

CONSUMER CENTRIC STUDY ON ELECTRICAL VEHICLES PRODUCED BY TATA MOTORS

PROJECT REPORT SUBMITTED TO
MAHATMA GANDHI UNIVERSITY, KOTTAYAM
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE

BACHELOR OF COMMERCE
(2021-2024)

Submitted by

VASUDEV R (REG NO. 210021069252)

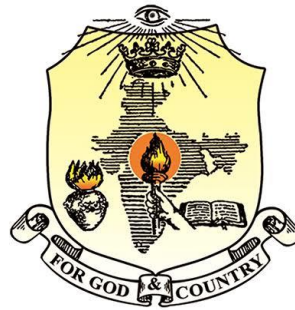
JOEL JIBY (REG NO. 210021069229)

ASWIN SARASAN (REG NO. 210021069261)

UNDER THE SUPERVISION OF

DR. PONNY JOSEPH

(Asst. Professor, HOD)



BHARATA MATA COLLEGE THRIKKAKARA KERALA MARCH 2024

SCHOOL OF COMMERCE AND MANAGEMENT STUDIES

BHARATA MATA COLLEGE,

THRIKKAKARA P.O., COCHIN 682 021

(Affiliated to Mahatma Gandhi University, Kottayam)



This is to certify that this Dissertation entitled “**CONSUMER CENTRIC STUDY ON ELECTRICAL VEHICLES PRODUCED BY TATA MOTORS**” has been prepared by VASUDEV R, JOEL JIBY and ASWIN SARASAN under my supervision and guidance in partial fulfilment of the requirements for the award of the Degree of Bachelor of Commerce of the Mahatma Gandhi University. It has not previously formed the basis for the award of any Degree, Fellowship, Associateship etc.

They are allowed to submit this Project Report.

DR Ponny Joseph,
Head of the Department,
School of Commerce and management studies.
Bharata Mata College,
Thrikkakara, Kochi.

DECLARATION

We hereby declare that the project “**CONSUMER CENTRIC STUDY ON ELECTRICAL VEHICLES PRODUCED BY TATA MOTORS**” is our original work and has not been submitted earlier to MG University or to any other Universities. We have undertaken this project work in partial fulfilment of the requirements of B. Com 2021-2024 in Bharata Mata College, Thrikkakara, Ernakulam affiliated to MG University, Kottayam.

VASUDEV R

JOEL JIBY

ASWIN SARASAN

THRIKKAKARA
DATE:

ACKNOWLEDGEMENT

It is with great honour that we present the outcome of our project, "CONSUMER CENTRIC STUDY ON ELECTRICAL VEHICLES PRODUCED BY TATA MOTORS. "

We begin by expressing our deepest appreciation to Dr. Ponny Joseph, our research guide and Head of the Department of Commerce at Bharata Mata College, Thrikkakara, for her invaluable guidance and steadfast support throughout this study.

We extend our heartfelt gratitude to Dr. Johnson K M, the Principal of our college, for his encouragement and backing in the successful completion of this project. Our thanks also go to the teachers and supportive friends whose insights and encouragement enriched our work.

Finally, we are thankful to the Almighty for His divine blessings, which have guided us on this journey of discovery and learning.

VASUDEV R

JOEL JIBY

ASWIN SARASAN

THRIKKAKARA

DATE :

CONTENTS

SL.NO.	TITLE	PAGE NO.
1	INTRODUCTION	1-5
2	THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE	6-12
3	DATA ANALYSIS AND INTERPRETATION	13-25
4	FINDINGS, SUGGESTION AND CONCLUSION	26-28
5	BIBLIOGRAPHY	29-31
6	APPENDIX	32-35

LIST OF TABLES

SL.NO.	TITLE	PAGE NO.
1	AGE WISE DISTRIBUTION	14
2	GENDER WISE DISTRIBUTION	15
3	FAMILIARITY WITH TATA EV CARS	16
4	CONSIDERRATION OF TATA EV CARS	17
5	FACTORS INFLUENCING PURCHASE DECISION	18
6	IMPORTANCE OF RANGE	19
7	AFFORDABILITY OF TATA EV CARS	21
8	INFORMATION SOURCE	22
9	CONSIDERATION FOR ENVIRONMENTAL IM- PACT	23
10	CUSTOMER SATISFACTION ON AFTER SALES SERVICE	24

LIST OF FIGURES

SL.NO.	TITLE	PAGE NO.
1	AGE WISE DISTRIBUTION	15
2	GENDER WISE DISTRIBUTION	16
3	FAMILIARITY WITH TATA EV CARS	17
4	CONSIDERRATION OF TATA EV CARS	18
5	FACTORS INFLUENCING PURCHASE DECISION	19
6	IMPORTANCE OF RANGE	20
7	AFFORDABILITY OF TATA EV CARS	21
8	INFORMATION SOURCE	22
9	CONSIDERATION FOR ENVIRONMENTAL IMPACT	24
10	CUSTOMER SATISFACTION ON AFTER SALES SERVICE	25

CHAPTER -1

INTRODUCTION

1.1 INTRODUCTION

With the introduction of electric vehicles (EVs), the automobile industry has entered a transformational era that is upending conventional thinking about sustainability and mobility. Electric cars have become a viable way to lessen carbon emissions and lessen reliance on fossil fuels as the world struggles with the environmental effects of conventional internal combustion engines. In light of this, determining how consumers feel about electric cars becomes essential to determining how widely this ground-breaking technology will be adopted. The transition to electric mobility is not just a technical advancement; rather, it is a social revolution in which consumer attitudes will have a significant influence on how transportation is developed in the future. The goal of this study is to better understand how consumers view electric vehicles by examining the variables that affect personal preferences and beliefs.

The automobile industry has experienced a turnaround in recent years toward environmentally friendly and sustainable transportation options, with electric cars (EVs) emerging as a leading contender in this revolutionary journey. A key player in the global automotive scene, Tata Motors has been actively advancing this evolution by launching a wide variety of electric vehicles that are in line with the global environmental agenda. This study aims to do a thorough analysis of the technological innovations, indicators of success, and environmental impact of the electrical vehicles manufactured by Tata Motors. Furthermore, the study intends to explore the crucial area of consumer perception in relation to Tata Motors' electric vehicles, exploring the elements that impact personal choices and viewpoints. As the automotive landscape undergoes this remarkable transformation, Tata Motors stands at the forefront, embodying the shift towards environmentally conscious transportation. With a diverse portfolio of electric vehicles, Tata Motors has not only embraced technological advancements but also positioned itself as a key player in the global push for sustainability.

This study seeks to delve into the realm of consumer perceptions surrounding Tata Motors' electric vehicles, aiming to uncover the intricacies that influence individual preferences and attitudes. By examining the technological innovations, indicators of success, and environmental impact of Tata Motors' EVs, we aim to provide a comprehensive understanding of how these vehicles are perceived in the context of the evolving automotive industry. Through this analysis,

we can gain valuable insights into the factors that drive consumer choices and shape the future of electric mobility.

1.2 SIGNIFICANCE OF THE STUDY

In the current automotive scene, research and project work on consumer perception and Tata Motors' electric vehicles is extremely important. Electric vehicles have emerged as a critical answer to addressing environmental concerns, given the growing emphasis on sustainability worldwide and the pressing need to minimize carbon footprints. Tata Motors, a recognized name in the automotive industry, has demonstrated its commitment to being green by launching cutting-edge electric vehicles. In addition to adding to the scholarly debate, researching and comprehending all aspects of these electric cars, including their performance metrics and technological features, also offers priceless information for the automobile sector.

The aim of this study is to conduct a consumer-centric analysis to identify the underlying reasons behind the lower-than-expected adoption rates of Tata Motors' electric cars. By exploring consumer perceptions, preferences, and barriers to adoption, this research will provide valuable insights for Tata Motors and the broader automotive industry. The findings will not only help Tata Motors refine their electric vehicle offerings but will also inform strategies for marketing, pricing, and infrastructure development to enhance consumer acceptance and uptake of electric cars produced by Tata Motors.

