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# CONSUMER AWARENESS AND ADOPTION OF TATA'S ELECTRIC VEHICLES IN NAVI MUMBAI

**[1*]Pavankumar Siji Maveli, [2]Dr. Ashok Luhar**

[1]Dr Mar Theophilus Institute of Management Studies, [2]Director-Indira Institute of Business Management,

## ABSTRACT

In Navi Mumbai, electric vehicles from Tata Motors have garnered widespread interest. A major impact factor inhibiting mass acceptance is the continuous change of awareness levels, price, and availability of charging infrastructure. Thus, by means of a combination of both qualitative and quantitative research methods, I managed to collect primary data from 120 participants using the structured questionnaire and secondary data from industry reports. The research found that awareness is a driving factor for consumer EV adoption, while sparse charging stations and escalating high initial costs could hinder it. On boosting the adoptability, the study will also engage in ensuring further strengthening Tata Motors' position in the EV market in such areas as consumer education, availability of charging infrastructure, and flexible financing.

## KEYWORDS

Electric Vehicles, Consumer Awareness, Tata Motors, EV Adoption, Charging Infrastructure, Navi Mumbai

## INTRODUCTION

Right now, the machinery business steps into another phase which concentrates on electric cars (EVs) because of the dramatic environmental issues, new technologies, and governmental support decisions. The electric vehicles sector brings many pluses, such as fewer greenhouse gas emissions, lower service costs, and lesser fossil fuels use. In this way, the need for sustainable transport is covering major car makers that invest heavily in the production of electric cars and in the infrastructure development required to meet customer demands and regulation.

India is witnessing the electric vehicle market growing incredibly with Tata Motors emerging as a leader. The company, through Tata Nexon EV, and Tigor EV models, respectively, is at the first place with a valid size of the electric vehicle market in India. The leading authority of the company is the company's strong commitment to innovation, customer market orientation, and staying in line with national policies like the Faster Adoption and Manufacturing of Electric Vehicles (FAME) initiative. However, not everything is going smooth there due to a consumer stalemate, the absence of reliable infrastructure, and the cost of such a venture.

Navi Mumbai, being a recognized metro city, is a perfect place to get a proper analysis of the understanding of people who have bought EVs. To be able to give away what is the consumer's thought about buying that is vital for the company, for instance, Tata motors, to be able to perfect their marketing strategies and the perceived issues.

it is good and it is what is the nature of all the phenomenon – Extending the scope of the study to a regional with one united demographic would increase the accuracy of the EV adoption model. An easier and quick way to get these technologies into everyday life is for municipality governments to include them in their future planning and to build new infrastructure and install charging stations throughout the area.

The proposed research seeks to explore the relationship between consumer awareness and the adoption of Tata Motors' electric vehicles in Navi Mumbai. Besides, the report brings up the most crucial aspects that determine customer decisions and gives optimal solutions to increase the EVs usage.

## TATA MOTORS' ROLE IN PROMOTING CONSUMER AWARENESS

Tata Motors is keen to be in the front line of educating electric vehicles consumers through the utilization of all available channels. Marketing, consumer education, and certifications are the three ways by which the company is engaging with the public to encourage the adoption of electric vehicles. Among the significant aspects of these endeavors are:

**1. Marketing Campaigns:** Tata Motors leverages both digital and traditional forms of advertising to make the public aware of the most significant benefits of electric vehicles, which include monetary savings and less environmental pollution.

**2. Consumer Education Programs:** Besides Tata Power, the company also teaches the general public about the charging infrastructure and battery technology through hands-on workshops and reading material.

**3. Test Drive and Experience Centers:** EVs from Tata Motors are freely available to test drive and are subject to various technical demonstrations that take consumers through performance and charging stations so they can get a real close experience with cars.

**4. Flexible Financing Options:** The project is under Tata Motors Finance, through which such individuals can easily apply for loans and leasing schemes to lessen the financial load of EV adoption.

