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Electric Vehicles as Disruptors in Sale for Automobile Industry

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Abstract: Today's economies are dramatically changing and are triggered by developments in emerging markets, the accelerated rise of new technologies, sustainability policies by governments against climate change, and changing consumer preferences around ownership. Digitalization, extensive automation, agile business models have revolutionized every industries, and automotive sector too. These forces are giving rise to major four disruptive tech-driven trends in the automobile sector: Affordability, Government Policies, Charging Infrastructure, and connectivity.
Keywords: Diverse Mobility, Charging Infrastructure, Electrification, Connectivity, Market fluctuation, Manufacturers, Suppliers.

I. INTRODUCTION

Indian Automobile sector is worth rupees 4.5 lakh crore annually, giving employment opportunities to the more than 37 million Indians. Automobile sector contributes to 7.5% of total India's GDP and is 50% of manufacturing GDP. The industry with 57 billion dollars turnover has started to leap into a new age of the vehicles, internal combustion engine vehicles transitioning into electric vehicles. The Indian automotive industry was affected in terms of sales. Car sales figures for 2019 are dropped as good as 50% as compared to 2018. This was a combined effect of many factors, but EV's being the industry relevant technological aspect for the future.

Electric vehicles categorized as fully electric, hybrids are entering the Indian market. Competing with current ICE vehicles in the market. This is a result of climate policies and counters chalked out by governments. Manufacturers are adopting to the change and everyone plans to launch their respective EV's by 2020. This requires tremendous amount of changes in strategies, supply chains, technology, manufacturing units, service infrastructure of automobiles etc. The biggest problem with this change is, its costs are extremely high and simultaneously creating disruption to sales of current ICE vehicles directly and indirectly.

II. LITERATURE REVIEW

M. Viswanath 2018 [1] - Various studies on consumer adoption of EVs has assumed that EVs are eco-innovations which have the potential to reduce the environmental problems of the transportation sector. Consequently, EV adoption behavior has been considered as a environment friendly behavior and factors related to environmental friendly behavior are often included in the analyzing EV adoption. In this regard, consumer EV adoption literature has mainly examined the roles of pro-environmental attitudes, values, beliefs and norms and their relationship with intentions to purchase EVs. The role of these environmental-related variables has also been found in exploratory studies where some EV adopters expressed protecting the environment as a motivation for their choice of car. Perception of EVs' positive environmental impacts also affected the intention to adopt to EVs for potential EV buyers.

Peter Gorrie 2019 [2] - Electric vehicles face two major obstacles: Their battery range is too short, and they cost too much. The first concern is regarding for batteries gain capacity and efficiency. For the latest generation, range exceeds 200 kilometers and some claim more than 400. Fuel costs are, literally, all over the map. Gasoline prices vary from city to city, and can rise and fall dramatically. Electricity rates tend to be more stable but vary widely in various places. In addition, most jurisdictions offer time-of-use rates, which means consumer pay less if they consume electricity during off-peak times. One result is that per kilometer driven variable, electricity is sometimes more expensive than gasoline.

Aurélie Glerum, Lidija Stankovikj 2014 [3] - Automobile manufacturers are making huge investments in electric car subsidiaries as they realize that electric vehicles are disrupting the auto industry. Significant internal changes will take place as teams fight for their share of budgets in R&D activities and existing powertrain heavyweights will refuse to step aside gracefully to electric divisions. Many new supply chain partnerships need to be created. The focus will move to new tech developments as the automobile becomes AI on wheels.

Marketline Industry Profile 2017 [4] - Dealers will have to unlearn and learn to sell both electric vehicles and conventional

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vehicles. Dealers should equip their personnel with a diversified skillset to sell electric vehicles. The automotive business model is expected to transform with the establishment of the electric vehicle in auto market.
Profitability from service operations is expected to come down as electric vehicles will require less maintenance.
Infosys Limited 2018 [5] - Suppliers will be significantly affected as automobile manufacturers switch to the electric powertrain. Only a few suppliers who take appropriate initiatives will survive and succeed, such as Bosch that has a separate division to focus on batteries.
Incentives and subsidies will turn the tide in favor of electric vehicles. The rapidly growing charging stations network combined with supercharging facilities will make adoption of electric vehicles easier for the end customer. Superior driving experience with packed innovative features will make it difficult for customers to resist the new experience, getting an electric vehicle. Once they drive an electric vehicle, they will find it difficult to go back.
Governments will take the Electric Vehicles Initiative (EVI) seriously as adoption of electric vehicles can reduce the carbon footprint.
Governments will play a key role in resolving subsidy-related issues to promote and make electric vehicles affordable. Governments will have to consider providing special privileges such as removal of tolls on expressways and providing priority parking spots to encourage adoption of electric vehicles.

