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Total Consumer Perception about "Tata Electric Vehicles 4-Wheeler in Ahmedabad"

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A B S T R A C T

This study shows the factor that buyer see before buying a tata electric vehicle such as awareness, affordability, environmental appeal, and charging infrastructure. Using surveys and interviews, that show that Tata EVs provide sustainability and technological features which provide high selling of tata evs. However, concerns about cost, charging infrastructure, and reliability persist, especially among older and lower-income consumers. Also a high brand value and trust is provided by tata. Based on these findings, the recommendation, trust and good technology it provides demand for more tata ev sales

INTRODUCTION

With rising environmental issues and the depletion of fossil fuel resources, the global automotive industry is changing partly as a response to these peer pressures, creating new approaches for transportation solutions (Vidani & Solanki, 2015). With less carbon footprints and lesser dependency on non-renewable energy sources, Electric vehicles (EVs) have proved to be an alternative solution for the internal combustion engine (ICE) vehicles. This shift is in line with international efforts aimed at controlling climate change and decreasing emissions of greenhouse gases. Given the context of air pollution and fossil fuel consumption levels in India, electric vehicles are desirable to an extent but largely indispensable. Tata Motors, among the large players in the Indian automotive sector, has led the EV space — especially for four-wheeler segment (Vidani, 2015).

Total consumer perception regarding Tata electric vehicles 4-wheeler in Ahmedabad This research paper is an attempt to study the total perception of consumers toward the 4-wheeler electronic vehicles of Tata within the territorial limits of Ahmedabad; it focuses on understanding consumer attitudes, preferences, and the process of decision-making with respect to the electric vehicle models offered by Tata within one of India's significant urban markets. Being the largest city in the state of Gujarat, Ahmedabad is well positioned to be an ideal market for electric vehicles due to rapid urban development besides growing environmental concerns. Increasing disposable incomes among the middle class also contribute, because these people have disposable incomes (Vidani, 2015). This paper covers Tata Motors evolved into the electric car segment, its strategic position related to the market in regards to the factors that affect and define electric vehicle adoption in India (Vidani, 2015).

Tata Motors: Pioneering the Electric Vehicle Revolution in India

Tata Motors Limited is a part of the Tata Group, one of the major players in the Indian automotive industry who have always spearheaded innovativeness, diversified product ranges, and commitment toward creating value for customers. The company played a significant role in inspiring and continuing to make electric vehicles popular in India through models such as the Tata Nexon EV or the Tata Tigor EV. The latest case study by Adlin Jeyakumar S. and A. Jayanthika Devi proves that Tata Motors is the present market leader concerning sales and production of electric vehicles in India, holding about 73% of the market share (Solanki & Vidani, 2016).

Tata Motors' EV journey commenced with the realization of the increasing need for sustainable mobility options which was spurred by the policies of the Indian Government promoting EVs coupled with the consumer interest to protect the environment. Various measures have been introduced by the Indian government to promote EV manufacturers and buyers through rebates and subsidies for instance the scheme of FAME has significantly improved the manufacturing and sale of electric vehicles. Which has given Tata Motors the leeway to embark on aggressive EV R&D with a view on developing battery efficiency, optimizing charging time and enhancing the performance of the vehicles (Vidani, 2016).

The Tata Nexon EV Max is the newest addition to Tata Motors' EV lineup, and its price, performance and range has made it easy for Indian customers to choose it. The Nexon EV Max boasts the best-in-class maximum range of over 300 kilometers on a single charge which caters to the range concern of any EV' potential buyer. Tata Motors has successfully established itself as a primary player in the shift of India's mobility towards electric by offering an affordable electric vehicle (Bhatt, Patel, & Vidani, 2017).

Consumer Perception and Adoption of Electric Vehicles

It is important to understand the perspective adopted, in this case, of consumers, for an electric vehicle to be accepted in any market. In India, consumer perception with regards to confidence in electric vehicles depends on the environmental issues, developing technology, the cost of the vehicle, and the policies set by the government. As pointed out by Ronak Singh (2023) in his work on consumers' buying choices in NCR areas, an electric vehicle image is formed by psychological, sociological and technological experience. The purchase of any electrical vehicle involves functionality of the vehicle, its cost and the advantages over than a standard petrol car (Niyati & Vidani, 2016).