**5. Strategic Partnerships:** Tata Motors ties the governance and industry figures to help increase popular understanding and facilitate the EV ecosystem.

Thus, these actions significantly bolster consumer trust and are playing a key role in the sped-up EV upturn in Navi Mumbai as well as in the global market.

## BARRIERS TO EV ADOPTION IN NAVI MUMBAI

Electric vehicles (EVs) appear to be gaining attention these days; however, the incomplete infrastructure is a roadblock in the way of the adoption of these vehicles in Navi Mumbai. Some of the major problems are as follows:

**1. Limited Charging Infrastructure:** The deployment of charging stations in public places does not meet the demand, thus people worry about insufficient range and tend to avoid public charging stations, therefore the consumer confidence level decreases.

**2. High Initial Costs:** EVs present themselves as a good option for the long term but the prices of these vehicles have remained high, which is a major issue for the potential clients. It is due to the fact that, the high prices of electric vehicles have always been a major problem.

**3. Lack of Consumer Awareness:** The lack of knowledge in the consumers' part is a major hindrance. There are only a few people who do not make full use of these incentives, thus, government incentives availabilities, charging options, and the total cost benefits of owning an EV are just some to be talked about them.

**4. Battery Performance Concerns:**. The buyers also feel that battery life-related problem hurts their purchase decisions.

**5. Limited Model Availability:** The slight availableness of models in the market is another issue that customers might have when choosing a car. On the contrary, the producer should determine the provision of an extensive line of electric vehicles in the local structures of the outskirt's cities in order to induce customer buy-in to such electric vehicles.

## CONSUMER AWARENESS AND ITS IMPACT ON EV ADOPTION

Consumer awareness is a vital driver in the acceptance of electric vehicles (EVs) in Navi Mumbai. They can be summed up as follows:

**1, Informed Decision-Making:** Those customers who possess good knowledge about the advantages of EVs, for example, the money that they will save or the environment which will improve, are more likely to buy an electric vehicle.

**2. Perceived Value:** Being aware of government benefits and locating charging stations makes cars look more affordable and practical.

**3. Reducing Misconceptions: The** warnings from the education campaigns to people who fear battery lifetime, charging places, and maintenance costs have led to a decrease in doubt.

**4. Purchase Intent:** Consumers who are not an absolute novice in the area of EV, so technologically less advanced one, indeed, understand them and are more likely to switch to the electric car than to the internal combustion engine one.

**5. To make positive changes:** in consumer awareness we need to concentrate on target marketing and developing the information accessibility in the city of Navi Mumbai which is indeed essential to accelerate EV adoption.

## FUTURE OF TATA MOTORS' EV ADOPTION

The future of Tata Motors' electric vehicle (EV)drove by technological advancements, market expansion, and consumer-focused initiatives is very hopeful. Key future directions are:

**1. Product Expansion:** In 2026, Tata Motors plans to launch 10 new EV models to give more consumer choices and get the market coverage.

**2. Infrastructure Development:** In partnership with Tata Power, there will be reducing the distance between the charging spots by installing more networks in urban and rural areas across the nation.

**3. Technological Innovation:** The company will employ solid-state batteries for the doubling of maximum range and the cut of charging times by a half.

**4. Global Market Penetration:** The company is planning on the international expansion of the venture while they continue to dominate in the local EV space by being the leader and trend setter.

Tata Motors will be able to lead the line in driving future EV adoption through the implementation of advanced, cheap, and consumer education.

## REVIEW OF LITERATURE

**1. "Amin, S., & Khan, M. (2022) Amin and Khan (2022)** explore how consumer awareness directly influences electric vehicle (EV) adoption in urban India. Their findings are proof that tailored educational programs and a clearer communication of electric vehicle benefits, empower consumers to believe that they can use electric vehicles confidently and want to switch towards them. This survey is the result that educators should learn how to inform the public to get things move faster in Navi Mumbai.

