

Artificial Intelligence: A Catalyst for Change

We are standing at the event horizon of a massive breakthrough in technology. The rise of artificial intelligence (AI) is already altering how we do business and how we communicate and our dependence on AI is only projected to increase over time. Over the course of the next ten years, artificial intelligence will likely add over \$13 trillion to global economic output (Conde), radically transforming most economic sectors. This change will perhaps be most noticeable in the automotive industry as it will revolutionize transportation and the supply chain management process. Unsurprisingly, the global market for transportation-related artificial intelligence technology is projected to grow at an astounding rate of 14% annually until 2023 (Conde). By 2030, artificial intelligence will drastically alter the automotive industry, by catalyzing the development of the intelligent supply chain, raising new concerns regarding cybersecurity, and benefitting the environment in the long term.

First, artificial intelligence allows for the growth of intelligent supply chains, which will accelerate the manufacturing process. Modifications to design plans can be made in real time. Furthermore, with regards to the production process, bottlenecks on the production floor can easily be identified and remedied. This is made possible through the Internet of Things (IoT), a system of communications between machines that do not require human input. Deloitte Digital IoT's Chief Technologist Robert Schmid described it well in layman's terms when he described IIoT (industrial IoT) technology. Sensors on the production floor "gather data, store it wirelessly and use analytics and machine learning to take some kind of action" (Wired Brand Lab). Ultimately, the elimination of a human presence through the IoT allows for faster communication. So how does this affect the automotive industry? Well, to an industry that relies primarily on manufacturing, this technology will have incredible results. Fewer automobiles will likely need to be recalled as improvements and modifications will be made faster than ever. Companies will be able to quickly respond to market and customer needs. In the long-term, the IoT will not be limited to the production process either as it will likely affect automobile maintenance as well, since real-time updates will alert suppliers of automobile performance. The 21st century has already seen the growth of automation in the production process, but with intelligent supply chains, this process will only be

accelerated further. AI in the manufacturing process will indirectly affect consumers as well. In the next ten years, we can expect to see the integration of blockchain technology, which has the capability of providing a record of transaction data to the consumer. Blockchain technology, while only recently gaining traction and media attention for use in cryptocurrency, has implications beyond cryptocurrency as well. By tracking transactions, consumers can get further insight into the manufacturing process—a sense of transparency in the production process previously unafforded to them. Through the Internet of Things and blockchain technology, the automotive industry will likely see intelligent supply chains flourish, ultimately affecting how automobiles are produced.

However, the rise of artificial intelligence in the automotive industry also raises concerns regarding cybersecurity. Hacking is a growing concern. In 2015, Chrysler recalled an estimated 1.4 million automobiles after security researchers hacked into a Jeep driving on the Interstate highway (Greenberg). Therefore, it can be assumed that as an increasing number of cars depend on artificial intelligence, stories such as the one mentioned above will become more prevalent in the news media. While hacking into a car may seem outlandish to some, it is just one of the consequences that will follow the growth of artificial intelligence. Security researchers at McAfee described just how easy this process was. By altering algorithms and ultimately “changing the magnitudes of a few features, zeroes to ones/ones to zeros, or removing a few features” the attacker has the ability to “wreak havoc...with disastrous effects” (Moore). The incredible ease with which this operation can be conducted is undoubtedly frightening and in the short term, we can predict more recalls from car manufacturers as they respond to this imminent crisis. Although the National Highway Traffic Safety Administration is beginning to look into this issue, they have yet to take any active measures in response to this problem. Currently, the responsibility lies with the manufacturers, as was evident in the 2015 Chrysler recall, but in the next ten years, government legislation and action will likely be necessary to combat this.

Finally, the impact of artificial intelligence on the environment, although indirect, cannot be ignored. According to the Environmental Protection Agency, transportation accounts for approximately 29% of all greenhouse gas emissions in the United States (“Sources of Greenhouse Gas Emissions”).

However, AI has the potential to reduce that number. Artificial intelligence allows for efficient routing in GPS systems. While this technology is currently being implemented, it will only continue to become more accurate over time. Efficient routes allow for reduced traffic, thereby reducing emissions. It is estimated that the improvement of artificial intelligence in GPS navigation systems and the transportation sector alone could reduce worldwide greenhouse gas emissions by 1.7% in the next ten years (“Putting AI to Work for the Planet”). It has the power to implement lasting change, that will consequently affect other parts of our lives as well. As companies in the automotive industry are financially incentivized to adopt artificial intelligence technology, they help reduce toxic gas emissions, protecting the environment as well.

Ultimately, artificial intelligence has the power to revolutionize the automotive industry, by developing intelligent supply chain systems, raising awareness about cybersecurity concerns and helping protect the environment. Over the course of the next ten years, we can expect AI to tackle economic and social issues, changing not just the automobiles themselves, but also how they are made, and the footprint that they will leave behind.

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