

Application of Artificial Intelligence and Robotics Technologies for Smart Warehouse

The Department's warehouse maintains and supplies general spare parts and consumables ("goods") required by different units for providing operation and maintenance services for E&M systems at various government departments and public venues. Under the existing practices, the staff decided the bin location on the rack manually for storage after goods receipt. The staff need to move around for putaway and order picking. The work processes are physically demanding and time-consuming, especially when there is variety of goods. Moreover, the warehouse operation is prone to error as all processes are manually controlled.

In order to support the pioneer of innovation technology, the Department has applied a new application combining automated guided vehicle ("AGV"), robot control system, warehouse management system and self-issuing locker, which would be the first smart warehouse among government departments and the first application integrating four technologies into one. An AGV is a robot following along marked QR code and radio waves for navigation. The use of AGV is a new concept for warehouse to carry the goods to person for order picking and putaway. Not only saving physical effort and enhancing occupational safety and health, the solution can efficiently assist with store operation, locker bin location allocation and performance visibility by applying artificial intelligence and robotics technologies. A self-issuing locker will also be introduced to allow users to collect the ordered goods any time in order to improve user experience.

By implementing the AGV system, it is expected:

- to reform workflow by using innovative technology;
- to facilitate the automation of the warehouse;
- to maximize the storage capacity in the warehouse;

- to improve the accuracy of the order handling process;
- to improve the overall efficiency of the warehouse operation; and
- to enhance user experience in collection of goods.