SOLVE FOR X.

Order Fulfillment Solutions for Low & Mid Capacity Applications

Presented by:

Ken Ruehrdanz

DEMATIC

© 2017 MHI® Copyright claimed for audiovisual works and sound recordings of seminar sessions. All rights reserved.

Order Fulfilment Solutions for Low & Mid Capacity Applications

Abstract: Learn about the most effective order fulfillment solutions for piece and case picking that are delivering compelling results in low-mid capacity operations. Explore order fulfillment processes that provide excellent productivity/efficiency and operational flexibility while reducing cycle time.

Find out how pick, pack and ship solutions, designed for small and medium size operations with low to mid rate order volumes, can allow your operation to succeed in today's demanding distribution environment.

What you will learn:

- How the best practices in industrial engineering and automation can significantly optimize your distribution operation.
- Enabling technology coupled with process improvement can bring significant performance improvements.

Issues

Space

Labor, Ergonomics

SKU Growth

Accuracy

Throughput
& Processing Time

Access

Your Business Model

Examples:

- Accommodate more SKUs than competitors
- Extend order cut off time
- Promotional/seasonal peaks

Data Analysis

Inventory profile

- Review year to see if mix changes
- Check days on hand

Order profile

- Determine activity & need to access “A’s, B’s” & “C’s” daily, weekly, monthly

Labor breakdown

- Where is labor used?
- Determine time spent on picking & replenishment

Activity Profiling

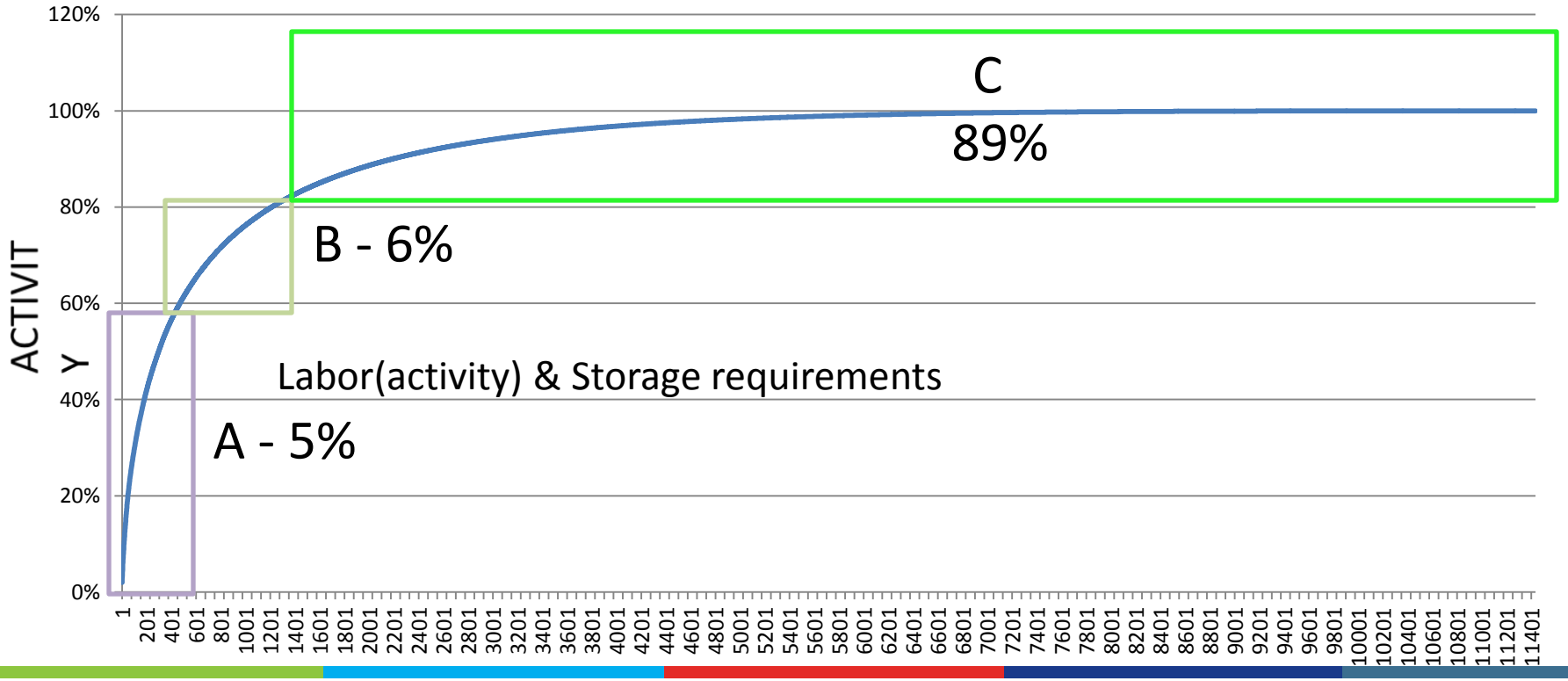
The systematic analysis of the items & orders handled in the DC determines the optimum design & operation

1. Total SKU's
2. % daily SKU's active
3. Orders per day
4. Daily unit volume
5. Units per order
6. Lines per order
7. Packing sequence
8. Unit cube & cube movement
9. Unit structure
10. Cartons per order
11. Order download
12. % volume cross-docked

