLAN OF ANALYSIS:

Information was gathered through structured questionnaires and consumer interviews.

The gathered information has been compiled and shown as percentages.

On the basis of the tabulated data, an analysis was conducted, and a graph was created.

A conclusion has been drawn based on the graphical representation.

Conclusion recommendations have been made in light of the analysis and inference findings.

DATA ANALYSIS AND INTERPRETATION:

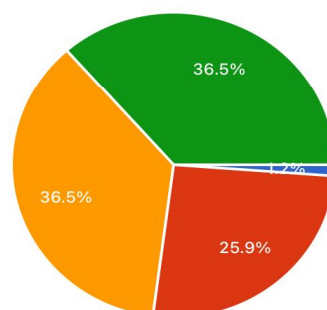
From the data gathered, it is evident that the most critical factor influencing customers' evaluation of an E-Vehicle for potential purchase is price, as indicated by 85 respondents. This suggests that cost is a significant consideration for consumers when deciding to adopt electric vehicles. Range per charge follows closely behind as the second most important factor, with 25.9% of respondents prioritizing this aspect. This indicates that consumers are concerned about the distance an electric vehicle can travel on a single charge, suggesting a need for longer-lasting batteries or more efficient energy usage. Charging infrastructure is also a key consideration, with 36.5% of respondents highlighting its importance. This underscores the importance of having a robust and accessible charging network to support the widespread adoption of electric vehicles. Lastly, the environmental impact of E-Vehicles is also a significant factor, with another 36.5% of respondents indicating its importance. This suggests that consumers are increasingly concerned about the ecological footprint of their transportation choices and are seeking more sustainable options.

What factor do you consider most important when evaluating an E-Vehicle for potential purchase?

85 responses



● Price
● Range per charge
● Charging infrastructure
● Environmental impact

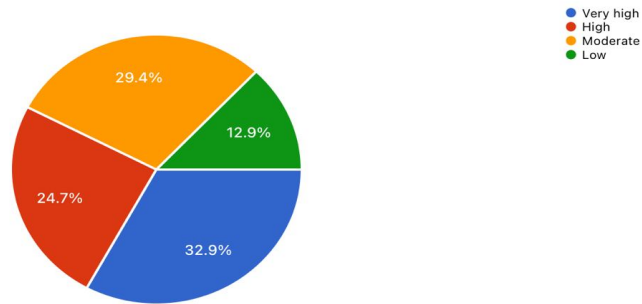


In analyzing the responses to the question "How would you rate your overall awareness of electric vehicles?" from 85 respondents, it is evident that a significant portion of the participants have

a moderate to very high awareness of electric vehicles. Specifically, 32.9% of respondents rated their awareness as very high, indicating a strong level of familiarity and knowledge about electric vehicles. Additionally, 24.7% of respondents rated their awareness as high, further suggesting a substantial awareness and understanding of electric vehicles among the surveyed individuals.

How would you rate your overall awareness of electric vehicles?

