

Emerging Trends & Technologies in Automotive Sector in India (With Special Focus on Electric Vehicles)

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ABSTRACT

In this research paper we will discuss the latest technologies that the automobile sector introduces in India but main focus will be on electric vehicles or e-vehicles. Now a days automotive sector lays special emphases electric vehicles which is very challenging role for this sector as well as for the economy also. No doubt with the introduction of electric vehicles, environment will be saved a lot. It is eco-friendly as well as the cost of batteries of these vehicles will be very less as compared to the cost of fuel importing from foreign countries. Not only this but the automotive sector has introduced other technical changes also like digital marketing and sales, Biometric Seat Technology, In-vehicle Infotainment and Telematics, Road Condition Analytics and Navigation, Smart Parking, etc.

Keywords: automotive sector, electric vehicles, eco-friendly, telematics, smart parking.

INTRODUCTION

Automobile sector is growing so fast. It contributes major share in GDP, and in the growth of Indian economy, it generates numerous employment opportunities for the people of India. It has introduced latest technologies also. Few examples of technology improvisation are digital marketing and sales, Biometric Seat Technology, In-vehicle Infotainment and Telematics, Road Condition Analytics and Navigation, Smart Parking, etc. but the main focus will be on electric vehicles. Electric vehicles are introduced in all sections i.e., two-wheelers, three-wheelers and four-wheelers. Government is also laying more emphasis on production of e-vehicles. The Government of India has entered into a joint venture of all the PSUs of the Ministry of Power entitled Energy Efficiency Services Limited (EESL). EESL will look after the acquiring and sales of electric vehicles in India. It keeps the record of all vehicles running in India for their maintenance, for improvements and for statistical analyses. With all these technological upgradations automobile sector has become the worlds' third largest manufacturing sector in the economy. All these technologies are discussed in this paper. What are the benefits and obstacles that will be faced by the automotive sector after these improvisations.

IMPORTANCE & OBJECTIVE OF THE STUDY

Automobile industry is over 100 years old but with the emerging new trends and technologies in this sector, this sector is growing so fast. Introduction of parking sensors, back camera view, which provides

easiness in car parking, touch screen, biometric seat technology which symbolises if any of the component or part of the machinery is not working properly, navigation which facilitates road condition and alert the customers about the traffic on the road, electric vehicles which will be the future of automotive sector because not only it saves our environment from heavy and toxic-pollution but it saves our lots of cost of importing the fuel from foreign countries.

When we talk about Indian Automobile market, major share i.e., 76% share has been contributed by two-wheelers and 17.4% share has been contributed by passenger cars. As most of the population is from lower- and middle-class economy so demand for small and mid-sized cars are more when we talk about passenger cars. Showing a positive growth of 35.9%, with the increase in export of total number of automobiles from 4,134,047 in 2020-21 to 5,617,246 in 2021-22. By the end of 2024, India aims to double its automobile industry size to INR15lakh. Showing a positive growth of 42.9%, export of passenger vehicles has increased from 404,397 to 577,875 units from April 2021 to March 2022. Export of Commercial Vehicle has increased from 50,334 to 92,297 units, from April 2021 to March 2022. Export of Three-Wheeler also has increased from 393,001 to 499,730 units over the same period and the export of Two Wheelers has increased from 3,282,786 to 4,443,018 units in April 2021 to March 2022. After all the technical upgradations, how it boosts our economy will be discussed in this research paper with special focus on electric vehicles.

EMERGING NEW TRENDS & TECHNIQUES IN AUTOMOTIVE SECTOR

Indian automotive industry is doing well in the economy, and is going to be the world's third largest automobile market in the world after facing the negative impact of COVID-19 in terms of disruptions in supply of components, increasing price of electric components, disruptions in supply of manpower, etc. We are going to define the emerging trends and technologies in automobile industry which are as follows:

DIGITALISATION

Through digitalisation customers can not search their products on internet but can get full information about it. Not only this but they can ask and solve their queries about the product online, they can renew their insurance policies online.

TELEMATICS

Telematics refers to the technology that deals with the transmission of computerized information over the long distance. Through GPS technology, it monitors cars, trucks, equipment and other assets and plot their movement on a computerized map. It tells us about the driving behaviour i.e., how fast we drive, how frequently we use the brake, and the distance covered by us.

CONNECTIVITY AND DATA TRANSMISSION

Connectivity and data transmission is very important for automobile industry. This technique is used to monitor traffic, provides parking assistance, monitors and controls engine. Connectivity and data transmission provides information regarding driving conditions, environment and much more.

ACCESSION OF 3D PRINTING TECHNOLOGY

With the assessment of 3D printing technology the exterior body of auto vehicles are capable to sustain crashes and collisions. The chassis of the vehicle is printed by using this technology. 3D printing technology is transmuting the basics of conventional car designing.

BIOMETRIC SEAT TECHNOLOGY

In the coming years biometric seat technology is coming which not only provides safety to the customers but improves their quality of life. In this technology sensors are fitted in the seat belts and steering wheel, which controls speed limit, gives audio warning, dials emergency services. This technology also monitors driver's breathing rate, heart rate, and body temperature and gives warning if the driver's condition is not well.

