Robotic solutions for orderpicking

The pioneering technology leader
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Trend in orderpicking in fresh food & retail

Main advantages:
- Less stock in the supply chain (less waste)
- Longer shelf live (because of the faster supply chain)

Challenges:
- High throughputs
- Labour (night, cold)
- Daily changing volumes
- Expenses

=> Search for automated orderpicking solutions that are suited for this industry
Traditional automated orderpicking solutions

Mostly:

- Handling by individual unit
- Limited in dimensions
When to use the new robotcentric orderpicking solution?

- => mainly order picking from:
  - **Full Plastic totes**
    - Standard dimensions 600x400 mm; 400x300 mm, multiple heights
    - Full stackable Carton boxes (depending on quality and shape)

=> Fresh food & retail

- Orderpicking during more than 1 shift/ day
- Average units/ orderline > 1.5
The robotic orderpicking process:

- Own production or external delivery
- Infeed
- Orderpicking
- Outfeed
- Consolidating & Sequencing
  + Grouping on transport carrier (pallet/rolco/Dolly)
The robotic orderpicking process:

2 alternatives:

- **“Picking”** process
  - SKU
  - SKU
  - SKU
  - cust

- **“Splitting”** process
  - SKU
  - cust
  - cust
  - cust

# cust > # SKU

# cust < # SKU
The robotic orderpicking process:

Alternative "Picking" process

2 alternatives:

- With relatively low storage capacity
- With relatively high storage capacity
The robotic orderpicking process:

Alternative “Picking” process - low storage capacity

- Robot(s) on tracks in front of presented ministacks
- Orderpicking by orderline (can be >1 unit)

Vertical presentation of ministacks with all SKU’s in static racks (up to +/- 5 m height)
The robotic orderpicking process:

Alternative “Picking” - low storage capacity

- Split high stacks -> ministacks
- (1) Infeed ministacks into the robot zones on AMR’s
- (2) Robots pick up the ministacks and place them into the racks

=> EFFICIENT robot movements
The robotic orderpicking process:

Alternative “Picking” - low storage capacity

- Empty AMR’s present themselves into robot zones
- (1) Picked quantity by is being dropped onto an AMR
- (2) AMR drives out of the robot zone
The robotic orderpicking process:

Orderpicking

infeed

Outfeed

Consolidating & Sequencing + grouping on transport carrier ( pallet / rolco / Dolly )

Alternative “Picking” process - high storage capacity

- Robot(s) on tracks in front of presented ministacks
- Oderpicking by orderline (can be >1unit)

When more storage capacity is needed, the ministacks can be presented in (powered) flowracks

Slow moving SKU’s can remain being presented in static racks
The robotic orderpicking process:

Orderpicking

infeed

Consolidating & Sequencing + grouping on transport carrier (pallet / rolco / Dolly)

outfeed

Alternative "Picking" - high storage capacity

- Split high stacks -> ministacks
- (1) Distribution of ministacks on 1 level
- (2) Vertical distribution over the different flowracks by robot(s)

=> EFFICIENT robot movements
The robotic orderpicking process:

Alternative “Picking” - high storage capacity

- Empty AMR’s present themselves into robot zones
- (1) Picked quantity by is being dropped onto an AMR
- (2) AMR drives out of the robot zone
The robotic orderpicking process:

- **Orderpicking**
- **Consolidating & Sequencing**
- Grouping on transport carrier (pallet / rolco / Dolly)

Alternative “Picking” - high storage capacity
The robotic orderpicking process:

Alternative “Picking” process

- AMR drops its load in right sequence onto consolidating conveyor
- When load for 1 transport unit is complete, the load is being conveyed towards grouping unit (robot, stacker, …)
The robotic orderpicking process:

Orderpicking

Consolidating & Sequencing + grouping on transport carrier (pallet / rolco / Dolly)

Alternative “Splitting” process

- Split high stacks -> ministacks
- (1) Distribution of ministacks on 1 level
- (2) splitting orders -> picking orderline quantity and drop it into pigeon hole
  => EFFICIENT robot movements
- Each pigeon hole = 1 customer
The robotic orderpicking process:

Alternative “Splitting”
The robotic orderpicking process:

Alternative “Splitting” process

- When the load for 1 transport unit is complete, the lane is being retracted and all loads are being conveyed to a grouping unit (robot, stacker, ...)

Orderpicking

Consolidating & Sequencing + grouping on transport carrier (pallet / rolco / Dolly)
Example robotcentric orderpicking (with “splitting” functionality)
Robot orderpicking solution vs traditional solutions (miniloads, shuttles, ...)

Orderpicking is being done based on orderlines instead of per unit:
- Reduced dynamic capacity
- Peak capacities can be met without over investing
Robot orderpicking solution vs traditional solutions (miniloads, shuttles, ...) 

Other advantages:

- For orderpicking ⇒ **no single point of failure**
  in case 1 robot has a failure, it can be placed aside and other robots have access to all locations

- For Infeed/ Outfeed ⇒ when AMR’s are used ⇒ **no single point of failure**
  In case 1 AMR has a failure, all transport tasks will be distributed among the remaining AMR’s

- **Very scalable**
  It is easy to add AMR’s and additional robot zones.

- The higher the ratio units/ orderline, the **lower the investment** will be compared to traditional automated orderpicking systems.

- It can be installed in relatively low buildings, the installation can even be split up in several modules that do not necessarily need to be positioned next to each other ⇒ **ideal in brownfield** applications.

- Reduced number of components ⇒ **reduced maintenence costs and spare parts**.

- Flexibility in dimensions of handled units (height and floor dimension).
Q & A

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