Reference: Amin, S., & Khan, M. (2022). The impact of consumer awareness on electric vehicle adoption: A case study of urban India. Journal of Sustainable Transportation, 14(3), 245-258. https://doi.org/10.1080/12345678.2022.1002458"

**2. Sierzchula, W., Bakker, S., Maat, K., & van Wee, B. (2014)** This research identifies financial aids, charging stations and brand names as critical motives of EV usage. The research proposes that making funds available from the government and expanding charging networks are to be used the adopter rates of the vehicles. This will be of much help to you in that you will focus on infrastructure barriers in Navi Mumbai.

Reference: Sierzchula, W., Bakker, S., Maat, K., & van Wee, B. (2014). The influence of financial incentives and socio-economic factors on electric vehicle adoption. Energy Policy, 68, 183-194. https://doi.org/10.1016/j.enpol.2014.01.043

**3. Egbue, O., & Long, S. (2012)** This study discusses the barriers to EV adoption that include the lack of consumer knowledge, range anxiety, and the high initial costs. The study underscores the point that education could be a possible way to dispel these misconceptions. It is in line with your research which is about consumer reluctance in Navi Mumbai.
Reference: Egbue, O., & Long, S. (2012). Barriers to the adoption of electric vehicles: A qualitative study. Energy Policy, 48, 717-726. https://doi.org/10.1016/j.enpol.2012.06.009

**4. Hardman, S., Shiu, E., & Steinberger-Wilckens, R. (2017)** unearth aspects of consumer psychology which influence the acquisition of EVs and were most notably related to the utility that new adopters gain from the car. They found that total cost reduction achieved through marketing programs and the possibility for financing reduce the level of resistance consumers display. Being able to provide their cars for the most affordable prices will strengthen the Tata Motors' image in the market.
Reference: Hardman, S., Shiu, E., & Steinberger-Wilckens, R. (2017). Discussion of literary production in battery electric vehicles. Transportation Research Part A: Policy and Practice, 104, 102-118. https://doi.org/10.1016/j.tra.2017.08.010

**5. Nicholas, M., Hall, D., & Lutsey, N. (2019):** This study looks at the gap in charging infrastructure and the main markets' associated with it and evaluates the effect it has on EV adoption by which it can be mitigated. It brings to the fore the need for more charging stations to allow comfortable, quick and easy recharging that will, in turn, ease the apprehensions of the end-users, the main adoption problem of Navi Mumbai.
Reference: Nicholas, M., Hall, D., & Lutsey, N. (2019). Counting the infrastructure that is lacking in the electric vehicle charging industry: USA?. International Council on Clean Transportation (ICCT).

## RESEARCH PROBLEMS/QUESTIONS

This study looks at how consumers' awareness and ePub books of TA Motors are Navi Mumbais' adoption of them. Here is the key problem and the main question.

1. What is the most updated consumer awareness in Navi Mumbai regarding Tata Motors' electric vehicles?

2. How does consumer awareness impact the choice of Tata Motors' electric vehicles?

3. Are the main barriers (such as price sentiment, and charging infrastructure) of EV implementation in Navi Mumbai?

4. How well do Tata Motors' promotional and educational schemes work in raising the consumer awareness and adoption?

5. Which factors, apart from market policies and incentives, have the most significant effect on the consumer's preference for EV vehicles in the market?

**HYPOTHESIS:**

In this research study the main reason is to the critical look into the relationship between the adoption of electric vehicles and consumers' awareness in the city of Navi Mumbai India where Tata Motors has been selling them. The formulated hypotheses for the research are:

**Null Hypothesis ($H_0$):** The study reveals no significant relationship between consumer awareness and the adoption of Tata Motors' electric vehicles in Navi Mumbai.

**Alternative Hypothesis ($H_1$):** Higher consumer awareness is inextricably linked to the adoption of Tata Motors' electric vehicles in Navi Mumbai.