In Ahmedabad, which is urbanizing quickly and facing environmental issues, people's views on electric cars are influenced by factors such as charging stations, government incentives, cost, and environmental benefits. Although the idea of electric cars is still new in India, more people are learning about their benefits. But challenges like fewer charging stations, higher prices, and range concerns still slow down adoption (Pradhan, Tshogay, & Vidani, 2016).

Ahmedabad has a growing middle class and is a promising market for EVs. The local government supports sustainable transport with electric buses and charging stations. These factors may positively influence how people in Ahmedabad see Tata's electric vehicles and their readiness to use them (Modi, Harkani, Radadiya, & Vidani, 2016) (Vidani, 2016) (Sukhanandi, Tank, & Vidani, 2018).

Factors Influencing Consumer Preferences For Tata Evs

Several factors influence whether people choose electric vehicles (EVs) like Tata's models, including environmental awareness, affordability, and performance (Singh, Vidani, & Nagoria, 2016).

Environmental Awareness: More people are realizing that traditional gasoline cars harm the environment, which encourages them to consider EVs. Tata Motors markets its EVs as eco-friendly, attracting consumers who care about reducing pollution and fighting climate change (Mala, Vidani, & Solanki, 2016) (Dhere, Vidani, & Solanki, 2016).

Affordability: Electric cars often cost more upfront than regular cars, but Tata Motors has worked to make its EVs, like the Nexon EV and Tigor EV, more affordable. This focus on cost-effectiveness appeals to budget-conscious consumers in Ahmedabad (Singh & Vidani, 2016) (Vidani & Plaha, 2016).

Performance and Reliability: Performance is also important to consumers. Tata has improved the range, charging speed, and reliability of its EVs, helping reduce concerns about running out of power (range anxiety) and charging convenience. The Nexon EV Max, with a long range and fast-charging features, is likely to attract consumers who value high performance and ease of

use (Solanki & Vidani, 2016) (Vidani, 2016).

Government Support: Policies and incentives from the government are important in making electric vehicles (EVs) popular. In India, the FAME scheme and state incentives in places like Gujarat help make EVs more affordable. Tata Motors has benefited from these programs, making its EVs more attractive to consumers interested in government incentives (Vidani, Chack, & Rathod, 2017) (Vidani, 2018) (Biharani & Vidani, 2018).

Charging Infrastructure: Access to charging stations is a key factor for EV adoption. Although Ahmedabad's charging network is still growing, Tata Motors is working with energy companies to expand charging options across India. Reliable charging infrastructure will be crucial for people in Ahmedabad when they decide to buy an EV (Vidani, 2018) (Odedra, Rabadiya, & Vidani, 2018)(Vasveliya & Vidani, 2019).

As the world shifts toward cleaner, electric vehicles, Tata Motors has become a leader in India's EV market, offering affordable, high-quality options. This study on "Total consumer perception about Tata electric vehicles 4-wheeler in Ahmedabad" seeks to understand the factors influencing people's opinions about Tata's EVs(Sachaniya, Vora, & Vidani, 2019) (Vidani, 2019). By addressing issues like charging access, affordability, and performance, Tata Motors is well-positioned to lead in India's growing EV market. The study's findings will provide insights into why people choose electric vehicles and the future of sustainable transportation in India (Vidani, Jacob, & Patel, 2019) (Vidani J. N., 2016) (Vidani & Singh, 2017).

Research Objectivies

- To study the awareness of Tata's electric 4-wheelers among consumers (Objective achieved in Question 7 of Questionnaire).
- To analyze the consumer perception regarding the affordability of Tata electric vehicles compared to other brands (Objective achieved in Question 8 of Questionnaire).
- To examine the belief of consumers regarding the environmental friendliness of Tata electric vehicles (Objective achieved in Question 9 of Questionnaire).
- To investigate consumer perceptions about whether the driving range of Tata electric vehicles meets their daily commuting needs (Objective achieved in Question 10 of Questionnaire).
- To assess consumer trust in the safety features of Tata electric vehicles (Objective achieved in Question 11 of Questionnaire).
- To evaluate consumer opinions on the design attractiveness of Tata electric vehicles (Objective achieved in Question 12 of Questionnaire).
- To study the consumer perception regarding the reliability of Tata's after-sales service for electric vehicles (Objective achieved in Question 13 of Questionnaire).
- To assess the impact of charging infrastructure availability on consumers' decisions to purchase Tata electric vehicles (Objective achieved in Question 14 of Questionnaire).

