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Robotic solutions for orderpicking

The pioneering technology leader

ABB

Presenter introduction: Chris Vleeschouwers & Wim Vermeir

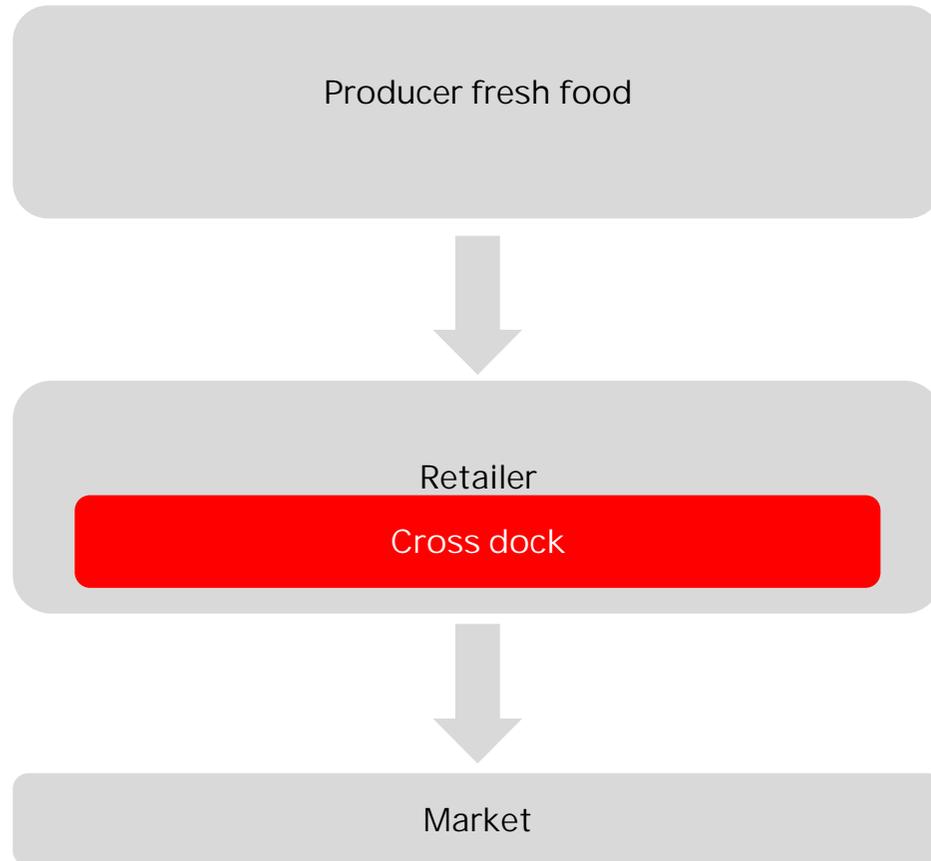


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Trend in orderpicking in fresh food & retail



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

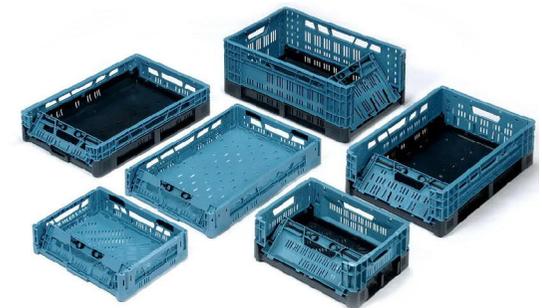


Mostly:

- 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)

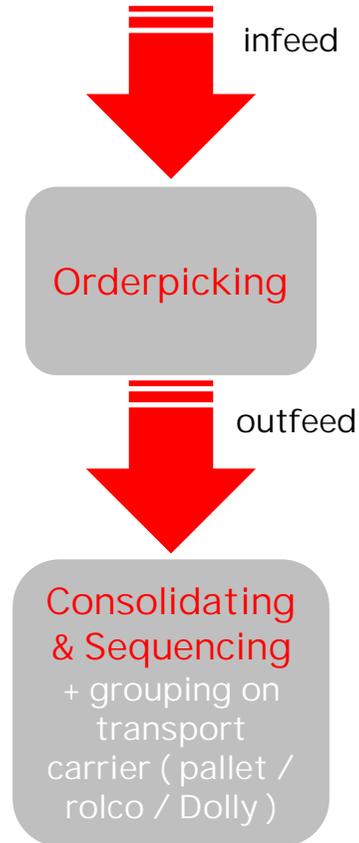


=> **Fresh food & retail**

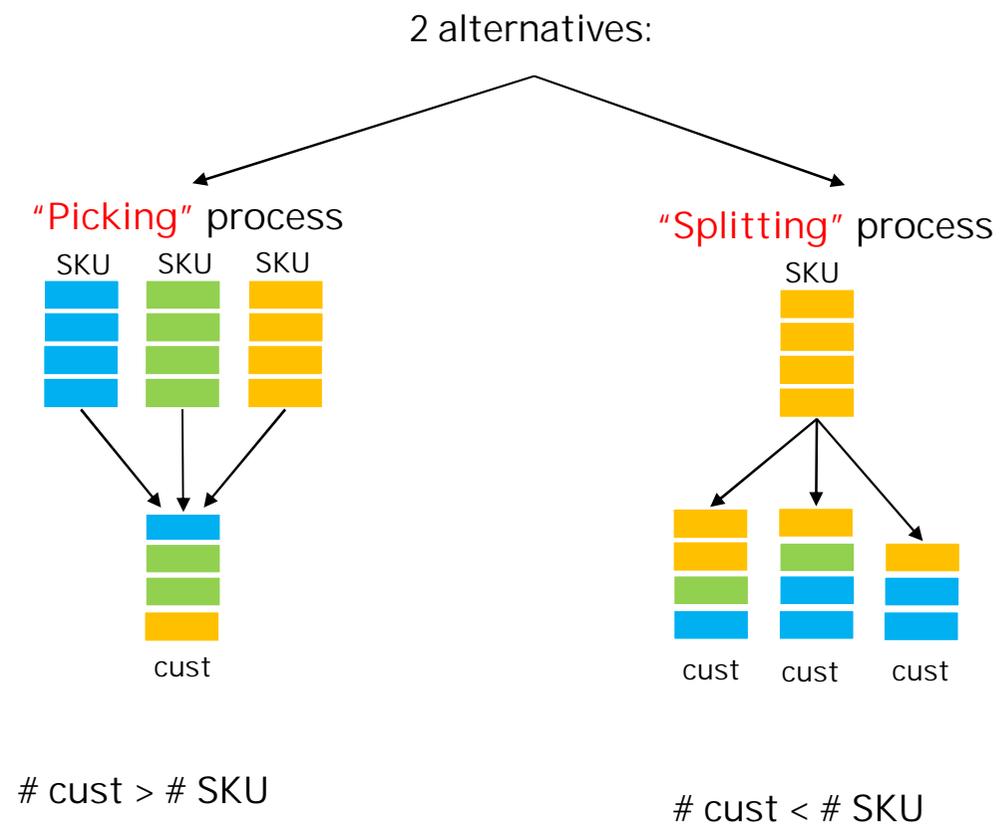
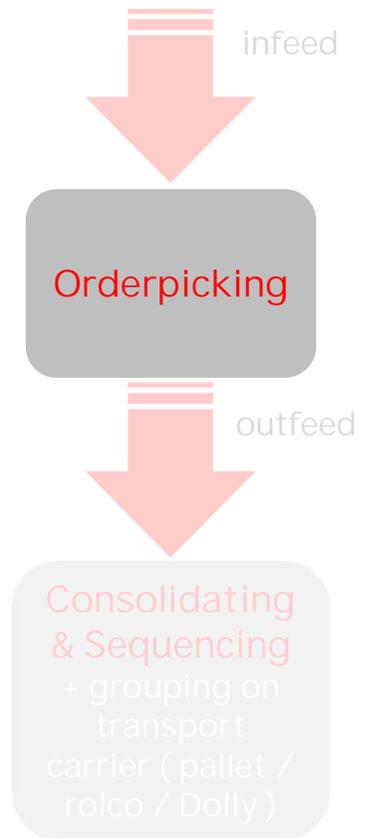
- Orderpicking during more than 1 shift/day
- Average **units/orderline** > 1,5

