A COMPETITIVE ADVANTAGE OF ARTIFICIAL INTELLIGENCE REVAMPING IN AUTOMOBILE INDUSTRY IN INDIA

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Abstract:

Facing the long-term existential threats of sustainability, overcapacity, and the prospect of decreasing volume due to the challenge of shared mobility, automotive players must harness AI's potential. The greatest potential lies in the abundance of data that auto suppliers and automakers amass and do not currently use effectively. The study mainly aim to analyze the Impact of artificial intelligence on automobile industry also it focuses on ascertain the future of AI in the Automotive Industry. The study found that, Industrial AI robots will also reach peak levels across the production and assembly lines in the automotive plants. All these stats state that artificial intelligence in automobile manufacturing is the future for AI companies to improve productivity and ensure quality.

Keywords: Artificial Intelligence, Automobile Industry, Industry Future, Impact of AI

1. Introduction

Artificial Intelligence (AI) has had a clear impact on many business sectors, but it is particularly powerful in the manufacturing and automotive industries. Projections show that AI in the automotive industry will have a compound annual growth rate of almost 40 percent reaching $15.9 billion by the year 2027. The world is seeing a continued increase in the demand for connected vehicles and smart technologies such as voice and image recognition. The result is an industry that will continue to rely on both AI and automation in the design, production, and use of automobiles.

The automotive industry is emerging as a major source of AI and machine learning. The importance of artificial intelligence (AI) to the automotive industry over the coming decade cannot be overstated. Facing the long-term existential threats of sustainability, overcapacity, and the prospect of decreasing volume due to the challenge of shared mobility, automotive players must harness AI's potential. The greatest potential lies in the abundance of data that auto suppliers and automakers amass and do not currently use effectively.

2. The Evolution of Artificial Intelligence in the Automotive Industry

AI and its associated technologies are constantly evolving and becoming better at replicating human thinking and decision making. The goal of most people who are building AI systems is to use machine learning to help make decisions that humans are responsible for today. The

applications of AI in the automotive industry are far-reaching and exciting. This is why AI has been penetrating the industry quickly and successfully.

If earlier AI systems were used to help with simple, constrained tasks like cruise control or parking, today AI is giving drivers the opportunity to enter completely autonomous cars and enjoy the ride.

3. Benefits of AI in the Automotive Industry

While bringing AI into a factory or service related to the automotive industry may be expensive at first, in the end, the benefits typically far outweigh the costs.

AI allows automotive manufacturers and others in the industry to reach new levels of technologies and efficiencies that once seemed like a dream. This includes self-driving cars, AI-based robots on the manufacturing floor, predictive maintenance, and more.

By powering autonomous cars and driving, AI gives drivers insights into what is going on in real-time around them. There are a wide range of use cases of AI in the industry, each with its own distinct benefits.

4. Literature Review

Tai Yoon Chai & Ismail Nizam (2021) researcher is to investigate the impact of Artificial Intelligence (AI) in automotive industry transformation. After further careful interpretation on data obtained, all dependent variables which include leadership change, autonomous vehicle, smart factory and marketing & sales are perceived as significant positive impact by artificial intelligence. **E S Soegoto et al (2019)** The researcher uses descriptive research method where data is obtained from existing facts. The results of this research explain how important driverless cars technology is in the application of artificial intelligence in the automotive industry, and how the advantages and disadvantages of driverless cars technology are applied nowadays. **ShubhamSen (2018)**The development of artificial intelligence has taken a significance step in recent years and since then, the development has taken place in every domain of the modern world. This paper enlightens the need of a strong artificial intelligence in the world of automobiles and recent development that has taken place till now in the field of automotive.

KishanChaitanyaMajji&KamaladeviBaskaran (2021) The Internet of Things (IoT) is enabled every basic object to stay connected and communicate over a single platform called the Internet, and it can be done without any human interactions or (say it one-to-one meetings). A virtual assistant works effectively in the motors, and automobile industry. New end cars will mostly function in a way that the person is safe to tame his car just by giving commands. Volkswagen, Skoda, and SEAT are a few of the automobiles which are in conversations to introduce Alexa in their mechanic hardware. **Iain M. Cockburn, Rebecca Henderson & Scott Stern (2019)** Rapid advances in the fi eld of artificial intelligence have profound implications for the economy as well as society at large. These innovations have the potential to directly influence both the production and the characteristics of a wide range of products and services, with important implications for productivity, employment, and competition. But, as important as these effects are likely to be, artificial intelligence also has the potential to change the innovation process itself, with consequences that may be equally profound, and which may,

over time, come to dominate the direct effect. **Caiming Zhang & Yang Lu (2021)** Artificial intelligence has attracted much attention from government, industry, and academia. In this study, popular articles published in recent years that relate to artificial intelligence are selected and explored. This study aims to provide a review of artificial intelligence based on industry information integration.