- To analyze the role of government subsidies and incentives in influencing the purchase decision of Tata electric vehicles (Objective achieved in Question 15 of Questionnaire).
- To explore consumers' willingness to pay a premium price for Tata electric vehicles in order to reduce pollution (Objective achieved in Question 16 of Questionnaire).
- Tata electric vehicles (Objective achieved in Question 17 of Questionnaire).
- To investigate consumers' likelihood of recommending Tata electric vehicles to friends and family (Objective achieved in Question 18 of Questionnaire).
- These research objectives align with the questions in your questionnaire and will guide the analysis of consumer perceptions about Tata electric vehicles.

LITERATURE REVIEW

The electric vehicle (EV) industry has seen substantial global growth, fueled by environmental concerns, rising fuel costs, and technological advancements. In India, with its large population, rapid urbanization, and increasing environmental challenges, there is immense potential for EV expansion. This literature review examines studies on EV adoption in India, focusing on consumer perceptions, barriers, trends, and Tata Motors' role in advancing the market (Vidani & Pathak, 2016) (Pathak & Vidani, 2016).

1. Tata Motors and its Role in the Indian EV Market

Tata Motors has emerged as a leader in India's EV market. Adlin Jebakumari S. and A. Jayanthila Devi (2023) explore this success in "*TATA Motors Limited: A Revolution in Electric Cars*". They analyze Tata's launch of affordable models like the Tata Nexon EV Max and Tigor EV, which meet Indian consumers' demands for cost-effective and sustainable cars. Holding about 73% of India's EV market, Tata's strategic focus on affordability and innovation has driven its success. Their SWOT analysis highlights Tata's market strength and customer base, but also notes challenges like expanding charging infrastructure and addressing concerns about EV range and charging time. This study shows how Tata Motors aligns product offerings with Indian consumer needs, supporting EV market growth (Vidani & Plaha, 2017) (Vidani J. N., 2020) (Vidani J. N., 2018).

2. Consumer Buying Behavior and EV Perception

Understanding consumer behavior is key to EV adoption. Ronak Singh (2023), in "*Consumer Buying Decision Over Electric Vehicles and Other Variants in NCR Region*", explores the impact of technology, environmental concerns, and functionality on consumer choices. Singh finds that innovation, rising fuel costs, and sustainability concerns make EVs attractive, but notes that high costs, limited charging options, and range anxiety remain barriers, especially in Tier 1 and Tier 2 cities. Singh's work underlines the need for affordable EVs and better infrastructure to boost adoption, providing insights into consumer preferences in urban and semi-urban areas (Vidani & Dholakia, 2020) (Vidani, Meghrajani, & Siddarth, 2023).

3. Perception of Electric Vehicles in India

Aditya Kumar's (2023) study, "*Consumer Perception towards Electric Vehicles in India*", analyzes consumer attitudes about EVs' environmental benefits, cost savings, and performance. Kumar notes growing awareness of EV benefits, though range anxiety, charging concerns, and higher initial costs hinder adoption. Kumar highlights government incentives like the FAME scheme that support EV uptake, while emphasizing that more infrastructure and affordability are needed to make EVs a mainstream choice. This study stresses that government policies play a crucial role in shaping consumer perceptions and encouraging adoption.

4. Factors Influencing EV Preference and Adoption

Udit Chawla et al. (2023) in "*Factors Influencing Customer Preference and*
In their 2023 study, "*Predicting Consumer Purchase Intention on Electric Cars in India: Mediating Role of Attitude,*" Mukesh and M. Narwal investigate how consumer attitudes shape their purchase intentions toward electric vehicles (EVs) in India. Through a quantitative analysis of 173 samples using SmartPLS 4 and SPSS, the study examines factors like price perception, government support, environmental concerns, and EV features such as range and charging time.

The findings indicate that positive consumer attitudes toward EVs are strongly influenced by the perception of cost benefits (via lower operating expenses or government subsidies) and concerns about environmental issues like pollution and climate change. However, barriers such as range anxiety and limited charging options continue to deter adoption. The authors emphasize that altering consumer perceptions through marketing and infrastructure development is essential for increasing EV uptake, highlighting the need for both policymakers and manufacturers to address cost, convenience, and accessibility concerns.

This research underscores that consumer attitudes play a crucial mediating role in EV purchase intentions, offering insights into strategies for encouraging EV adoption in India.

