CUSTOMER PERCEPTION TOWARDS E-VEHICLE WITH SPECIAL REFERENCE TO COIMBATORE CITY

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I. INTRODUCTION

The world is very fast paced nowadays and in this fast paced world automobiles plays a vital role in daily life. The automobile helps us in being productive, performance or coping with livelihood issues, vehicles save so much time and effort. Majority of Indians depend on vehicles like two-wheelers and four-wheelers for their mobility needs. However, the concerns over greenhouse gas emission and their ill effects and depletion of fuel make the mankind forced to look for alternatives options. All major automobile industry are in transitional phase to launch electric bikes because of the recent NitiAayog directive. Though the electric vehicles seem to be best solution to the aforesaid issues, but when comes to customer making or decision making process the transitional shift from petrol to Electric Vehicles is very hesitated.

The history of the automobile industry was initially connected to electricity. Nowadays, because of several factors, the automobile industry has been doing researches on electric vehicles for a long time, even though there are lot of obstacles in commercializing them. This factor was the main lead to analyse the customer's perception and environmental consciousness towards electric vehicles. The future is electric vehicle there is no doubt in that as it will help in reducing the usage of Fossil fuel but there are some problems in using e-vehicles such as battery running out, speed, and other problems faced. Ironically this influence the customer behaviour in purchase intention of full electric vehicle by Indians, there is a need to study the factors influencing the consumer acceptance of these vehicle. Various factors that influence the purchase decision are situations like regulatory environment, personal current psychological factors, like attitude, perception, and society acceptance and consideration levels. From environmental perspective, increase in high Co-2 emissions and depletion of Fossil Fuels.

The cause for the production of air pollution in urban areas is associated with an array of sources but the division of transport makes a critical division is minimal. The influence of air quality on human health and the economy is well known and in this sense, producers are transitioning to reduce the impact on earth.

Electric cars are seen as a potential choice for transportation, what is in addition, a few National Governments have successful revised innovation development plans. Governments are quick to advance electric vehicle as an alternative for portability, to eliminate the air emission in urban areas. Tests show that electric bikes can be financially feasible by 2020 and 2030 electric four wheelers will be a prominent option for innovation, if governments offer incentive charging forces and under pinning’s are available.

The electric vehicles market segment has seen significant growth as it offers a pollution-free ride than its IC Engine operated counterparts. Due to public attention to limited amount of fuel energy and emissions of greenhouse gaseous by the internal combustion engine vehicles, people start to look for environmental friendly options. One of the alternative and effective way is electric vehicles. It is cost efficient, and environmental friendly. To the goals 7 and 13 of sustainable development goals (SDGs) to transform our world, even the policy makers are forced to take action and NitiAayog has worked out Zero Emission vehicles (ZEVs) policy to promote and boost the usage of electric vehicles.

STATEMENT OF THE PROBLEM

Customer preference is a study of physiological, social, physical behaviours, psychological behaviour of all potential customers as they become aware of evaluation, purchase and consumption and tell others about the products and services. The study is to analyze the customer perception towards purchasing electric vehicles.
which way be useful in future. As the customer are currently transitioning to E-vehicles. There are more and more customers purchasing E-vehicles which made the researcher various about the customer perception towards purchasing E-vehicles. This study focuses on perception of customer or potential customer view towards purchasing and using E-vehicles.

SCOPE OF THE STUDY

The scope of the study is to know the "customer perception towards E-vehicle", here in this study it focuses on customer awareness factors influencing like psychological, environmental benefits etc.. E-vehicles are the future, it could save energy and protect environment which is important for future and for our future generation. This study will help the electric vehicle dealers whether to establish the outlet and also this study helps to know the adoption rate as compared to combustion vehicles in day to day life.

OBJECTIVES OF THE STUDY

- To test the customer awareness about E-vehicle.
- To measure customer's environmental consciousness on buying of electric vehicle.
- To identify customer perception towards E-vehicle
- To identify the factors that promotes customers shifting to electric vehicles.
- To identify the level of satisfaction of customer.