III. OBJECTIVES

A. To study the Electric Vehicles and their effects on the automobile industry.
B. To study the effects on sales of automotive because of EV.
C. To study the market place for Electric vehicles.
D. To know the increasing need, for Electric vehicle.

IV. RESEARCH METHODOLOGY

The study is based on both Primary and secondary data collected from various sources such as personal interviews , research papers, news articles, reports and other online databases.
The paper will showcase the impact of Electric vehicles as Disruptor in sales of automobile industry.
Study of attitudes towards EVs , purchase intentions for electric vehicles , mobility needs and mobility behaviour of consumers , driving behaviour and eco driving to overall attitudes ,acceptance and experience of EV-specific features, especially regeneration function (for further information see) or limited range usability of the EV. Barriers like charging the battery, usage and acceptance of public recharging facilities and approach towards renewable energy, preferences like, affinity for technological innovations, environmental concerns or need for change will be emphasized in the research.
As we have researched about the trends and development happened and going to happen, we make sure the facts and figures showed in the paper are accurate. We will analyse all aspects of Electric Vehicles as disruptors in automotive sales.
Data Collection – Primary & Secondary
Research Strategy – Case Study
Research Approach – Deductive

V. ELECTRIC VEHICLES AS DISRUPTOR TO AUTOMOBILE SALES

A. *Technology Barrier*

Electric vehicles were emerging technology few decades back and now becoming the future of automobile industry in India and everywhere around the world.
Technology changes in terms of vehicles transitioning to hybrid cars or fully electric vehicles created requirement of totally new aspects of technology.
The industry has to shift its research & development focus to electric vehicle technology and which is amounts to humongous costs for them. Also changes in supply chain of manufacturers are made to accommodate changes in product design again leading to cost. This cost of technology has directly contributed to adding barrier in sales of EV's and eventually being the disruptor to automobile sales.

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B. *Affordability*

The affordability of EV's in India is still not upto the mark yet. The segment still isn't making meaningful leap even after more than 4 years after the government has started promoting cleaner vehicles for one of the world's most polluted countries. The potential of India's EV market can't be ignored. There are only 27 cars per 1,000 Indians, compared with 570 for the same number of Germans, allowing global automakers an opportunity to challenge the dominance of Maruti - Suzuki Motor Corp. that sells every second car on the road. Maruti is not introducing its first EV until 2020. Tata Motors Ltd. and Mahindra and Mahindra Ltd. build some entry level electric cars, still they have a limited range or are exclusively issued for government use.

Lack of competition and EV hesitant manufacturers have resulted into very high cost of EV's. Maruti Suzuki's estimate suggests, cost of a EV small car compared to its ICE car is twice the price. A small hatch worth rupees 4.5 lakh will cost more than 9 lakhs. This affects the behaviour of the buyer putting them in dilemma whether to buy ICE car or to accept costlier change. At the same time emission norms & environment policies like BS6 causing reduction in automobile sales.

C. *Sparse Charging Infrastructure*

India had an estimated 650 charging stations for 1000 cars and SUV in 2018. China, being the largest market for EVs, has about 456,000 charging points giving a brief idea about non-existent charging infrastructure in India.

India's inadequate charging infrastructure is a egg-chicken problem. Both government and and manufacturers are sceptical whether to or not to setup charging points first or not. Or should they wait till market transformation begins.

D. *Government Support*

Government support to EV's, majorly impact the transformation of automobile industry in the future. Budget in July included incentives such as reduced taxes, income tax benefits and import duty exemptions for certain EV parts. For certain locally manufactured EV's government has given subsidies to promote the sales. This eventually affects pricing, which is being the most important aspect of the electric vehicles.

