Automation in Manufacturing

The manufacturing sector is facing increasing pressure to reduce costs, accelerate production and meet challenging consumer delivery timelines. The introduction of autonomous systems in the manufacturing process provides an opportunity to meet these growing expectations. The below example details how AT&T and Whirlpool have used 5G technology to enable a fleet of Automated Guided Vehicles, and how this impact could be shared amongst the sector.

1 Situation

A major multinational manufacturer of home appliances was experiencing problems with its existing fleet of Wi-Fi connected automated guided vehicles (AGVs). Reliant on Wi-Fi to receive instructions and navigate, the AGVs were frequently halting and breaking down due to signal disruption. This resulted in production delays, traffic jams and an increased need for staff attention to resolve issues.

2 Task & Action

The manufacturer moved to a 5G-enabled AGV fleet, deploying a private, superfast 5G network across the factory floor and installing 5G receivers on the AGVs. The first phase of the 5G rollout covered 200,000 square feet in the centre of the factory and the AGVs supported lineside operations by bringing parts to and from points-of-use and the centralized storage area.

3 Results

Conversion to a majority AGV fleet: Initially, only a small number of vehicles in the factory were driverless due to the limitations of Wi-Fi connectivity, meaning the full benefits of AGVs were missed. 5G will enable up to 80% of factory floor vehicles to be driverless.
Adoption of AGVs in maintenance and delivery processes: The 5G-enabled AGV system can be expanded for use in maintenance, delivery and other areas of manufacturing operations, leading to significant cost savings.
Low reaction times to changing customer demands: The low latency, high bandwidth, edge processing of 5G allowed for tight software integration with ERP systems. Customers were able to flexibly request changes to their original orders.
Reduced damage: As more AGVs are used, a reduction in damage of handled parts should be observed. The AGVs mean accuracy is increased, as once programmed, no supervision is required.

4 Why 5G?

Traditional factories are often unsuitable for Wi-Fi connections. Metallic construction materials used to build most factories often interfere with Wi-Fi signals, and other features such as ceiling-mounted conveyor belts can also cause disruption. Additionally, any factory with even a small proportion of old equipment could experience radio-frequency interference. 5G allowed for improvements to be made without the need to remodel the whole factory. The 5G solution has allowed for super-fast connections and better coverage meaning the AGVs can move reliably from one end of the plant to another.

Increased efficiency by automating up of up to
80% of vehicles
on the factory floor

Cost savings
from automation of maintenance and delivery processes

Improved customer satisfaction
by accommodating changes to orders