II. REVIEW OF LITERATURE

PRETTY BHALLA, INASS SALAMAH ALI, AFROZE NAZNEEN (2018)

Contemporary environmental concerns are thrusting the manufacturing and sales of Electric vehicles. Combination of Indian skilled and semiskilled technological base, a platform of large customer base, and relatively cheaper production and labour cost, has fascinated almost all global electric vehicle manufacturers and component suppliers, to start operations from India — Bosch, AVL and Cummins. The elements influencing customer acceptability of these vehicles must be studied in order to understand the commercial success and purchase intentions of electric automobiles among Indians. Individual perception on aspects like environmental issues, cost, trust, technological innovation, infrastructure, and societal acceptance are some of the elements that affect car customers’ buying decisions. The findings indicate that customer trust in technology and environmental concerns are antecedent factors for perceptions about buying electric vehicles. Cost, infrastructure, and societal acceptance are factors that inhibit adoption. Therefore, government must take the lead in promoting the sales of electric vehicles by developing environmental policy, infrastructure, and subsidising the cost of the vehicles or lowering bank interest rates.

Mr. OMKAR TUPE, Prof. SHWETA KISHORE, Dr. ARLOPH JOHNVEIRA (2020)

With the current depletion of fossil fuels and its price hike, there is a need for another energy resource to run the vehicle. Electric vehicles are being looked at by the automotive industry as a potential answer for India's economy and ecology. However, despite governments implementing EV policies, the current market penetration of EVs is relatively low. This report will examine the potential market for electric vehicles in India and analyse consumer attitudes towards them.

AJEX THOMAS VARGHESE, V.S. ABILASH AND SINI V. PILLAI (2021)

The primary purpose of this study is to analyse the consumer perception and purchase intention of electric vehicles in India. Electric vehicles are being looked at by the automotive industry as a potential answer for India's economy and ecology. However, despite governments implementing EV policies, the current market penetration of EVs is relatively low. This report will examine the potential market for electric vehicles in India and analyse consumer attitudes towards them.

PROFILE OF THE STUDY

ABOUT E-VEHICLES

All electric vehicles, also referred to as battery electric vehicles (BEVs), have an electric motor instead of an internal combustion engine. The electric motor of the vehicle is powered by a sizable traction battery pack, which must be hooked into a wall outlet or charging device (also known as an EVSE). The car does not have a
tailpipe or other usual liquid fuel components, like a fuel pump, fuel line, or fuel tank, because it is powered by electricity.

KEY COMPONENTS
Battery (all-electric auxiliary), Charge port, DC/DC Converter, Electric traction motor, On board charger, Power electronics controller, Thermal system (cooling), Traction battery pack Transmission (electric).

MOTIVE
- All forms of electric vehicles can help improve fuel economy, lower fuel costs, and reduce emission.
- The government offers subsidies to those who are willing to switch to electric vehicles
- Less maintenance due to an efficient electric system.

POPULAR E-VEHICLES BRANDS
- Ather 450x
- Revolt RV 400
- Bajaj chetak
- Ola S1 air
- Hero photon
- Tata Nexon EV
- Hyundai Kona Electric
- MG ZS EV
- Tata Tiago

III. RESEARCH METHODOLOGY

Research Design
Research design is a detailed blueprint used to guide the research study toward its objectives. The research design for the study is descriptive analytical in nature that is concluded among Customers and likely customers of E-vehicle

Primary Data
In order to fulfill the objectives of the study, Primary data were collected by using well-structured questionnaire methods from the respondents who are using are interested in E-vehicles. A noteworthy features is that all respondents answered the questionnaire with so much excitement.

Secondary Data
Secondary data is collected from newspaper, Magazines, journals, books, website etc. The secondary data pertaining to the study gathered from various sources. The latest information are gathered from internet web resources.

Sample Design
An established strategy for drawing a sample from a certain population is known as a sample design. It alludes to the method or process the researcher would use while choosing the items for the sample. The process to determine how many items should be included in the sample is also a result of sample design. Convenient sampling was employed to select the sample for this study.

Sample Size
The sample for this research has been collected from 120 respondents.

Tools for Analysis
The researcher has adopted various statistical techniques in an efficient manner for analysing the customer perception towards E-vehicles. The major statistical tool used for the analysis is as below
- Percentage analysis
- Rank Method

LIMITATIONS
- The research material available to the researcher is limited to study.
The time frame available to study is limited to study it in wide coverage and so the research is done from only collecting responses from 120 respondents.

The attitudes of the customers are subjected to frequent changes the result of the study is based on present condition.

IV. ANALYSIS AND INTERPRETATION

RANK METHOD

Ranking is the data transformation in which numerical or ordinal values are replaced by their rank when the data are sorted. Ranking provide an incentive for better data collection within institution, they can expose pockets of institutional weakness and confirm areas of strength, and they are useful for benchmarking against like institutions. Rankings encourage institutions to re-examine mission statement.

