

Interreg
Euregio Meuse-Rhine



EUROPEAN UNION
European Regional
Development Fund

QRM4.0

Mobile Robots



TECHNOLOGY SHEET



Fontys

HOGESCHOOL
ENGINEERING

Mobile robots for lead time reduction

Time is money. In manufacturing production systems the faster one can bin pick, process, pack and transport, the more orders can be handled, hence the production would be more profitable. This is defined as the lead time reduction or quick response manufacturing (QRM). Nowadays, production systems range from fully manual systems to sophisticated automated systems. The manual productions are flexible but less cost-efficient, while the automated processes are more efficient in high volume productions but less flexible. Combination of using both manual and automated systems offers the advantages of both sides for manufactures. Using of mobile robots can efficiently reduce the lead time throughout the manufacturing production since the goals can be achieved easier and faster by taking advantage of them.

Thanks to the portable embedded batteries as energy suppliers and the manipulating arms as actuators, mobile robots are enabled to perform certain tasks, such as transporting and feeding materials, (pre)assembly or quality inspection at different workstations of production lines. Mobile robots can follow a plan more efficient than humans, usually without specific restriction.



Fig. 1. Three different types of mobile robots using by the RoboHub Eindhoven at Fontys University of Applied Sciences [1].

Mobile robots and lead time reduction

The mobile robots are always available and can work day and night to deliver products upon request without severe restrictions. Moreover, the communication between a series of the robotic systems can be easily managed following a specific supervisory control structure. That is why mobile robots are assumed as the backbone of future factories (www.mobile-industrial-robots.com). Nowadays, using mobile robots in modern manufacturing production systems have reduced the lead time efficiently. For instance, the companies having warehouses in their supply chains take advantage of effective automation proposed by the automated guided vehicles (AGVs) within the production line. Additionally, other mobile robots like automated guided carts (AGCs), transport inventory around the warehouses, while following magnetic stripes or a track laid in the warehouse. Fig. 2 illustrates two different mobile robots, designed for the RoboCup competition to carry different object with various shapes and transporting between two given point throughout an unstructured environments. These are two educational examples of mobile robots that can be used in industry.



Fig. 2. Two educational mobile robot, designed for the RoboCup competition to carry different object with various shapes throughout unstructured environments at Fontys University of Applied Sciences (www.fontys.nl/robotica)

Fig. 3 represents an AGV that aims to make the production environment autonomous while products will be transported from point A to point B, and then placed on the storage. This is another example of autonomous handling of object by mobile robots in the production environment. The AGV robots are able to interact with their environment, such as other machines, robot arms, and mobile robots from other manufacturers to be able to achieved the task.



Fig. 3. An automated ground vehicle that aims to make the production environment autonomous by transporting products between two given points (www.fontys.nl/robotica).

Need some help?

The Interreg project [QRM4.0](#) supports production companies in improving their lead times by providing practical advice and granting financial support to companies that want to take steps to implement digital tools on their shop floor. Would you like to know more? Contact michiel.vanosch@fontys.nl

