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# Consumer preference on electric vehicles and its business in the global market

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**Abstract**

Now a day's global market contributes consumer preference on electric vehicles and its business in the worldwide market, such as environmental pollution, global warming, and oil dependency. However, the current market penetration of EV is relatively low, despite many governments implementing strong promotion policies. This paper presents a consumer preference for electric vehicles its business globally. They are aiming to inform policy-makers better and give direction to further research. To estimates, consumer preferences for financial, technical, infrastructure, and policy attributes are then reviewed. A categorization of influential factors for consumer preferences into groups such as socio-economic variables, psychological factors, mobility conditions, social influence, etc. is then made, and their effects are elaborated. Finally, to discuss a research agenda to improve EV consumer preference studies and give recommendations for further research.

**Keywords:** electric vehicles, pollution, global warming, and oil dependency

## 1. Introduction

Nowadays, the term globalization used everywhere in the world. Adam Smith (1776) coined the term `globalization` in his book `Wealth of Nation` The historical pieces of evidence proved that Indians were business with countries like Chinese, British and other southeast Asian countries. The Chinese used to sell silk to the world. The British come to India purchase spices, and in return, India used to buy ammunition. So, globalization is not a new concept. In the earlier days, Indian spices, silk handicrafts, gold, silver ornaments, etc. were existing everywhere in the world.

The automotive industry is one of the largest industries globally, and it has collaborated with the rest of the industry. It has a potential effect, and it plays a vital role in the economic growth of a country. The transport sector alone produces nearly 23% of global carbon dioxide emissions (IPCC, 2014). India is the third-largest country that occupies the major contributor of carbon dioxide emission in transportation. To reduce oil depletion and global warming and combat climate change in the future, the international community must develop sustainable clean energy transportation (Mathieson et al., 2015)

Globalization of business is complementary to globalization market countries' chalk out strategies to open up the doors to foreign investment through global companies, multinational business firms, and transnational enterprises. India had a business market with all parts of the world. But at each point of time, different kinds of political regimes and their patterns of Government rules and regulations were poorly concentrated on world market trade. Recently remarkable changes happened and revision in trade regulation policy that independent India had implemented over forty years. Moreover, this revision was implemented only after the International Monetary Fund's recommendations and the World Bank to the developing countries.

In the current scenario, EVs have emerged as a disruptive innovation in the automotive industry because of climate change imposes of stringent emission rules, smart city imperatives at both the global and India level, and battery technology innovation. In effect, EVs have become a promising alternative to IC Technology. Currently, research in EVs has increased in developed countries and also in developing countries. Many researchers have focused on discovering the importance, impact, prospectives, and challenges in different countries. Very few studies have been reported in India, which stands out as an interesting case since the country is an essential potential market in the automobile industry, and its energy sources are fossil fuels. Automotive is a stable industry with a known set of competitors, predictable product development cycles, and

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easily replicable global trends. Last few years, the automotive sector saw the decline of this magnitude was around100 years back. Incidentally, at that time, EVs, which had a market share of 38% in the USA in 1900, were clamping disrupted by IC engines on account of a combination of starter motor innovation, range limitations of electric cars (60miles in 1900) as also the cost of IC engine cars decreasing significantly because of the mass production of EVs (Masiero et al., 2017). Incumbents in the automotive industry should ready for a changing landscape as India grows into the world's third-largest passenger-vehicle market, and global trends disrupt the sector. This paper deals with the customer preference for electric vehicles and their business in India and the rest of the world market.