5. Sustainability and Electric Vehicles in India

In the context of global sustainability, EV adoption is on the rise, and India is no exception. Udit Chawla et al. (2023) highlight in their study that ecological awareness is increasingly shaping consumer preferences for EVs in India. The transition from traditional fuel-based vehicles to EVs is largely driven by environmental concerns and the desire for sustainable mobility solutions.

While the environmental advantages of EVs are recognized, the study finds that consumers seek a balance between sustainability and performance. Manufacturers like Tata Motors, which prioritize affordability without sacrificing performance, are well-positioned to capture a growing share of the Indian market. The study also underscores government policies, such as the FAME scheme, as essential drivers in this sustainability transition. However, it suggests that additional measures are needed to make EVs accessible across urban and rural settings, fostering more widespread adoption in India.

Research Gap

Electric vehicle (EV) market in India, particularly in cities like Ahmedabad, is growing rapidly. However, there remains a significant gap in understanding total consumer perception of Tata Electric Vehicles (EVs). While research on consumer perceptions of EVs has expanded, there is limited focus on how these perceptions are shaped specifically for Tata's electric 4-wheelers, such as the Nexon EV and Tigor EV, within the context of an evolving urban market like Ahmedabad.

One key research gap is understanding the local context of consumer perception in Ahmedabad, which has unique socio-economic conditions, infrastructure challenges, and cultural dynamics. Ahmedabad, a mid-sized urban canter, may face different adoption rates, barriers, and motivators compared to larger metro cities like Mumbai or Delhi. Many studies generalize findings across broader areas without considering the distinct concerns of consumers in tier-2 cities. Regional differences in EV adoption, especially for Tata, remain underexplored.

Another gap lies in understanding the socio-economic factors that influence perceptions of Tata EVs. While some studies have examined the role of income and education in EV adoption, little research focuses on how specific socio-demographic characteristics like age, occupation, and family size impact decisions related to Tata's electric cars. For example, younger, tech-savvy consumers may have different perceptions compared to older, more traditional buyers. Income levels in Ahmedabad may also affect adoption, as higher-income consumers may prioritize technological innovation, while middle-income buyers might focus on affordability and operational costs. Exploring these factors can provide a clearer picture of Tata's target demographic in the city.

Despite increasing awareness of Tata's electric vehicles, there is a lack of in-depth consumer education regarding the benefits and limitations of EVs. Most research on EV adoption in India focuses on general awareness rather than brand-specific knowledge. Tata's position as a leader in the EV market, especially with models like the Nexon EV, needs more study in terms of consumer trust, brand recognition, and perceived value. Comparisons between Tata and competitors like Mahindra or Hyundai are rarely explored, yet such insights are vital for understanding consumer decision-making.

Additionally, charging infrastructure and range anxiety are significant barriers to EV adoption in India, but little research examines how consumers in Ahmedabad specifically perceive and experience these challenges. Local infrastructure, such as the density of charging stations and access to fast-charging points, is a critical issue that warrants further investigation.

Finally, post-purchase satisfaction is an under-explored area. While pre-purchase factors like affordability and awareness are well-documented, fewer studies examine long-term consumer satisfaction with Tata EVs. Understanding how ownership impacts satisfaction, particularly regarding maintenance and reliability, is crucial for encouraging repeat purchases and positive word-of-mouth.

In conclusion, the Indian EV market, particularly for Tata's electric vehicles, has significant growth potential. Addressing these research gaps will offer valuable insights into consumer perceptions, ultimately helping Tata Motors, policymakers, and stakeholders drive EV adoption more effectively.

Hypothesis (Only List)

H_1: There is a significant relationship between Age group and Monthly Income (in INR).

- H_2: There is a significant relationship between Age group and awareness of Tata's electric 4-wheelers (like Nexon EV, Tigor EV, etc.).
- H_3: There is a significant relationship between Age group and the perception of Tata electric vehicles' affordability compared to other electric vehicle brands.
- H_4: There is a significant relationship between Age group and the belief that Tata electric vehicles are environmentally friendly.
- H_5: There is a significant relationship between Age group and the belief that the driving range of Tata electric vehicles meets daily commuting needs.
- H_6: There is a significant relationship between Age group and the trust in the safety features of Tata electric vehicles.
- H_7: There is a significant relationship between Age group and the perception of the attractiveness of Tata electric vehicles' designs.
- H_8: There is a significant relationship between Age group and the belief in Tata's reliable after-sales service for its electric vehicles.
- H_9: There is a significant relationship between Age group and the influence of charging infrastructure availability on the decision to purchase an electric vehicle.
- H_{10}: There is a significant relationship between Age group and the perception that government subsidies and incentives make it easier to buy a Tata electric vehicle.