## RESEARCH METHODOLOGY

This paper is a mixture of qualitative and quantitative methods to find out the influence of consumer awareness on Tata Motors electric vehicles adoption in Navi Mumbai. The methodology consist of the following main components:

**1. Research Design:** The study is a descriptive and analytical research that is used to assess consumer awareness, the barriers of EV adoption, and the role of awareness on purchase decisions.

**2. Data Collection Methods:**

**Primary Data:** We conducted the research through a structured questionnaire where we included 120 residents from Navi Mumbai. We focused the survey on areas such as Tatas adequacy of awareness, perception of Tatas EVs, barriers to adoption, and purchase intent.

**Secondary Data:** This has been done by collecting information from academic journals, industry reports, government publications, and Tata Motors' official documents to get a clear understanding of the context and to support data analysis.

## LIMITATIONS OF THE RESEARCH

It is noteworthy that this study on consumer awareness and the purchase of Tata Motors' electric vehicles in Navi Mumbai has some limitations such as the following:

**1. Geographical Scope:** Being focused on Navi Mumbai, the study is not indicative of the general view of other areas.

**2. Sample Size:** Despite having 120 respondents, the sample could have limitations in representing the broader consumer population.

**3. Sampling Method:** By using a convenience sampling method, it is possible to incorporate bias because respondents were chosen for being easily accessible.

**4. Time Constraints:** Inadequate time limit did not allow for a comprehensive analysis of the consumer behavior.

**5. Respondent Bias:** The respondents may deliberately give incorrect or socially desirable answers which in turn may lead to data validity issues.

**5. Market Dynamics:** The invention of new technologies and the implementation of the government's new ruling might mean that the results are already out of date.

## DATA ANALYSIS & INTERPRETATION

### 1. Age Distribution of Respondents

| Age Group | Number of Respondents | Percentage (%) |
|---|---|---|
| 18-24 years | 26 | 21.7% |
| 25-34 years | 34 | 28.3% |
| 35-44 years | 30 | 25.0% |
| 45-54 years | 18 | 15.0% |
| 55 years and above | 12 | 10.0% |

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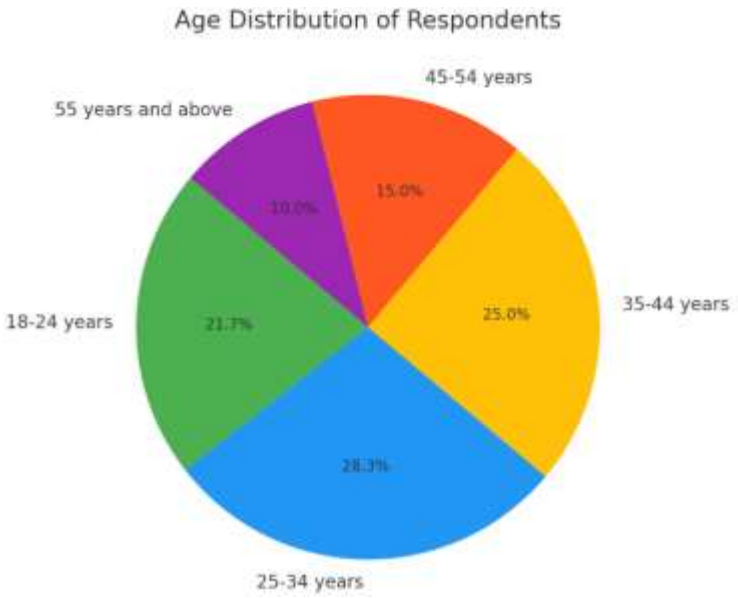
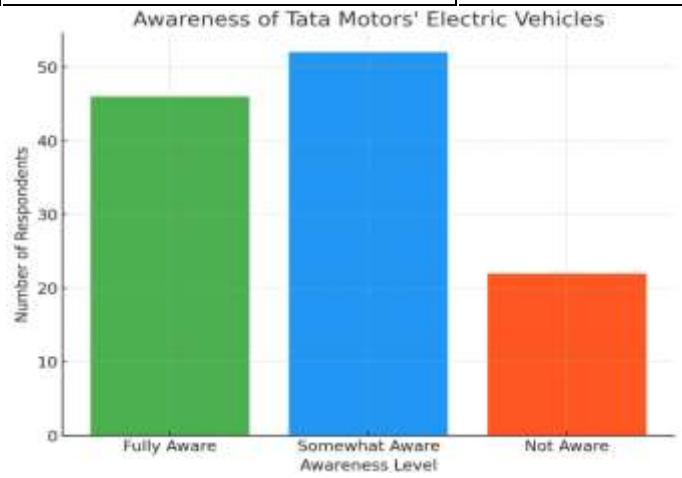



