STUDY ON ELECTRIC VEHICLES MARKET AND ITSGROWTH WITH REFERENCE TO DELHI-NCR

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ABSTRACT

With its growing middle class and robust economic growth, India is currently one of the top ten automotive markets in the world. It is anticipated that this trend of rising auto sales would continue. In addition to the deregulation of petrol prices, there has been a lot of discussion in recent years over gasoline pricing. Furthermore, the discussion concerning energy security has become increasingly heated and focus has switched to alternative drive train technology because to the likelihood of an interruption in Middle Eastern supply lines. The potential of alternative technologies in automobiles, like as EVs, depends on improved battery technologies, driving ranges, government incentives, regulations, lower prices, and better charging infrastructure, just like in the case of many other comparable markets. It was difficult to predict future demand for electric vehicles because it required analyzing consumer preferences for a product that most consumers are not familiar with. In order to understand how consumers feel about electric vehicles from a dealer's perspective, a poll of dealers was undertaken.

Keywords: Automobile, Consumer Preference, EV, Energy Conservation, Technology

INTRODUCTION

An electric vehicle (EV) is a vehicle that generates power from an electric motor rather than an internal combustion engine that consumes fuel and other gases (Douche, 2011). In order to address challenges including increasing pollution, global warming, the loss of natural resources, and more, such vehicles are being looked at as a potential replacement for current-generation cars (Bessa & Matos, 2021). Even though the idea of electric automobiles has been around for a while, it has gained a lot of attention in the last 10 years due to the expanding carbon footprint and other negative effects of gasoline-powered vehicles on the environment.

India took the first firm decision to encourage electric cars in 2010. Electric vehicles may be able to achieve charge-sustaining operation, which we define as infinite driving range and zero downtime, at the lowest possible overall cost with careful system planning and design of in-motion charging (Weiller, 2019). Although the goal was to provide subsidies and support infrastructure for electric vehicles, it remained primarily on paper (Koyanagi, 2020). There is a trade-off between system power and road coverage.

Infrastructure costs increase as a result of the substantial and expensive road electrification required by low-power systems (et al., 2021). High-power systems require components with high power densities, but doing so will necessitate research to overcome present technical limitations (Varghese et al., 2021).

With the appropriate design of an in-motion charging system, EVs may be able to achieve an unlimited range and zero downtime regardless of road electrification technology (Khalid & Khuman, 2022).

In motion charging may also reduce the overall capital costs related to the infrastructure (such as power converters, materials, construction work, installation, and so forth) and the fleet of vehicles (battery size, efficiency, number of vehicles, etc.) by increasing a vehicle's useful range and operating hours.

Kilowatts (kW) are the unit of measurement for a car's electric motor power, same like for other types of machinery. Electric motors are capable of producing their maximum torque over a wide RPM range.

This means that a 100 kW internal combustion engine, which can only generate its maximum torque over a limited range of speeds, is less effective than a 100 kW electric motor in a car.

The conversion of electrical energy to mechanical energy wastes energy and the efficiency of charging vary substantially depending on the type of charger.

LITERATURE REVIEW

Viswanathan and Gyimesi (2011) To find out more about how people feel about electric vehicles, interviews with automotive executives and a consumer survey were performed.45 percent of the drivers surveyed said they were not familiar with electric vehicles. Consumers who are more knowledgeable are more likely to pay a greater price. Higher-end technologically but even informed customers might be taken advantage of. Some individuals are unaware of the long-term fuel savings offered by electric automobiles.

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Budde Christensen et al. (2012) In this regard, prior business model literature has emphasized ways in which competitive advantage may be protected by founding new enterprises or by reorganising existing ones. The necessity for transport decarbonisation has generated new business prospects.

Cahill et al. (2014) After speaking with automakers and dealers, data on customer satisfaction was analyzed. In general, traditional vehicle dealerships offer substantially better customer service. Buyers of PEVs outnumber those of cars. Introducing cutting-edge training and educational methods expanding dealer knowledge about electric automobiles could greatly increase sales and Consumer interaction.