Table 1. Validation of Questionaire

Statements	Citation from JV citation file (You can add more than 1 citation)
I am aware of Tata's electric 4-wheelers (like Nexon EV, Tigor EV, etc.).	(Saxena & Vidani, 2023)
Tata electric vehicles are affordable compared to other electric vehicle brands.	(Mahajan & Vidani, 2023)
I believe Tata electric vehicles are environmentally friendly.	(Sharma & Vidani, 2023)
The driving range of Tata electric vehicles meets my daily commuting needs.	(Patel, Chaudhary, & Vidani, 2023)
I trust the safety features of Tata electric vehicles.	(Chaudhary, Patel, & Vidani, 2023)
I find Tata electric vehicles' designs to be attractive.	(Bansal, Pophalkar, & Vidani, 2023)
I believe that Tata offers a reliable after-sales service for its electric vehicles.	(Vidani, Das, Meghrajani, & Chaudasi, 2023)

The availability of charging infrastructure influences my decision to purchase an electric vehicle.	(Vidani, Das, Meghrajani, & Singh, 2023)
I think government subsidies and incentives make it easier to buy a Tata electric vehicle.	(Saxena & Vidani, 2023)
I am willing to pay a premium price for an electric vehicle if it contributes to reducing pollution.	(Vidani J. N., 2022)
Range anxiety (fear of running out of charge) is a concern for me when considering electric vehicles.	(Vidani & Das, 2021)
I would recommend Tata electric vehicles to friends and family.	(Rathod, Meghrajani, & Vidani, 2022)

*Source: Author's Compilation

METHODOLOGY

Table 2. Research Methodology

Research Design	Descriptive
Sample Method	Non-Probability - Convenient Sampling method
Data Collection Method	Primary method
Data Collection Method	Structured Questionnaire
Type of Questions	Close ended
Data Collection mode	Online through Google Form
Data Analysis methods	Tables
Data Analysis Tools	SPSS and Excel
Sampling Size	162
Survey Area	Ahmedabad
Sampling Unit	Students, Private and government Job employees, Businessmen, Home maker, Professionals like CA, Doctor etc.

*Source: Author's Compilation

Demographic Summary

The sample's demographic profile shows a varied composition in several important areas. Men make up 78.4% of the participants, and women make up

20.9%. With 85.6% of respondents being between the ages of 18 and 25, and 10.5% being between the ages of 25 and 32, the age group distribution reveals a preponderance of younger people. In terms of educational background, the majority of participants (39.2%) have a postgraduate degree, while 35.9% have finished their undergraduate studies. In terms of occupation, a sizable percentage (59.5%) are students, followed by professionals such as doctors or attorneys (4.6%) and other occupations (34%). Most people (72.7%) make less than INR 25,000 per month, while smaller groups make between INR 25,000 and 50,000 (18.2%) and more than INR 50,000 (8.4%). This demographic profile offers important background information for comprehending the socioeconomic background of the sample.

Cronbach Alpha

Table 3. Cronbach Alpha

Cronbach Alpha Value	No. of items
0.933	13

*Source: SPSS Software

Excellent internal consistency is indicated by the 13 items' Cronbach's Alpha rating of 0.933, which shows that the scale's items are very dependable and accurately measure the same underlying construct. The scale can be regarded as robust for use in additional study because of its high level of reliability, which indicates that the responses to these items are highly associated. The scale shows little inaccuracy and can be used with confidence to measure the desired variable if the score is more than 0.9. Strong measurement reliability is ensured by the internal consistency, which is generally far beyond the permissible threshold.From your project

Table 4. Results of Hypothsis Testing

Add rows as per number of hypothesis you have created

Sr. No	Alternate Hypothesis	Result p =	>/< 0.05	Accept/ Reject Null hypothesis	R value	Relationship
1	**H_1:** There is a significant relationship between Age group and Monthly Income (in INR).	0.001	< 0.005	H01 Rejected (Null hypothesis rejected)	0.001	Weak
2	**H_2:** There is a significant relationship between Age group and awareness of Tata's electric 4-wheelers (like Nexon EV, Tigor	0.001	>0.005	H02 Rejected (Null hypothesis rejected)	0.401	Weak

