International Conference on Innovative Research in Engineering, Management and Sciences
International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2019 IJSRCSEIT | Volume 4 | Issue 9 | ISSN : 2456-3307

Automotive Industry Redefined By Information Technology: Review

K M Bilvika [*1]

[*1] Dept.of Information Science & Engineering, New Horizon College of Engineering Bengaluru, India.
bilvikagm@gmail.com[1]

ABSTRACT

At the dawn of second automobile century, the competitiveness among various automotive companies is decided by the very fact that how competent are they in adapting to changing advancement in information and technology. In today's day and age, technology is at work when we drive a car, when we buy one, when we interact with the dealer and is an integral part in research and development. Information and technology has become an important part of automobile firms starting from its design to performing various analysis virtually which has brought down lead time to a fraction of what they were and enabling engineers to innovate and improve with greater ease. With issues such as global warming, depleting natural resources, the responsibilities of firms have increased exponentially in the last decade and the contribution of Information science towards it by the means of data provided is second to none.

Keywords : component, formatting, style, styling, insert

I. INTRODUCTION

The IT industry is one of the largest in the world. It has its presence everywhere and the main reason for this is; it helps to meet particular demands of the field. India is expected to emerge as the world's third largest passenger vehicle market by 2021. Hitting that mark will depend on the better advancement of information technology especially in the field of Big Data and Analytics, Simulation, Robotics and Augmented reality. Cars are becoming large smart devices with mapping capabilities and braking capabilities with the kind of advancement that has happened in the past decade in these fields. Industry 4.0 considers it as four main pillars.

Being able to design the product without having to put in huge monetary investment or resources is a blessing mainly because it's not only efficient but precious natural resources are taken care from depleting. The software solutions eliminate the need for multiple prototypes as well as reduce the risk of product recalls, it is expected that the demand for these solutions will increase many folds in the near future. This will create a height in the demand for computer aided engineering. Any major automotive manufacturer must integrate multiple web based sales channels with its mainframe production line and order management system to reap the benefit from the customer end. For this to happen efficiently, the data analytics has to be taken care with lot more priority.

II. FOUR PILLARS

A. Simulation

In today's day and age it has become a norm in every automation company that any new equipment purchased or manufactured above a certain value should be verified by simulation modelling like CAE(Computer Aided Engineering) and CFD(Computational Fluid Dynamics) to name a few. The conceptual phase error removal and for a better lead time in analysis simulation has played a huge role. From a conceptual design point to final modelling can be realised in virtual mode which in turn is not only efficient but has played a huge role in avoiding natural resources depletion. Simulation model life cycle has helped automotive firms for better design and decision making. Whether a particular design works or not can be identified at the earliest stage which in turn saves lot of time and money.

Using simulation tools a car design of any possible diversity is checked for crash analysis, fatigue analysis, NVH (Noise Vibration and Harshness) analysis and various load case analysis. By knowing the behaviour of cars at the design phase itself with the above mentioned analysis, the materials that are considered for the manufacturing has been reinvented for its particular usage. Reinforced plastics and fibres are examples of it[1]. This helps in handling of physical resources in a better way keeping financial constraints in mind.

B. Big data and Analytics

Big data is helping the automotive industry in many ways from enhancing vehicle safety to the ultimate customer satisfaction. It has helped the car makers to provide customised approach to the customers. It gives a personalised flavour of design and interior to the customers[4]. The data analytics has modified the very nature of working in automobile industry especially in the field of retail norms. The data analytics has forced the firms to come out of their past glory of advertisement and marketing and use a customised approach to impress the customers. For example Audi has collaborated with Adobe for not only maintaining its website and corporate information but also to provide a new brand experience for the visitors. The main contribution of the data analytics is it has helped the firms to understand what customer is searching for and deliver accordingly.

The data accumulated from the various sensors present in the car acts as an eye opener in passenger and vehicle safety. This has formed the core of predictive analysis. Mapping technology has helped in the safety of the customers and in following traffic norms. Product recall from the distributed market is a nightmare for any firm. Forecasting and predictive nature of data analytics is helping to combat them. OEMs (Original Equipment Manufacturers) are able to track their customers even after sale. The data generated about driving behaviour, speed and abiding by the traffic norms is used to create driver profiles. The advanced analytics which uses the data gathered from survey and through feedbacks from the customers has helped the firms to keep up with the latest designs and trends.

C. Robotics

In an era which has been witnessing striking advances in artificial intelligence and machine learning the global automotive industry has embraced the emergence of industrial robots[2]. All the leading automobile players are concentrating in robotic technology to simplify the automation task. Robots have been extensively used in almost all the automobile industry where there is hazardous working environment and it cannot be avoided. Because of the efficiency most of the auto-makers prefer robotic intervention in their production and assembly lines. It has been a proven fact that the utilization of industrial robots has revamped the production and assembly lines. The magical robotic arm has 100% accuracy. Bottle neck removing and protecting workers have been the main advantage.

The rapid adoption of the robotic arm by the auto-makers to enhance the efficiency and precision of production lines will result in further more growth of robotics market[1].

D. Augmented Reality

Augmented reality supports human workers in frequently changing work environment. It provides spatially registered information to perform task directly in the users field. Artificial Intelligence and Machine Learning has played an immense role in the development of virtual reality. Augmented reality guides the user through unfamiliar task and helps in visualizing information. It helps in data visualization and interaction[1][3]. It can create a local environment where an individual can be helped to drive a car. This avoids amateur road accidents. It acts as a 'human- machine' interface. The first IAR(Industrial Augmented Reality) systems were mostly experimental but in the last decade it is used for relevant commercial initiatives. Google glasses are a significant example. The Augmented Reality system is widely used to monitor video see through applications[5].

III. CONCLUSION

With too much of data available, the interpretation of the data for meaningful insights is a big challenge for the automobile industries. Though computational methods for analysis gives us a fair bit of idea about the design, still greater work has to be done to gather further more reliable information. Big Data works on the principal of no data is less. With all the development in informational technology, it has become the responsibility of every auto-maker to shift the interest of the customers from non-renewable source of energy to the environmental friendlier cars. This has resulted in increasing automobile industries to show their interest towards hybrid and electrical vehicles. Such changes are likely to be beneficial for both drivers and manufactures.

IV. REFERENCES

[1] Erboz, Gizem,"How To Define Industry 4.0: Main Pillars Of Industry 4.0" 7th International Conference on Management, Nitra, Slovakia, 2017.

[2] Isak Karabegovic, "The Role of Industrial Robots in the Development of Automotive Industry in China",International Journal of Engineering Works, Vol. 3, Issue 12, PP.92-97, December 2016.

[3] Ahish Agrawal , Gourav Acharya , Krishna Balasubramanian , Nehal Agrawal and Ratnesh Chaturvedi,"A Review on the use of Augmented Reality to Generate Safety Awareness and Enhance Emergency Response" International Journal of Current Engineering and Technology, India, Vol.6, No.3 , June 2016.

[4] Nada Elgendy and Ahmed Elragal, "Big Data Analytics: A Literature Review Paper",Springer International Publishing, Switzerland, pp. 214–227, 2014.

[5] Bjorn Blissing, Fredrik Bruzelius and Johan Ölvander, "Augmented and mixed reality as a tool for evaluation of vehicle active safety systems,", Rome-Italy, International Conference Road Safety and Simulation ,2013