Martin Eling, Davide Nuessle & Julian Staubli (2022) the results illustrate that both cost efficiencies and new revenue streams can be realized, as the insurance business model will shift from loss compensation to loss prediction and prevention. Moreover, we identify two possible developments with respect to the insurability of risks. The first is that the application of artificial intelligence by insurance companies might allow for a more accurate prediction of loss probabilities, thus reducing one of the industry's most inherent problems, namely asymmetric information. **Sayed Suhaib Kamran et al (2022)** in this era of the fourth Industrial Revolution (Industry 4.0), industries have become all the more sophisticated owing to the intelligent technologies employed to maximize production, quality, and profits; and minimize wastage, time and cost of production. This paper studies various aspects of AI and related tools and techniques and aims to employ them in the automobile industry to make modern vehicles smart, safe and reliable. **Nikolai Mayer & Dr. S. Jimmy Gandhi (2019)** this paper explores AI applications in the automotive industry of the future with respect to the automotive value chain. The applications of AI are analyzed for all the sub processes in the automotive value chain, which include: Research and Development, Procurement, Logistics, Operations, Marketing, Sales, and Connected Customer. The AI applications for each sector are investigated in terms of risk and impact on businesses in the automotive sector. This helps to identify, from an organizational perspective, the most applicable areas of AI technology in the future automotive industry.

5. The Impact of AI in the Automotive Industry

- **Improve factories**

Quality control in a factory is also improving due to machine learning. Workers who are tasked with the job have the potential to make errors. Systems that run with artificial intelligence (AI) can also miss issues if they weren't programmed correctly. However, machine learning can improve the process by gathering feedback and updating the system.

- **Predict inventory demand**

Cars are expensive to build, and inventory has a significant impact on profits. If a car has higher demand than expected, auto manufacturers can miss sales. On the flip side, if a car has lower demand than anticipated, it may have to be sold at a loss.

- **Generate customer sales**

Machine learning can help car companies sell more vehicles. It can collect data about a customer like demographics, past transactions, and online activities, and create personalized promotions.

- **Prevent problems**

With machine learning, maintenance becomes "predictive." Instead of basing service on mileage or waiting until a car breaks down, sensors can detect damage and predict problems before they happen and notify drivers via the dashboard or their phones. Drivers can then schedule service at a convenient time for them.

- **Communicate With Customers**

If a car needs service, an automated chatbot can set up and confirm appointments and send reminders. Chatbots can also conduct surveys after service is done to help auto manufacturers and dealerships personalize service.

- **Avoid Collisions**

Infiniti offers Predictive Forward Collision Warning and Forward Emergency Braking features. The technology analyzes the speed and distance between the driver's car and the two cars in front of it. If the two vehicles in front of the car slow down or brake suddenly, the system alerts the driver. It can even take over and slow or stop the car if the driver does not have time to respond.
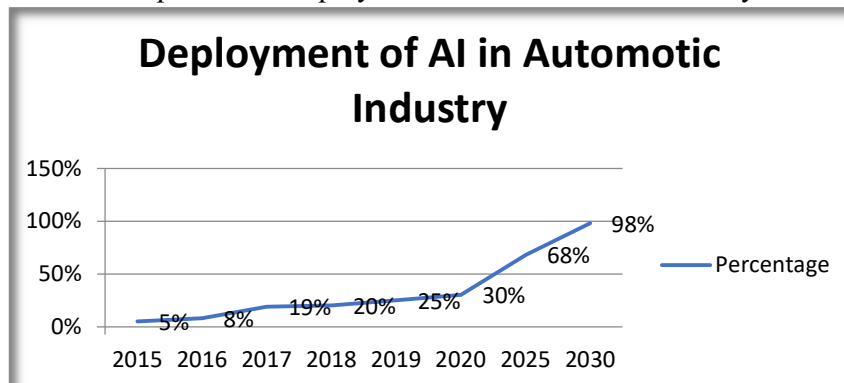
6. **The Future of AI in the Automotive Industry**

The future of AI in the automotive industry will be flourishing. The term automation in the automotive sector has been a buzz since the past few years. The use of AI in the automotive industry worldwide is on the rise.