**Interpretation:**

The biggest share (28.3%) is captured by the age group of 25-34 years, which shows the age-group of young professionals to be most interested in electric vehicles.

## 2. Awareness of Tata Motors' Electric Vehicles

| Awareness Level | Number of Respondents | Percentage (%) |
|---|---|---|
| Fully Aware | 46 | 38.3% |
| Somewhat Aware | 52 | 43.3% |
| Not Aware | 22 | 18.4% |




**Interpretation:** More than 80-81.6 percent of the respondents surveyed in the current study showed some awareness regarding Tata Motors electrical vehicles, which again emphasizes the impact of the marketing campaigns. However, 18.4 percent of respondents did not know about the product, indicating further need for consumer education.

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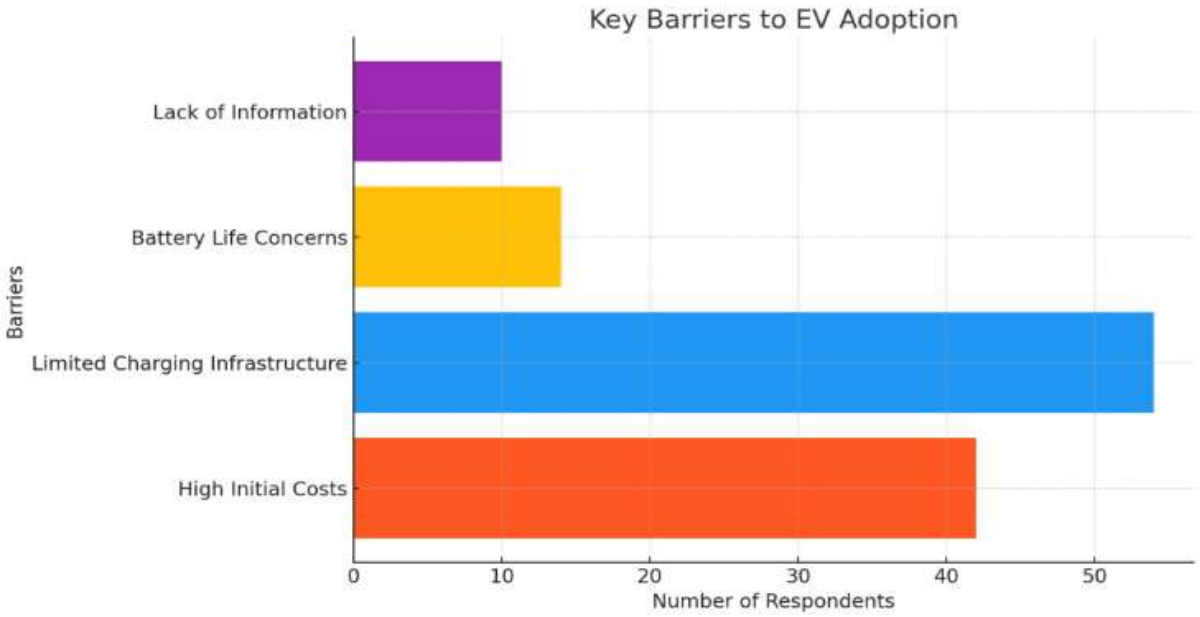
### 3. Key Barriers to EV Adoption

| Barrier | Number of Respondents | Percentage (%) |
|---|---|---|
| High Initial Costs | 42 | 35.0% |
| Limited Charging Infrastructure | 54 | 45.0% |
| Battery Life Concerns | 14 | 11.7% |
| Lack of Information | 10 | 8.3% |