The robotic orderpicking process :

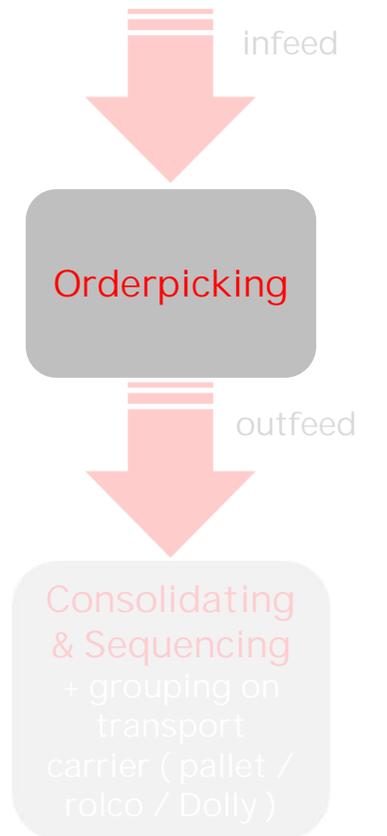
Own production or external delivery



The robotic orderpicking process :



The robotic orderpicking process :



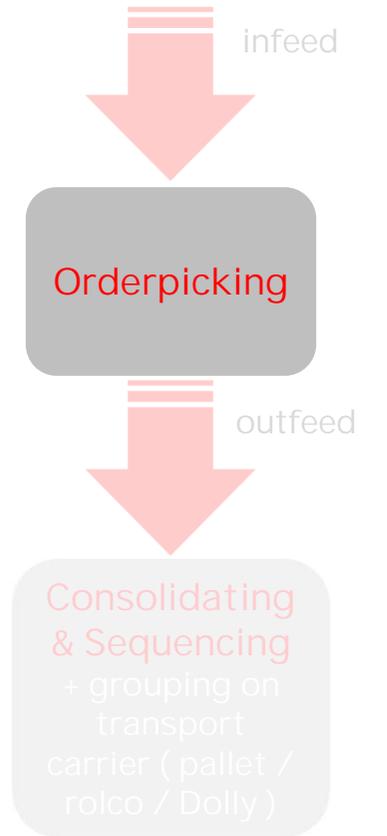
Alternative "Picking" process

2 alternatives:

With relatively
low storage
capacity

With relatively
high storage
capacity

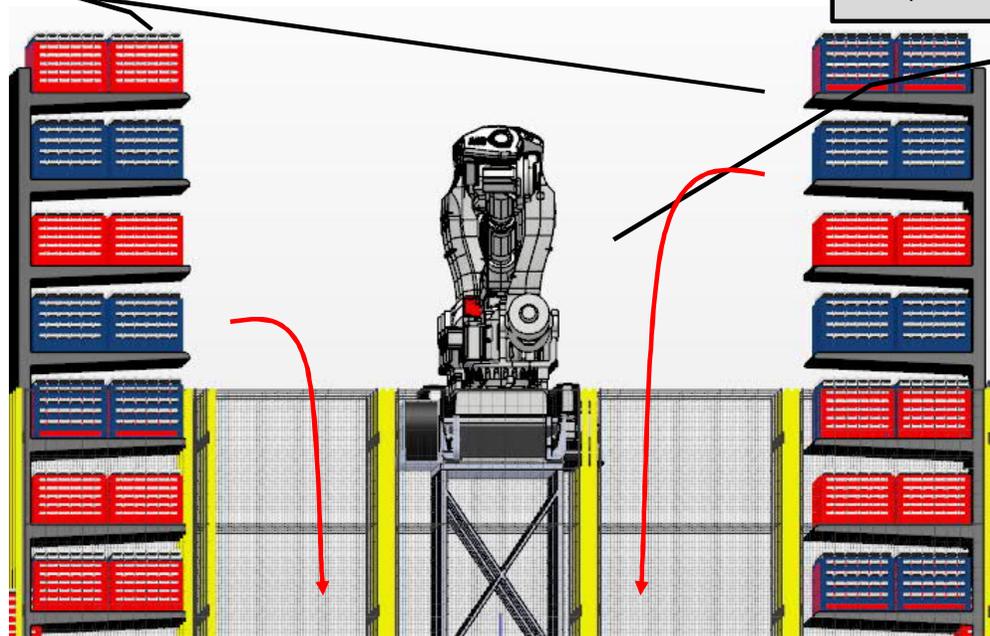
The robotic orderpicking process :