	EV, etc.).					
3	**H_3:** There is a significant relationship between Age group and the perception of Tata electric vehicles' affordability compared to other electric vehicle brands.	0.001	>0.005	H03 Rejected (Null hypothesis rejected)	0.079	Weak
4	**H_4:** There is a significant relationship between Age group and the belief that Tata electric vehicles are environmentally friendly.	0.001	>0.005	H04 Rejected (Null hypothesis rejected)	0.169	Weak
5	**H_5:** There is a significant relationship between Age group and the belief that the driving range of Tata electric vehicles meets daily commuting needs.	0.001	>0.005	H05 Rejected (Null hypothesis rejected)	0.041	Weak
6	**H_6:** There is a significant relationship between Age group and the trust in the safety features of Tata electric vehicles.	0.001	>0.005	H06 Rejected (Null hypothesis rejected)	0.287	Weak
7	**H_7:** There is a significant relationship between Age group and the perception of the attractiveness of Tata electric vehicles' designs.	0.001	>0.005	H07 Rejected (Null hypothesis rejected)	0.151	Weak

8	**H_8:** There is a significant relationship between Age group and the belief in Tata's reliable after-sales service for its electric vehicles.	0.001	>0.005	H08 Rejected (Null hypothesis Weak rejected)	0.056	Weak
9	**H_9:** There is a significant relationship between Age group and the influence of charging infrastructure availability on the decision to purchase an electric vehicle.	0.001		vH09 Rejected (Null hypothesis rejected)	0.065	Weak
10	**H_{10}:** There is a significant relationship between Age group and the perception that government subsidies and incentives make it easier to buy a Tata electric vehicle.	0.001		H10 Rejected (Null hypothesis rejected)	0.155	Weak

*Source: Author's Compilation

DISCUSSION

Ahmedabad consumers' perceptions of Tata Electric Vehicles (EVs) offers important new information about how demographic variables affect consumers' opinions of Tata's electric four-wheelers. Tata Motors, a major player in this sector, is making significant progress in popularizing EVs, and the Indian electric vehicle market is expanding in tandem with the rising worldwide shift towards sustainability. Determining the prospects and constraints for Tata's electric vehicles requires an understanding of consumer perception.

Awareness and Knowledge of Tata Electric Vehicles

Understanding and familiarity with Tata Electric Vehicles

According to the report, Ahmedabad buyers were highly aware of Tata's EVs, especially the Nexon EV and Tigor EV. Tata's aggressive marketing tactics and the growing awareness of EVs in the area are primarily to blame for this. Tata's attempts to increase brand awareness have been successful, as seen by the respondents' reasonable familiarity with the company's electric models

across all age categories. However, different demographic groups have varying levels of knowledge regarding EV technology and its advantages.

Perception of Affordability

Consumer opinions were significantly influenced by affordability, with many respondents believing that Tata's EVs were more reasonably priced than those of rival companies. With price points that deliberately target the middle-class market, Tata's foray into the inexpensive EV segment has been positively received. The widespread belief that EVs are luxury goods, however, may put off prospective purchasers used to more affordable internal combustion engine (ICE) automobiles. Due to their greater sensitivity to costs, older age groups and those with lesser incomes were most affected.

Environmental Impact and Sustainability

The environmental impacts of Tata's electric vehicles translated to a favorable perception of the brand especially among younger generation consumers. Most respondents were in concurrence that Tata's electric vehicles are environmentally friendly which corresponds with the increasing demand for sustainable modes of transport. However, older consumers were not as well persuaded about the long standing benefits brought by the use of electric vehicles especially as a form of transport, perhaps due to insufficient information or disbelief surrounding the green electric mobility.

Safety, Design, and Trust

This includes Safety and Design aspects which had an influence on the way users perceived the offerings. Tata's focus on safety features, especially on the case of the Nexon EV, was mentioned by many as a reason to want to go for the brand. The safety ratings of the vehicle, coupled with modern designs appealed to the youth and urban dwellers in particular. These factors created a heightened sentiment of trust towards the quality of products offered by the Tata brand.

Infrastructure and Subsidies

Many of the responses highlighted charging infrastructure as a key factor. Notably, in the case of Tata's efforts to push EVs, the shortage of charging stations was a key hindrance to its uptake. The role of government subsidies and incentives was acknowledged as important too in making EVs more accessible to the average consumer thus smoothing the transfer to electric mobility.