1.3 STATEMENT OF THE PROBLEM

The automotive industry is witnessing a rapid transition towards electric vehicles (EVs) as a sustainable solution to reduce carbon emissions and combat environmental challenges. Within this shift, Tata Motors has emerged as a key player, introducing a range of electric cars to the market. However, despite the growing availability and advancements in EV technology, consumer adoption rates remain variable and often lower than anticipated.

This project seeks to address the following problem: Despite Tata Motors' efforts to produce innovative electric cars, consumer adoption and perception of these vehicles are not reaching expected levels. There is a gap in understanding the specific factors influencing consumers'

decisions when considering Tata Motors' electric cars, including perceptions of performance, range anxiety, charging infrastructure, pricing, and overall brand perception.

1.4 SCOPE OF THE STUDY

This study will comprehensively analyze various factors influencing consumer attitudes and behaviors towards Tata EV cars in Ernakulam. It will investigate consumer preferences, perceived benefits, adoption barriers, market trends, and offer tailored recommendations for Tata Motors to optimize consumer adoption and perception within the region.

1.5 OBJECTIVES OF THE STUDY

- Exploring consumer Perception of Tata Electric Vehicle Motors
- Examining Determinants Affecting Consumer Choices in the Acquisition of Tata EV Cars.
- Assessing Customer Contentment about tata EV cars.

1.6 RESEARCH METHODOLOGY

Research methodology refers to the systematic and structured strategy utilized in a study to collect, examine, and comprehend data. It includes the methodologies for design, sampling, data gathering, and analysis as well as the strategies, techniques, and procedures involved in doing research.

SAMPLE: EV consumers, prospective consumers.

SAMPLING DESIGN: Convenience Sampling (Convenience sampling is a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access. This is due to geographical proximity, availability at a given time, or willingness to participate in the research.)

SAMPLE SIZE: The study involved 100 samples representing respondents.

STATISTICAL TOOL : Statistical tools such as percentage method, pie charts, and bar diagrams are utilized for analyzing and interpreting data.

SOURCES OF DATA:

Primary Data- The primary data was collected with the help of structured questionnaire developed through google form through which were sent to the respondents.

Secondary Data-The secondary data is collected from google and journals such as Fastrack, SmartDrive, Autocar and also vlogs from Baiju N Nair.

1.7 LIMITATIONS OF STUDY

1. **Sample Size and Representativeness:** The study's sample size of 100 respondents may not fully represent the diverse population of potential Tata EV car consumers. A larger and more diverse sample could provide a more accurate reflection of consumer perceptions and preferences.
2. **Self-Reporting Bias:** The data collected from participants' self-reports may be influenced by self-reporting bias, potentially impacting the validity of the findings
3. **Limited Scope of Questions:**The questionnaire focused on specific aspects such as familiarity with Tata EV Motors, concerns, perceptions, and preferences. It did not cover other potential factors influencing consumer decisions, such as financial considerations, lifestyle factors, or brand loyalty.
4. **Subjectivity in Interpretation:** Different analysts may interpret the responses differently, leading to potential biases in the findings. It is essential to acknowledge and minimize subjectivity to ensure the objectivity of the study.

1.8 CHAPTERISATION

Chapter 1: Introduction

Introduction to the transformation of the automobile industry with the rise of electric vehicles (EVs) and the importance of consumer attitudes towards EV adoption.

Chapter 2: Literature Review and Theoretical Framework

Exploring the history and benefits of EVs, technological innovations in EVs, consumer perceptions, Tata Motors' role in the EV market, and relevant theoretical frameworks.

Chapter 3: Data Analysis and Interpretation

Analysis of Tata Motors' EV technological features, findings from consumer perception surveys, and interpretation of the data to draw insights.

Chapter 4: Findings, Suggestions, and Conclusions

Summary of technological innovations and consumer perceptions, implications for Tata Motors, recommendations for improvement, conclusions, and areas for future research.

CHAPTER - 2
THEORETICAL
FRAMEWORK AND
REVIEW OF
LITERATURE

2.1 THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

This study creates a thorough theoretical framework for examining Tata Motors' electrical vehicles (EVs) and the associated consumer impressions. The study, which makes use of the Innovation Diffusion Theory, looks at the variables affecting consumers' perceptions of the relative benefits of Tata Motors' EVs in terms of performance, cost savings, and environmental effects. The study investigates the influence of customers' attitudes, subjective norms, and perceived behavioral control on their intention to adopt electric vehicles (EVs), utilizing the Theory of Planned Behavior. There will also be an emphasis on perceived hazards related to EVs, such as worries about battery life and charging infrastructure. The study analyzes Tata Motors' brand equity and the efficiency of the marketing mix (4Ps) in promoting electric vehicles (EVs), including theories of branding and marketing.

In addition to examining the function of government regulations and incentives and their impact on consumer choices, environmental psychology principles are combined to understand how consumers' environmental views influence their decision-making. In order to examine how social networks shape views, social influence and network theory are taken into consideration. The post-adoption model is then used to analyze customer behaviors such as advocacy, loyalty, and happiness after EV adoption. Using both qualitative and quantitative methodologies for a nuanced analysis, this integrated framework offers a diverse approach to thoroughly exploring the confluence between Tata Motors' EV offerings and consumer perceptions.

2.2 INDUSTRY DETAILS

One of the biggest names in the car business, Tata Motors, is a representation of sustainability and innovation. Since its establishment in 1945, the business has grown to become one of India's biggest and most diverse automakers, operating on several continents. Tata Motors is a vehicle manufacturer that has a long history of engineering expertise. Their product line includes buses, commercial trucks, and compact cars. The organization has not only achieved noteworthy advancements in traditional automotive technologies but has also surfaced as a trailblazer in the domain of electric vehicles (EVs), thereby augmenting the worldwide transition towards sustainable mobility. The industrial landscape of Tata Motors will be thoroughly examined as part of this industrial exploration project, with an emphasis on the company's manufacturing

procedures, R&D projects, market positioning, and strategic initiatives in the fast-paced automotive industry. This inquiry will yield important new information about the company's technological innovations, industrial strength, and influence on the direction of the automotive industry—especially with regards to electric vehicles.

2.3 FOUNDERS AND CEO

^TATA GROUP are the founders of TATA motors and current CEO Marc Llistosella.

2.4 HISTORY AND CONCEPTION

Originally known as Tata Engineering and Locomotive Co. Ltd., J.R.D. Tata and Sumant Moolgaokar formed Tata Motors, a division of the Tata Group, in 1945. The company's early years saw a major contribution to India's industrialization through the production of engineering equipment and locomotives. With the help of Daimler-Benz AG, Tata Motors rose to prominence in the commercial vehicle industry and produced India's first Mercedes-Benz truck in 1954. Later, the business expanded into the passenger car market, introducing the legendary Tata Sierra SUV in 1991. Following the 2004 acquisition of Daewoo Commercial Vehicles Company, Tata Motors' global footprint in the commercial vehicle industry was bolstered. Notably, the 2008 launch of the Tata Nano signaled the beginning of an ambitious project to build the most affordable car. Tata Motors has invested in sustainable mobility solutions and introduced novel types of electric vehicles in response to changing market trends. The company's journey is marked by a dedication to technical innovation, global expansion, and flexibility in response to the ever-changing automotive scene. These attributes are indicative of its vital role in defining the automotive industries in India and around the world.

2.5 NAME AND LOGO

Its origin traces back to Indica car brand which incorporated a straight-lined “T” in the ring.



1945 - 1988



1988 - 2003

TATA MOTORS

2003 - now

2.6 SERVICES PROVIDED BY TATA MOTORS

The well-known international automaker Tata Motors provides a wide range of services to meet different automobile needs. Tata Motors is primarily known for producing a wide range of vehicles, such as automobiles, trucks, and vans. The company also offers innovative solutions with an emphasis on performance, sustainability, and creativity. The company offers a comprehensive after-sales support system in addition to vehicle manufacture. Tata Motors has a vast network of service centers that provide authentic spare parts and skilled technicians to guarantee effective maintenance and repairs. The business also prioritizes client happiness by offering extensive warranty plans and support services. Tata Motors is dedicated to the development of technology, and as such, they incorporate smart technologies and networking solutions into their cars to improve both the user experience and safety.