- Review historical data
- Forecast future activity

Data Analysis to Identify ABC Movers

Example



Chapter 2
Low-Mid Capacity System Solutions

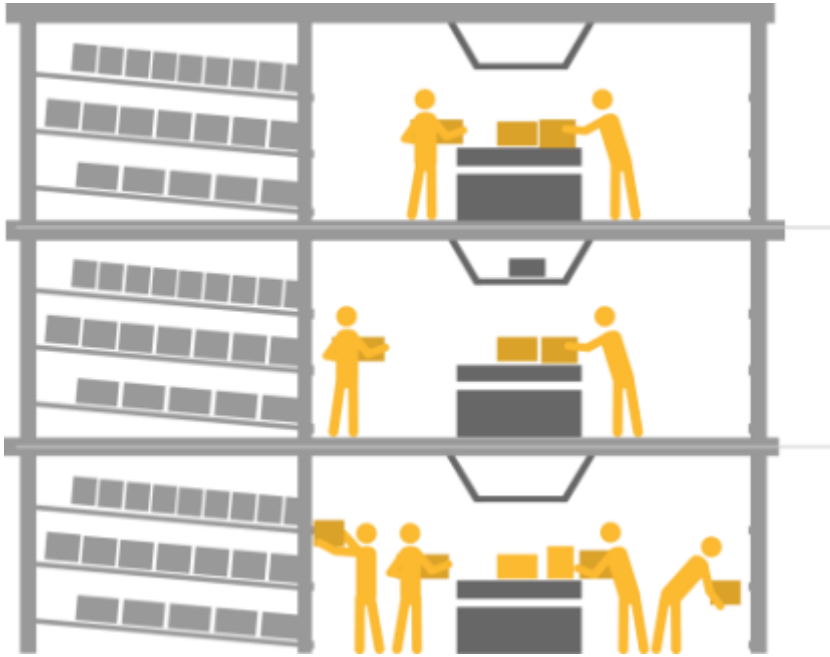
System Attributes

- Pre:
  - ✓ defined
  - ✓ engineered
  - ✓ tested
- Predictable performance
- Low risk
- Moderate investment
- Scalable

Warehouse Execution System

- Directs & controls
- Management
- Optimization

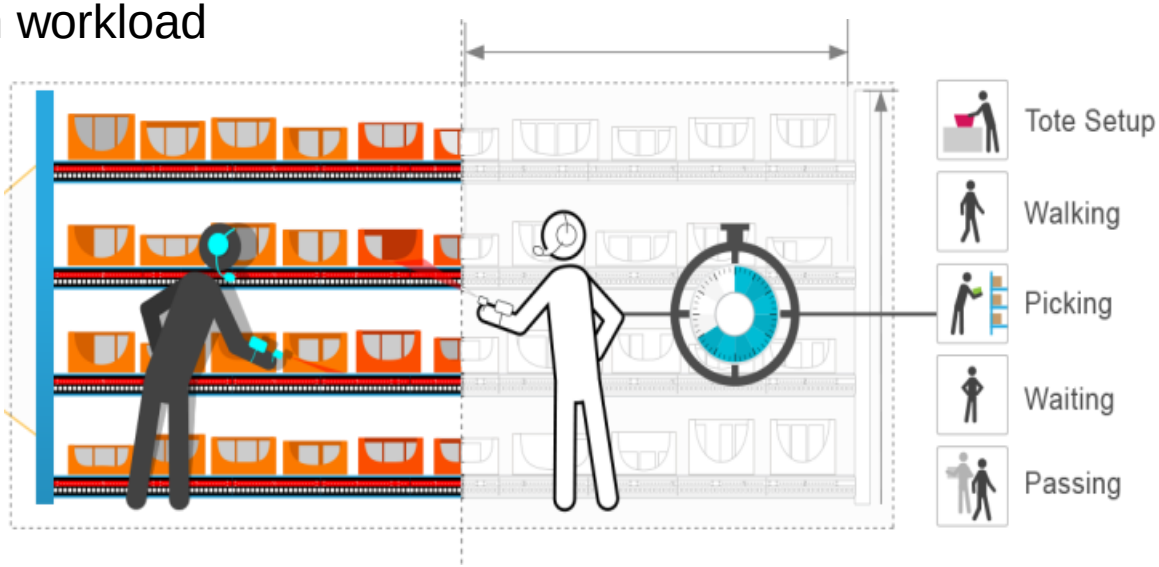
Manual



Mechanized

Warehouse Execution System

- Prioritize tasks
- Balance workflow
- Support order processing speed
- Facilitate labor productivity
- Enable order & inventory accuracy
- Accommodate variations in workload
- Reconfigurable for change
- Scalable for growth