To summarize, many enhancements have been accomplished by Tata motors in positioning its electric vehicles as a viable option within the city of Ahmedabad. Nevertheless, factors such as increased consumer education, improvement in infrastructure towards charging of EVs and reduction in the prices of these vehicles could in creased adoption rates.

Theoretical Implications

The study of the perception of Tata Electric Vehicles (EVs) among consumers in Ahmedabad has important theoretical implications consumer behavior, marketing, and sustainable transport. With regard to consumption of Tata's EVs, (which is aimed at Indian market which is exhibiting burgeoning growth in electric vehicles) this paper brings together several important adoptions and barriers theories to the analysis.

1**. Theory of Planned Behavior (TPB**)

Ajzen's Theory of Planned Behavior (1991) postulates that an individual's behavior is moderated by three predictors: attitude, subjective norm, and perceived behavioural control. Concerning Tata EVs, however, it is more of the consumer attitudes towards environmental concern and sustainability as well as towards the vehicles affordability and safety that determine the adoption intentions. The study revealed that favorable attitudes were motivated by positive beliefs about safety and environmental concerns relating to Tata EVs. Nevertheless, such consumer behavior was limited by external factors, such as availability and affordability of infrastructure.

2**. Innovation Diffusion Theory (IDT**)

Everett Rogers's Innovation Diffusion Theory (1962) emphasizes that a person's decision to adopt innovation is determined by his or her relative advantage over other options, compatibility, and complexity of the innovation among other factors. The study affirms the IDT, though especially so in terms of relative advantage and compatibility. Any consumers who thought of Tata EVs as cheap and green were likely to opt for them. Younger consumers who are more environmentally conscious and open to technology found Tata EVs consistent with their lifestyle which reinforces the notion that consumer value based innovations are likely to make heads turn.

3. Consumer Perception and Brand Trust

The concept of brand trust has contributed a lot to consumer perception. The consumers' belief in the safety features and after sales services offered by Tata Motors ameliorated their attitude towards Tatas EVs. This can be associated with the Elaboration Likelihood Model (ELM) (Petty & Cacioppo, 1986) which states that in certain situations, the consumers making the purchasing decisions may opt to use peripheral cues such as the reputation of the brand as opposed to evaluating the product.

4**. Sustainability and Green Consumer Behavior**

In addition, the research extends comprehension in the area of green consumer behavior and the usage of green products. These findings confirm the Value-Belief-Norm Theory (VBN) proposed by Stern et al. (1999) which connects attitudes towards the environment to actual consumer behaviour. More progressive and younger audience of consumers held a more favorable view about Tata's EVs as a choice option, endorsing the revolution of sustenance activism in purchase decisions.

5. Socio-Demographic Variables

The study demonstrates the effect of the age and income factor on consumer perceptions. Concerns on costs were shared among older and lower-income groups, while younger and more affluent ones were more concerned with sustainability and technological advancements. These findings are consistent with the Demographic Characteristics Theory. Therefore, there is a need to consider different marketing strategies for different consumer segments if Tata Motors is to promote these vehicles. This research demonstrates how attitudes toward and receptivity of electric vehicles are appreciated in the context of india.

Practical Implications

on consumer perception of Tata Electric Vehicles (EVs) in Ahmedabad offers valuable theoretical implications for consumer behavior, marketing, and sustainable transportation. By examining how consumers perceive Tata's EVs, particularly in India's growing electric vehicle market, the study integrates several key theories to provide insights into adoption patterns and barriers.

1. Theory of Planned Behavior (TPB)

At the core of Ajzen's Theory of Planned Behavior (1991) is the premise that a person's behavior is determined by the person's attitudes, subjective norms and perceived control. In the context of Tata EVs, the adoption intents are highly influenced by the consumers' attitudes towards environmental sustainability, price, and safety. It was however noted that favorable attitudes were driven by the positive connotation that they associated with the environmental benefits and safety features of Tata EVs. However, low disposable incomes and consequences such as lack of sufficient infrastructure restrained very low, less than the average, income consumer behavior. This is also in relation to the control that is perceived in TPB whereby perceived control in this context is powerfully correlated with purchasing intentions (use and costs).

2. Innovation Diffusion Theory (IDT)

Everett Rogers theory of innovation diffusion (1962) suggests that factors such as usefulness, consistency, and complexity determine their adoption Studies support IDT, especially in terms of its usefulness on and on compatibility. Consumers who thought Tata EVs were affordable and environmentally friendly generally embraced them. Younger consumers supporting the view that new products that align with consumer values are likely to succeed but suffer them in terms of complexity (understanding of EV technology) and infrastructure compatibility.