Automobile manufacturers around the world are using AI technology in every aspect of the vehicle manufacturing process. With a blend of AI and machine learning, autonomous vehicles go safely through traffic.
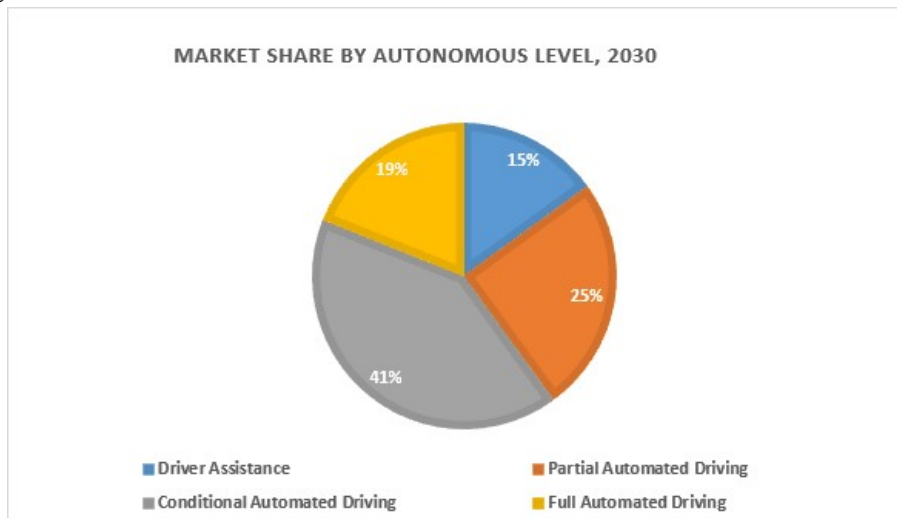
Thus, AI in automotive, using cloud computing, IoT, ML, deep learning, and cognitive systems, will bring safe and efficient autonomous vehicles to market. Likewise, AI-powered smart automotive manufacturing is also expected to surge along with technology.

AI robots have not yet rolled completely, but they will completely take over the manufacturing operations in the next coming decade. As we discussed in the above section, the list of AI use cases in the automotive industry will gain prominence in the future. The below figure depicts the growth of AI development and deployment in the automotive industry from 2015 to 2030.

The above figure depicts that the future of the automotive industry will be around AI. Moreover, by considering many other AI trends in the automotive industry, it is estimated that self-driving vehicles will hit the streets by 2030.

According to the this reports, it is estimated that the global sales of self-driving systems to reach 80 million units by 2032 from 33 million units in 2019. The expected growth rate is fabulous and generates fruitful business for smart automobile manufacturers. You can analyze the penetration of autonomous vehicles by observing their market share by 2030 from the below figure.

MARKET SHARE BY AUTONOMOUS LEVEL, 2030

- Driver Assistance
- Partial Automated Driving
- Conditional Automated Driving
- Full Automated Driving

Research reports say that the market share of fully automated driving is just 0.01% in 2019. And, by 2030, it's going to hit 19% of the total automobile market share with rapid advancements in AI, the technology will occupy its brand in the automotive market space.

Industrial AI robots will also reach peak levels across the production and assembly lines in the automotive plants. All these stats state that artificial intelligence in automobile manufacturing is the future for AI companies to improve productivity and ensure quality.

7. Conclusion

This study has proven that artificial intelligence in the context of automobiles is not only related to self-driving cars. Artificial intelligence has much significant impact on the entire foundation and supply chain flow of automotive industry (Zaki, 2019). Artificial intelligence is being optimised and used in automotive industry (Lin, et al., 2018). Although AI implementation would eliminate some of the existing job roles, but it is creating new job roles as well. AI application such as Internet of Things (IoT), cloud computing and big data will improve efficiency of manufacturing process by reducing waste, producing parts with better quality and offer order-to-made to fulfill increasing demanding consumers. Workers in manufacturing need to enhance their knowledge in order to become skilful workers while automotive organisation as industry pioneer for technology adoption will justify the return on investment towards smart factory. As artificial intelligence is being pursued and developed by multinational and governmental organisations and its potentials are yet to be fully discover especially in automotive industry, it is crucial that artificial intelligence applications are being

develop with appropriate ethic and legal framework which compliance with Personal Data Protection Act and respective laws.

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