## 2. Review of Literature

The first model of the electric vehicle was discovered (5), and then an early type of electric motor fitted and created a small model car. (6) (Anyosjedlock1828) in 1834, a shorter, circular, and electrified truck was built and operated. (5)(Thomas Davenport (1834). In the middle of the 19 century, the first vehicle was invented. An electric vehicle land speed record (760 mph) is the highest speed traveled by an individual (2). Later, EVs may operate through a combined system with electricity or self-contained batteries, solar panels, or electric generators to convert fuel to electricity. (7) (Asif Faiz et al. 1996) By the 1920s, an improved road infrastructure required vehicles with more astonishing world-wide discoveries of large petroleum reserves. This led to the vast availability of affordable gasoline, making gas-powered cars cheaper to operate over a long distance. Moreover, the worldwide use of electric vehicles was declined due to the high cost, low top speed, and short-range of battery electric vehicles than that of internal combustion engine vehicles, but electric trains were used continuously.(NEMMP 2020) Globally, the automotive industry is progressing through a paradigm shift. The shift to electric mobility has become necessary because of the fast depletion of fossil fuels, the rapid increase in fuel costs, the impact of transportation on the environment, and concerns over climate change.

### Statement of the problem

As the world becomes electric vehicles to spending more time and its business in the global market, it's becoming increasingly difficult to target electric cars. Consumer preference is a rigid marketing tool to control. Consumers are overwhelmed by marketing messages spread through electric vehicles, and its business in the global market should not only consider the electric cars are more suitable for the ride and also electricity cost. It is difficult to maintain infrastructure, buying an electric vehicle, Positive environment, Incentives given by Government, Beneficial financial options, The factor affecting buying electric car likes lack of consumer choice, price, and long recharge time, lack of trust to new technology. So the marketers need a way to turn damaging electric vehicles and their business in the global market into a positive one and create awareness among the consumers. Due to the change in technology, product and services are evolving and adapting to the electric vehicles sphere

### IMPORTANCE OF THE STUDY

Consumer preference for electric vehicles is one of the vital reasons for a company to achieve the organization's goal. Therefore, it is substantial to seek out the underlying factors that influence customer preference, which thus contributes to the organization indirectly the nation's economy. Besides that, it is essential to examine the influence of the independent variables as the chosen factors are less towards the field of electricity cost, public relations, the preference, and the viewpoint of branding, satisfaction based on the customer. It is a rare perspective compare to researches conducted based on factors like product quality, store environment, price, and promotion.

### OBJECTIVES OF THE STUDY

1. To study consumer preference for electric vehicles and its global market
2. To know the effectiveness of electric cars and their global market.
3. To find out consumer preference towards electric vehicles.

## 3. RESEARCH METHODOLOGY

This study is descriptive to explore the consumer preference for electric vehicles towards the global market about electric cars. Both primary and secondary data were used in this study. Secondary data used for collecting information on published sources like magazines, books, journals, and annual reports, etc. about electric vehicles for a clear understanding of the concept. Primary data were collected using a questionnaire. The

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first part of the questionnaire consists of the consumer's demographic profile, and the second part consists of five-point scaling questions relating to consumer preference for electric vehicles. The sample size is limited to 150 and convenient sampling techniques adopted, using suitable statistical tools like percentage analysis, cross-tabulation, chi-square test, cluster analysis, and discriminate analysis.

## 4. ANALYSIS OF THE STUDY

### Demographic Profile of the Respondents

The demographic profile of the respondents helps to segment the consumers in the market. Percentage analysis was used to understand the segment of respondents in this study and analyze the effectiveness of electric vehicles problems the consumer faces, and the techniques used in the consumer preference

**Table – 1**

**Demographic Profile of the Respondents**

| | Profile | Frequency | Percentage |
|---|---|---|---|
| **Gender** | Male | 99 | 66.0 |
| | Female | 51 | 34.0 |
| **Occupation** | Student | 61 | 40.7 |
| | Professional | 29 | 19.3 |
| | Business | 19 | 12.7 |
| | Employed | 41 | 27.3 |
| **Age** | Below30 years | 112 | 74.7 |
| | Above30 years | 38 | 25.3 |
| **Education** | Graduation | 40 | 26.7 |
| | Post-Graduation | 85 | 56.7 |
| | Diploma | 7 | 4.7 |
| | Others | 18 | 12.0 |
| **Family** | Nuclear family | 113 | 75.3 |
| | Joint family | 37 | 24.7 |
| **Total** | | **150** | **100.0** |