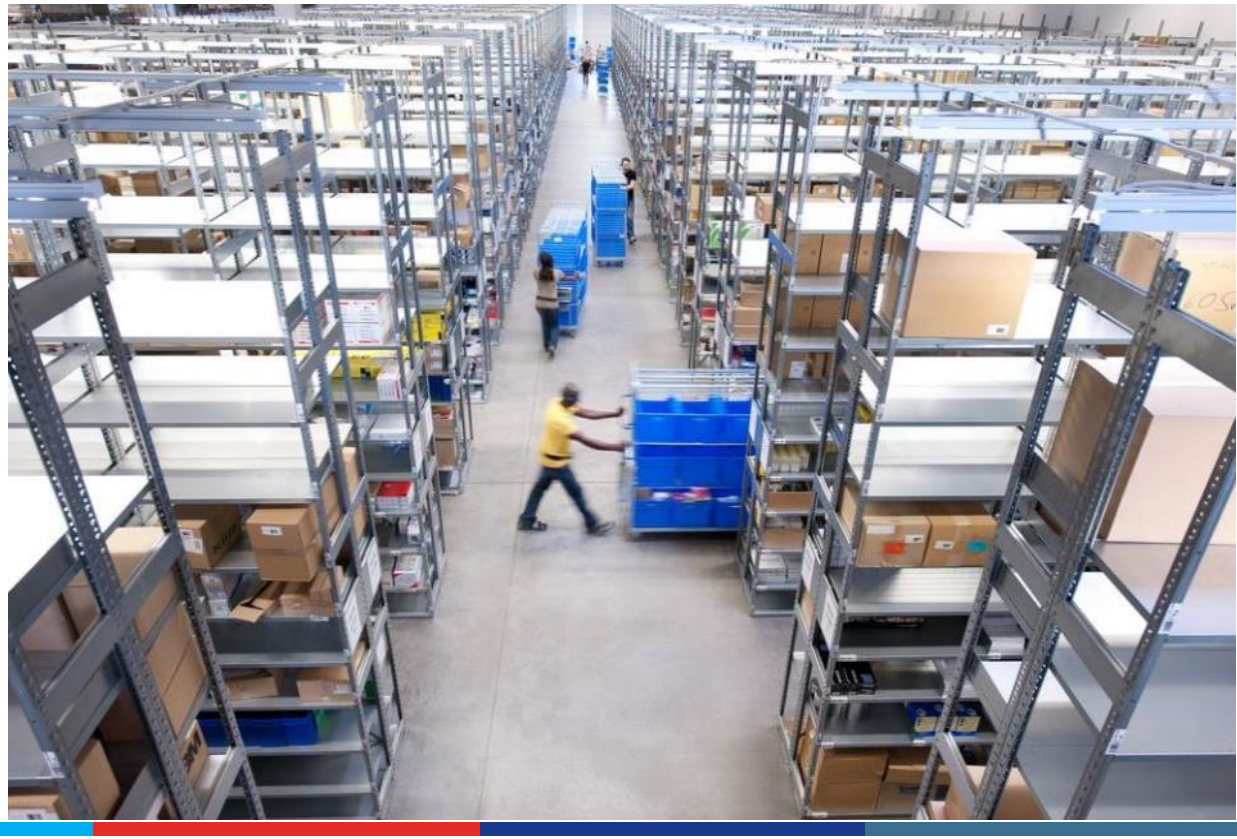


Case Study #1 Office Supplies

Person-to-Goods

Piece Picking

- Carts
- Discrete order pick
- Multiple orders per cart
- RF, voice, light directed
- WES software
- Pick path optimization



Packing

Workstations

- Park cart at workstation
- Packing materials
- Scan validation
- Pack to shipper
- Convey to shipping

Case Study #2 Beverage

Person-to-Goods

Pick from Pallet to Pallet:

- Voice directed
- Pick path optimization
- Directed to the pick face
- Case & piece picking

Pre-Pick

Low Velocity

- Pre-pick slow moving inventory to mobile cart
- Voice directed pick
- Move cart to order consolidation
- Combine with mid – high velocity SKUs at outbound

Case Study #3 Auto Parts Distributor

Batch Pick to Put Wall

- Voice directed pick carts
- Pick path optimization
- Consolidate with put wall
- Light or voice directed

“Every fast mover is a slow mover”

Case Study #4: Electrical Supplies

Zone Route

- High SKU count
- SKU Velocity by zone
- Put-away (blue totes)
- Pick to carton (shipper)
- Direct cartons to zones with picks

Put-away

Order container to pick zones

Piece Picking

- Voice or RF devices
- Pick to shipper
- WES software

Order container to pick zones

Variation

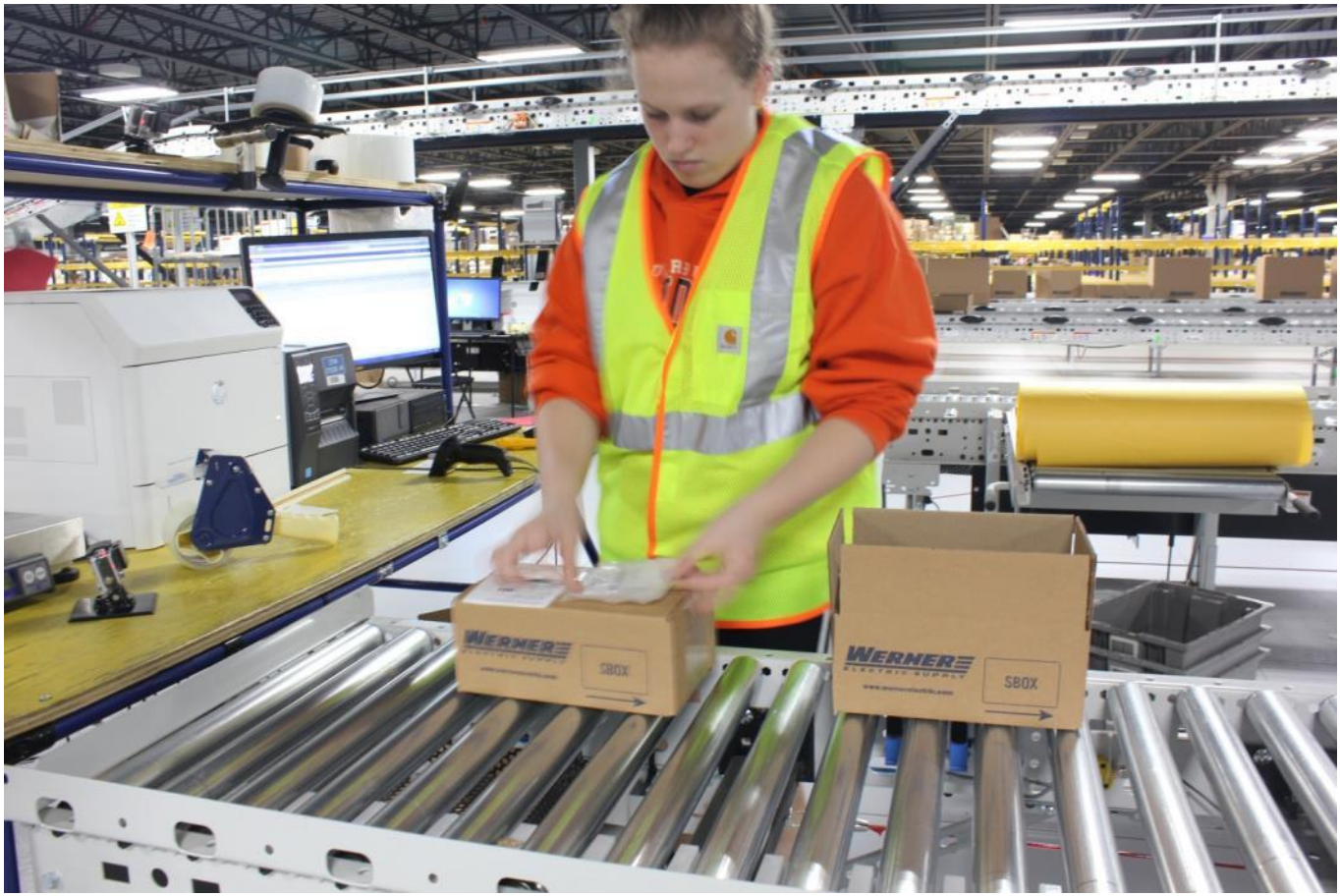
Pick & Pass

- Order container to every zone
- Light or voice directed
- Most orders need every SKU