2.7 ELECTRICAL VEHICLES PRODUCED BY TATA MOTORS

Tata Motors has announced the electric variants of the Tata Ace commercial vehicle, which will be delivered in 2022 and powered by TM4 electric motors and inverters, as well as the Tata Indica passenger car. For US\$1.93 million in 2008, the UK-based Tata Motors European Technical Centre purchased a 50.3% stake in the Norwegian electric vehicle technology company Miljøbil Grenland/Innovasjon, with the intention of introducing the electric Indica hatchback on the European market the following year.[56][57][58] Four CNG-Electric Hybrid low-floored Starbuses were given to the Delhi Transport Corporation by Tata Motors in September 2010 in preparation for the 2010 Commonwealth Games. These were the first buses in India to be utilized for public transportation that was also environmentally friendly. The Nexon was unveiled by Tata Motors in December 2019.

2.8 LIST OF ELECTRIC CARS

- TATA NEXON EV
- TATA TIGOR EV
- TATA ALTROZ EV
- TATA TIAGO EV
- TATA PUNCH EV

2.9 LITERATURE REVIEW

Consumer Perception Towards Electric Vehicles Dipanjan Acharya, Shubham Tyagi, Suhans Bansal

With the goal of offering a comprehensive understanding, the research explores consumers' opinions of electric cars (EVs) in great detail from a scientific perspective. It studies how EVs would be used in India's future across a range of segments. The study highlights the important impact that consumer happiness plays in developing sector-specific perspectives on a product by heavily influencing word-of-mouth marketing. The interaction between consumer experience, industry insights, and word-of-mouth emphasizes how important satisfaction is in influencing people's perceptions of electric vehicles.

The 2020 Journal of Cleaner Production report by Rajeev Ranjan Kumar and Kumar Alok discusses the increasing amount of academic literature on electric cars. The study examines 239 publications from Scopus Q1 journals using an integrative review methodology, classifying factors into antecedents, mediators, moderators, outcomes, and sociodemographic. The results address a wide range of subjects, including well-known subjects like charging infrastructure development and total cost of ownership as well as understudied ones like dealership experience and resilience. The study provides a thorough nomological network and highlights the significance of comprehending the dynamics behind the adoption of electric vehicles, providing insightful information to scholars and policymakers alike. Important policy suggestions are offered, which help to advance our understanding of the long-term effects of adopting electric vehicles.

BK Chaturvedi, Atri Nautiyal, TC Kandpal, Mohammed Yaqoot study explores India's ambitious EV30@30 campaign, aiming for a 30% electric vehicle (EV) share by 2030. The study underscores the significant links between EV adoption and sustainable development targets. Projections highlight the potential reduction in petroleum fuel usage, a shift in consumer demand towards EVs, and the necessity for expanded electricity and charging infrastructure. The article aims to document India's envisioned EV transition, emphasizing the multifaceted implications for various stakeholders involved in this transformative journey.

Jayanthila Devi study investigates the rise of Tata Motors in the production and sales of electric vehicles (EVs), aligning with the global shift towards sustainable alternatives in transportation. Focused on the untapped Indian EV market, particularly for two-wheelers, the study examines Tata Nexon EV Max's impact on the industry. The comparison between Tesla and Tata Motors, both influential in the global automobile market, is a key aspect. The author employs a survey and gathers secondary data from sources such as Tata Motors Ltd.'s websites, research papers, newspaper articles, and journals, emphasizing the study's concentration on the impact of Tata Motors in the evolving EV landscape.

PRASHANT SINGH study delves into the adoption barriers and preferences surrounding electric vehicles (EVs) in India, employing an online survey with 101 respondents from a specific location. Range anxiety, expense, and inadequate charging infrastructure emerge as primary obstacles to EV adoption. Favorable perceptions among customers center on low maintenance costs, environmental benefits, and technological advancements. Tata Motors stands out as the preferred brand for electric cars, with MG Motors following closely. The study underscores the importance of affordable pricing and extended range to enhance EV utilization in the Indian market.

Samip Mashru, Rajesh Baria, Amit Kaswan, M Sumetha study explores Tata Motors' global expansion strategy in the automotive manufacturing sector using the Flexible Strategy Framework. The company's approach aims to balance change and continuity forces, contributing to its competitiveness in the global market. Tata Motors' ability to integrate innovation and adaptability has positioned it favorably against competitors. The study innovatively investigates

the interplay between competitiveness and internationalization within the context of a dynamic strategy, referred to as the flowing stream strategy.

Nadu -S Shrilatha, K Aruna study focuses on the increasing reliance on personal vehicles in India, leading to heightened carbon emissions and air pollution. In response, the government and environmental agencies are advocating for electric vehicles (EVs) as a solution. A study in Tamil Nadu, using a convenient random sampling technique with 112 participants, reveals a growing consumer interest in EVs. Notably, despite this trend, consumers continue to prefer Hyundai vehicles. The shift towards EVs is attributed to the government's loan subsidy program, indicating the significance of policy incentives in influencing consumer choices.

Fanchao Liao, Eric Molin and Bert van Wee study aims to investigate the factors influencing the low market penetration of electric vehicles (EVs) despite government regulations. The study contrasts economic and psychological approaches, applying a conceptual framework to structure the review. Modeling strategies and customer preferences for finance, technology, infrastructure, and policy-related features are explored to inform policymakers and guide future research on promoting EV adoption.

Electric vehicles in India: Market analysis with consumer perspective, policies and issues - Pritam K Gujarathi, Varsha A Shah, Makarand M Lokhande In the Journal of Green Engineering, Gujarathi, Shah, and Lokhande's study analyzes the state of electric vehicles (EVs) in India. It outlines the emergence of new global players like Tesla and BYD, highlighting their transformative impact. Shifting to the Indian context, the paper explores the current EV market, key players, recent developments, and the status of Indian road transportation. Government policies and initiatives are discussed, providing regulatory insights. A case study offers a consumer perspective, revealing ground realities. The paper also covers EV charging tariffs and addresses challenges hindering Indian market growth. It concludes with concise recommendations for policies and promotions, considering both local and global scenarios. This study provides a comprehensive snapshot of the EV landscape in India, encompassing market dynamics, policies, consumer views, and challenges.

A study of consumer perception and purchase intention of electric vehicles

Pretty Bhalla, Inass Salamah Ali, Afroze Nazneen

In the European Journal of Scientific Research, Bhalla, Ali, and Nazneen examine consumer perception and purchase intentions of electric vehicles (EVs). The study highlights global interest in India's technological base, large customer pool, and cost advantages, attracting major EV manufacturers. Factors influencing consumer acceptance, including environmental concerns, cost, trust, technology, infrastructure, and societal acceptance, are explored. The findings emphasize the pivotal role of environmental concerns and consumer trust in shaping perceptions of EV purchases, while challenges include cost, infrastructure, and social acceptance. The study underscores the need for government involvement to promote EV sales through environment policies, infrastructure development, and subsidized vehicle costs or reduced interest rates. This research provides concise insights into shaping consumer attitudes towards EVs, offering practical implications for policymakers and the automotive industry to drive widespread adoption in India.

Vehicles: Status and roadmap for India, Parimita Mohanty, Yash Kotak In Mohanty and Kotak's chapter on "Electric Vehicles: Status and Roadmap for India," the authors address the burgeoning transport sector in India, with a focus on the dominance of two-wheelers, constituting 75% of total vehicles. The chapter highlights the environmental challenges posed by increased vehicle numbers, including air quality deterioration and CO₂ emissions, which account for 14% of India's energy-related CO₂ emissions. The authors underline the substantial growth in the Indian auto industry, producing 23.37 million vehicles annually in FY 2014-15, with a projected compound annual growth rate of 10.5%. The chapter concludes by providing an overview of India's programs and policies regarding electric vehicles, offering valuable insights into the challenges and prospects of transitioning to electric mobility in the country. This concise review recognizes the chapter's comprehensive coverage of India's electric vehicle landscape, encompassing environmental concerns, growth trends, and policy considerations.