RANK OF THE PREFERED COMPANY BY THE E-VEHICLE

<table>
<thead>
<tr>
<th>Companies of e-vehicle</th>
<th>Number of respondents</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ather 450</td>
<td>24</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Revolt RV 400</td>
<td>5</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Bajaj Chetak</td>
<td>10</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Hero Photon</td>
<td>7</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Ola S1 Air</td>
<td>12</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Tata Nexon EV</td>
<td>28</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>Hyundai Kona Electric</td>
<td>11</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>MG ZS EV</td>
<td>4</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Tata Tiago</td>
<td>16</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

INTERPRETATION

It is inferred that the respondents rank Tata Nexon EV as their first preference, the respondents rank Ather 450 as their second preferred e-vehicle, the respondents rank Tata Tiago as their third preferred vehicle, the respondents rank Ola S1 Air as fourth, the respondents rank Hyundai Kona Electric as fifth, the respondents rank Bajaj Chetak as sixth, the respondents rank Hero Photon as seventh, the respondents rank Revolt RV 400 as their eighth, the respondents rank MG ZS EV as ninth and the respondents they rank other vehicles as tenth preference.

INFERENCE

Majority of the respondents rank Tata Nexon EV as first preferred E-vehicle.

RANK OF THE THOUGHTS OF RESPONDENTS ON E-VEHICLE

<table>
<thead>
<tr>
<th>Thoughts on e-vehicle</th>
<th>Number of respondents</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is eco-friendly</td>
<td>74</td>
<td>62</td>
<td>1</td>
</tr>
<tr>
<td>It is cost efficient</td>
<td>24</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Low maintenance</td>
<td>20</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>

INTERPRETATION

It is inferred that the respondents rank that e-vehicle being eco-friendly as the first thought that comes to mind, the respondents rank that e-vehicle being cost efficient is the second thought that comes to mind,
respondents rank e-vehicle being low maintenance is the third thought that comes to mind and the respondents rank that other thoughts only comes last.

**INERENCE**

Majority of the respondents ranks e-vehicles being eco-friendly as number one thought that comes to mind.

**RANK OF THE SUBSIDIES THAT RESPONDENTS KNOW**

<table>
<thead>
<tr>
<th>Knowledge on subsidies</th>
<th>Number of respondents</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income tax subsidies</td>
<td>40</td>
<td>34</td>
<td>1</td>
</tr>
<tr>
<td>Purchase incentives</td>
<td>20</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>Coupons</td>
<td>10</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Interest subventions</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Road tax exemptions</td>
<td>22</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Registration fees</td>
<td>16</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Scrapping incentives</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

**INTERPRETATION**

It is inferred that the respondents rank income tax subsidy as the most known subsidies, the respondents rank road tax exemptions as second known subsidy, the respondents rank purchase incentives are the third known subsidy, the respondents rank registration fees subsidy is the fourth known, the respondents rank coupons are the fifth known subsidy, the respondents rank interest subventions are the sixth know subsidy, the respondents says that other subsidy as the seventh and the respondents rank scrapping incentives are the eighth known subsidy.

**INERENCE**

Majority of the respondents rank income tax subsidies as most know subsidies provided by the government.

**RANK OF THE RESPONDENTS PREFERENCE TO GET ADVICE ABOUT E-VEHICLE**

<table>
<thead>
<tr>
<th>Preference for advice</th>
<th>Number of respondents</th>
<th>Percentage</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Researching about it themselves</td>
<td>16</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>From friends</td>
<td>32</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>From family</td>
<td>26</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>From former user</td>
<td>19</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>From neighbours</td>
<td>4</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>From current user</td>
<td>22</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>120</strong></td>
<td><strong>100</strong></td>
<td><strong>7</strong></td>
</tr>
</tbody>
</table>

**INTERPRETATION**

It is inferred that the respondents rank getting advice from friends first, the respondents rank getting advice from family second, the respondents rank getting advice from current user as third, the respondents rank getting advice from former user as fourth, the respondents researching about it themselves as fifth, the respondents says rank getting advice from neighbours as sixth and the respondents rank using other sources as their last resort.
INFERENCES

Majority of the respondents ranks advice from friends as number one to get to know about purchasing e-vehicle.