Order container to pick zones

Packing

- Scan verification
- Weigh check
- Label print & apply
  - ✓ manual
  - ✓ automatic
- Seal carton



Shipping

Sort to Pallet Building

- Sort
- Scan
- Manual palletize

Case Study #5: Apparel Retail

Put-to-Order

- Most SKUs to every order
- Allocate inventory to order container
- Continuous flow of SKU containers

Route SKU Container

- Scan tunnel
- Divert to zone
- Put to order

Wrist Mounted Devices

- Scan carton bar code
- Confirm SKU
- Put to order

Put-to-Order

- Goods-to-person configuration
- Single SKU cartons
- Conveyed to zones
- High density “puts”
- Outbound container contents tracking
- Omit dedicated pick faces
- Omit slotting & re-slotting

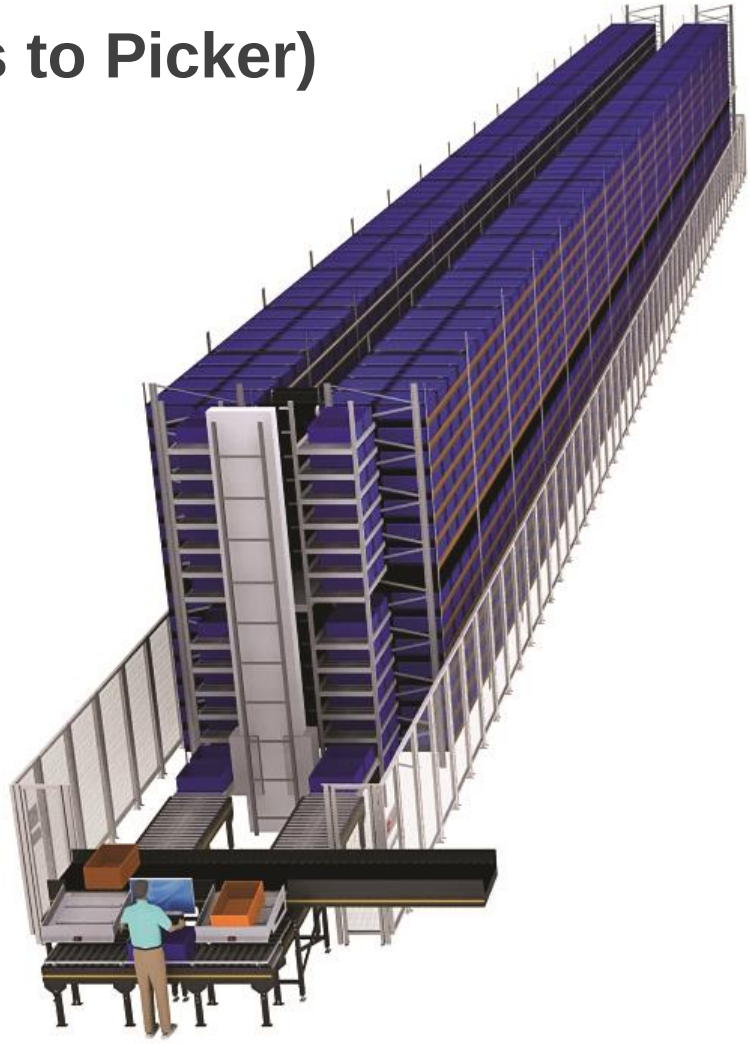
Case Study #6: Industrial Supplies

ASRS with Goods-to-Person (SKUs to Picker)

- Piece pick solution
- Dual purpose workstations
- ASRS Multishuttle
- WES software
- Interface to WMS
- 200-350 picks/hr/operator
- Reduced fulfillment cost/order
- Compact footprint
- System capacity for growth
- Inventory accuracy
  - ✓ cycle counting
  - ✓ weigh check

ASRS with Goods-to-Person (SKUs to Picker)

1. Travel time
2. Omit pick face
3. Omit re-slot
4. Accurate
5. Less space
6. Security
7. Optimized replenishment
8. Ergonomic
9. Engineered work stations
10. Speed
11. Productivity
12. Less labor
13. Staff accordingly
14. Sequencing



Store in Tote

- Automated storage
- Put-away, de-cant
- Inventory buffer
- Put to order workstations
- Pack & ship

Dual Purpose Workstation

Decant:

- Unload product
- Items to totes
- Totes to storage

Order picking;

- Donor tote on conveyor
- Pick from donor tote
- Put to shipping container
- 1 - 6 put positions

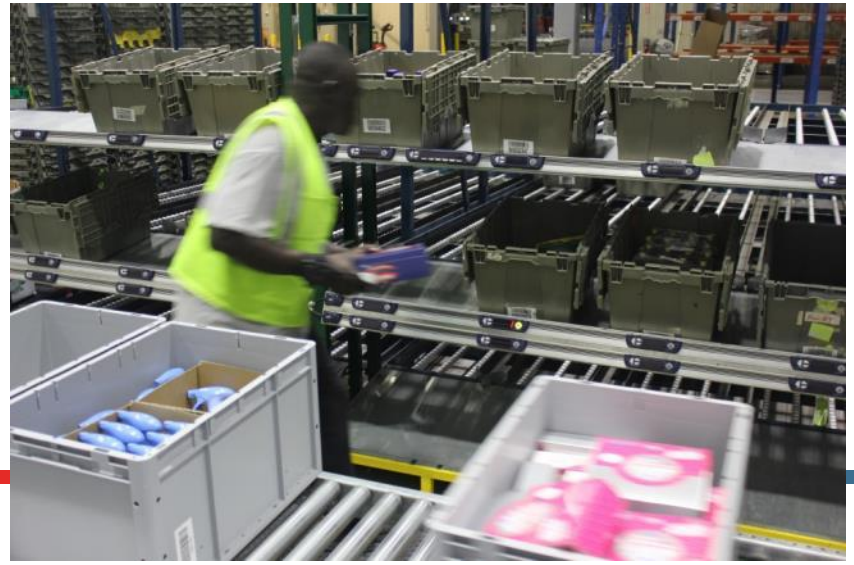
Dedicated Workstations

Decant:

- Unload inventory
- Items to totes
- In-line scale
- Totes to storage

Order picking:

- Donor tote on conveyor
- Pick from donor tote
- Put to shipping container
- Flow rack
- Palletize totes



Goods-to-Person System Overview

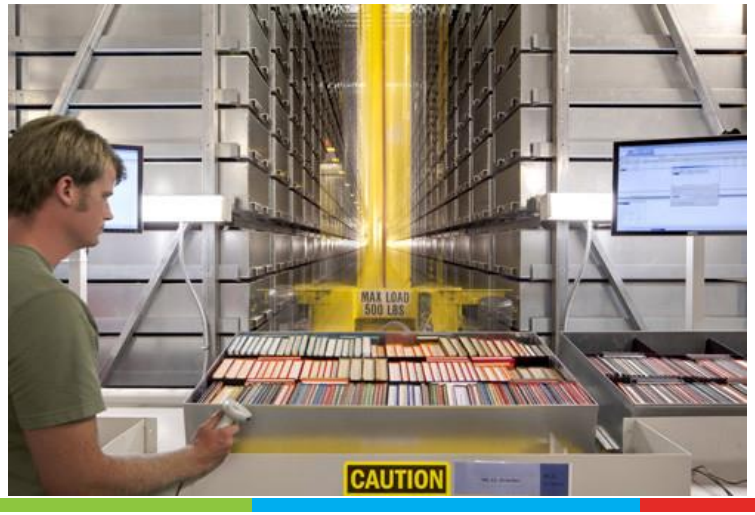
Compact footprint

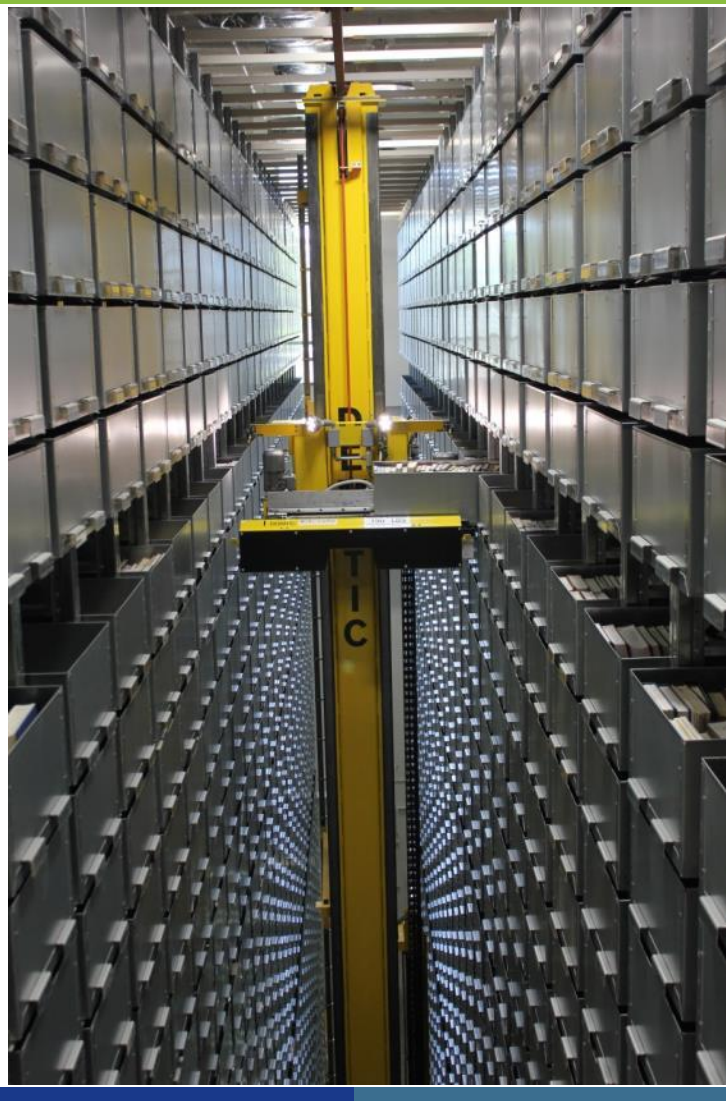
- Process improvement
- Inventory storage
- Workstations
- Conveyor
- Software

Case Study #7: Document Storage

ASRS with Goods-to-Person

- All slow moving inventory
- University libraries
- Books stored in bins
- Single or multiple SKUs/bin
- High density storage





Case Study #8: Food

Case Pick to Palletizing

- 3 level case pick module
- Case pick to conveyor
- Voice directed w/route & stop labels
- Sort: label guided pallet building, route & stop
- WES software, reverse stop sequencing
- Interface to WMS
- Route based direct-to-store delivery
- 10,000 – 18,000 cases/shift
- Lot tracking
- Accuracy/productivity
- Compact footprint