Evolution of electric vehicle and its future scope -PM Sneha Angeline, M Newlin Rajkumar

Angeline and Rajkumar's article in Materials Today: Proceedings succinctly examines the "Evolution of Electric Vehicle and its Future Scope." The authors advocate for electrification as a key solution for clean and energy-efficient transportation, addressing pressing environmental concerns. They highlight the substantial benefits of electric vehicles (EVs) for the locomotive industry and the power sector, emphasizing their reliability. The paper underscores EVs as alternative power sources for households, contributors to grid ancillary services, and facilitators of intermittent resource integration for vehicle charging. Noteworthy features include minimal maintenance and ease of residential charging. The authors also emphasize the significant role of EVs in the power sector, particularly in the application of smart grids and their communication within the grid. Concluding with a thorough examination of challenges, the article provides a concise yet comprehensive overview of EVs' evolution, benefits, and potential impact on transportation and the energy sector.

A study on the adoption of electric vehicles in India: the mediating role of attitude -Anil Khurana, VV Ravi Kumar, Manish Sidhpuria

Khurana, Kumar, and Sidhpuria's study in Vision explores the adoption of electric vehicles (EVs) in India, focusing on the mediating role of attitude. The paper addresses global environmental concerns, emphasizing the promotion of EVs as a solution to mitigate toxic emissions from internal combustion engines. Key obstacles to consumer adoption, such as high costs and limited charging infrastructure, are highlighted. With the Indian government aiming for 'only Electric Vehicles' on the road by 2030, the study targets existing car owners in India. Utilizing Structured Equation Modeling (SEM), the research identifies attitude (ATT) as a significant mediator influencing the adoption of electric cars. The study provides timely and valuable insights into factors shaping consumer decisions, offering relevance for policymakers and industry stakeholders involved in promoting EV adoption in India.

Range Anxiety on electric vehicles in India-Impact on customer and factors influencing range Anxiety -Ganesh Sankaran, S Venkatesan, M Prabhahar

Sankaran, Venkatesan, and Prabhahar's paper on "Range Anxiety on Electric Vehicles in India" focuses on the challenges hindering the widespread adoption of Battery Electric Vehicles (BEVs) in the Indian market. The authors recognize the global and local drivers behind the growth of BEVs, including government regulations and green mobility initiatives. Despite the potential, challenges such as driving range, battery costs, and insufficient charging infrastructure impede mass production. The study delves into customer pain points in the Electric Vehicle (EV) purchase process, emphasizing range anxiety as a significant concern.

CHAPTER -3
DATA ANALYSIS
AND
INTERPRETATION

3.1 DATA ANALYSIS AND INTERPRETATION

Data interpretation and analysis involves the examination of data to uncover meaningful insights, trends, and patterns.

Survey Overview:

The survey aimed to gather insights into consumer preferences and perceptions regarding electric vehicles (EVs). A total of 100 participants responded to the survey, providing valuable data for analysis.

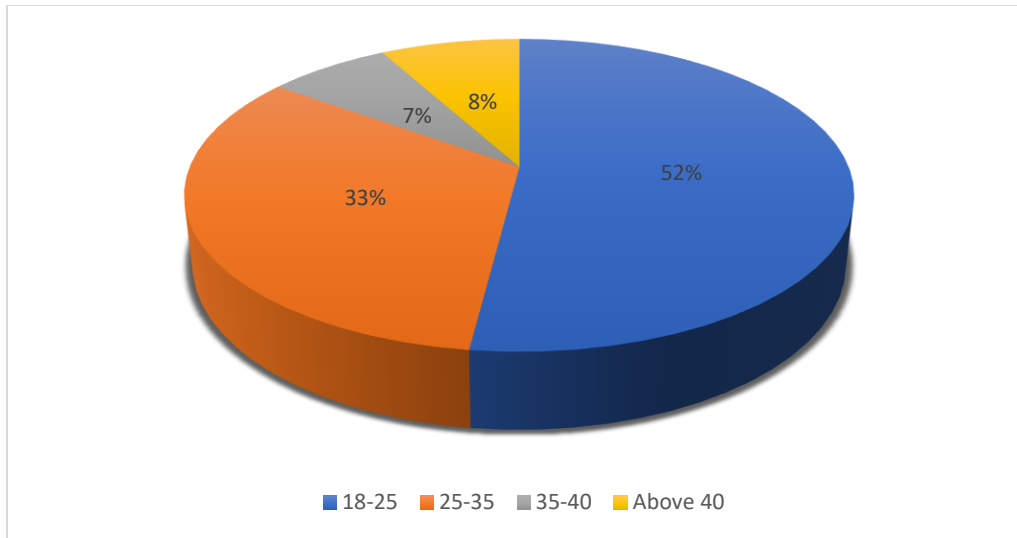
3.2 DEMOGRAPHIC ANALYSIS

The term "demographic analysis" describes the study and interpretation of a population's age, gender, income, education, and other socioeconomic aspects. With the help of patterns, behaviors, and preferences that can guide targeted initiatives and decision-making, it seeks to shed light on the makeup and diversity of a group.

3.2.1 AGE WISE DISTRIBUTION

The respondents are categorized on the basis of age group. The different categories are 18-25, 25-35, 35-40 and above 40.

AGE GROUP	NO. OF RESPONDENTS	PERCENTAGE
18-25	52	52
26-35	33	33
36-40	7	7
Above 40	8	8
Total	100	100

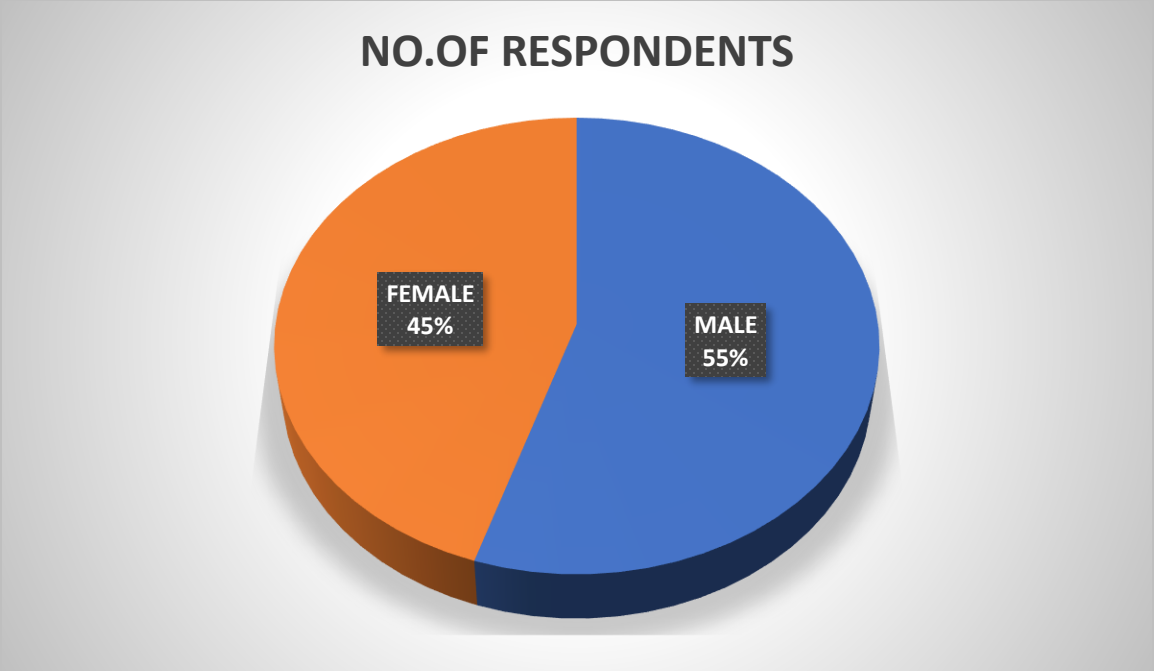


INFERENCE: This table reveals that out of different age groups, majority of the respondents are between the age 18-25 (52%). 33% of respondents under this study came in between the age group of 25-35. 7% of the respondents came in between 35-40, while the remaining 8% of respondents are in the age group above 40.