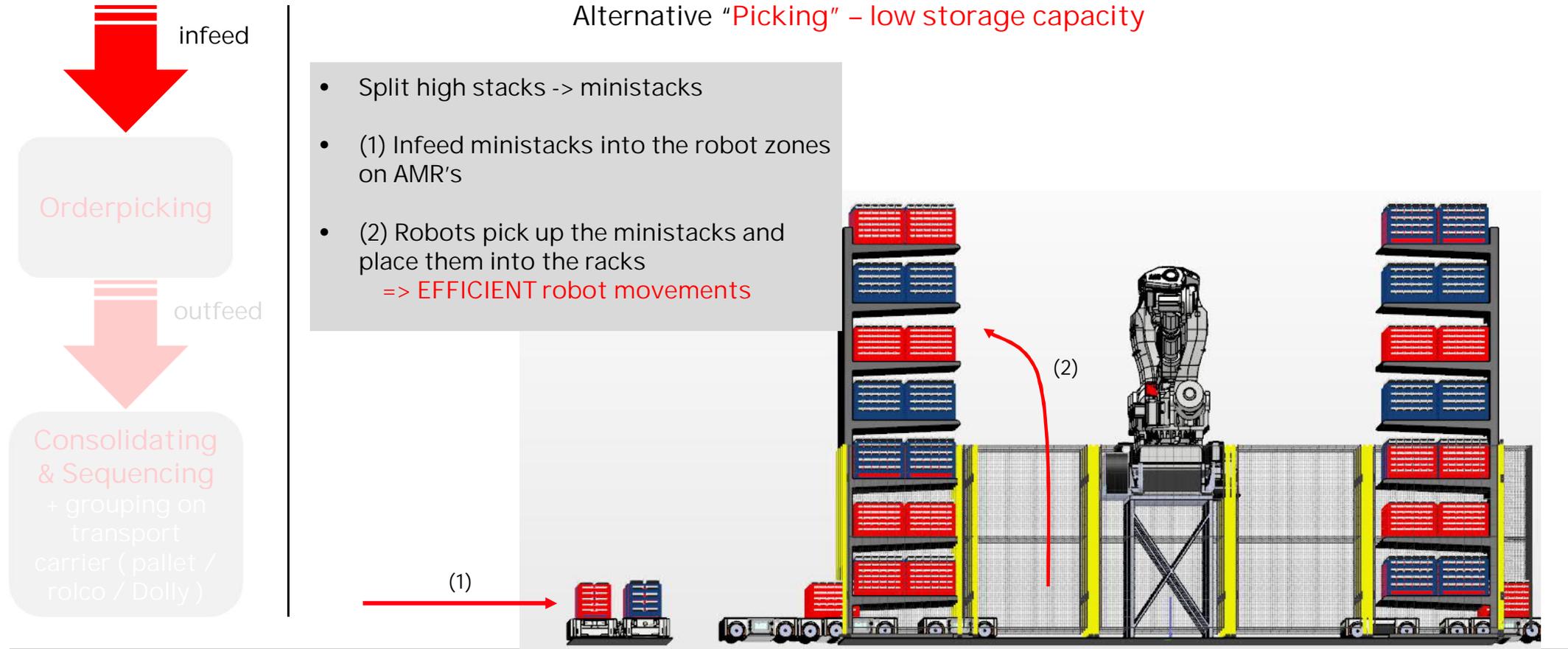
Alternative "Picking" process - low storage capacity

Vertical presentation of ministacks with all SKU's in static racks (up to +/- 5 m height)

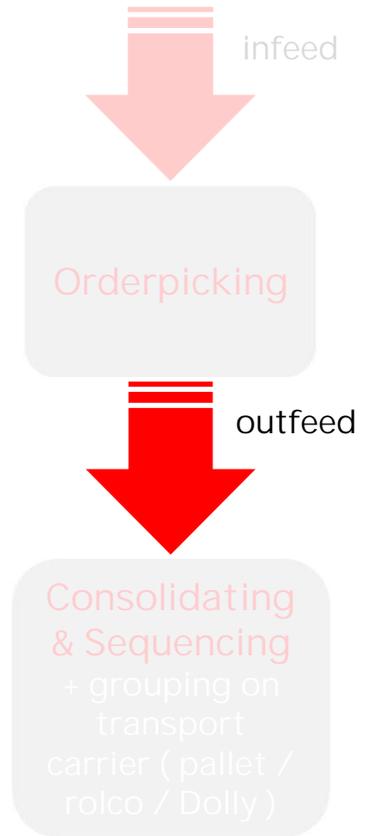
- Robot(s) on tracks in front of presented ministacks
- Orderpicking by orderline (can be > 1 unit)



The robotic orderpicking process :

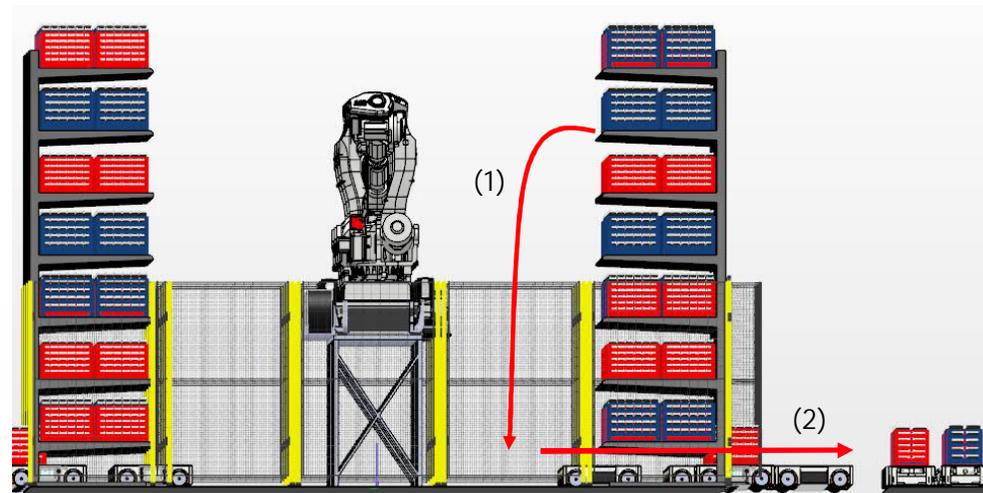


The robotic orderpicking process :