3. Consumer Perception and Brand Trust

The concept of brand trust was central to the study's findings regarding consumer perceptions. In the case of Tata's EVs, it was found that the trust of consumer in the safety features and after sales service associated with Tata Motors worked in a positive way in shaping consumers' attitudes towards Tata's EVs. This is consistent with the Elaboration Likelihood Model (ELM)(Petty & Cacioppo, 1986), which posulates that in processing information, consumers may use identifiable factors in the environment such as the reputation of the brand. Nevertheless, due to the favorable perception of the company among the consumers

4. Sustainability and Green Consumer Behavior

The research also enhances comprehension of green consumption and the acceptance of green products. The results uphold the Value-belief-Norm Theory (VBN) (Stern et al., 1999), which explains the relationship between environmental attitudes and consumer actions. Certain EVs produced by Tata were more likely to be viewed as favorable by environmentally conscious young consumers, which emphasizes the role of sustainability in decision making nowadays.

5. Socio-Demographic Variables

The study points out the effects of age and income on consumer perceptions. Concerns about cost were raised by older and low-income groups, while concerns about technology and sustainability were raised by younger and richer consumers. These outcomes correspond with the Demographic Characteristics Theory, which supports the idea that marketing strategies of Tata Motors should be focused in particular consumer segments for effective adoption. The study also sheds more light on green consumption and the acceptance of the green products. The findings support the Value-belief-Norm Theory (VBN) (Stern et al., 1999), which established a connection between consumers' attitudes towards the environment and their behaviours.

Conclusion

This research adds to the body of knowledge on how consumers perceive and accept Tata Electric Vehicles (EVs) in India, especially with regard to critical elements such as awareness, affordability, infrastructure, and brand. Consumer awareness is however very high, especially among the youth who are eco-friendly. Unfortunately, there are some information windows that fall under the technology or the long-term benefits of EVs, making it clear that consumer advocacy and education is lacking. Affordability is still a major worry, especially among the lower income earners and this ought to be countered with messages aimed at allaying the concerns such as cost savings and government compensation. In addition to this, the charging infrastructure remains a critical hindrance, the extension of the network of fast charging solutions as well as the encouragement of home charging systems will go a long way in enhancing acceptability. Consumers are also influenced by notions owing to Tata's brand image which has been associated with safety and dependability.

FUTHER STUDY

This study provides valuable insights into consumer perceptions of Tata Electric Vehicles (EVs) in Ahmedabad but also add more research about future of ev in India

1. Consumer Experience and Post-Purchase Satisfaction: Getting insights regarding the experiences of Tata EV owners after purchase would be another area of research. This would include the analysis of after-sales maintenance, reliability, service, and costs in the long run.
2. Analysis in Other Terms and in Larger Space: In this particular study, research was conducted only in Ahmedabad, hence conducting research in other metro cities such as Mumbai, Delhi, and Bangalore and even in semi-urban or rural areas as well would give a wider scope of consumer perception and adoption. In a regional comparison, for instance, attitudes towards the electric vehicles in India could cover the availability of infrastructure.
3. Psychographic Factors and Consumer Segmentation: Although demographic aspects such as age and income have been examined, more research could consider psychographics - the values, attitudes and lifestyle patterns - factors that drive EV uptake. Psychographic factors

such as the green values or social influence of potential buyers can assist in formulating effective marketing strategies.

4. Impact of Government Policies and Incentives: Further research could explore the effect of policies that can put effect for buying barrier for low budget and salaried person
5. Technological Innovations: With the evolution of electric vehicles, it would also be interesting to study the effect of advancements in aspects such as battery longevity, charging methods, and AI features on the attitude of end-users. There exists a business case for understanding the influence of such advancements in sustainability on consumers in the case of products offered by Tata Motors.
6. Urbanization and EV Adoption: Insights into the effects of urbanization and urban mobility patterns (like car-sharing, congestion, and so on) on EV penetration can aid Tata in formulating solutions targeted at urban consumers for cleaner cities.
7. Non-Adopters' Insights: Exploring the factors causing some consumers to be non-adopters despite their awareness may highlight certain psychological and sociocultural barricades which can also suggest how such problems can be solved.

To conclude, it is recommended that in the future research attention be directed towards these directions in order to have a better explanation of the factors influencing EV adoption and help Tata Motors in expanding its market share.

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