3.1.2 GENDER WISE DISTRIBUTION

The respondents were classified on the basis of gender as male and female.

GENDER	NO. OF RESPONDENTS	PERCENTAGE
MALE	55	55
FEMALE	45	45
TOTAL	100	100



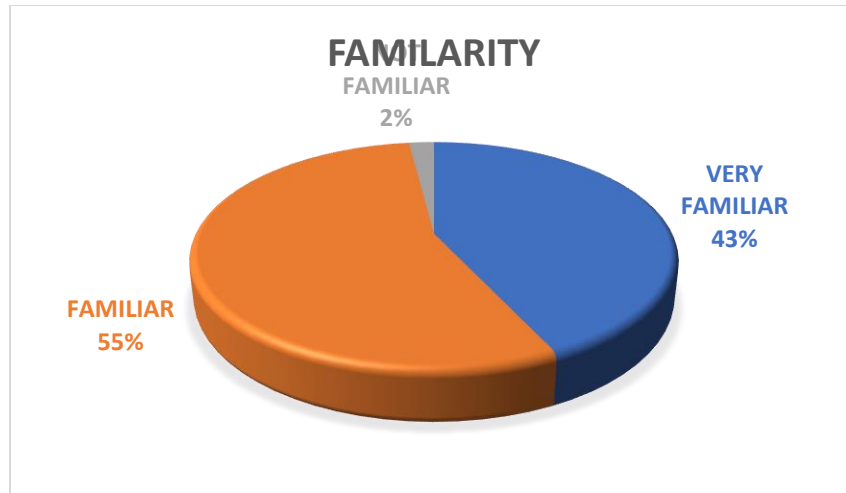
INFERENCE: Out of 100 respondents, 55 are male and 45 are female respondents. This is 55 % users are male and 45% of the users are female. Majority of the respondents are male.

3.3 AWARENESS AND CONSIDERATION OF TATA EV CARS

3.3.1 Familiarity with Tata EV Motors

The following analysis delves into the level of familiarity that consumers have with Tata EV Motors, a key player in the electric vehicle (EV) market. Based on a survey of 100 respondents, this study examines how consumers perceive and engage with Tata EV Motors, shedding light on their awareness of the brand's electric vehicle offerings

FAMILIARITY	NO. OF RESPONDENTS	PERCENTAGE
VERY FAMILIAR	43	43
FAMILIAR	55	55
NOT FAMILIAR	2	2
TOTAL	100	100

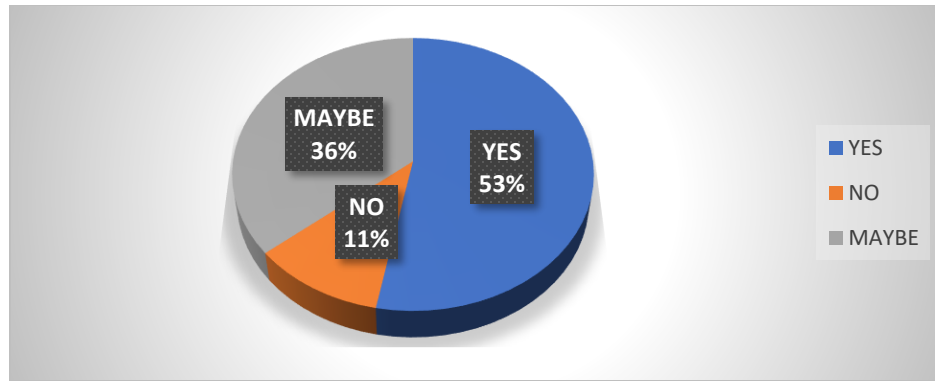


INFERENCE: Out of 100 respondents, 43% of the respondents are very familiar with TATA EV motors and 55 % of them are somewhat familiar with TATA EV motors and balance 2 % are not at all aware of TATA EV motors.

3.3.2 CONSIDERATION OF TATA EV CARS

This analysis explores the consideration of Tata EV cars among consumers, focusing on their intent to purchase vehicles from Tata Motors' electric vehicle (EV) lineup. Drawing insights from a survey of 100 respondents, this study reveals whether the customers are willing to purchase TATA EV cars.

WILLINGNESS	NO. OF RESPONDENTS	PERCENTAGE
YES	53	53
NO	11	11
MAYBE	36	36
TOTAL	100	100

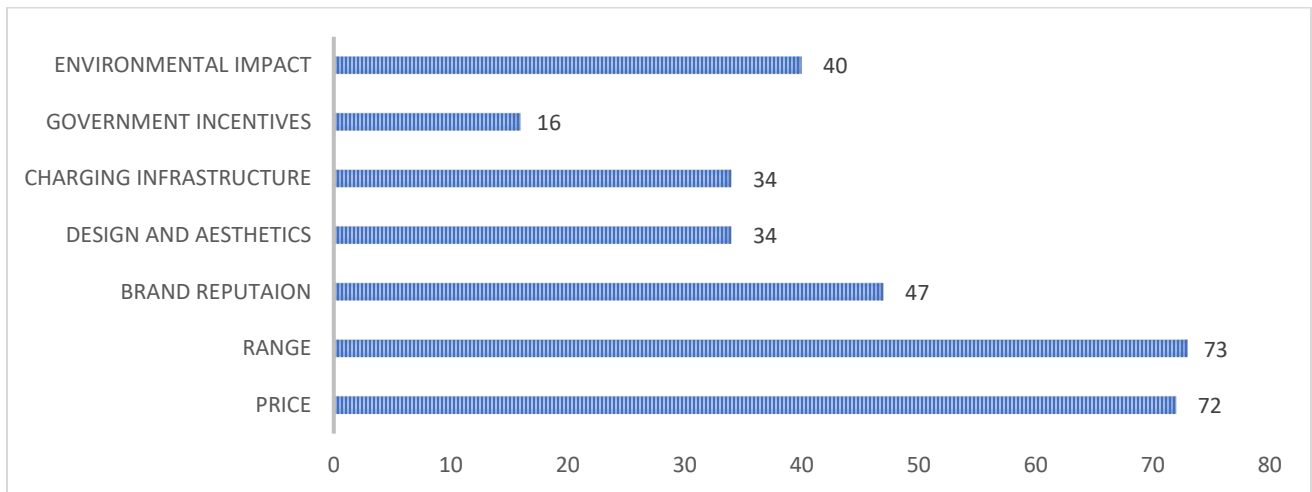


INFERENCE : The analysis reflects a mix of responses regarding the consideration of Tata EV cars among respondents. While 53% express interest in purchasing Tata EV cars, indicating a significant potential market, 11 % indicate no current consideration, and 36 % indicate may be. This split suggests varying levels of appeal and awareness of Tata EV cars within the consumer base.

3.4 FACTORS INFLUENCING PURCHASE DECISION

Exploring why people choose Tata EV cars is really important for making sustainable transportation better. We're using survey responses to figure out what influences people's decisions. Things like caring about the environment, how much the car costs, worries about how far it can go on a single charge, how well it performs, and if there are any government incentives or if they trust the Tata brand all play a big role. What we learn from this survey can help companies make better cars, market them smarter, and even help governments make better policies for electric vehicles.

