Artificial intelligence In Auto mobile industry.

ABSTRACT:

The objective of this paper is to introduce the concept of artificial intelligence in the world of automobiles. 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.

EXISTING ISSUES WIRH CURRENT AUTOMOBILE INDUSTRY:

VEHICLE ACCIDENTS:

Tens of millions of people have lost their lives or have become disabled worldwide in the last 10 years because of vehicle accidents. Almost all the traffic accidents are caused by human mistakes. Unfortunately, according to statistics, in the next 10 years, the number of lives lost each year will likely double. According to the World Health Organization, road traffic injuries caused an estimated 3.26 million deaths worldwide in the year 2020. (Source: World Health Organization, 2020). Worldwide it was estimated in 2020 that 4.5 million people were killed in traffic accidents (7.7% of all deaths) (World report on road traffic injury prevention, WHO, 2020)

GRAND THEFT:

Auto The term is associated with the stealing of the automobile. This a major security concern in the entire automobile industry where hundreds of vehicles get stolen every year without any trace. Property losses due to motor vehicle theft in 2013 were estimated at $4.3 billion alone in the United States of America as per Wall Street Journal. In India, as per Ministry of Transportation, the no. of vehicles stolen is roughly around 135431 in 2013.

DRIVER DISTRACTIONS:

The safety factor while driving an automobile is something that cannot go neglected. It is one of the key features that can cause or prevent a catastrophe. Even though all the standard or elite class automobile has been equipped all the latest available technologies that increase the chances of driving safety, statistics tells a different story. As per “accident attorney” website, the major form of distraction is texting, talking to co passenger, high volume music, alcohol etc. And what is more concerning is that majority of them are caused in teenagers.

MAINTENANCE SCHEDULING:

Maintenance of the automobiles is a very essential and necessary task for every vehicle owner. A good maintenance scheduling results in better efficiency and better performance of the vehicle. However, it often happens that the regular or scheduled maintenance is not been done by the owner which leads to the downfall of performance for the vehicle. Another situation arises when the owner is not sure when to go for a maintenance run. It may often lead to unnecessary servicing of the vehicle which is again not good for the vehicle and for the owner.

MISCELLANEOUS ISSUES:

There are few more issues which are not being addressed by modern automobiles. Although research works are being carried out by all the major automobile industries, it might take another five to six years to make these technologies available for commercialization. Till then, let us consider that they still do not exist. These issues include an automatic speed controlling device that will have a predefined speed limit by the user. Also, there is no technology which can do an automatic diagnosis of the vehicle and tells which part needs a replacement. There are other issues which are minute in nature, but can cause a major disaster on the road. For example, a bad mechanical component in any of the system can cause a havoc in the entire vehicle system. Bad weather conditions can sometimes cause unexpected tragedies which could totally be avoided. The condition of the vehicle is sometimes so awful that driving such vehicles are itself a disaster. The driver who has no experience prior to driving and automobiles might find themselves in a critical situation. So far, no technology or vehicle engineering has been commercialized that can help such drivers. Illegal driving is another factor that can be an issue. Any driver below the specified age for driving are often seen on the roads and the only way to catch these pricks are through the assistance of cops, which sometimes prove to be too late in some cases.

BENEFITS WITH ARTIFICIAL INTELLIGENCE:

Artificial intelligence is taking the automobile industry by storm while all the major automobile players are utilizing their resources and technology to come up with the best. In the same way, when intelligence is applied to the technology within an automobile, it would recognize the environment and evaluate the contextual implications when it moves or faces any hurdles. In 2015, the install rate of AI based systems in new vehicles was just 8%; this number is expected

to soar to 109% in 2025. This is because different kinds of AI systems will be installed in vehicles.