In this study, Out of 150 respondents, 66% were male, and 34% were female. 74.7% were under the age group of below 30 years, and 25.3% of respondents fall under the age group of above 30. 56.7% have done their Post-Graduation, 26.7% of the respondents have done their graduation, whereas 7% of respondents have done their diploma. The remaining 12% falls under other categories. 66.7% of them belong to the nuclear family and the other 33.3% as a joint family. 40.7% of the respondents are students, 19.3% are professionals, whereas 12.7% of the respondents are engaged in the business and service sector, and 27.3% of the respondents are employed. 45.3% of the respondents fall under the income group of Rs.1,00,000 to Rs.2,00,000, 21.3% of respondents fall under the income group of Rs.2,00,000 to 3,00,000, 14.7% of respondents fall under the income group of Rs.5,00,000 and above. Whereas, 10.7% of respondents fall under the income group of Rs.3, 00,000 to 4, 00,000 and 8% of respondents fall under income group of Rs.4, 00,000 to 5, 00,000. The demographic profile is used to frequently segment the market, as well as understand the market segment of consumers helps the marker to know about the target group helps to achieve the highest position in the competitive marketing scenario (Kotler,2010). The study also examined the association between understanding the segment of respondents in this study and analysing the effectiveness of electric vehicles problems the consumer faces, and the techniques used in consumer preference.

**Table -2**

**Consumer preference on electric vehicles**

| Particulars | Frequ | Percentage |
|---|---|---|

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| | | ency | |
|---|---|---|---|
| Own an electrical vehicle | Yes | 135 | 90.0 |
| | No | 15 | 10.0 |
| Electricity cost | 12 rupees | 38 | 25.3 |
| | More than 12 rupees | 83 | 55.3 |
| | Less than 5 rupees | 10 | 6.7 |
| | Between 5 and 12 rupees | 10 | 6.7 |
| | More than 15 rupees | 9 | 6.0 |
| EVs can protect Global warming | Strongly agree | 6 | 4.0 |
| | Agree | 99 | 66.0 |
| | Disagree | 9 | 6.0 |
| | Strongly disagree | 14 | 9.3 |
| | I don't know | 7 | 4.7 |
| factor encourages deciding buying electric vehicle | Price | 97 | 64.7 |
| | Positive environment | 36 | 24.0 |
| | Easy to operate | 4 | 2.7 |
| | Beneficial financial options | 13 | 8.7 |
| **Total** | | **150** | **100.0** |

In this study, out of 150 respondents, 90% of respondents share those own an electric vehicle and rest 10% of the respondent does not own an electric vehicle; 55.3% of respondents give more importance electricity cost for the success of more than 12 rupees, followed by 12 rupees (25.3%), Less than 5 rupees (6.7%), Between 5 and 12 rupees (6.7%) and 6% of respondent come to know by more than 15 rupees. 66% of EVs can protect Global warming with their strongly agree. They are the most popular Global warming for sharing, and 9.3% of respondents agree, 6% of consumers with their Disagree, 4.7 % with strongly disagree, and 4% with I don't know. 64.7% of the respondent's access factor encourages deciding to buy an electric vehicle like price, whereas 24% of people access a positive environment. In comparison, 8.7% of respondents beneficial financial options, and the remaining 2.7% of respondents access easy to operate. Therefore it is accomplished that go electricity cost means spreading word of mouth by using and it is an effective tool in promoting reduce cost through cars as well it is considered an easy way of beneficial financial options.

**Ranking Attributes of Consumer preference on electric vehicles**

Consumer preference on electric vehicles is one of the most powerful promotional tactics for Consumer preference. The science behind electric vehicles is the key factors that drive growth in electric vehicles i.e. enjoyable, trustworthy, informative, convenient, acceptable, entertaining, reliable, appropriate, time consuming, easy to reject and disruptive. The above attributes are gathered with previous studies. Ranking the attributes helps to identify the attribute which influencing more in the mind-set of consumer.