Case Study #9: Retail Grocery

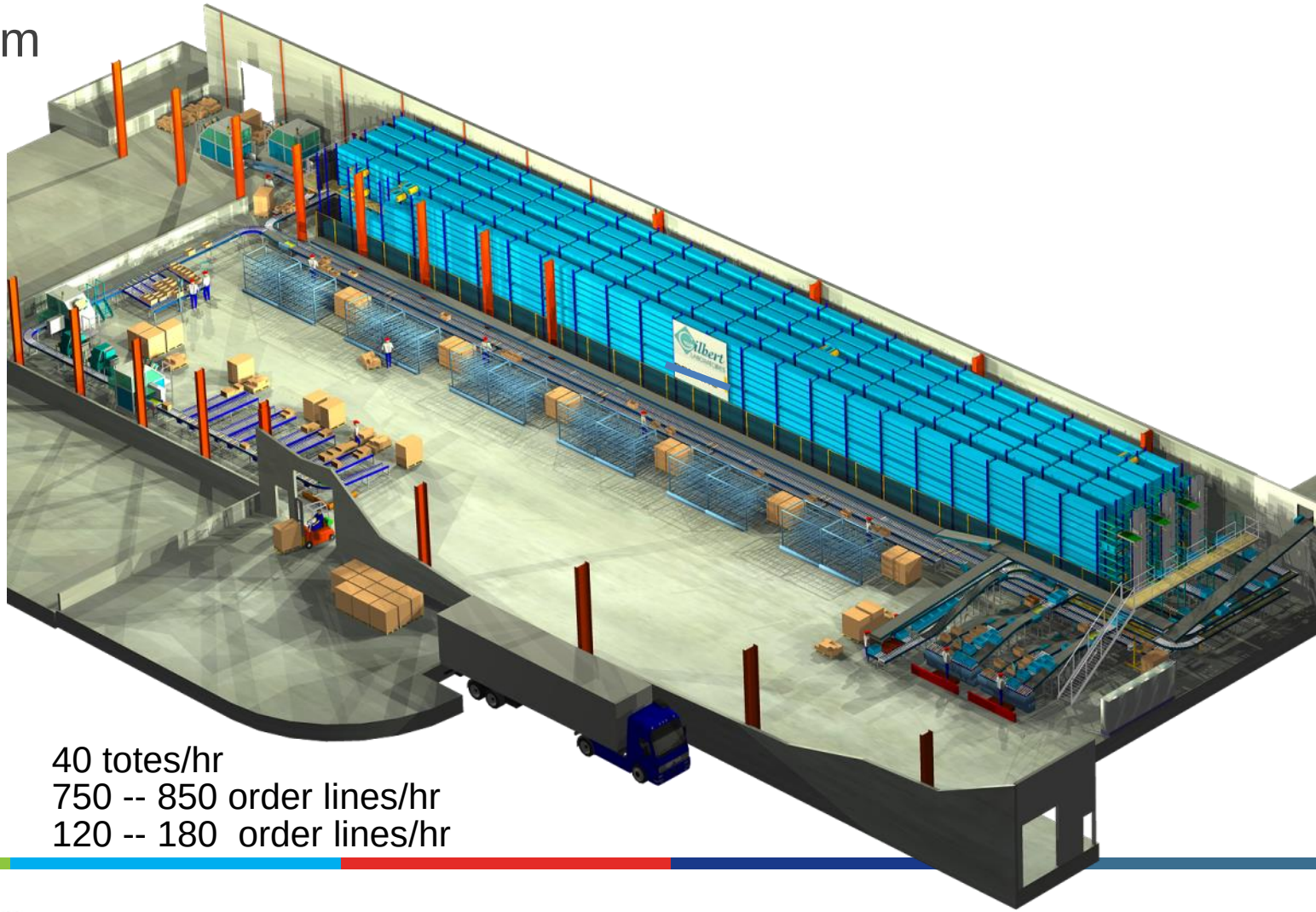
Goods-to-Person, Case Picking

- Workstations: replenishment & case picking
- Automated inventory storage
- Warehouse Execution System w/host
- Productivity, processing speed/accuracy
- 400 – 500 cases/operator/hr.
- Compact system footprint
- Scan verification, weight check ↑ accuracy
- Replenishment & picking at same time
- Expand-able for changes, growth, acquisitions

Case Study #10 Personal Care

Hybrid System

- Low velocity SKUs in ASRS
- Goods-to-person picking
- Zone route conveyor for high velocity SKUs