DRIVERLESS CAR:

The thought behind driverless cars was around from the 1970s, so it is not entirely new. AI powered cars, depicted in movies over the years, have always captured our imaginations. But the lack of technical brilliance and resources probably kept it from becoming a reality, until recently. Eventually, all the factors leading to artificial intelligence shaped up and now driverless cars have become a reality. Well, almost, it is just a matter of time before you begin to see real intelligence in them. The idea is to empower the vehicle to act like a human driver and drive through various circumstances. This may sound easy, but is in no way a simple task because a lot of careful computing is required. Through techniques like sensor fusion and deep learning, researchers could develop a technology that would help build a three-dimensional map of all the activities that happen around the car. Some of the leading tech and automotive giants like Google and Tesla are spending millions of dollars in research to come up with better technology and to make autonomous cars a commercial reality.

Fig 8: - Autonomous car under development by Google

DRIVER ASSIST FEATURE:

While relatively few companies are working on fully-automated models, a growing number of manufacturers are easing in that direction. By introducing features that assist the driver without taking the wheel, many companies are taking a cautious approach to AI-based features, while still turning out vehicles with advanced safety features. Automatic braking, collision avoidance systems, pedestrian and cyclists' alerts, cross-traffic alerts, and intelligent cruise controls are some of the lesser features being powered by AI. The willingness of vehicle

manufacturers to develop automated cars, transfer trucks, and other vehicles opens a wealth of new opportunities. Companies that can put rubber to the road and innovate in this exciting new market will find investment dollars plentiful.

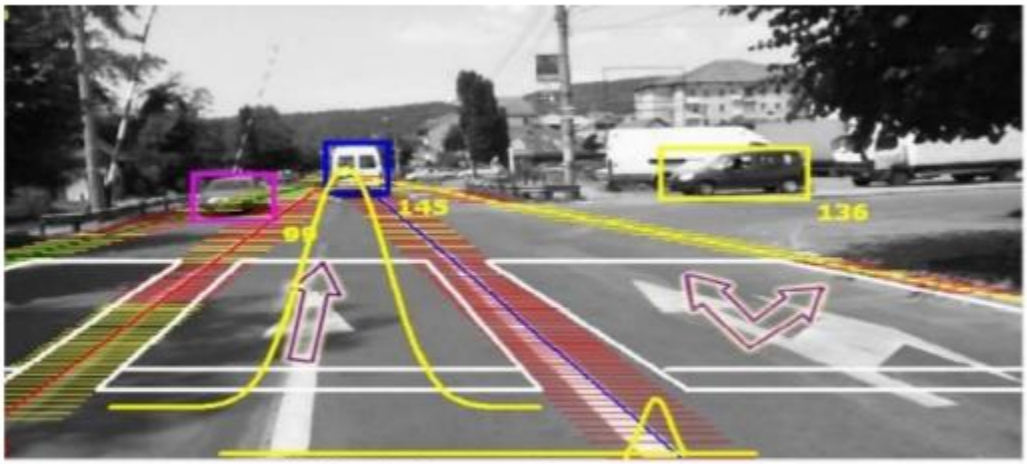

Fig 9: - Driver assistant software

CLOUD HOSTED INTELLIGENCE:

Cloud computing has certain advantages that make it the perfect platform for staging and deploying AI technology in the automotive field. Among these are fast processing speed, big data access and analytics, and centralized connectivity. As companies endeavor to develop cutting-edge automotive technology, cloud-based platforms will be developed to support them. One example of where the power of the cloud is being used is the partnership between General Motors and IBM's Watson supercomputer. An extension of GM's popular On Star system, the platform being developed will include AI enhanced features.

Fig 10: - Vehicle connected to the cloud settings

INTERNET OF THINGS:

By 2020, industry analysts estimate that nearly 250 million cars will be connected to the Internet. With new vehicles coming equipped with a host of smart sensors, embedded connectivity applications, and big-data enhanced geo analytical capabilities, it only makes sense to have an IoT tie-in as well. Here are just a few of the ways IoT technology is impacting, or will soon impact the automotive industry.

Fig 11: - Internet of Things utilized in an automobile

COGNITIVE CAPABILITIES:

The driverless revolution will continue to cruise along the streets, and you will be witness to not just small cars with AI capabilities, but huge 18-wheel trucks carrying an assortment of goods as well. This is taken a step further with cognitive analysis that kind of imitates the human behavior by looking at the behavior patterns and data mining capabilities. Cognitive systems are supposed to work just like a human would interpret a real-life situation, and to do that, a deeper understanding of unstructured data is essential. Insights would be drawn from plenty of unstructured data to decide on how to respond naturally in real time. Cognitive capabilities would be able to handle dynamic operating conditions as well. Car manufacturers have already started incorporating this into their vehicles.