VI. CONCLUSION

The current ICE automobile market sales are majorly affected by emergence of EV's in market, of which major direct disruptors components are lack of affordability, non-existent charging network, rapid technological changes and government support. Automobile industry needs today is a strategic transition plan that's not only situate EVs as the sole immediate future and also a competitor to Internal combustion Engines of today, but rather positions a way forward plan that is complementary to the already existent ICE automobile industry. This strategy will be sustainable for sales in ICE automobile market while boosting the EV's sales.

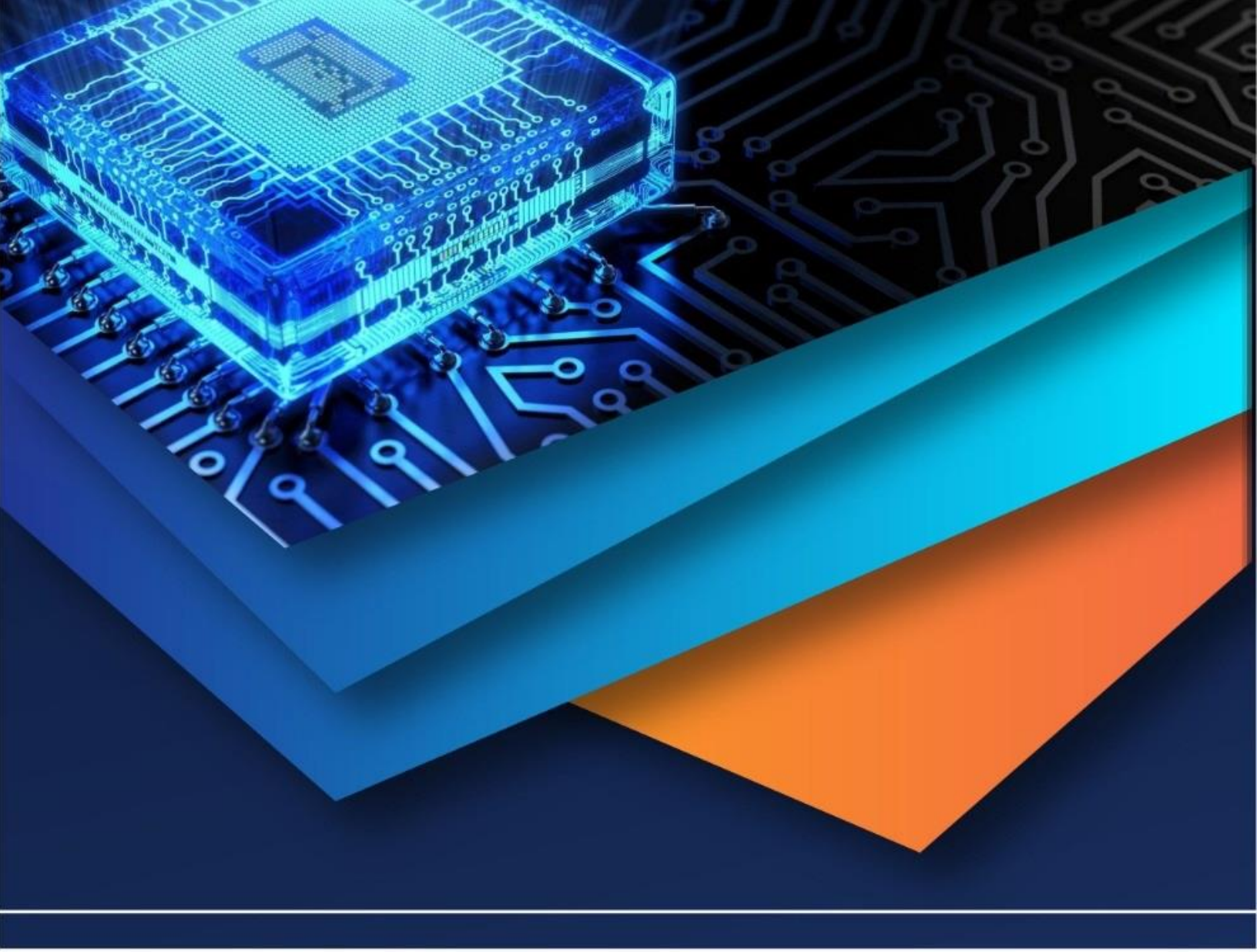
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