**Table – 3**

**Ranking Attributes of Consumer preference on electric vehicles**

| Attributes | Weighted Average mean | Rank |
|---|---|---|
| Enjoyable | 3.73 | 2 |
| Trustworthy | 3.28 | 7 |
| Informative | 3.75 | 1 |
| Convenient | 3.71 | 3 |
| Acceptable | 3.47 | 5 |
| Entertaining | 3.55 | 4 |

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| | | |
|---|---|---|
| Reliable | 3.21 | 8 |
| Appropriate | 3.34 | 6 |
| Time consuming | 2.71 | 11 |
| Easy to reject | 2.75 | 10 |
| Disruptive | 2.93 | 9 |

most important positive attribute of an viral marketing is being informative (3.75), while the second most popular reason for enjoying (3.73), it is been followed by convenient (3.71), entertaining (3.55), acceptable (3.47), appropriate (3.34), trustworthy (3.28), reliable (3.21) are most important viral attributes which are considered while spreading marketing messages and negative attributes towards being disruptive (2.93), followed by easy to reject (2.75) and time consuming (2.71). It is concluded from the above table viral messages spread by consumer through social networking sites are more informative, enjoyable, convenient and entertaining way of online communication tool.

**Discriminant Analysis Validation of Cluster Results**

In this study, the discriminant analysis was carried out for 2 cluster groups according to their perception level and it resulted in 1 discriminant functions and consequently 1 eigen values.

**Table -4: Discriminant Analysis Validation of Cluster Results**

| Dimensions | n -63 | n -87 | n -150 | Wilks' Lambda | F value | P value |
|---|---|---|---|---|---|---|
| Knowledge about electric vehicle | 17.11 (1.833) | 15.64 (2.199) | 16.26 (2.172) | .888 | 18.657 | .000 |
| Incentives given by Government | 25.22 (2.524) | 19.78 (2.838) | 22.07 (3.816) | .501 | 147.164 | .000 |
| pure electric available in global market | 12.37 (1.903) | 10.79 (1.862) | 11.45 (2.029) | .853 | 25.558 | .000 |
| Availability of charging stations in the global scenario | 12.48 (3.482) | 11.49 (3.827) | 11.91 (3.706) | .983 | 2.592 | .110 |
| battery life for EVs | 15.94 (2.055) | 11.79 (2.602) | 13.53 (3.142) | .574 | 110.000 | .000 |
| Environmental conscious | 16.38 (1.689) | 14.07 (2.662) | 15.04 (2.567) | .801 | 36.756 | .000 |

From the above table, consumers are clustered into two groups with six attributes according to their consumer preference towards electric vehicles that are internally homogeneous and externally heterogeneous. For discriminating variables, the F-test for Wilks's Lambda was used to determine the variables that significantly contributed to the differentiation of groups. F-test value shows that Knowledge about an electric

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vehicle, Incentives are given by Government, pure electric available in global market, availability of charging stations in the global scenario, battery life for EVs and environmental conscious towards electric vehicles (significantly smaller than 0.05) are significantly discriminate towards Consumer preference through electric vehicles. In contrast, only irritating was not a significant (significant value is more than 0.05) discriminating attribute to the respondents. The mean scores for attributes that encourage the groups for consumer preference through electric vehicles were: Knowledge about electric vehicle =16.26 (SD= 2.172), Incentives given by Government = 22.07 (SD= 3.816), pure electric available in global market = 11.45 (SD = 2.029), Availability of charging stations in the global scenario = 11.91 (SD= 3.706), battery life for EVs = 13.53 (SD= 3.142) and environmental conscious = 15.04 (SD = 2.567).

**Eigenvalues**

| Function | Eigenvalue | % of Variance | Cumulative % | Canonical Correlation |
|---|---|---|---|---|
| 1 | 1.855[a] | 100.0 | 100.0 | .806 |

a. First 1 canonical discriminant functions were used in the analysis

The highest eigenvalue (1.855) corresponds to the discriminant function, which shows that it has the strongest power of discrimination of the function and the canonical correlation is a correlation between the discriminant scores and the levels of the dependent variable. The present correlation of 0.806 is extremely high.