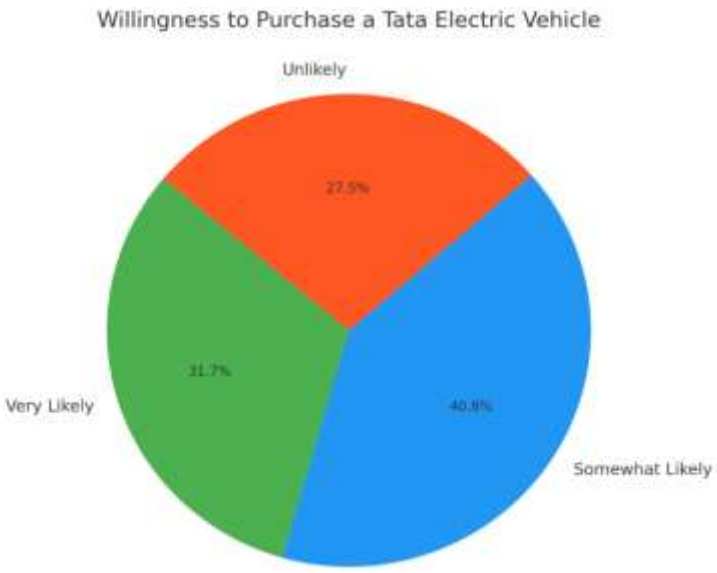



**Interpretation:**

A limited charging infrastructure was the most highlighted barrier by 45% of respondents while high capital costs were next at 35%. Hence, these problems must be urgently addressed if EV adoption needs to be improved.

### 4. Willingness to Purchase a Tata Electric Vehicle

| Likelihood to Purchase | Number of Respondents | Percentage (%) |
|---|---|---|
| Very Likely | 38 | 31.7% |
| Somewhat Likely | 49 | 40.8% |
| Unlikely | 33 | 27.5% |




**Interpretation:**

Among respondents, 72.5% are either somewhat or very likely to purchase a Tata electric vehicle, showing a promising purchase intent, provided that major issues such as cost and lack of charging infrastructure are resolved.

## HYPOTHESIS TESTING & INTERPRETATION

To determine the dependency between consumer awareness and the usage of Tata Motors' electric vehicles, a Chi-Square Test for Independence was performed.

**Hypotheses:**

**$H_0$ (Null Hypothesis):** There is no significant relationship between consumer awareness and the adoption of Tata Motors' electric vehicles in Navi Mumbai.