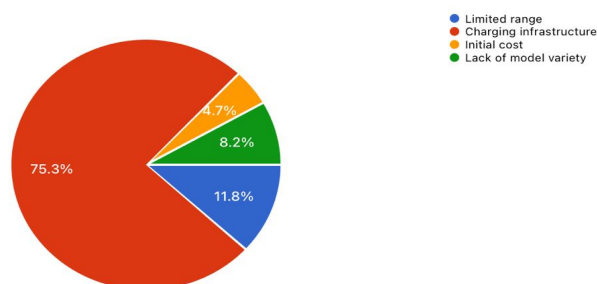
© 85 responses



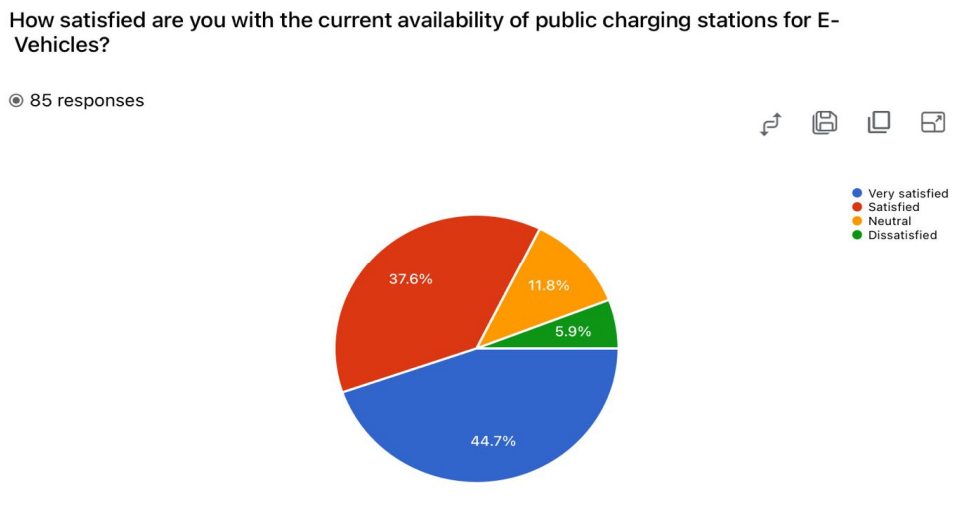
In analyzing the statement "What is your main concern regarding the adoption of E-Vehicles?" based on 85 responses, several key concerns emerged. Firstly, a significant proportion, 75.3%, highlighted the concern of limited range, indicating apprehension about the distance E-Vehicles can travel on a single charge. This concern is closely tied to the availability and accessibility of charging infrastructure, as indicated by 11.8% of respondents, suggesting that the perceived inconvenience or lack of charging stations contributes to their hesitation towards adopting E-Vehicles. Another notable concern, raised by 8.2% of respondents, is the initial cost of E-Vehicles, suggesting that the upfront investment required for purchasing an E-Vehicle is a significant barrier. Lastly, a smaller but still significant concern, expressed by 4.7% of respondents, is the lack of model variety in the market, indicating that the limited options available for E-Vehicles may influence their decision-making process.

What is your main concern regarding the adoption of E-Vehicles?

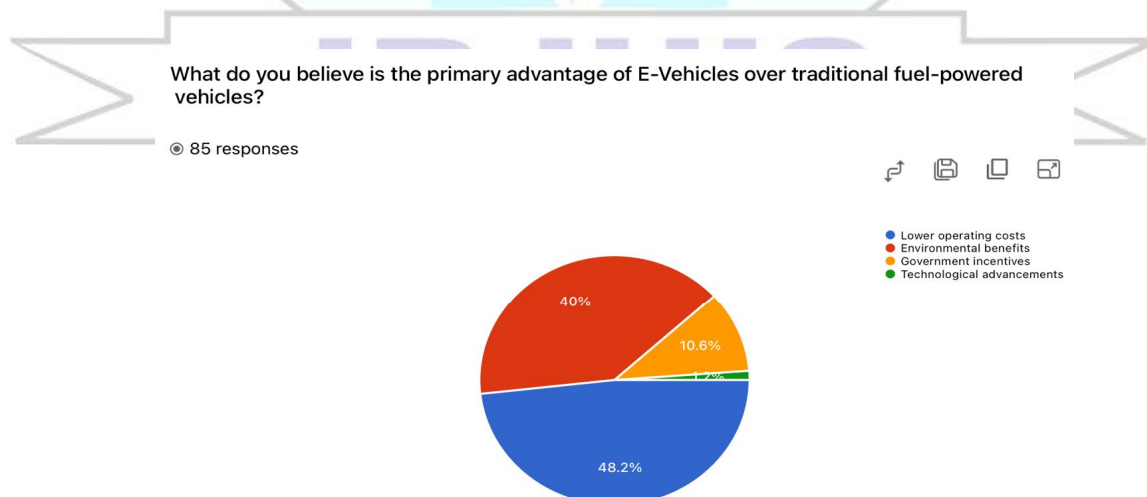
© 85 responses



The statement provides insights into the satisfaction levels regarding the availability of public charging stations for E-Vehicles based on 85 responses. The majority of respondents, comprising 44.7%, indicated being "Very satisfied," highlighting a positive perception of the current availability of charging stations. Additionally, 37.6% expressed being "Satisfied," further indicating a predominantly positive sentiment



