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EMERGING WAREHOUSING ROBOTIZATION SOLUTIONS

RADAR - OCTOBER 2019

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Emerging Warehousing Robotization solutions 2019

Automation in warehousing has been rapidly growing in the last ten years, with 3 main levers explaining this evolution:

- / A change in demand, driven by eCommerce, towards **more added value logistics flows** (enlarged offers, smaller orders, faster deliveries...) requiring increased productivity gains to maintain margins
- / A **shortage in labor** in many countries, specifically close to large urban areas, coupled with salary increases and a **higher cost of warehouse rentals** in key areas

- / A search for **better working conditions in warehouses** to reduce job painfulness, mainly in Western countries, that is pushing for 'fixed' position jobs allowed by Goods To Persons systems.

All over the world, the leading companies in Material Handling Equipments (MHE) have strongly increased their R&D spending to develop successful new solutions and cope with this higher and changing demand. Today, solutions such as X-sorters (Cross belts, Tilt-tray,..) , Pocket sorters, AGVs (Automated Guided Vehicles), AS-RS (Automated Retrieval & stocking systems) with staker cranes, mini-loads, multi-shuttles, ... are becoming widespread in many industries and have proven their efficiency both in terms of productivity and service.

We wanted here to present a panel of emerging solutions **more focused on robotization**.

These solutions are emerging technologies and share some key characteristics:

- / **Rise of the AMRs.** Autonomous Mobile Robots (AMR) can be used in various situations in the Warehouse, such as carrying loads, sorting parcels, or being assistant for picking,... They mainly differ from AGVs by the fact that AMRs can be managed as a fleet with powerful algorithms
- / Development of **robotics arms** with dedicated tooling
- / **High level of flexibility** with low or no physical infrastructure needed , and some providing **RaaS solutions** (robots as a service)

Of course these solutions are still not fully mature and some are present only in one region (US , Asia, or Europe,..). But they bring new opportunities, either as a solution for some typologies of flows not covered by the existing MHE solutions, or as an alternative to them.



This radar is by no way an exhaustive list of solutions nor of suppliers.

This radar is more **an illustration of the current new trends** in the very dynamic environment of robotized warehousing, with new solutions or suppliers appearing almost every month, some of them raising tens of millions of USD from investors. These new solutions cover a wide spectrum of situations and typology of products and flows, often overlapping with each other.

This makes also the selection and the choice of the right solution quite challenging and requires professional methodology and expertise to do so.



The 2019
EMERGING WAREHOUSING
ROBOTIZATION solutions radar
by **WAVESTONE**

In order to make this report useful for operational managers, we have chosen to present these robotics solutions by warehousing process :

Receiving/Unloading

- / **Unloading robots:** to unload cartons from a truck
- / **Depalletizing robots:** robots solutions that handles cartons individually to depalettize and bring cartons to a conveyor

Put-away and stock retrieval

- / **3D Shuttles:** a new generation of GTP AS-RS systems with shuttles able to navigate in 3 dimensions (length, width, height) and to bring the goods directly to the picking station.
- / **Mobile shelves:** GTP system with an AMR carrying shelves to the picking stations

Picking

- / **Autonomous Picking:** robotics solutions able to do autonomous navigation, storing and unstacking operations in classical shelves storage environment

- / **Arm Robots:** robotized arms can be used in different configurations in industry and logistics, for example in picking or some packing operations.
- / **End of Arm tooling:** specific tools to be installed at the end of robotized arms. These tools have enhanced functions such as vision or prehension specific to the products to be manipulated.

On demand conveying

- / **Picking assistants (AMR based)** autonomous robots that allows to convoy goods from human pickers localized in classical storage aisles to the next step operations (for example packing)
- / **Load Transport (AMR based)** AMRs can be used as point to point individual conveyor systems. AMRs bring more flexibility, require less physical

infrastructure and are safer than AGVs

Sorting

- / **Flat AMR or Tilt-Tray AMR:** these sorters are mainly used at Express/Parcel companies, and popular in China. They used AMRs to convoy goods to the right chute in a 3D like sorting system.

Stock counting

- / **Inventory by drone**

Shipping

- / **Palletizing robots:** robots solutions that handles cartons individually to build pallets using algorithms to optimize cartons positioning.

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