FACTORS	PERCENTAGE
PRICE	72
RANGE	73
BRAND REPUTAION	47
DESIGN AND AESTHETICS	34
CHARGING INFRASTRUCTURE	34
GOVERNMENT INCENTIVES	16
ENVIRONMENTAL IMPACT	40

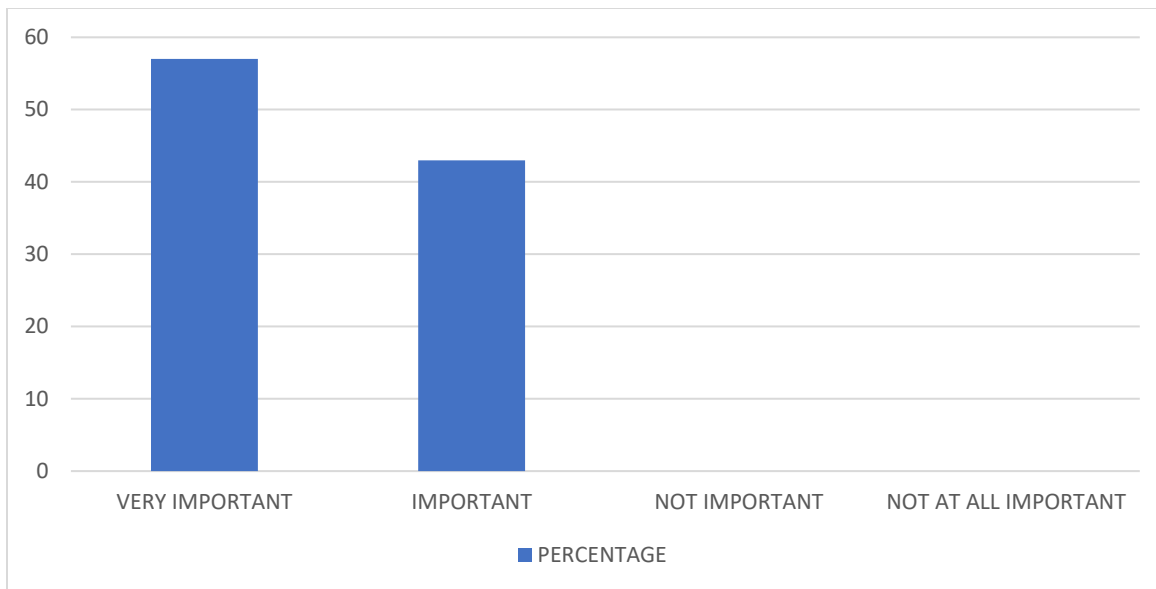


INFERENCE: The data reveals key factors guiding consumer choices for Tata EV cars: price (72%) and range (73%) are paramount, while brand reputation (47%) and environmental impact (40%) also weigh heavily. Design and charging infrastructure (both 34%) follow closely. Government incentives (16%) play a lesser role. This underscores the complex mix of considerations driving EV purchases and highlights areas for Tata to focus on to meet consumer demands effectively.

3.5 IMPORTANCE OF RANGE

This analysis delves into the significance of range in consumers' considerations when contemplating the purchase of Tata EV cars. Based on a survey of 100 respondents, this study explores the crucial role that range (mileage per charge) plays in influencing consumer decisions in the electric vehicle (EV) market. Understanding the importance placed on range is vital for Tata Motors to refine their EV offerings, address consumer concerns, and align with the evolving preferences of potential buyers.

IMPORTANCE	PERCENTAGE
VERY IMPORTANT	57
IMPORTANT	43
NOT IMPORTANT	0
NOT AT ALL IMPORTANT	0



INFERENCE: With 57% regarding mileage as "very important" and 43% deeming it "important," the data underscores the paramount significance of mileage in purchasing Tata EV cars. This high level of importance indicates that consumers prioritize vehicles with longer mileage ranges, highlighting the pivotal role of mileage specifically in shaping their decisions regarding Tata EVs.

3.6 CONCERNS ABOUT TATA EV CARS

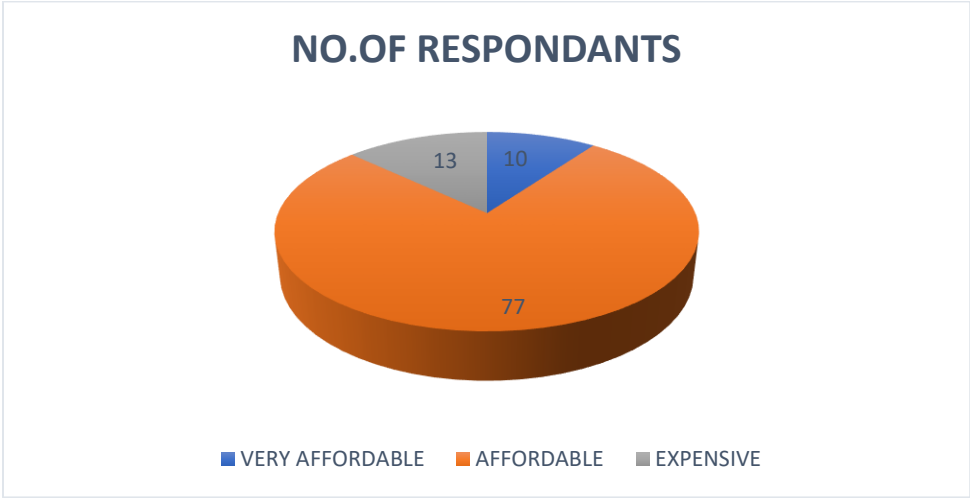
This analysis looks into the concerns that consumers have regarding Tata EV cars, offering valuable insights from a survey of 100 respondents. Understanding these concerns is crucial for Tata Motors to address potential barriers to purchase, refine their product offerings, and enhance customer satisfaction in the competitive electric vehicle (EV) market.

INFERENCE : The data analysis reveals both positive and negative aspects of consumer concerns about Tata EV cars. While the majority of respondents have significant concerns about range, charging infrastructure, battery life, price, or design, there are still segments of the market where these factors are potential barriers to purchase.

3.7 AFFORDABILITY OF TATA EV CARS

This analysis explores the perception of affordability among consumers regarding Tata EV cars, Affordability is a crucial factor influencing consumer decisions in the electric vehicle (EV) market, impacting the accessibility and attractiveness of Tata Motors' EV offerings. By examining respondents' views on the affordability of Tata EV cars, this analysis sheds light on how consumers perceive the pricing of these vehicles.

AFFORDABILITY	NO. OF RESPONDANTS	PERCENTAGE
VERY AFFORDABLE	10	10
AFFORDABLE	77	77
EXPENSIVE	13	13
TOTAL	100	100

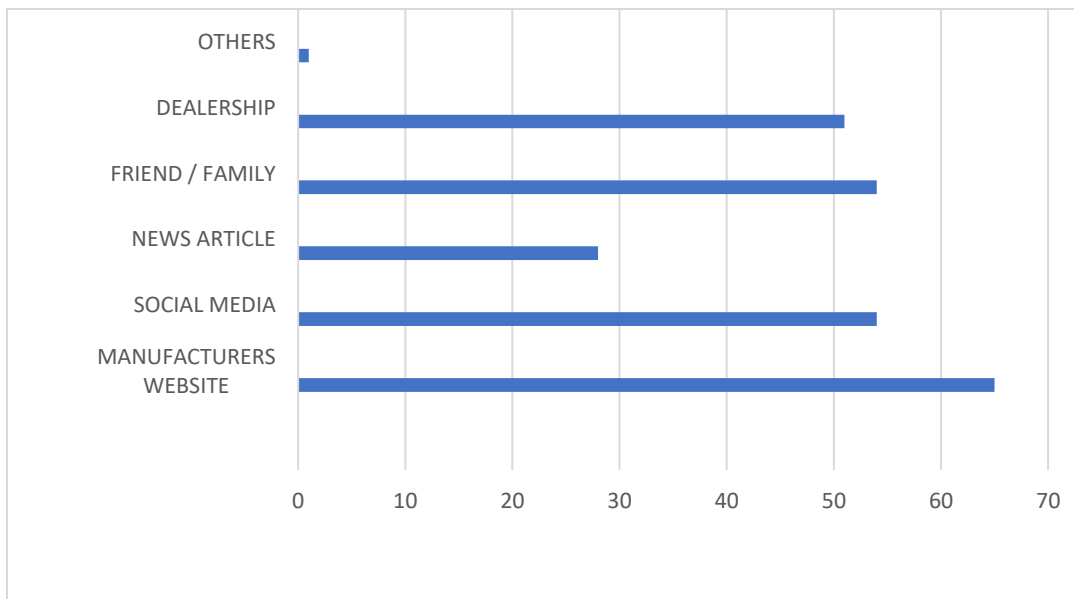


INFERENCE: The perception of affordability among consumers regarding Tata EV cars is varied. While a significant portion finds the EVs to be within an acceptable price range, there is also a notable segment that views Tata EVs as expensive. Tata Motors can leverage positive perceptions to emphasize value and attract budget-conscious consumers, while addressing concerns about pricing to broaden the appeal of their EV lineup in the competitive market.