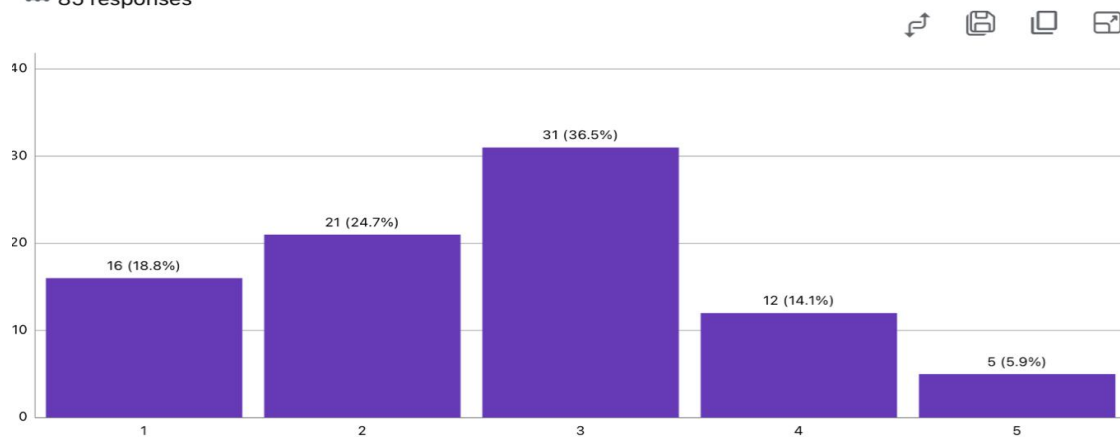
The primary advantage of electric vehicles (E-Vehicles) over traditional fuel-powered vehicles is perceived in several key areas. Approximately 48.2% of respondents believe that lower operating costs are the primary advantage, indicating a significant financial motivation driving the adoption of E-Vehicles. This is followed by 40% of respondents who prioritize the environmental benefits, indicating a growing awareness and concern for the environment among consumers. Additionally, 10.6% of respondents value government incentives, highlighting the impact of policy and incentives in influencing consumer choices towards E-Vehicles. Lastly, 1.2% of respondents mention technological advancements, indicating a smaller but still notable group that values the technological innovation associated with E-Vehicles



Regarding ownership or driving experience with E-Vehicles, 37.6% indicated that they have owned or driven an E-Vehicle, while the majority, comprising 62.4%, have not. This data suggests that a significant portion of the respondents have some level of familiarity or experience with E-Vehicles, indicating a growing interest or adoption of this technology. However, the majority still lacks direct experience, highlighting a potential gap in understanding or exposure to E-Vehicles among the general population.

On a scale of 1 to 5, how likely are you to recommend an E-Vehicle to a friend or family member?

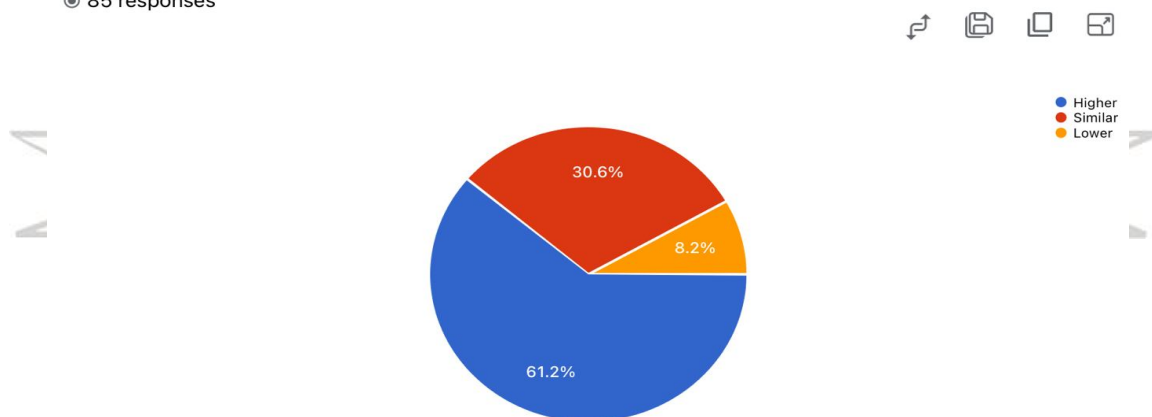
85 responses



According to the data gathered from 85 responses regarding the likelihood of recommending an E-Vehicle to a friend or family member, the majority of respondents rated their likelihood at either 3 or 4, comprising 36.5% and 24.7% of the total responses, respectively. This indicates a substantial portion, amounting to 61.2%, are inclined towards recommending E-Vehicles

How do you perceive the resale value of E-Vehicles compared to traditional vehicles?