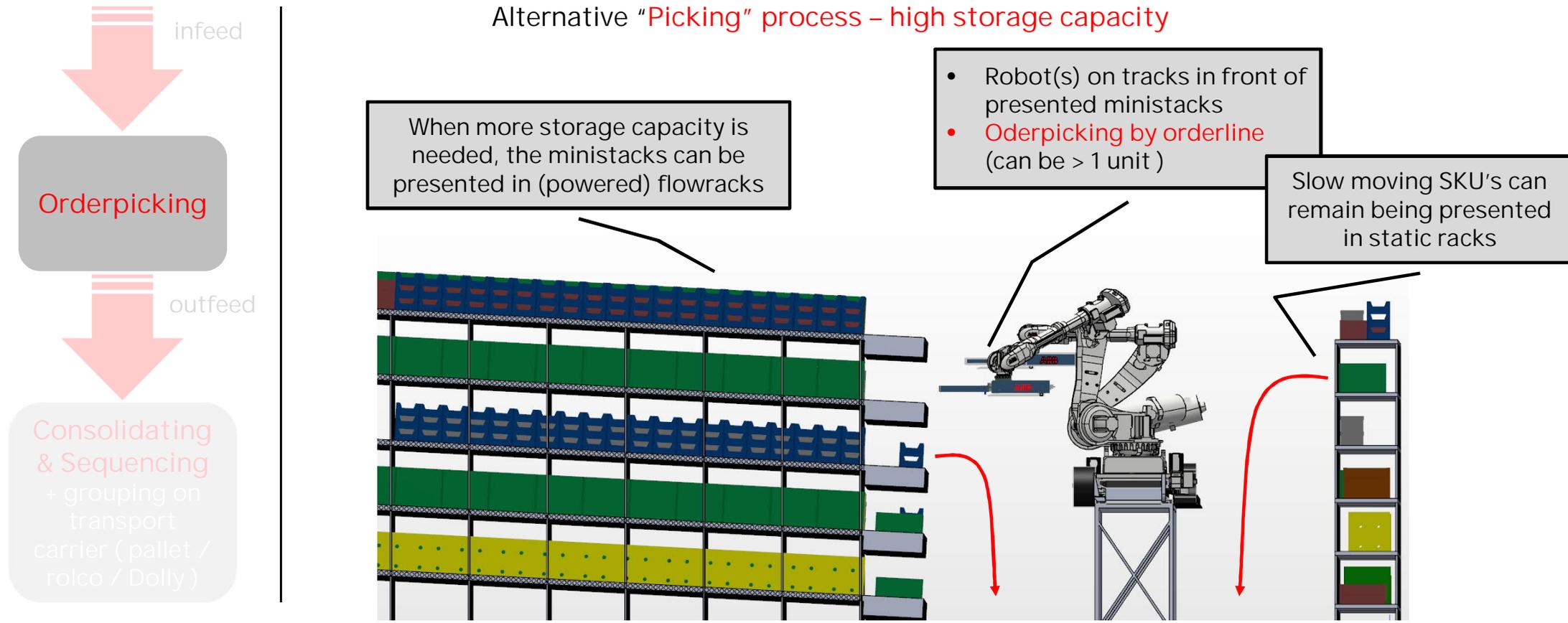


Alternative "Picking" – low storage capacity

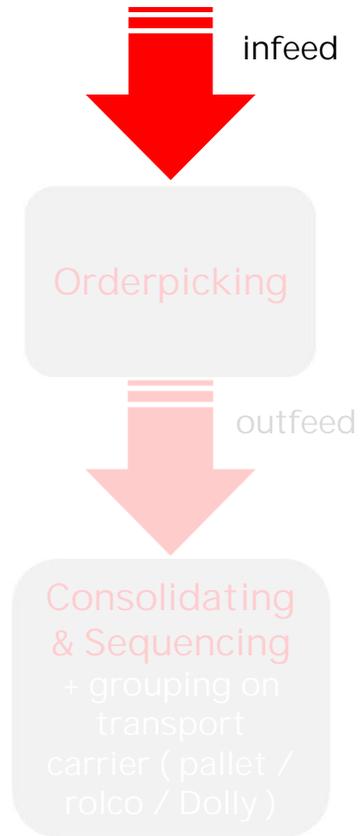
- Empty AMR's present themselves into robot zones
- (1) Picked quantity by is being dropped onto an AMR
- (2) AMR drives out of the robot zone



The robotic orderpicking process :

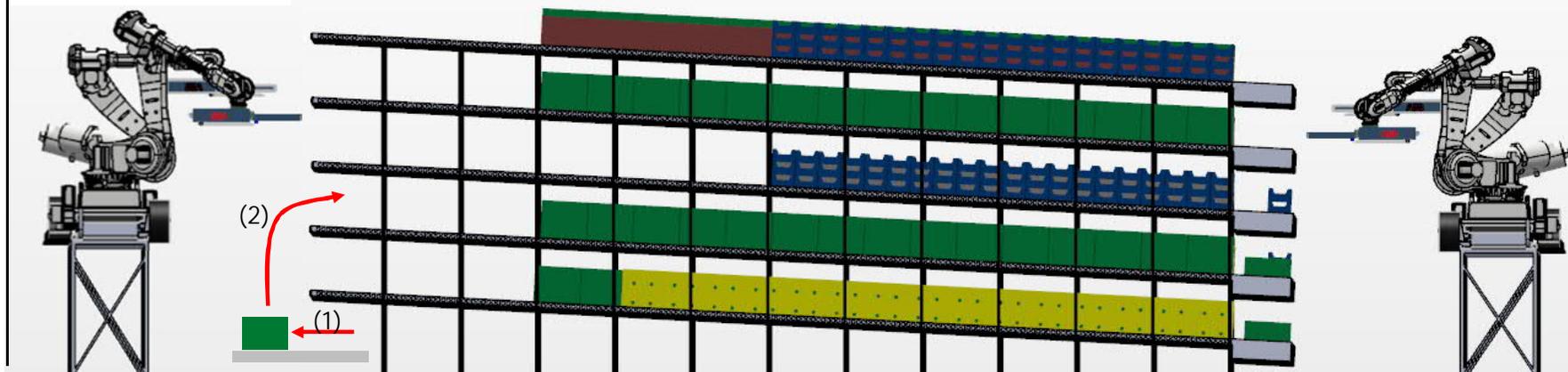


The robotic orderpicking process :

