Smart Warehouse Logistics

U.S. Department of Defense

AT&T

Industry 4.0 is continuing to reshape the global logistics sector and 5G is increasingly becoming its critical enabler. Automation, artificial intelligence and augmented reality technologies are being steadily adopted by businesses looking to improve the efficiency of warehouse operations in light of increasing budget pressures. This example details how AT&T and the US Department of Defense have used 5G technology to create a Smart Warehouse.

1 Situation

Smart Warehouses are being adopted in many different sectors. In this example, a US naval base in California decided to explore the concept of a Smart Warehouse to enhance, optimise and secure their logistics operations. As a result a variety of enabled technology solutions have been implemented.

2 Task & Action

5G supported the creation of a Smart Warehouse, where artificial intelligence, machine learning, virtual and augmented reality was applied to maintenance, prototyping and operations applications.

Artificial Intelligence and Machine Learning: 5G was used in a cloud environment, allowing for real-time recognition and classification of parts that were placed on a moving conveyor belt. A camera was trained to recognise the type and number of parts and update a database accordingly. Metrics were displayed on a monitoring and managing operations dashboard.

5G-enabled AR for advanced put/pick technology: 5G enabled the enhanced accuracy of a remotely controlled device and reduced its put/pick processing times. This technology can be integrated with robotic material movers, smart storage devices, and optimisation algorithms to further improve warehouse efficiencies.

3 Results

The deployment of a private 5G network at the warehouse delivered data throughput speeds of 3.9 gigabits per second with less than 10 milliseconds of latency. As a result, the efficiency, accuracy, timeliness, security, and safety of warehouse operations including material and supply handling, management, storage, and distribution was improved.

4 Why 5G?

5G was an essential backbone for the Smart Warehouse solutions tested here. It offered high-performance, efficient, secure, and scalable private network solutions. The increased throughput of data, internet of things (IoT) support, and low latency capabilities of 5G made it essential for this use-case and a consideration for any Smart Warehouse facility.

5 Wider Applications

Oil rigs, refineries and ports: The ability to track items using 5G and RFID tags which was used in put/pick processing in this example, could be applied to ports, oil rigs and refiners and any warehouse which wants to effectively track items. For example, RFID tags which were used as trackers could be given to employees on oil rigs, to track them in the event of a fire.

3.9 gigabits per second data throughput speeds

< 10 milliseconds of latency

Up to **100x** faster connection capability than 4G (Thales Group, 2022)