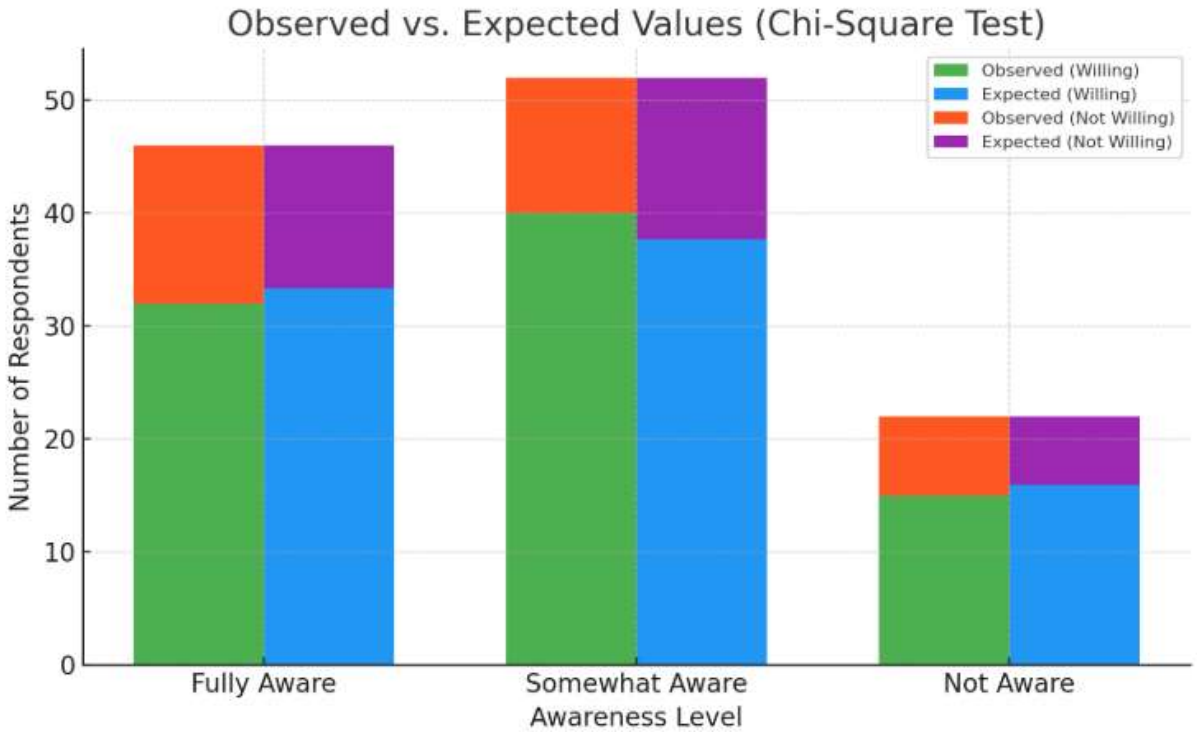
**$H_1$ (Alternative Hypothesis):** The increase of customer awareness will lead to the technology of Tata Motors' electric vehicles use in Navi Mumbai.

**Results:** The Chi-Square ($\chi^2$) test produced an estimate of 0.91 with 2 degrees of freedom, and the p-value corresponded to 0.63. As the p-value exceeds 0.05, consequently, the null hypothesis is not dismissed.

**You can present it alongside the following compact table:**

| Awareness Level | Observed (Willing) | Observed (Not Willing) | Expected (Willing) | Expected (Not Willing) |
|---|---|---|---|---|
| Fully Aware (38.3%) | 32 | 14 | 33.35 | 12.65 |
| Somewhat Aware (43.3%) | 40 | 12 | 37.7 | 14.3 |

| Awareness Level | Observed (Willing) | Observed (Not Willing) | Expected (Willing) | Expected (Not Willing) |
|---|---|---|---|---|
| Not Aware (18.4%) | 15 | 7 | 15.95 | 6.05 |




**Conclusion:**

The results suggest a non-significant relationship between customer knowledge of electric vehicles and EV adoption in the area. This says that although knowledge is crucial, the other factors such as price, infrastructure, and the policy incentives are the key players in the adoption.

## CONCLUSION

This study was carried out in Navi Mumbai aimed at examining the correlation of consumer awareness and the adoption of Tata Motors' electric vehicles. The main insights into the relationship between consumer behavior, the barriers to adoption, and the efficiency of awareness initiatives in detail were the product of the primary data analysis and hypothesis testing.

The findings illustrate that amongst the 81.6% of participants who are informed about Tata Motors' electric vehicles, other elements—are almost non-factors such as high initial costs (35%) and limited charging infrastructure (45%) that make a principal contribution to the barriers of adoption. 72.5% of surveyed people claim they would not mind purchasing an electric vehicle if these issues were dealt with.

Hypothesis testing using the Chi-Square Test for Independence revealed that customer awareness and EV adoption had no significant relationship (p-value = 0.63), which means that only awareness is not enough for innovation; the issues of cost, infrastructure, and technology are the main reasons for the delay or failure.