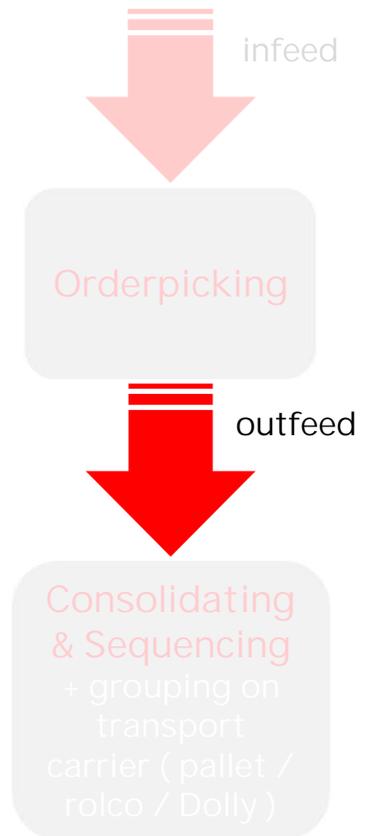


Alternative "Picking" – high storage capacity

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

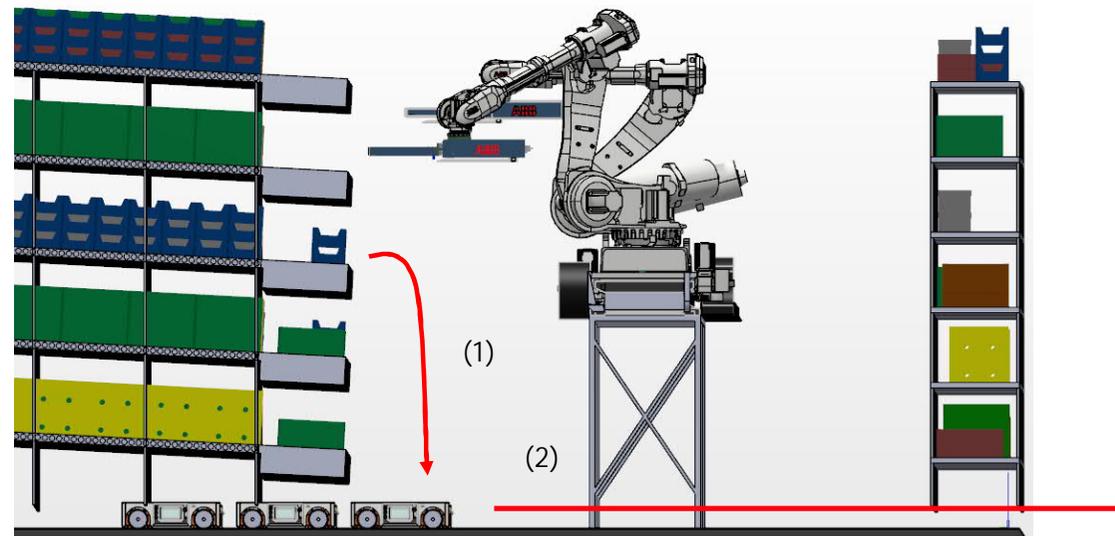


The robotic orderpicking process :

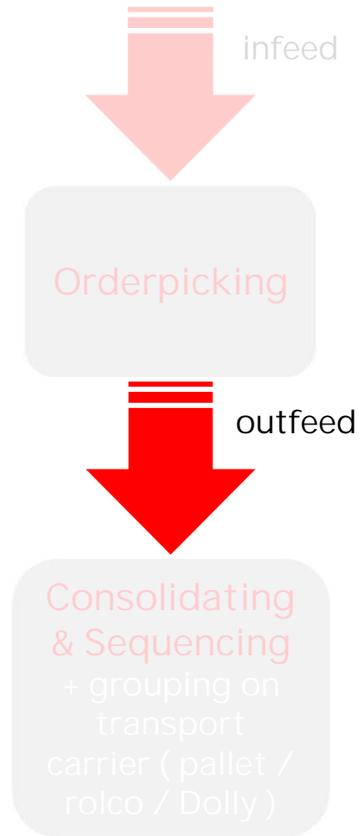


Alternative "Picking" – high storage capacity

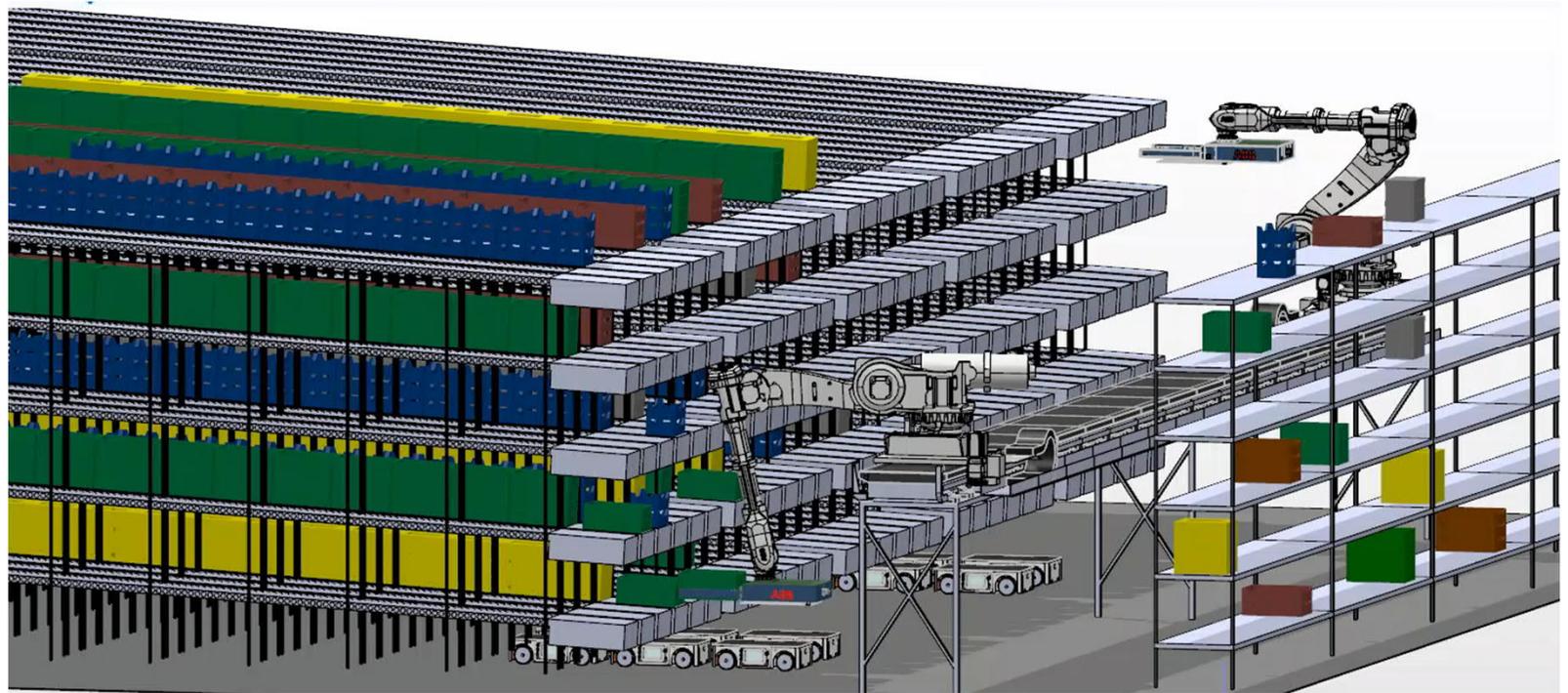
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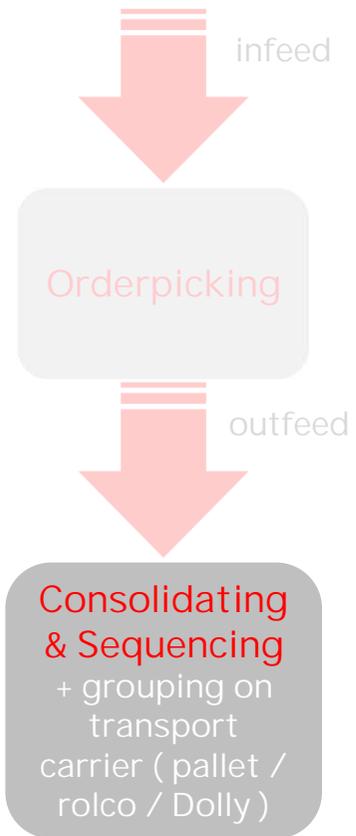
The robotic orderpicking process :



