Impact of AI in Automotive Manufacturing Operations

Executive Summary

Target Audience

This research report is targeted at automotive manufacturing operations managers who are focused on maintaining a competitive advantage by adopting new technologies and looking forward to adapt to change ahead of the curve. Additionally, artificial intelligence experts may find value in seeing practical applications of their research and technology in the automotive industry. Government officials will find useful insights into how innovation is practically applied in automotive manufacturing and how the technology of artificial intelligence will affect social, political, economic, and strategic considerations.

Research Conclusions

Although artificial intelligence technologies have received major media coverage in recent years, the application of A.I. and expert systems has been ongoing in industry for decades. Artificial intelligence and robotics development are advancing more rapidly in the past and this will change how they are utilized in industrial settings. Automotive manufacturing operations have traditionally led the way in introducing innovative new technologies, and this trend has also been observed with the introduction of A.I. and expert systems in a manufacturing setting. The main drivers for introducing A.I. into automotive manufacturing are the increasingly competitive global market demanding higher standards in product development and manufacturing, and a consumer market

demanding and expecting increasing customization in all products, including automobiles.

The implementation of reconfigurable manufacturing systems is one area where A.I. deployment is expected to have a positive impact. A.I. is expected to shift the production floor to a cognitive factory model, where decisions traditionally made by human staff will be delegated to A.I. enabled technologies, and will improve the RMS design process driving value for all manufacturers.

The social impacts of A.I. are wide ranging. Companies will have to account for the impact loss of jobs will have, and how to train people to work in new emerging fields. Governments will have to find new ways to attract companies to their country and region, this includes areas that have not traditionally been an automotive manufacturing hub. The incentive of this investment for both countries and companies are large as the economic impact of industry 4.0 is expected to be in the trillions.

Key Recommendations

The lessons being taught in current training should be continued but also improved. Function allocation will need to be used for addressing safety and profitability, and correct function allocation will also aid in designing new factory layouts. Enabling robots to handle more tasks and applications will require higher expertise and further training of staff.

Innovative interface design relying on human-automation interaction principles and self-optimization of structures will enhance the value of infrastructure investment in machining and assembly tools making it possible to invest in new markets.