85 responses

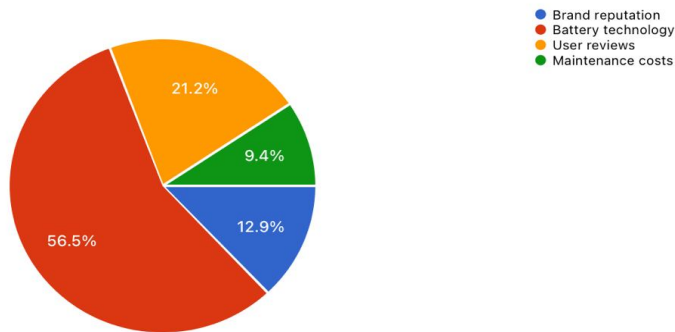


In analyzing the perception of customers towards the resale value of E-Vehicles compared to traditional vehicles, it is evident that a majority of the respondents, 61.2 percent, perceive the resale

value of E-Vehicles to be higher than that of traditional vehicles. This indicates a positive outlook towards the depreciation and value retention of E-Vehicles, possibly driven by the perception of technological advancements, environmental benefits, and increasing market demand for E-Vehicles.

What factors influence your perception of the reliability of E-Vehicles?

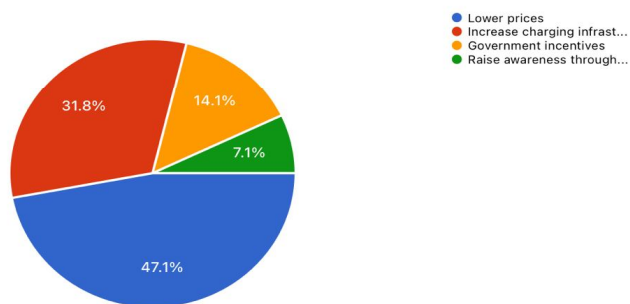
85 responses



In analyzing the factors influencing the perception of E-Vehicles' reliability based on 85 responses, brand reputation emerges as the most significant factor, with 56.5% of respondents indicating its importance. This suggests that consumers heavily rely on established brands to infer reliability in the context of electric vehicles. Battery technology, a crucial component in EVs, is the second most influential factor, with 21.2% of respondents considering it.

In your opinion, what could be done to improve the overall perception and adoption of E-Vehicles?

85 responses



In analyzing the responses regarding improving the overall perception and adoption of E-Vehicles, it's evident that several key factors stand out. Firstly, a significant portion, 47.1%, emphasized the importance of lower prices, indicating that pricing plays a crucial role in influencing consumer attitudes towards electric vehicles.

FINDINGS AND SUGGESTION:

RESULTS:

Based on the data gathered, it's clear that price is a critical factor influencing customers' evaluation of E-Vehicles for potential purchase, with 85 respondents highlighting its importance. This indicates that cost plays a significant role in consumers' decisions to adopt electric vehicles. Following closely behind, range per charge is the second most important factor, with 25.9% of respondents prioritising this aspect. This underscores the need for longer-lasting batteries or more efficient energy usage to address consumers' concerns about the distance an electric vehicle can travel on a single charge

In terms of awareness, the data indicates a moderate to very high level of awareness regarding electric vehicles among the respondents. Approximately 32.9% rated their awareness as very high, indicating a strong familiarity and knowledge about electric vehicles. Another 24.7% rated their awareness as high, further suggesting a substantial understanding of electric vehicles. Moreover, 29.4% rated their awareness as moderate, indicating a reasonable level of awareness. However, 12.9% rated their awareness as low, suggesting a segment of the population that lacks sufficient knowledge about electric vehicles. Overall, the data indicates a growing interest and understanding of electric vehicles among consumers.