Alternative "Picking" – high storage capacity

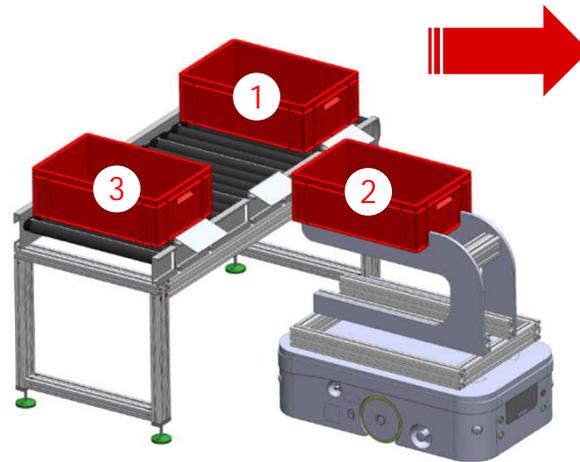


The robotic orderpicking process :

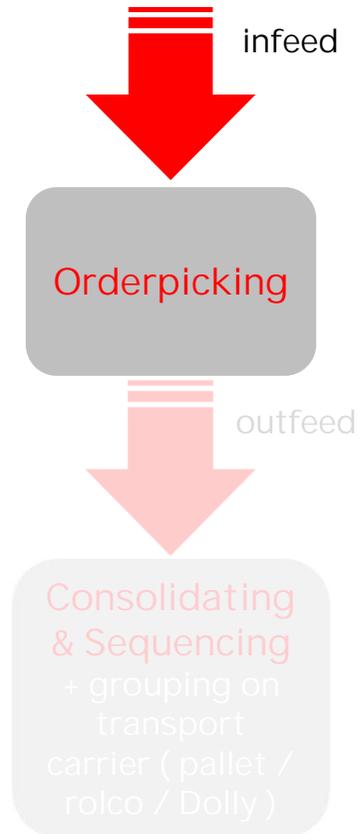


Alternative "Picking" process

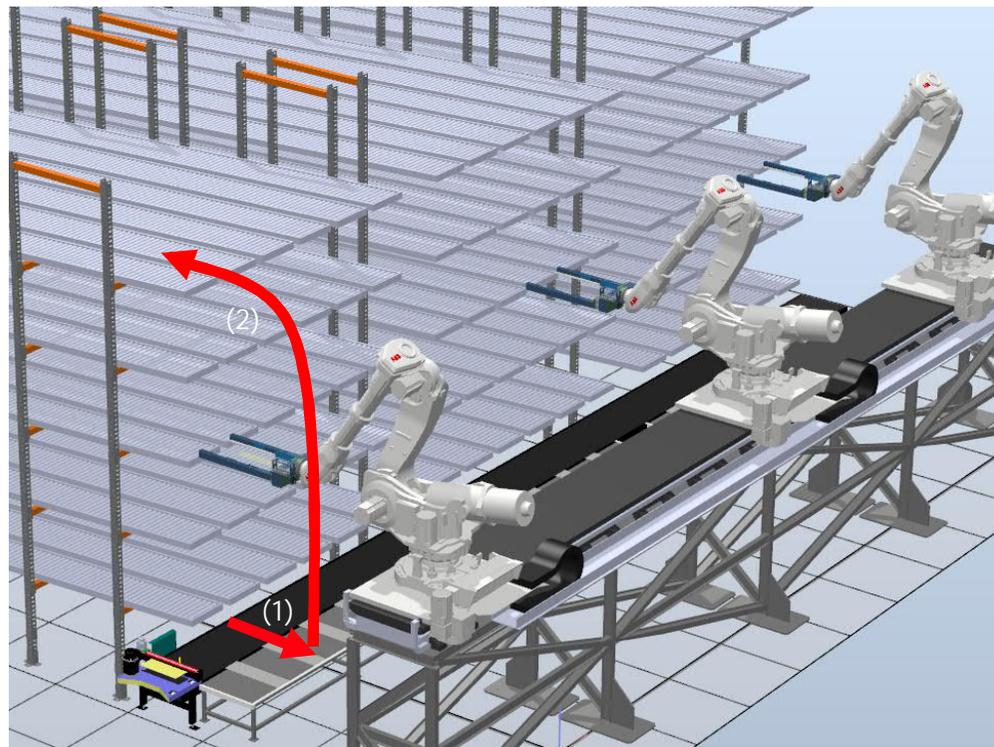
- AMR drops its load in right sequence onto consolidating conveyor
- When load for 1 transport unit is complete, the load is being conveyed towards grouping unit (robot, stacker, ...)