MECHANISTIC MAINTENANCE SYSTEM

In this technology certain indicators are displayed on the dashboard of the car if there are any malfunctions in the car relating to engine, battery, low fuel, handbrake, seatbelt, etc.

CAR PARKING SENSORS AND REAR VIEW CAMERA

This technology provides so much convenience to the customers especially these days when everyone is struggling with the parking space. Through this technique customers can easily park their cars with so much convenience.

ELECTRIC VEHICLES

The problem of pollution is very serious and dangerous for the people of India for a very long time because it comes among the polluted countries. Not only pollution from vehicles but burning of industrial waste also causes hazardous air pollution. So in order to overcome from such serious problem India is slowly-slowly switching towards electric vehicles because these vehicles are environment friendly as these vehicles run on battery which are charged electrically and does not cause any pollution neither air pollution nor noise pollution. Under 'National Electric Mobility Mission Plan 2020' India promoted the use of electric vehicles. This Plan boosts up domestic manufacturing capacity as well as it also deals with the problems of pollution and National energy security. As per the Paris Agreement, Indian government plans to use the maximum number of electric vehicles by 2030.

Government is also laying more emphasis on production of e-vehicles. The Government of India has entered into a joint venture of all the PSUs of the Ministry of Power entitled Energy Efficiency Services Limited (EESL). EESL will look after the acquiring and sales of electric vehicles in India. It keeps the record of all vehicles running in India for their maintenance, for improvements and for statistical analyses. Many cars manufacturing companies like Reva Electric Company and Ola have assured manufacturing electric cars more common over a decade.

Electric vehicles are gaining so much popularity these days in the automotive sector. These are light-weight and easy to drive, even the old ones are liking these electric vehicles so much because of their

easiness to handle, drive and require low maintenance also. Electric vehicles are introduced in two-wheelers, three-wheelers, and four-wheelers sections. Not only automobile industries but government also promoting these electric vehicles by providing subsidies to the customers on purchase of these vehicles. Now a days E-Rickshaws are very popular because the cost of running these E-Rickshaws are comparatively lower to the normal taxis. Not only this but two-wheelers are also gaining popularity among the people, especially the youngsters are liking these e-vehicles. In four-wheelers, most popular brands of electric cars are BYD (BYD Atto 3, BYD E6), Hyundai (Hyundai IONIQ5), BMW(BMW i7), Mercedes-Benz(Mercedes-Benz EQB), MG(MG ZS EV), PMV(PMV EaS E), Volvo(Volvo XC40), Tata(Tata Tigor EV, Tata Tiago EV, Tata Nexon EV Max, Tata Nexon EV Prime), Hyundai, Mahindra, Tesla, BMW(BMW i4, BMW iX), Kia(Kia EV6), Mercedes-Benz(Mercedes-Benz EQS). Electric vehicles are supported by electric charging stations in India, namely, New Delhi, Ahmedabad, Chennai, Lucknow, Mumbai, Pune, Hyderabad, Kolkata, Gurgaon, Jaipur, Bangalore, Noida, Ghaziabad, Chandigarh.

CERTAIN CHALLENGES FOR E-VEHICLES TO BECOME POPUPAR IN INDIA

- **INCENTIVES**

The cost of manufacturing electric vehicles are very expensive and comes in the category of premium price segment, that's why electric vehicles are dependent on incentives. So, in order to gain popularity in Indian market, government has to provide incentives and subsidies like in case of developed automobile markets like China and US where these electric vehicles are running in huge quantities.

- **EXPENSIVE BATTERY**

Battery and power electronics of electric vehicles is very expensive and cost almost two-thirds of the cost of an electric vehicle. They are made up with nickel-metal hydride (NiMH) and Lithium-ion (LiON) material. But due to less demand in volumes, the cost of manufacturing these vehicles is comparatively higher.

- **PRICE FACTOR**

Like we have discussed several times in this research paper that the cost of manufacturing these electric vehicles is comparatively higher so these are offered to customers at a comparatively higher cost in the market.

- **POWER STATIONS**

These electric vehicles are charged by using electricity but now a days India itself is suffering from shortage of electricity. Many power stations are closed due to failure to generate electricity.

CONCLUSION

Besides the above challenges which we have discussed in this research paper, when we compare the advantages of using electric vehicles on road, we find that advantages are comparatively more than the challenges of using electric vehicles. These challenges can be reduced or rather removed when we work on these challenges. The only thing is that the government of India have to start campaigns to publicise

these electric vehicles, make people aware about these electric vehicles so that the demand of electric vehicles can be increased and when the demand increases, there will be huge production of these E-Vehicles, so automatically the cost of manufacturing e-vehicles will be decreased by economies of large-scale production. Once the cost of manufacturing e-vehicles decreased, then it is not necessary for Indian government to provide incentives and subsidies because they will be offered at lower price to the customers. Power generation should be ramped up to meet the future demand. The Government should define the regulations on emissions and fuel efficiency, clarify aspirations, strategic intent and direction, explore incentives and subsidies, it can support Electric Vehicles adoption and focus on developing a supportive ecosystem.

After all the technological implementations surely the automobile industry will boost up the economy and will generate huge employment opportunities to the people of India. Indian automotive industry has the ability to produce a 5.7 per cent higher value add in a 30 per cent electric car sales scenario and will support around 20 to 25 per cent jobs.

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