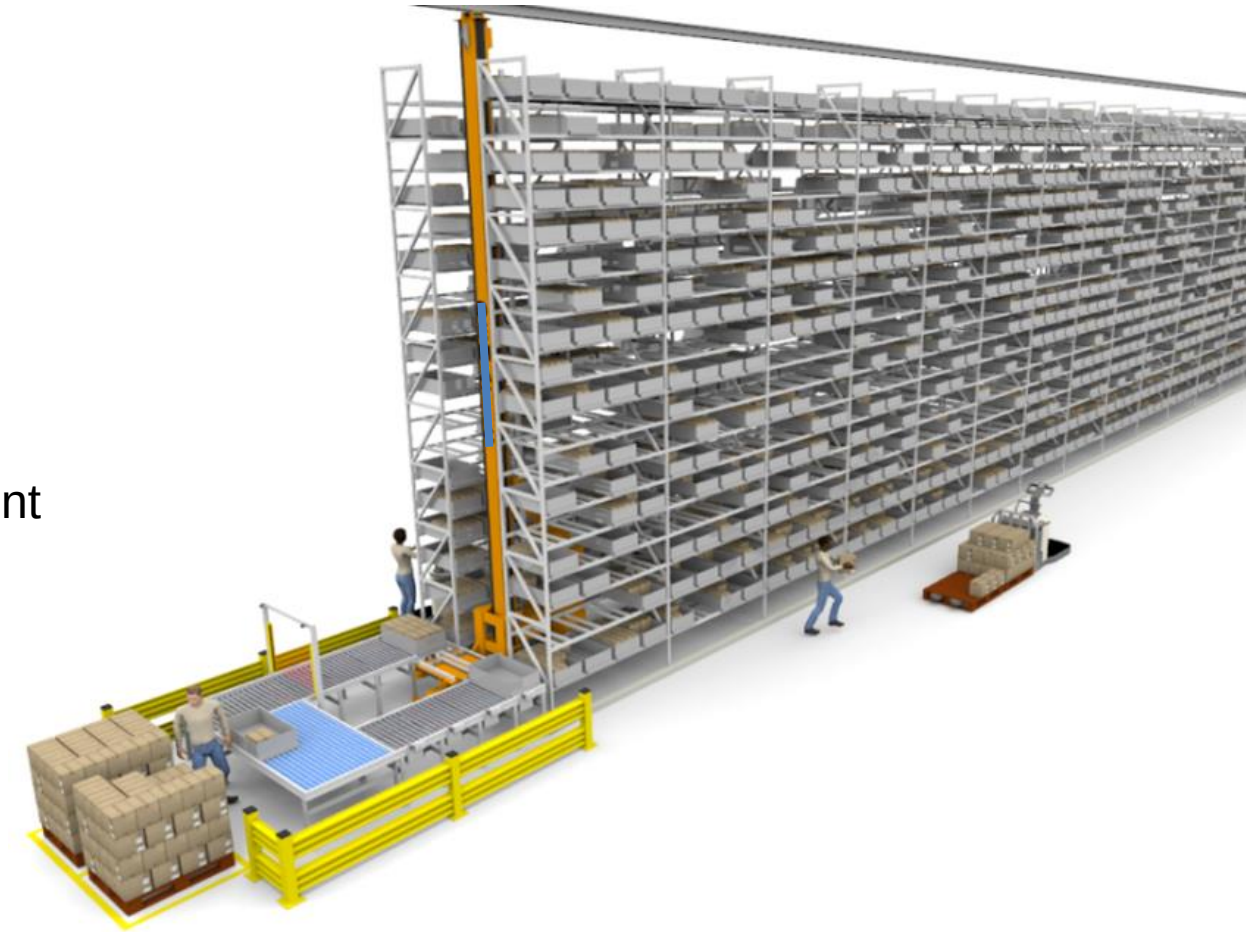
Rates

Inbound:	40 totes/hr
Pick Station:	750 -- 850 order lines/hr
Pick to Light:	120 -- 180 order lines/hr

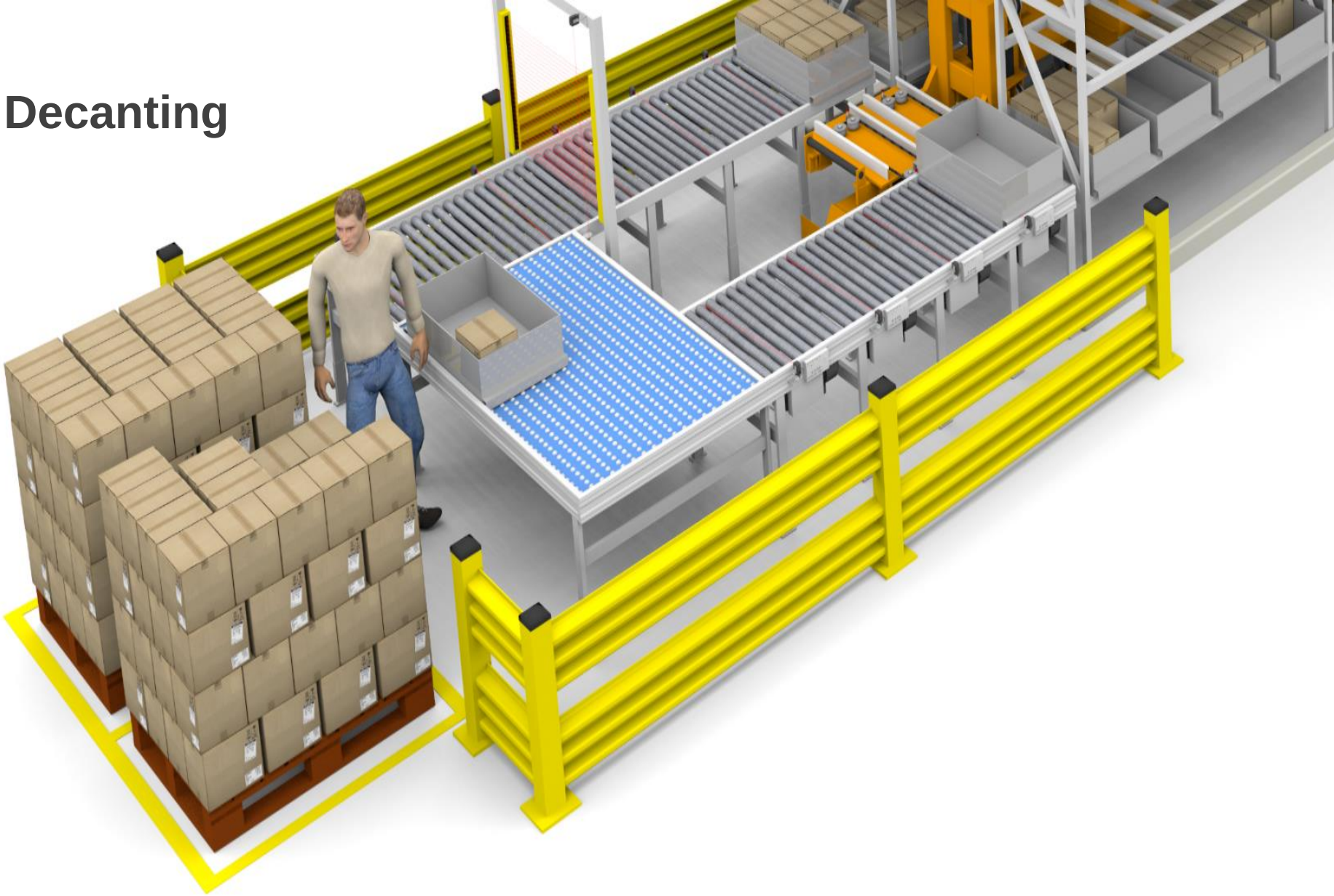
Case Study #11 Food Distributor

Dynamic Slotting

- Piece Picking
- Mixed case pallet building
- Pick faces: 500 – 2,000
- Compact footprint
- High density pick locations
- Auto pick face replenishment
- Scan validation