The robotic orderpicking process :

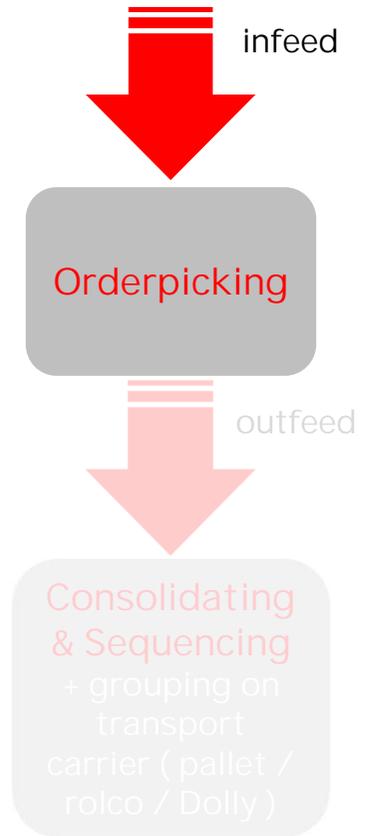


Alternative "Splitting" process

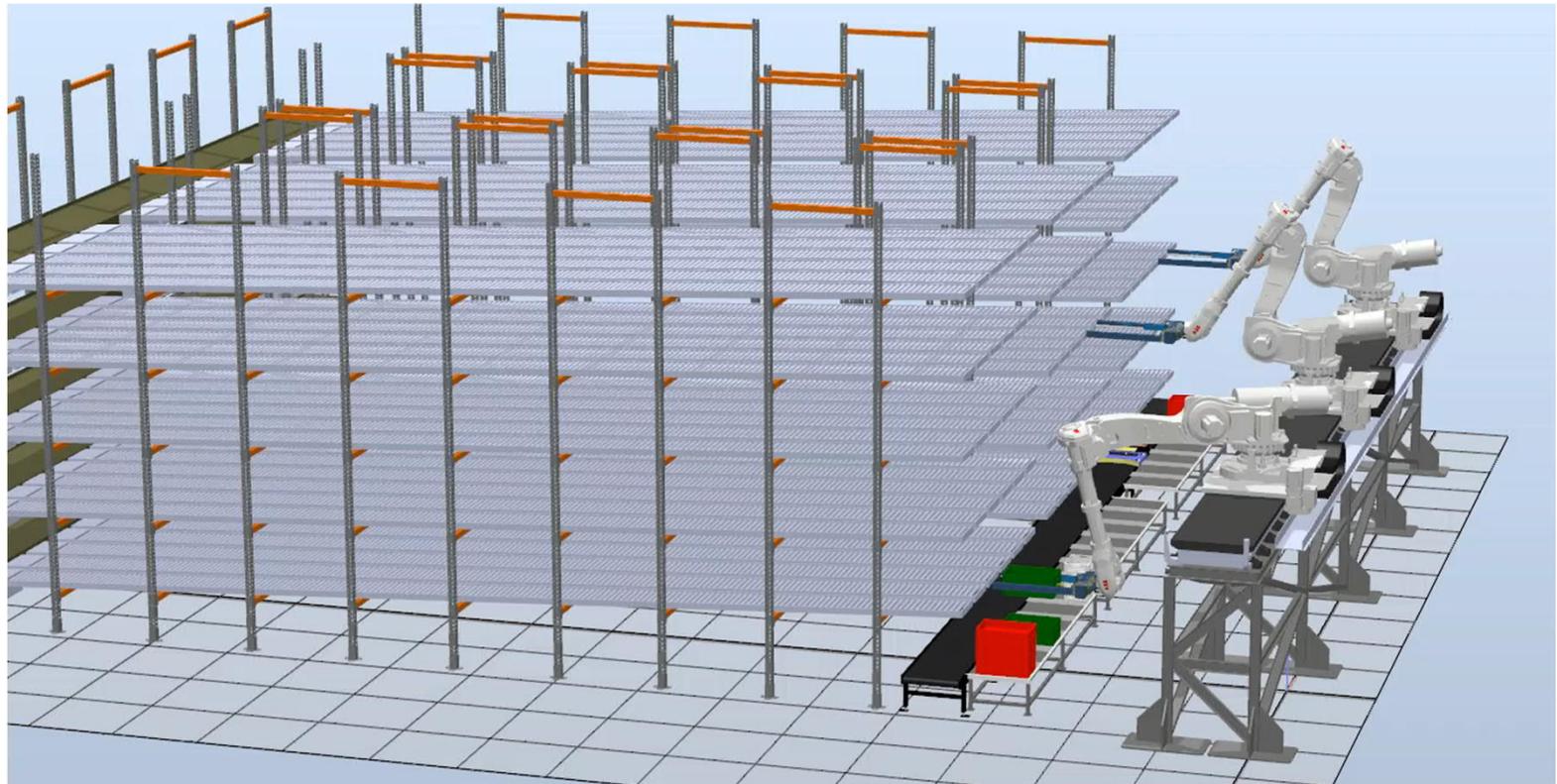


- Split high stacks -> ministacks
- (1) Distribution of ministacks on 1 level
- (2) splitting orders-> picking orderline quantity and drop it into pigeon hole
=> **EFFICIENT robot movements**
- Each pigeon hole = 1 customer

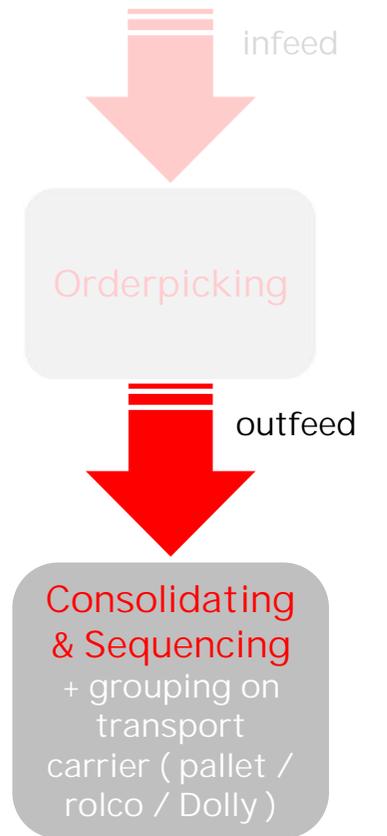
The robotic orderpicking process :