According to study by Bailey et al. (2015), there is no meaningful correlation between the perceived presence of one charging station and PEV demand. But there is a small but significant correlation between station and PEV interest, between the availability of numerous charging stations and PEV interest.

CFA (2016) According to the second annual survey by the Consumer Federation of America, consumer interest in electric vehicles is rising. While prices continue to decline, there are more electric vehicle models available. Sales of electric vehicles have surpassed those of hybrid cars in the years since their debut to the market.

Fleet managers can fine-tune their business models and increase the profitability of a chosen technology (Pinto et al., 2020) if they can optimise technology selection based on supplier type, according to Cagno et al. (2018). the conversion of a company's fleet, which presently consists of combustion vehicles, to EVs in order to comprehend how the electrical system would be impacted by the installation of charging stations.

RESEARCH METHODOLOGY

Non-probability sampling entails non-random selection based on practicality or other factors, making it simple to gather data.

In this instance, non-probability sampling is applied.

Sampling Population: Dealers of all electric vehicles in the NCR and Delhi

Sample Size: A total of 100 dealers are included in the sample. Sampling Area: The replies from dealers in Delhi/NCR are included in the data sample.

Research Instrument

This study's tool was a structured questionnaire created by Google Forms.

When an assumption is backed up by data, it is referred to as a hypothesis. This is where any investigation must begin in order to convert the research questions into forecasts. Its component pieces include the population, the variables, and the relationships between the variables. A research hypothesis is a statement that is used to investigate the relationship between two or more variables.

1. H0=Null hypothesis=Consumer buying decision is not affected by advertising promotional strategy for electric vehicle.

   H1=Alternative hypothesis=Consumers buying decision is affected by advertising promotional strategy for electric vehicle.

2. H0=Null hypothesis=Consumer are not aware of electric vehicle.

   H1=Alternative hypothesis=Consumer are aware of electric vehicle.

3. H0=Null hypothesis=various factors did not influence the purchase behaviour of consumer.

   H1=Alternative hypothesis=various factors did influence the purchase behaviour of consumer.

RESEARCH OBJECTIVES

1. To identify the factors affecting consumer perception towards electronic vehicles from dealers point of view.
2. To study the relationship of identifiable factors with consumer perception towards electric vehicle from dealer point of view.

RESEARCH GAPS

In India, the EV market is currently very modest. For the past two years, the sale of electric automobiles has stalled at 2000 units annually. However, there is a goal of selling only electric vehicles by 2030, and as of 2023, the CAGR is 28.12%. The areas of research that need improvement are infrastructure, safety regulations for electric vehicles, high capital costs, and vehicle servicing.

DATA ANALYSIS

Data analysis is utilized in a range of business, scientific, and social science sectors. It has many dimensions and methodologies, encapsulating several techniques under many titles. Data analysis aids in the more scientific decision-making and more efficient operation of firms in today's commercial world. The open source statistical programme "Gretl" is the instrument utilised for data analysis in this study. It is used because it will facilitate the analysis of regression between the variables.

FINDINGS

1. 30.2% customers are aware regarding the availability of electric vehicles while they visit the showroom.
2. 27.6% of customers are aware of the green benefits of electric vehicles.
3. 31% customers get attracted to the innovative concept of electric vehicles.