**Wilks' Lambda**

| Test of Function(s) | Wilks' Lambda | Chi-square | Df | Sig. |
|---|---|---|---|---|
| 1 | .350 | 152.099 | 6 | .000 |

The calculated lambda value is .350 < 0.5which indicates the stronger power of the discriminant function. The computed chi-square value is 152.09, and it is significant at the level of significance .000 at the degrees of freedom 6. In chi-square analysis, if the considerable value is less than 0.05, reject the null hypothesis, and accept the alternate hypothesis. In the above-obtained result, since the significance value is less than 0.05, the null hypothesis is rejected. The alternate hypothesis is accepted, and it is concluded that the perception of respondents on consumer preference does significantly vary according to their discriminant variables.

## 5. SUGGESTIONS

Pure electric vehicles (BEVs) currently make up 66 percent of the global EV market. BEV sales are growing faster than those of plug-in hybrid vehicles (PHEV). However, specific needs have very different powertrain preferences, influenced by regulatory actions, customer choice, and the availability of particular models. However, in an attempt to reduce spending on subsidies while still encouraging EV sales, the government recently communicated a change in the incentive policy. On the one hand, it raised the minimum range to qualify for any incentive to 150 kilometers (up from 100) and the energy-density requirement to 105 watt-hours per kilogram (up from 90). Therefore, consumers are not influenced by monetary incentives for spreading consumer preference on electric vehicles. Companies must consider this in their marketing plan to electric cars as one of the strategies for a cheaper cost. Therefore, companies need to understand that it is necessary to create a positive response for their electric vehicles because of people forward those messages to their family, friends, and a negative. A positive reaction can be a huge success for companies. The government must be aware of the misleading information about the consumer preference available in Consumer preference on electric vehicles.

## 6. CONCLUSION

People started using the consumer preference on electric vehicles for sharing information, for the recommendation, and to increase the knowledge and consumer preference with their electric cars. Electric cars are an effective strategy, an essential tool for all business concerns, which can integrate social networking and marketing strategies according to changing and developing consumer behaviour expectations to achieve organizational goals. Consumers will share their opinions on electric cars with or without company interaction.

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Hence, it is the best method for promoting companies' products, creating brand awareness through integrated marketing strategies. Entry into network and marketing has low entry barriers, and consequently, any company can do it. Based on this research and other studies, we recommend that organizations focus on electric vehicles to create consumer awareness and introduce new products. This strategy has low cost and more impact on customers for marketers because customers have more trust in their family and friends than company advertisements.

## 7. Reference


1. Hemanth Kumar .S(2020) A Study on Consumer Awareness Towards e-banking With Special Reference to HDFC Kanchipuram; Emperor Journal of Applied Scientific Research; Volume 2 Issue 2 Pp 7-12
2. Dr S Praveen Kumar, Gowtham Chakravarthy(2019) Impact on Consumer Behaviour Towards Selected Fast Moving Consumer Goods in Thiruvallur District; Emperor Journal of Applied Scientific Research; Volume 1 Issue 2 Pp 1-8
3. K Murugan(2019) A Study on Customer Perception towards Online Marketing in Chengalpattu Town; Emperor Journal of Economics and Social Science Research Volume 1 Issue 4 Pp 16-23
4. R.Mayakkannan(2017)A Study on Employee Perception on Public Sector Banks in Chennai City; International Journal of Applied Business and Economic Research ISSN : 0972-7302 available at http: www.serialsjournals.com; Serials Publications Pvt. Ltd. Volume 15 • Number 21 (Part 2) • 2017, https://orcid.org/0000-0001-9693-0867
5. R.Mayakkannan (2019) A Study on Green Marketing Practices in India, Emperor International Journal of Finance and Management Research ISSN: 2395-5929, Volume-V Issue-4April-2019P.P1–5http://www.eijfmr.com/2019/apr_2019/apr-2019-01.pdf; https://doi.org/10.35337/eijfmr.2019.5401
6. A Ebinesan(2018) a study on service quality perception and satisfaction adopted by technology banking with special reference to public and private sector banks in chennai district; Emperor International Journal of Finance and Management Research Volume- 5Issue- 11 Pp 39-50