Alternative "Splitting"

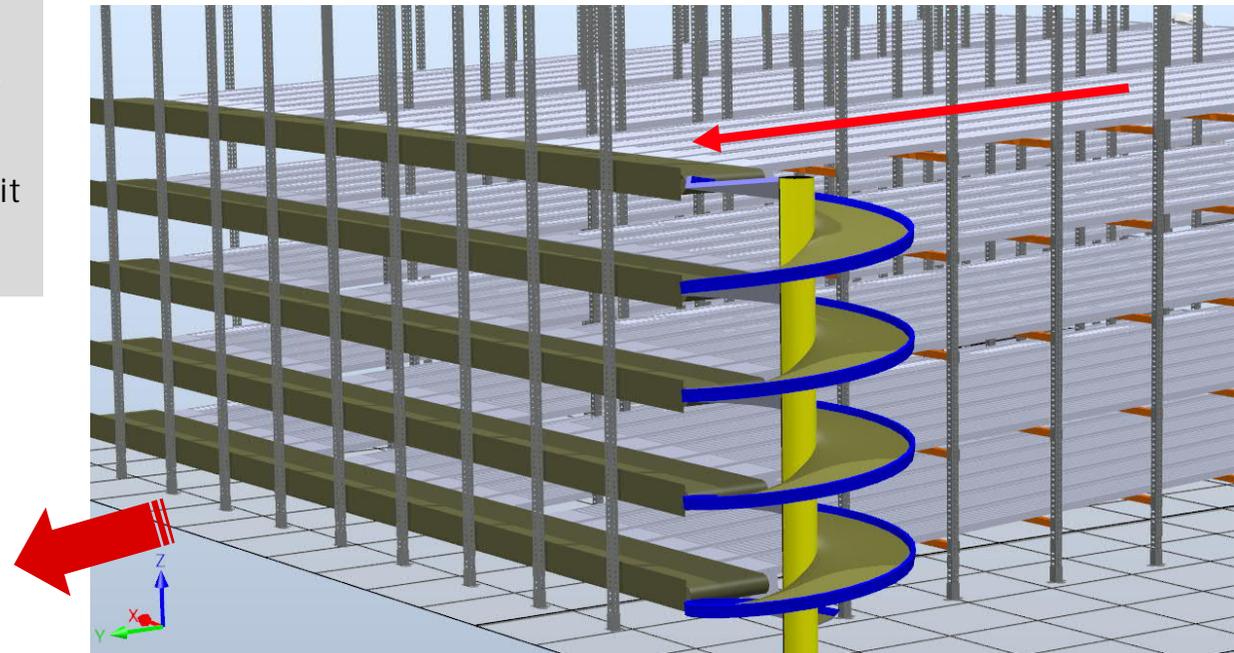


The robotic orderpicking process :



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, ...)

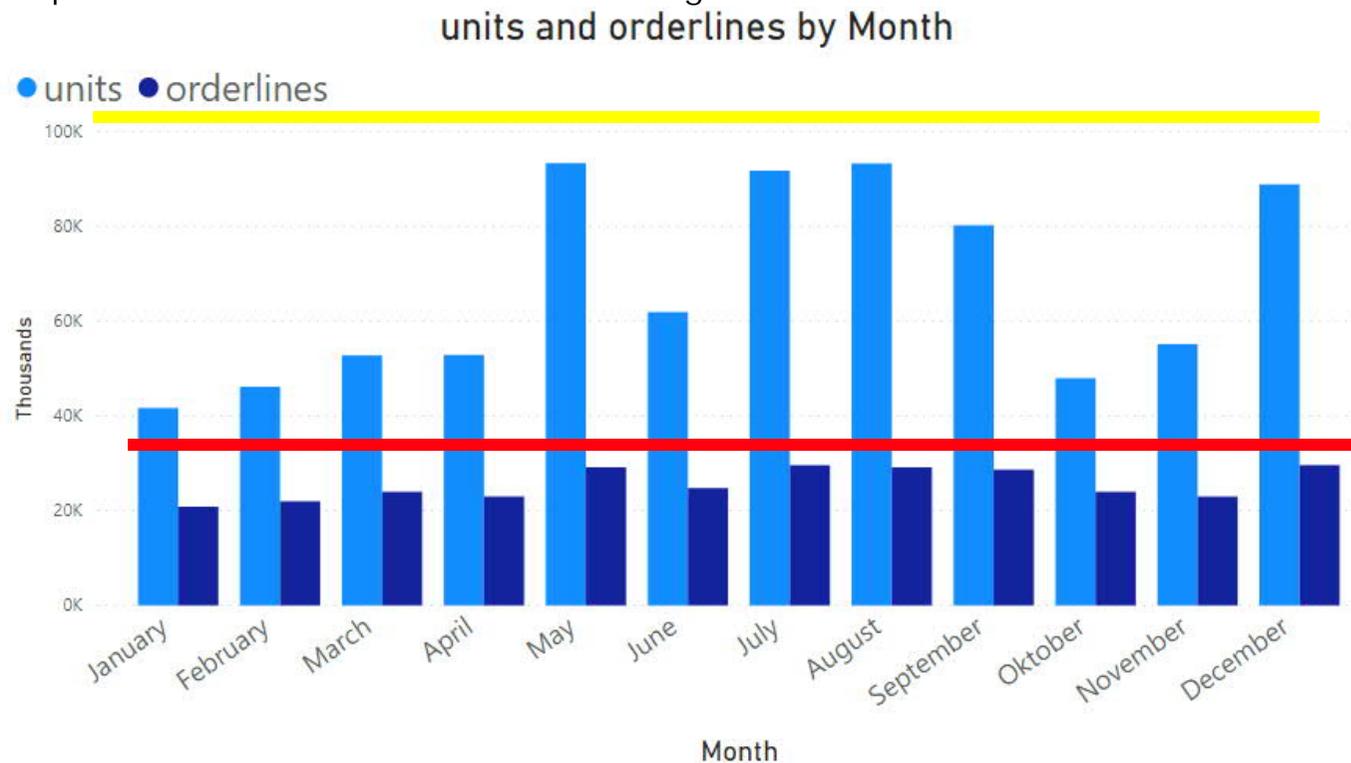


Example robotcentric orderpicking (with “splitting” functionality)

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



Orderpicking based on handling single units

Orderpicking based on handling orderline quantities

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 maintenance costs and spare parts.**
- Flexibility in dimensions of handled units (height and floordimension).

Q & A



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