The Dream Team
Item Picking and AutoStore

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Agenda

- Order Fulfillment Challenges and Trends
- Dense Cube-based Storage and Retrieval
- The Emergence of Robotic Picking
- The Dream Team – ItemPiQ & AutoStore
Challenges and Trends

- Carbon footprint
  - Sustainability
  - RISING ENERGY COSTS

- Urbanization
  - Reduced space
  - INCREASED REAL ESTATE COSTS

- High labor costs
  - Reduced labor force
  - LABOR AVAILABILITY & COSTS
## Challenges and Trends

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<td>High competition for scarce resources</td>
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Challenges and Trends

- 3PL Manufacturers
- Smaller Order Volumes
- Same-Day Delivery
- Packaging Innovation
- Crossovers

GROWING SEGMENTS

HEIGHTENED CONSUMER EXPECTATIONS

MORE VARIETY INCREASED RETURNS

- Wholesale
- Bricks and Mortar
- Cost of Poor Quality
- Mobile Commerce
- <10,000 - >1Mio SKUs
- Extreme Peaks

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Space saving storage and picking system
Meeting the most challenging requirements

AutoStore

Do you want to store a large number of SKU’s while increasing storage density and remaining very flexible?
AutoStore is a highly efficient robotized storage and order processing solution that integrates easily into both new and existing buildings.

1. Density
60% reduction of space

2. Scalability
Scale whatever you need

3. Flexibility
Build around obstacles

4. Energy efficiency
10 robots = 1 toaster

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Store four times more!
Reduced space utilization

Manual storage

AS/RS (traditional)

AutoStore

40-60% reduction of space
Grow and expand your warehouse at any time
By simply adding robots, workstations and grid

Need to improve performance?
Add more robots

Need to improve capacity?
Add more grid

Need more picks?
Add more ports
Grow and expand your warehouse at any time
By simply adding robots, workstations and grid

Expand the system during full operation!
Build AutoStore Around Every Obstacle
Easy to retrofit into existing warehouses/buildings

- Build grid around pillars and other static obstacles
- Adapting to any building shape
- Flexible port locations (picking & receiving)
- Applicable in low ceiling buildings
- All bins can be delivered to all ports
- Pick and replenish simultaneously
- Easy to relocate system if needed
Energy Efficient System
Realize significant energy cost savings

- Battery powered robots: 10 robots consume as much energy as a toaster
- Save on energy costs – no need for warehouse lighting
Standard Software Functionality
Warehouse processes included

INBOUND
- ASN receiving
- Blind receiving
- Put to light

STORAGE
- Cycle Counting
- Supervisor Approval
- TU Maintenance
- Inventory Control
- Bin Forecasting; Bin Preparation; Bin Subdividing
- Bin Maintenance

ORDER PLANING
- Reservation
- Allocation Releasing
- Grouping
- Order Groups / Waves
- Dock Assignment
- Sealing Shipping

ORDER PICKING
- Voice picking
- Cluster picking
- Single order picking

CONSOLIDATION

SHIPPING
- Sealing shipping
Key advantages of ItemPiQ
Fast and reliable picking system

ItemPiQ

Do you want to reduce operational cost, retain flexibility and increase efficiency in your warehouse?

Our intelligent automated item picking application, ItemPiQ, enables all these aspects and more for your warehouse.

1. Fast order fulfillment
   - Up to 1,000 picks per hour

2. Variety of products
   - Multi-functional gripper

3. No teaching process
   - Picking unknown products

4. Reliability
   - Certified industrial components
High performance
Rapid order fulfillment

- Robot can work 24/7 with a performance of up to 1,000 picks per hour
- Supports humans in simple, repetitive and in ergonomic picking tasks
- Optimized processes: robot picks and human focuses on more complex handling/work tasks
- Lower cost per pick in comparison to manual picking and return on investment within three years (> 1 shift operation)
Product range
Picks & places a wide range of SKUs
Why Automation?
Return on Investment Calculation

Assumption
- $44k head count costs
- 2 Shifts
- Total $88k per year
- Objective: 2-3 years ROI
Advantages of robotic item picking

**24/7 Operations**
Manual vs. automated

**Cost efficiency**
Annual Labor Costs
Manual labor avg = $44K/yr

**Quality of picking**
Lower failure rate than manual picking. Saves expensive returns.

**Flexibility**
No time restriction/work force regulations (working hours, warehouse condition, etc.)

**Easy-to-use**
Plug & play functionality
Advantages of ItemPiQ
Use of unique gripper, seamless WMS integration and self-learning

Can pick a wide range of products
The unique gripper with 4 different grasping methods can pick products in different shapes and sizes of up to 1.5 kg.

Self-learning to increase picking performance
Smart software allows continuous learning to enhance picking strategies of unknown products. No CAD or 360° Pictures of products needed.

Seamless Software integration
Interface to WMS as performance accelerator. Standard interface to connect to any WMS system.

Easy-to-use
Intuitive user interface ensures fast ramp-up and smooth operations. No robotics know-how needed!
ItemPiQ
Makes sure the right products are assigned to the robot

Products that need to be picked manually

Products that the robot can pick
**ItemPiQ & AutoStore**

**Example Solution – Process Description**

1. Green Bin (Order Bin) is sent to the ItemPiQ Robot Station
2. Robot is picking orderlines from Grey Bin
3. Green Bin is sent back to AS for temporary storage
4. Green Bin is brought out for Consolidation/Packing
ItemPiQ - 1:1 at Conveyor Port

Order Bin

SKU Bin

Manual Consolidation

Up to 600 picks/h
Error Handling

- Robot will detect loss of item and re-pick
- Pick success rate is measured in WMS Software
Use Cases: Pick to Transit Bin or Direct to Shipping Carton

- **Pick to Store Tote**
  - ItemPiQ to AutoStore Bin
  - Send Bin to Workstation for manual Consolidation and packing into Store tote.
  - *Increased Pick Performance at Manual Stations*

- **Pick to Transit Tote for Packing**
  - ItemPiQ to AutoStore Bin
  - Send Bin to Pack Benches for packing Process

- **Pick to Shipping Carton**
  - Place empty Shipping Carton into Bin
  - ItemPiQ to AutoStore Bin
  - Manually remove Carton to finish process
Order Types - Direct to Shipping Carton

Process flow

1. ItemPiQ picks items automatically to an empty Order Bin (green) with Shipping Carton inside.
   
   Order Bin is stored in AutoStore.

2. Order Bin is retrieved to Manual Station.

   Shipping Carton is removed from Order Bin and placed on takeaway conveyor.

   Shipping Carton is removed from Order Bin and placed on Pick to Location. Additional items to complete the order are placed in manually. Finish order.

3. New empty Shipping Carton placed into Order Bin and returned to Grid.

   Shipping Carton is removed from Order Bin and placed on takeaway conveyor.

(1) Design for 1 Carton size approx 600x400. Could in future be multiple Shipping cartons of smaller sizes.
ItemPiQ
Example Solution in Development - 1:1 Carousel Port to Carousel Port

- Conveyor Port is limited to ~200 bin presentations per hour so will limit ItemPiQ performance.

- Similar process could be achieved at a carousel port to increase ItemPiQ performance (~350-400 bin presentations per hour).

- Configuration is back-to-back carousel ports in a tunnel.
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