Lastly, in analyzing the factors influencing the perception of E-Vehicles' reliability, brand reputation emerges as the most significant factor, with 56.5% of respondents indicating its importance. This suggests that consumers heavily rely on established brands to infer reliability in the context of electric vehicles. Battery technology is the second most influential factor, with 21.2% of respondents considering it. This highlights the pivotal role of advanced battery technologies in shaping consumer perceptions. User reviews, reflecting real-world experiences, are also significant, with 12.9% of respondents relying on them to assess reliability.

SUGGESTIONS:

Based on the analysis of the data, several key suggestions can be made to improve the overall perception and adoption of E-Vehicles. Firstly, it is clear that pricing is a critical factor for consumers. Therefore, manufacturers and policymakers should focus on reducing the cost of E-Vehicles through incentives, subsidies, and advancements in technology to make them more affordable and competitive with traditional vehicles. Secondly, the need for an extensive charging infrastructure cannot be overstated. Investing in the development of a robust network of charging stations, especially in urban areas and along highways, is essential to alleviate range anxiety and increase consumer confidence in E-Vehicles.

Moreover, government incentives such as tax credits, rebates, and subsidies can significantly impact consumer decisions. Therefore, policymakers should continue to implement and expand such

incentives to make E-Vehicles more attractive to a broader range of consumers. Additionally, raising awareness about the benefits of E-Vehicles, including their environmental advantages, cost savings, and technological advancements, is crucial. This can be achieved through targeted marketing campaigns, educational programs, and collaboration with media outlets to ensure accurate and positive coverage of E-Vehicles. Furthermore, improving battery technology and efficiency is paramount to address concerns about range per charge. Continued research and development in this area are essential to increase the range of E-Vehicles and reduce charging times. Additionally, offering a variety of E-Vehicle models to cater to different consumer preferences and needs can help broaden the appeal of E-Vehicles.

LIMITATIONS:

The data analysis on customers' perceptions towards E-Vehicles provides valuable insights, but it's essential to acknowledge the limitations inherent in the study. Firstly, the survey sample size of 85 respondents, while providing useful insights, may not fully represent the diversity of opinions and perspectives within the broader population. The responses may be skewed towards individuals with a particular interest or awareness of E-Vehicles, potentially leading to a biased representation of consumer perceptions. Additionally, the survey's reliance on self-reported data introduces the possibility of response bias, where participants may provide answers that they perceive as socially desirable or align with their preconceived notions.

Secondly, the study's focus on a specific geographical region or demographic group could limit the generalisability of the findings. E-Vehicle perceptions and adoption may vary significantly based on factors such as location, income level, or cultural background. Thus, extrapolating the findings to a broader population without considering these factors may result in misleading conclusions. The survey's closed-ended questions may not capture the full complexity of consumers' perceptions towards E-Vehicles. While the data provides valuable quantitative insights, it may overlook nuanced factors that influence consumer behavior, such as personal experiences, social influences, or lifestyle preferences. A more in-depth qualitative analysis, such as interviews or focus groups, could provide a more comprehensive understanding of these factors but was not included in this study.

Lastly, the study's focus on perception and adoption may not fully capture the dynamic nature of consumer behavior towards E-Vehicles. Consumer perceptions are subject to change based on various factors, including technological advancements, market trends, and regulatory changes. Therefore, the findings of this study may be relevant only within the context of the survey period and may not reflect long-term trends or future developments in the E-Vehicle market.

THE STUDY'S SCOPE:

The study aims to comprehensively explore customers' perceptions towards E-Vehicles,

focusing on key factors influencing their evaluation and adoption. The scope includes analyzing responses from 85 participants regarding their perceptions, preferences, and concerns related to electric vehicles. The study will investigate factors such as pricing, range per charge, charging infrastructure, government incentives, and environmental impact, which are crucial in shaping consumers' attitudes towards E-Vehicles. Additionally, the study will assess the level of awareness among participants regarding electric vehicles, including their understanding of the technology, benefits, and challenges associated with E-Vehicles.

Furthermore, the study will delve into participants' ownership or driving experience with E-Vehicles to understand the extent of their familiarity and exposure to this technology. This will provide insights into the level of acceptance and adoption of E-Vehicles among consumers.