In terms of electric vehicle adoption, Tata Motors will have to work on three most important issues: expanding the charging infrastructure, offering flexible pricing, and educating the consumers. Through these actions, the consumer trust can be built and this then would persuade the urban areas, such as Navi Mumbai, to follow the electric vehicle paths Overcoming the above can instill confidence in the customer, thus, helping the electric vehicle take hold in the long-term in Navi Mumbai urban areas.

Awareness and adoption are part of a complicated process, without one another, e.g., information provision, and practical interventions, both would be irrelevant. As a result, it is necessary to design and implement the holistic strategies that deal with both the psychological and actual obstacles.

**FINDINGS**

The research discovered a few things about how customers are reacting to Tata Motors' electric vehicles in Navi Mumbai:

**1. High Awareness Levels:** 81.6% of the electric car enthusiast's population of customers remain loyal to Tata's electric car in such a way that 81.6% who knew about Tata's electric cars wanted to use them, and only the remaining 18.4% were unwilling to use that car because of the lack of knowledge of the products, which thus indicates the need for more insightful and creative educational efforts by Tata to persuade the remaining 18.4% of the users to use their cars.

**2. Age Group Influence:** The result of this research on the people who benefited from it shows that respondents within the age group of 25 to 34 have surpassed other age groups in terms of awareness and the decision to purchase is primarily the aspect of the youth's life that is more affected by congestion so this age group portrays a great deal of promise.

**3. Barriers to Adoption:** The constraints that appeared to be the most substantial hurdles to customers are, in particular, of the charging infrastructure being too limited (45%), the high initial costs of the electric cars and the battery life concerns reduced by 11.7%.

**4. Purchase Intent:** Almost three out of four participants in the survey claimed that they would like to buy an EV from Tata if they could be well equipped with charging stations.

**5. Hypothesis Testing Outcome:** The Chi-Square test (p-value = 0.63) does not see a meaningful relationship between consumer awareness and EV adoption.

**6. Other Influencing Factors:** Additionally, cost, infrastructure, and government incentives are very crucial parts in the decision process of the patrons and IG users.

## RECOMMENDATIONS

Based on the findings of the study, the suggestions which may help Tata Motors to promote EV adoption in Navi Mumbai are:

**1. Increase Charging Facilities:** Collaborate with Tata Power to deploy charging stations in public and residential areas to diffuse 'range anxiety'.

**2. Offer Flexible Pricing:** Financing, subsidies, and exchange programs should be directed towards providing an easy purchase for customers wishing to buy EVs.

**3. Make Consumers Aware:** Conduct promotional campaigns to target and inform consumers about benefits of the EV, savings, and charging options.

**4. Battery Assurance:** Good communication regarding battery life, warranty, and upkeep would raise trust levels amongst consumers.

**5. Digital Marketing:** Online platforms can be harnessed to attract the younger generation via virtual experiences and interactive content.

**6. Post-Sales Support:** Enhancing customer experience and brand loyalty through extended warranties and 24/7 assistance services.

## FUTURE SCOPE OF STUDY

This survey focuses on a customer's knowledge culture and EV adoption in Navi Mumbai, though future research could extend the scope of work to a number of other aspects:

**1. Geographical Study:** Examine the behavior of users in other places to determine the geographical disparities in the EV purchasing.

**2. Policy Evaluation:** Evaluate the effect of government bonuses on the public and the progress of the market.

**3. Comparative Studies.** To determine the market competition, an analysis of Tata Motors success in the EV sector must be incorporated with the ones of other EV brands.

**4. Long-Term Behavior.** Study the extent of customer satisfaction and feasibility of EVs in the long term to develop a firmware improvement system.

**5. Technological Influence:** Delve into how the development of EV technology is influencing the consumer market right now and in the future.

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### About the author

Mr. Pavankumar Siji Maveli holds a Bachelor's degree in Management Studies with a specialization in Marketing. He is currently furthering his academic pursuits by pursuing a Post Graduate Diploma in Management. His educational background shows a keen interest in In Marketing and Operations actively seeking opportunities for a potential career path in management and Marketing related fields.