V. FINDINGS

- Majority 85% (102) of the respondents come under the age of 16 – 26 years.
- Majority 73% (87) of the respondents are female.
- Majority 82% (98) of the respondents are unmarried.
- Majority 52% (62) of the respondents have 4 members in the family.
- Majority 69% (83) of the respondents are students.
- Majority 52% (62) of the respondents have 2 members depending on them.
- Majority 72% (82) of the respondents have 2 earning members in the family.
- Majority 33% (39) of the respondents have monthly income of Rs.16,000-Rs.30,000 in the family.
- Majority 41% (49) of the respondents and their family receive Rs.2,50,001-Rs.5,00,000.
- Majority 71% (85) of the respondents prefer electric bikes/electric scooters.
- Majority 55% (66) of the respondents intention of purchase is because it is environmentally friendly.
- Majority 24% (28) of the respondents prefer Tata Nexon EV as their preferred E-vehicle.
- Majority 72% (82) of the respondents thoughts on e-vehicles are it is eco-friendly.
- Majority 52% (62) of the respondents have 2 earning members in the family.
- Majority 69% (83) of the respondents are students.
- Majority 62% (74) of the respondents prefer Tata Nexon EV as their preferred E-vehicle.
- Majority 55% (66) of the respondents intention of purchase is because it is environmentally friendly.
- Majority 24% (28) of the respondents prefer Tata Nexon EV as their preferred E-vehicle.
- Majority 72% (82) of the respondents think it is eco-friendly.
- Majority 41% (49) of the respondents know a little about the subsidies provided by the government for e-vehicle.
- Majority 34% (40) of the respondents know about income tax subsidies provided by the government.
- Majority 52% (62) of the respondents think maybe it is too early to be reliable.
- Majority 42% (50) of the respondents face the problem of battery running out.
- Majority 80% (96) of the respondents are willing to compromise speed for environmental benefit.
- Majority 57% (69) of the respondents would buy e-vehicle in the future.
- Majority 27% (32) of the respondents prefer to get advice from friends about purchasing e-vehicle.
- Majority 34% (40) of the respondents would likely buy an e-vehicle as their next vehicle.
- Majority 50% (60) of the respondents agree with the statement electric vehicles can protect from global warming.
- Majority 51% (61) of the respondents agree with the statement e-vehicles will reduce environmental hazards.
- Majority 46% (55) of the respondents agree with the statement using e-vehicle will reduce our carbon footprint.

RANK METHOD

- Majority of the respondents rank Tata Nexon EV as first preferred E-vehicle.
- Majority of the respondents ranks e-vehicles being eco-friendly as number one thought that comes to mind.
- Majority of the respondents ranks income tax subsidies as most know subsidies provided by the government.
- Majority of the respondents ranks advice from friends as number one to get to know about purchasing e-vehicle.

VI. SUGGESTIONS

- Introducing more range and models in two wheelers and four wheelers would improve customer perception.
- Increasing the number of charging stations.
- Installing charging facilities at convenient locations.
- Reduction in the cost of electric vehicles and making them affordable also helps in changing the customer perception.
- Making more practical e-vehicle for long-distance travel.
- Improving the battery technology and developing more efficient charging methods.
- Incentivize renewable energy.
VII. CONCLUSION

Electric vehicles (EVs) are a rapidly growing segment of the automotive industry as more and more consumers seek environmentally-friendly and cost-effective alternatives to traditional gasoline-powered vehicles. Sales have nearly doubled in the last two years. There is a 9% increase in sales. With advances in battery technology, EVs now offer longer ranges and faster charging times, making them more practical for everyday use and would change the customer perception. As far as it is affordable even tourists wish to travel using e-vehicle. The adoption of EVs is also being supported by government incentives and regulations aimed at reducing carbon emissions and promoting clean energy. In many countries, electric vehicles are exempt from certain taxes and tolls, and some governments offer rebates or subsidies to encourage their purchase.

While the initial cost of purchasing an EV may be higher than a traditional gas-powered vehicle, the savings in fuel costs and maintenance expenses over the life of the vehicle can make them a more affordable option in the long run. Furthermore, as the cost of batteries continues to decline due to the discovery of lithium in India, EVs are becoming more price-competitive with gas-powered vehicles. There are, however, some challenges associated with the widespread adoption of electric vehicles. These include the availability of charging infrastructure, which can be a limiting factor for drivers who need to travel long distances, and the limited range of some EV models. Additionally, the production of EVs requires the use of rare earth minerals, which can be environmentally damaging if not sourced responsibly.

Overall, while there are still some hurdles to overcome, the growth of the electric vehicle market shows no signs of slowing down as Tata Nexon EV in the four wheelers and Ather 450 in the two wheelers are the most preferred vehicles by the respondents. As more consumers become aware of the benefits of EVs and as battery technology continues to improve, it is likely that electric vehicles will become an increasingly common sight on our roads in the coming years.

VIII. REFERENCES


WEBSITES

[9] https://doi.org/10.3390/su132212851