Supply Chain Management

Autonomous Vehicles in Industry 4.0

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1 Abstract

Industry 4.0, synonymous with smart manufacturing, is the fourth industrial revolution that is characterized by the integration of digital technologies into the manufacturing sector. Industry 4.0 technologies revolutionalize the automation, monitoring, and analysis of supply chains through smart technologies. Autonomous Vehicles have emerged as a transformative innovation in modern technology, embodying the principles of Industry 4.0 of automation and integration of digital technologies. This report would take a closer look into Autonomous Vehicles and Industry 4.0, by first introducing the Autonomous Vechicles and their importance in the modern world, followed by their integration into Industry 4.0. The report then looks into the theoretical aspects of Autonomous Vehicles and Industry 4.0, followed by a discussion on the benefits of integrating Autonomous Vehicles into Industry 4.0, concluding with some problem statements for which Autonomous Vehicles can provide solutions. The report is a culmination of extensive brainstorming, review of case studies, and relevant research publications on Autonomous Vehicles and their role in Industry 4.0.

2 Introduction of Autonomous Vehicles

The industrial revolution characterized by the convergence of automation, artificial intelligence, and the Internet of Things (IoT), has paved way for autonomous vehicles to redesign and redefine transporation, logistics and supply chain management since the digitalization is not only the manufacturing process upgrade, but also logistics and intelligent transport solutions [1]. Autonomous Vehicles (AVs) have the potential of providing more efficient logistics and passanger transfer methods. AVs make the use of advanced sensors, machine learning algorithms, and interconnected systems to provide efficiency, safety, and sustainability. Smart sensors such as LiDAR, along with the implementation of cognitive computing and IoT represents an AV as a cyber-physical system (CPS), within which information from all related perspectives is closely monitored and synchronized between the physical devices and the cyber computational space [1]. By utilizing advanced information analytics, AVs will undoubtedly be able to perform more efficiently, collaboratively, safely, and resiliently, thus making it possible to integrate AVs with Industry 4.0.

3 Background

4 Theoretical Concept to Autonomous Vehicles

5 Theoretical Explanations of Autonomous Vehicles in Industry 4.0

6 Benefits of Autonomous Vehicles in Industry 4.0

7 Problem Statements

References

[1] Raivo Sell, Anton Rassõlkin, Ruxin Wang, and Tauno Otto. Integration of autonomous vehicles and industry 4.0. *Proceedings of the Estonian Academy of Sciences*, 68:389–394, 12 2019.