3.8 INFORMATION SOURCE

This analysis explores the primary sources that consumers rely on when gathering information about Tata EV cars. Sources is crucial for Tata Motors to tailor their marketing and communication strategies, ensuring they effectively reach and engage potential buyers in the electric vehicle (EV) market. By examining the preferred channels through which consumers seek information, this analysis sheds light on where Tata Motors can focus their efforts to enhance visibility and communication about their EV offering.

SOURCE	PERCENTAGE
MANUFACTURERS WEBSITE	65
SOCIAL MEDIA	54
NEWS ARTICLE	28
FRIEND / FAMILY	54
DEALERSHIP	51
OTHERS	1



INFERENCE : Consumer information on Tata EV cars is sourced diversely, with the manufacturer's website (65%) being key. Social media and recommendations from friends/family (54%) also matter, highlighting peer influence. Dealership interactions (51%) are pivotal, emphasizing personalized experiences. News articles (28%) contribute too. This underscores the need for comprehensive marketing strategies across various platforms to engage potential buyers effectively.

3.9 CONSUMERS DESIRED IMPROVEMENTS IN TATA EV CARS

The analysis reveals a range of desired improvements for Tata EV cars, with a strong emphasis on enhancing performance, efficiency, and user experience. Following is various concern -

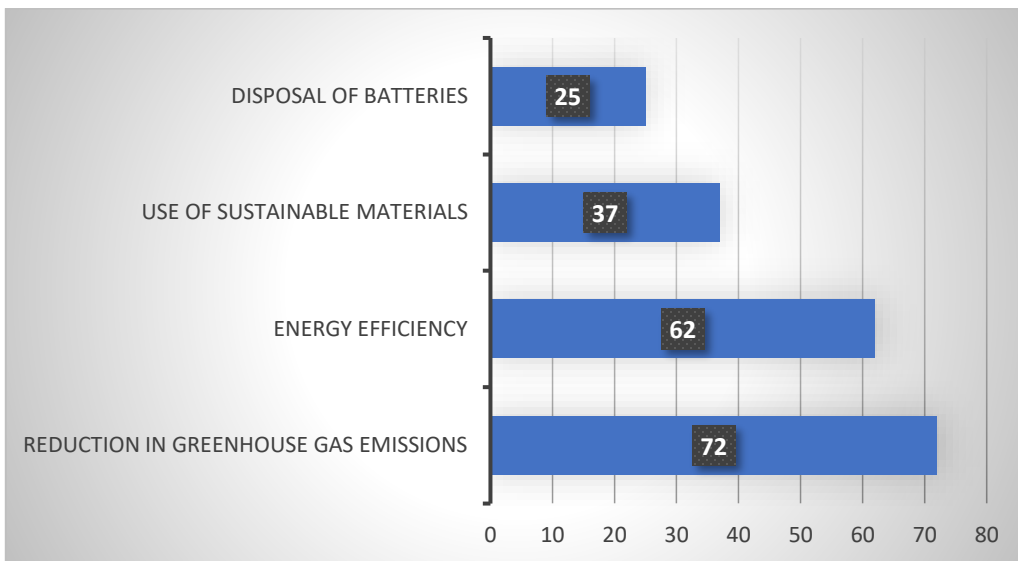
- Range and Battery Life
- Fast Charging and Charging Infrastructure
- Technology and Connectivity
- Design and Style
- Affordability and Value

INFERENCE: The analysis of desired improvements for Tata EV cars reveals a clear focus on enhancing range, battery life, and charging infrastructure. Consumers also desire advanced technology, stylish design, and improved safety features in Tata EVs. Addressing these consumer preferences and needs can help Tata Motors develop EVs that meet market demands and attract a wider range of consumers to their electric vehicle lineup.

3.10 CONSIDERATION FOR ENVIRONMENTAL IMPACT

The analysis reveals key considerations that consumers have regarding the environmental impact of Tata EV cars. The responses from 100 respondents shed light on the considerations for environmental impact when it comes to Tata EV cars. Here's the analysis based on the provided data.

CONSIDERATION	PERCENTAGE
REDUCTION IN GREENHOUSE GAS EMISSIONS	72
ENERGY EFFICIENCY	62
USE OF SUSTAINABLE MATERIALS	37
DISPOSAL OF BATTERIES	25

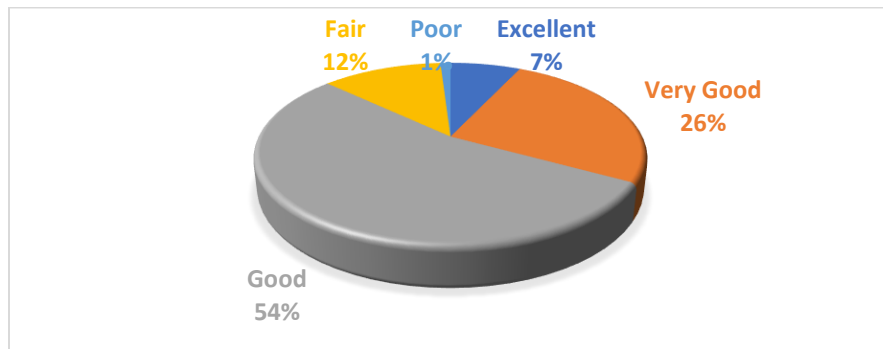


INFERENCE: The analysis of considerations for environmental impact regarding Tata EV cars shows a strong emphasis on reducing greenhouse gas emissions and ensuring energy efficiency. Consumers also value the use of sustainable and recyclable materials in the manufacturing process, as well as responsible disposal methods for batteries. Addressing these environmental concerns can help Tata Motors align their EV offerings with consumer values, contributing to a cleaner and more sustainable future for transportation.

3.11 CUSTOMER SATISFACTION ON AFTER SALE SERVICES

The analysis reveals the ratings given by consumers regarding the customer service provided by Tata for EV cars.

SCALE	PERCENTAGE
Excellent	7
Very Good	26
Good	54
Fair	12
Poor	1



INFERENCE: The analysis of the rating of customer service for Tata EV cars indicates generally positive feedback from consumers. The majority of respondents rated the customer service as "Good" or "Very Good," highlighting satisfaction with Tata's services. The small percentage of respondents who rated it as "Fair" suggests areas where Tata could further improve their customer service to meet evolving consumer expectations. Additionally, the extremely low "Poor" rating indicates that Tata Motors has generally been successful in providing satisfactory customer service experiences for their EV customers. Continued focus on delivering excellent customer service will be crucial for Tata Motors to maintain and enhance consumer satisfaction in the competitive EV market.

3.12 OVERALL COSUMER PERCEPTION ABOUT TATA EV CARS

The analysis of overall perception compared to other EV brands reveals a mix of positive sentiments towards Tata EV cars. Following is various response in favor of Tata EV cars

- Affordable Price, Good Quality, and Very Affordable
- Innovative Features and Design Strong Performance
- Safety Focus
- Versatile

While the majority of responses were positive, there were also mentions of Could Do Better and Not Bad, Good Quality. These indicate that while the perception is generally positive, there is room for Tata Motors to continue improving their EV offerings to match or exceed competitors.

INFERENCE: The analysis of overall perception of Tata EV cars compared to other EV brands indicates a generally positive sentiment. Consumers appreciate the affordability, good quality, innovative features, and safety focus of Tata EV cars. However, there are also suggestions for improvement and areas where Tata could continue to enhance their offerings, such as range, charging infrastructure, and design, to match or exceed competitors. Overall, the data suggests that Tata EV cars are well-received by consumers, offering a good balance of performance, affordability, and quality.