Overall, the study aims to provide a comprehensive analysis of customers' perceptions towards E-Vehicles, highlighting key factors influencing their evaluation and adoption decisions. By understanding consumers' attitudes, preferences, and concerns regarding E-Vehicles, the study seeks to provide valuable insights for policymakers, manufacturers, and marketers to enhance the adoption and acceptance of E-Vehicles in the market.

CONCLUSION:

In conclusion, the data gathered provides valuable insights into customers' perceptions towards E-Vehicles, highlighting key considerations and factors that influence their evaluation and adoption. Price emerges as a critical factor, with a significant majority of respondents emphasising the importance of lower prices in driving adoption. This underscores the need for cost-effective solutions to make E-Vehicles more accessible to a wider consumer base. Range per charge and charging infrastructure also play pivotal roles, indicating that improvements in battery technology and charging networks are crucial for addressing consumer concerns about range anxiety. Government incentives are seen as another key driver, suggesting that supportive policies can significantly impact the adoption of E-Vehicles.

The advantages of E-Vehicles, particularly lower operating costs and environmental benefits, resonate strongly with consumers. This suggests that highlighting these advantages in marketing and educational campaigns could further promote the adoption of E-Vehicles.

Overall, the data indicates a positive perception towards E-Vehicles, with a majority of respondents inclined towards recommending them to others. This highlights a potential for further growth and adoption of E-Vehicles in the market. However, addressing the challenges and concerns identified in the data, such as pricing, range, and charging infrastructure, will be crucial for accelerating the adoption of E-Vehicles and promoting a sustainable future of transportation.

Firstly, it is evident that environmental consciousness plays a pivotal role in driving positive perceptions towards e-vehicles. As individuals become increasingly aware of climate change and air

pollution, the appeal of zero-emission transportation options grows stronger. Governments and environmental organizations have also been instrumental in promoting e-vehicles through incentives and awareness campaigns, further bolstering their image as sustainable alternatives to traditional vehicles.

Secondly, technological advancements in battery technology and charging infrastructure have significantly improved the performance and convenience of e-vehicles, addressing some of the key concerns raised by potential customers. The increasing range of electric vehicles, coupled with faster charging times, has alleviated range anxiety and enhanced the overall user experience. Additionally, the integration of smart features and connectivity options has added a new dimension of attractiveness to e-vehicles, appealing to tech-savvy consumers.

In conclusion, while the perception of customers towards e-vehicles is influenced by a multitude of factors, including environmental concerns, technological advancements, and socio-economic dynamics, it is clear that the transition towards electrified transportation is well underway. As governments, industry players, and consumers alike recognise the urgent need to mitigate climate change and reduce dependence on fossil fuels, e-vehicles represent a promising solution with the potential to revolutionise the automotive industry. By addressing existing challenges and capitalising on emerging opportunities, we can accelerate the transition towards a more sustainable and electrified future.

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APPENDIX:

Customers perception towards E-Vehicles

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What factor do you consider most important when evaluating an E-Vehicle for potential purchase?

- Price
- Range per charge
- Charging infrastructure
- Environmental impact

How would you rate your overall awareness of electric vehicles?

- Very high
- High
- Moderate
- Low

What is your main concern regarding the adoption of E-Vehicles?

- Limited range
- Charging infrastructure
- Initial cost
- Lack of model variety

How satisfied are you with the current availability of public charging stations for E-Vehicles?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied

What do you believe is the primary advantage of E-Vehicles over traditional fuel-powered vehicles?

- Lower operating costs
- Environmental benefits
- Government incentives
- Technological advancements

Have you ever owned or driven an E-Vehicle?

- Yes
- No

On a scale of 1 to 5, how likely are you to recommend an E-Vehicle to a friend or family member?

- 1 2 3 4 5
- Being not likely at all Being extremely likely

How do you perceive the resale value of E-Vehicles compared to traditional vehicles?

- Higher
- Similar
- Lower

What factors influence your perception of the reliability of E-Vehicles?

- Brand reputation
- Battery technology
- User reviews
- Maintenance costs

In your opinion, what could be done to improve the overall perception and adoption of E-Vehicles?

- Lower prices
- Increase charging infrastructure
- Government incentives
- Raise awareness through marketing campaigns