4. 30% People feel recognized/responsible while/after purchasing electric vehicles.
5. 37.5% know that there are government incentives for the purchase of electric vehicles.
6. 37.7% are aware that the market share of electric vehicles is rising nowadays.
7. 37.7% of the educated youth of the nation is now buying more electric vehicles.
8. 45% customers complain regarding the safety issues of Electric vehicles.
9. 44.8% Support services (like repair/service/maintenance/ public charging station) are still lacking for electric vehicles.
10. 45% experienced that Lengthy charging time periods for electric vehicles are a major issue for potential customers.
11. 26.9% customers face anxiety over the resale value of their electric vehicles.
12. 41.9% are experiencing that there are still fewer choices available among electric vehicles.
13. 52.5% felt that there a benefit of Electric vehicles isstill under doubt.
14. 55.7% customers feel that electric vehicles will be more efficient and pocket friendly in the future, thus delaying purchases.
15. 42.5% estimating the potential savings from an electric vehicle is tedious.

IMPLICATIONS

1. For scholars looking to learn more about electronic employees, the study project might serve as a starting point for information.
2. People must become more knowledgeable about electric vehicles in order to appreciate the advantages they offer.
3. In order to draw customers, electric vehicle manufacturers need market widely and provide enticing deals.
4. Adopting electronic vehicles is urgently necessary since it would protect the environment and help prevent the scarcity of resources. Electric vehicle makers should focus on this.

DISCUSSION

The study's conclusions indicated that the Indian market for electric vehicles was more attentive to and attracted towards contemporary climatic developments taking place worldwide. Consideration was given to a number of factors that affected the decision. The conclusions about the end user that were drawn from the study of several literary works and reports that are freely available. Once the critical factors had been identified, they were all incorporated into a regression model to establish their relative weights in relation to the acceptability of EV in the modern environment. It was found that despite the fact that there has been much advancement achieved recently, consumer perceptions of EVs continue to be one of the most crucial and influencing factors. This illustrated the general public's ignorance of and lack of access to pertinent information. The development of electric fuelling stations is still in its infancy. If you're on a long trip or visiting relatives in a rural or suburban area and run out of energy, it could be more challenging to find a charging station because not many of the places you frequent have electric fuelling stations for your vehicle. It's possible that you're stranded.

CONCLUSION

The goal of this study was to find out what elements, in light of recent climatic events, were impacting Indian consumers' willingness to use electric automobiles. After a thorough assessment of the literature, three variables—Dealer perception, Consumer perception, Range Anxiety, and Vehicle Price—were found to be the main influences on the consumer's choice. Along the same lines, a new variable called "Heating issue of battery" was also added, which was in line with recent climate problems the nation was experiencing and recent EV fires in several Indian cities. We discovered that these factors are strongly related to Indian consumers' acceptance of EVs. The consumer's perception is something that is having a large and beneficial impact on the acceptance factor, even in the modern context and between the climatic difficulties, it was discovered when all the factors were regressed together in a regression model.

FUTURE SCOPE OF THE STUDY

Electric vehicles are the way of the future and are here to stay, which will give rise to many studies and points of view in the near future. It is still an untouched market for the auto industry and eventually for EVs in a country like India where the population is expanding at a rapid rate and is predicted to overtake China in the near future. A time-stretched study can be carried out using general sampling and clustered sampling, and a region-specific study could be conducted in areas where the climate is wreaking havoc and where significant EV-related difficulties have been detected. The current EV owners in India who have arrived during various seasons and the difficulties they encountered may be strengthened and thoroughly interviewed. Studies might be undertaken to determine the validity and viability of the campaigns that are being run with respect to their reach to the intended audience, since it was determined via the study that consumer perception is one of the main variables in today's society.

RECOMMENDATIONS

The limitations of the current study leave enough area for further investigation. In this work, the suggested conceptual

model was empirically tested in India. It is wise to conduct comparative studies in multiple contexts and locations.

It might be possible for future studies to examine the effects of additional covariates. Examples include perceived customer efficacy, knowledge, skepticism, safety, risk, curiosity, and experience.

In the future, it would be beneficial to test this idea with actual EV owners. There is a tonne of opportunity for more research in this area given the rising environmental concerns around the world.

1. There are a finite number of charging stations.
2. To include more electric vehicle models.
3. Driving an electric car can assist you in reducing yourreliance on petrol.

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