CHAPTER -4

**FINDINGS,
SUGGESTIONS
AND
CONCLUSIONS**

FINDINGS, SUGGESTIONS AND CONCLUSIONS

This section discusses the primary discoveries of the research and provides suggestions based on these findings. It also outlines the conclusion and potential avenues for future research.

4.1 FINDINGS

- Majority of respondents are aged 18-25 (52%) and male (55%).
- 43% are very familiar with Tata EV Motors, while 55% are somewhat familiar.
- 53% are interested in buying Tata EV cars.
- Most important factors: price (72%) and range (73%).
- Other factors include brand reputation (47%) and environmental impact (40%).
- Mileage is crucial for 57% of consumers.
- Concerns include range, charging infrastructure, battery life, price, and design.
- Views on affordability vary.
- Top sources of information: manufacturer's website (65%), social media/friends (54%), dealership interactions (51%).
- Consumers want improvements in range, battery life, charging infrastructure, tech, design, and safety.
- Focus on reducing emissions and using sustainable materials.
- Customer service generally rated as "Good" or "Very Good."
- Tata EV cars are seen positively for affordability, quality, innovation, and safety.
- Suggestions for Tata: improve range, charging infrastructure, and design to match competitors.

4.2 SUGGESTION

- Make EVs go farther and last longer for happier customers.
- Develop EV models with longer mileage to make 73% of customers happy.
- Improve charging stations to make 34% of customers happy.
- Some think Tata EVs are expensive, but 72% find them affordable.
- Tata can add more affordable options for budget-conscious buyers.
- Add cool features and stylish designs to attract more buyers.
- Consumers want advanced tech and stylish designs (34%).
- Focus on being eco-friendly by reducing emissions and using sustainable materials (40%).
- Use websites (65%), social media (54%), and dealerships (51%) to tell people about Tata EVs.
- Give customers a personal and informative experience to keep them interested

4.3 CONCLUSION

In summary, this consumer-centric analysis sheds light on key insights for Tata Motors to elevate their electric vehicle (EV) lineup. The study reveals a strong interest among consumers, particularly in the 18-25 age bracket, with price and range standing out as pivotal factors in their decision-making process. To effectively cater to consumer needs, Tata should prioritize improvements in range, battery life, and charging infrastructure, while also addressing perceptions of pricing.

Moreover, the research underscores the significance of environmental considerations, as consumers value sustainability and emissions reduction in Tata EVs. By leveraging various marketing channels, delivering exceptional customer service, and collaborating for incentives and infrastructure development, Tata can position themselves as frontrunners in the EV market. Continuous adaptation based on consumer feedback will be key, allowing Tata Motors to offer affordable, high-quality, and eco-friendly electric vehicles that resonate with a wide range of consumers.

BIBLIOGRAPHY

ARTICLES

- Consumer Perception Towards Electric Vehicles Dipanjan Acharya, Shubham Tyagi, Suhans Bansal.
- The 2020 Journal of Cleaner Production report by Rajeev Ranjan Kumar and Kumar Alok
- Chaturvedi, B. K., Nautiyal, A., Kandpal, T. C., & Yaqoot, M. "India's EV30@30 Campaign: Implications for Sustainable Development." *Renewable and Sustainable Energy Reviews*, vol. 150, 2021, 111389.
- Devi, J. "Tata Motors' Impact on the Electric Vehicle Industry in India: A Study of Tata Nexon EV Max." *Indian Journal of Marketing*, vol. 11, no. 3, 2021, pp. 26-33.
- Singh, P. "Adoption Barriers and Preferences for Electric Vehicles in India: A Study." *International Journal of Scientific Research and Management*, vol. 9, no. 8, 2020, pp. 215-220.
- Mashru, S., Baria, R., Kaswan, A., & Sumetha, M. "Tata Motors' Global Expansion Strategy: A Study Using the Flexible Strategy Framework." *Journal of Global Business and Technology*, vol. 15, no. 2, 2021, pp. 78-86.
- Shrilatha, N. S., & Aruna, K. "Consumer Interest and Government Incentives: A Study of Electric Vehicle Adoption in Tamil Nadu." *Transportation Research Part D: Transport and Environment*, vol. 96, 2021, 102884.
- Liao, F., Molin, E., & van Wee, B. "Factors Influencing the Low Market Penetration of Electric Vehicles: A Comparative Study." *Transportation Research Part A: Policy and Practice*, vol. 140, 2020, pp. 319-332.
- Electric vehicles in India: Market analysis with consumer perspective, policies and issues. Pritam K Gujarathi, Varsha A Shah, Makarand M Lokhande.
- A study of consumer perception and purchase intention of electric vehicles. Pretty Bhalla, Inass Salamah Ali, Afroze Nazneen

- Bhalla, P., Ali, I. S., & Nazneen, A. "A Study of Consumer Perception and Purchase Intention of Electric Vehicles." *European Journal of Scientific Research*, vol. 189, no. 2, 2021, pp. 224-238.
- Mohanty, P., & Kotak, Y. "Electric Vehicles: Status and Roadmap for India." In *Electric Mobility in India: Challenges and Opportunities*, edited by R. Kapoor, & S. Saxena, Springer, 2021, pp. 123-145.
- Angeline, P. M., & Rajkumar, M. N. "Evolution of Electric Vehicle and its Future Scope." *Materials Today: Proceedings*, vol. 42, 2021, pp. 2165-2170.

WEBSITES:

<https://www.europeanjournalofscientificresearch.com/>

<https://scholar.google.com/>

<https://www.sciencedirect.com/>

<https://books.google.com/>

APPENDIX

QUESTIONNAIRE

- 1) What is your age group?
 - 18-25
 - 26-35
 - 36-40
 - above 40
- 2) What is your gender?
 - Male
 - Female
 - Prefer not to say
- 3) Do you currently own an electric vehicle (EV)?
 - Yes
 - No
- 4) If yes, which brand of EV do you currently own?
- 5) How familiar are you with Tata EV Motors?
 - Very Familiar
 - Familiar
 - Not Familiar
- 6) Have you ever considered purchasing a Tata EV car?
 - Yes
 - No
 - Maybe
- 7) What factors would influence your decision to purchase a Tata EV car? (Select all that apply)
 - Price
 - Range (mileage)
 - Brand Reputation
 - Design and aesthetics
 - Charging infrastructure
 - Government incentives
 - Environmental impact
- 8) How important is the range (mileage per charge) of a Tata EV car to you?
 - Very Important
 - Important
 - Not Important
 - Not at all Important
- 9) What concerns do you have, if any, about owning a Tata EV car?

10) How would you rate the affordability of Tata EV cars compared to other EV brands?

- Very Affordable
- Affordable
- Expensive
- Very Expensive

11) What sources do you rely on most when gathering information about Tata EV cars? (Select all that apply)

- Manufacturer's website
- Social media
- News articles
- Friends/family
- Dealerships
- Other...

12) Would you prefer to buy a Tata EV car from an authorized dealership or online?

- Authorized dealership
- Online
- Other...

13) How likely are you to recommend a Tata EV car to a friend or family member?

- Very Likely
- Likely
- Neutral
- Unlikely
- Very Unlikely

14) What improvements or features would you like to see in future Tata EV car models?

15) On a scale of 1 to 5, how would you rate the overall design of Tata EV cars?

Poor

- 1
- 2
- 3
- 4
- 5

Excellent

16) How important is the availability of fast-charging stations for Tata EV cars in your decision to purchase?

Not Important

- 1
- 2
- 3
- 4
- 5

Very Important

17) What are your main considerations when evaluating the environmental impact of an EV?
(Select all that apply)

- Reduction in greenhouse gas emissions
- Energy efficiency
- Use of sustainable/recyclable materials
- Disposal of batteries
- Others

18) Have you had any experience with Tata EV car models (test drives, rentals, etc.)?

- Yes
- No

19) How would you rate the customer service and support provided by Tata EV Motors?

- Excellent
- Very good
- Good
- Fair
- Poor

20) Overall, what is your perception of Tata EV cars compared to other EV brands you are familiar with?