Fig 12: - BMW harnessing the cognitive abilities of IBM Watson

INTELLIGENCE RISK INSURACE MANAGEMENT:

Always looking for ways to reduce risks, insurance companies have partnered with automotive and technology companies to help identify risky drivers. One such partnership involves Nauti, a technology developer, BMW I Ventures, and Toyota Research Institute, as well as the insurance company Allianz Group. Nauto has established agreements with the others to develop AI-based products that aid in fleet management, logistics, and driver safety. Using deep-learning AI technology, Nauto is developing a cloud-based platform that will track driver alertness, near misses, and unsafe driving habits. Eventually, Nauto plans to have a connected car network that will include an everincreasing number of connected cars. Nauto's AI platform and associated network will help fleet companies operate their vehicles more safely and more efficiently. By tracking driver behaviour, the system will help insurance companies identify drivers prone to have risky driving habits. Premiums will, no doubt, be adjusted accordingly. Nauto's efforts represent just one of countless opportunities for innovators in this niche space.

MERITS & DEMERITS:

As you have already realized, we have a lot of data from the car, and we have a lot of data from the owner of the smartphone. Artificial intelligence, which we also offer for the car, gives you recommendations. For example, we already know that you have a meeting tomorrow morning because we accessed your calendar, and we also know that your gas level is not enough. With AI we will send a notification to your smartphone saying, "please leave half an hour early because you need to get gas". The best features include: -

a) Safety

b) Convenient

c) Cost Effective

d) Predictive Driving

e) Great for Disabled People

AI is developing with such an incredible speed, sometimes it seems magical. There is an opinion among researchers and developers that AI could grow so immensely strong that it would be difficult for humans to control. Humans developed AI systems by introducing into them every possible intelligence they could, for which the humans themselves now seem threatened.

The demerits include: -

f) Threat to Privacy

g) Technical Errors& Software Bugs

h) Ambiguous Decisions

ECONOMICAL ASPECTS:

The use of artificial intelligence in the automobiles can be a major change in the automobile industry and can change the way automobiles and the terms associated with it has been seen till today. However, all good things come with a price. The technology of artificial intelligence may sound like a fantasy and more like a sci-fi movie, but this technology carries a heavy price tag on its head. The usage of sensors, smart screen, touch sensitive screens etc. are not available cheaply in the market. These electronic components are the most sophisticated things available in the market and artificial intelligence needs their sophistic nature to work at its best. Also, not to forget, the usage of the microprocessors and microcontrollers are a key factor in this technology. They are the one who will be running and controlling all the features and functions that was mentioned earlier. Hence, they need to be the best in the market, which indirectly implies that the cost factor will rise. The industries and the companies who wish to imply such technologies needs to invest a huge sum of money to make it successfully commercialized. In fact, statistics suggests that there has been a 4.7 billion USD has been spent so far by the firms who are developing artificial intelligence related technologies.

CONCLUSION :

It seems that we are standing at the point on the timeline where it is difficult to foresee the future of humanity in the context of Artificial Intelligence. We always embrace new technologies which seemed to be changing our way of living. However, the important fact here is that the kind of change we are embracing must bring a positive outcome for the welfare of society and eventually of humanity. Artificial intelligence is the kind of change which we

certainly should not take for granted. It is different than any other technology which humanity has ever developed and the fact which makes it unique is its ability to act autonomously. It is the change which not only starts exhibiting soon its positive impact on society but severely negative impacts, too. So, if we are embracing it as a change which is expected to change the way we live, then we should be happily ready to face the consequences whether it is related to employment, privacy, or eventually the very existence of humanity. However, whatever the case will eventually be, we certainly need a legal policy framework which can make sure to mitigate the challenges associated with AI and compensate the affected parties in case of a fatal error.