Decanting



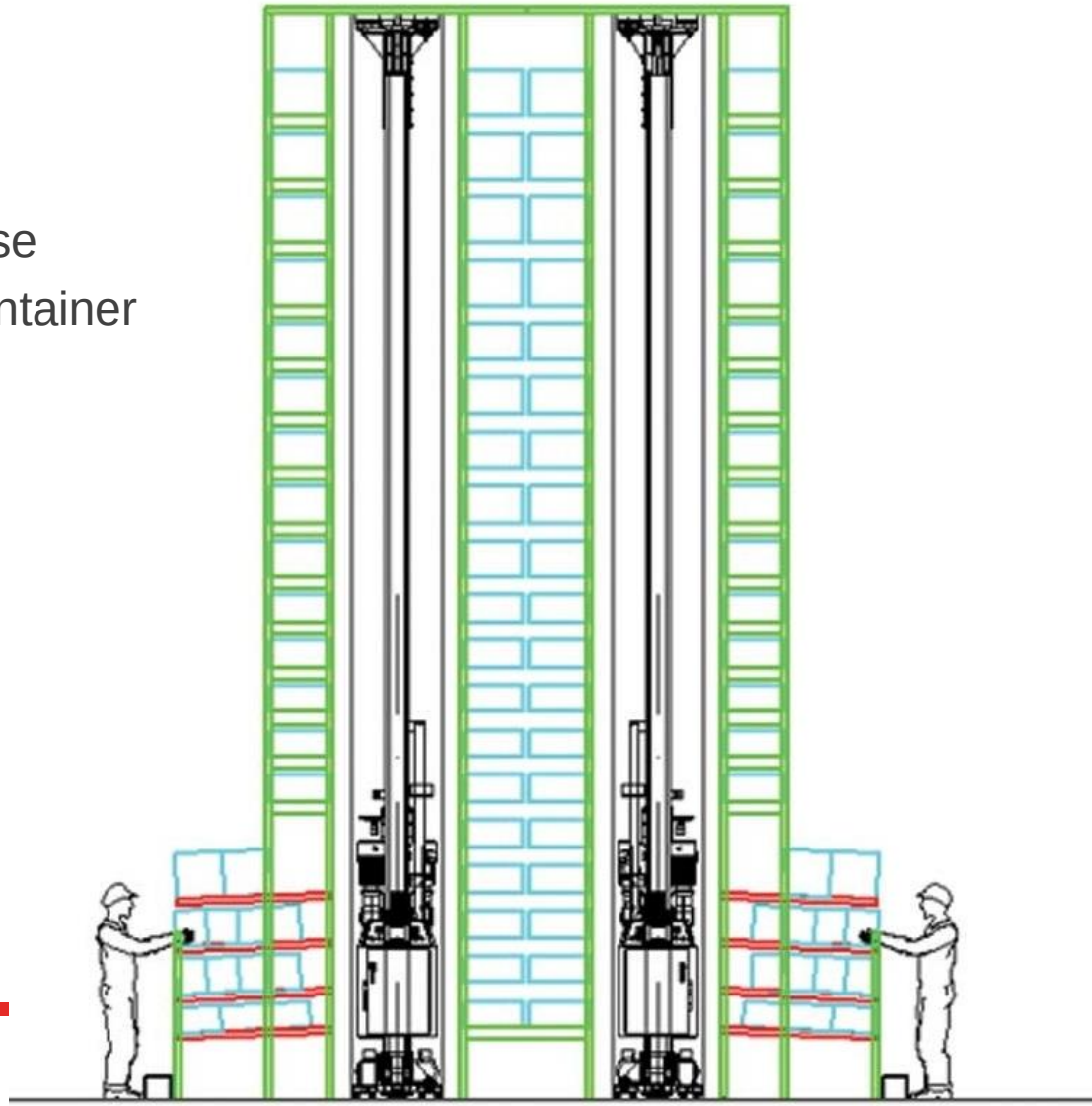
Picking

Dynamic Slotting

Two Aisle Configuration

Tote – ASRS

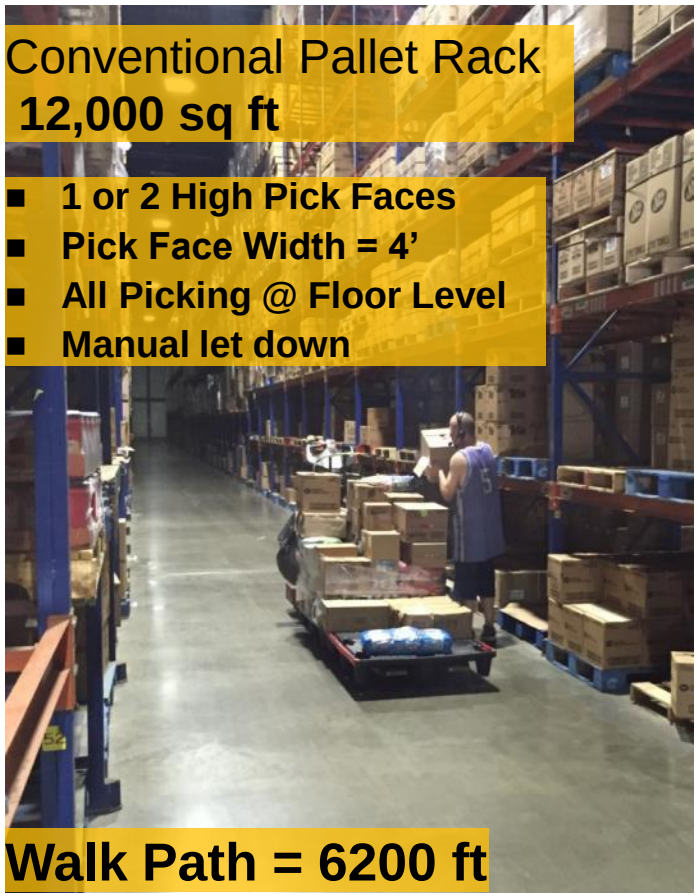
- Store & replenish by tote or case
- Single or multiple SKUs per container
- Pick from sides



Value Analysis

Conventional Pallet Rack
12,000 sq ft

- **1 or 2 High Pick Faces**
- **Pick Face Width = 4'**
- **All Picking @ Floor Level**
- **Manual let down**



Walk Path = 6200 ft

Dynamic Slotted
3500 sq ft

- **4 high pick faces**
- **1600 Pick Faces**
- **Automatic let down**
- **Pick face width = product case**

Walk Path = 650 ft

Dynamic Slotting Pick Module

Feature/Benefit Analysis

Feature	Benefit
8 to 1 reduction in footprint	Less building cost & energy
Reduced pick path	Productivity gain, less labor
Auto pick face replen	Less labor, fast line set up
Reduced processing time	Increase service level
Stock more SKUs	> revenues & customers
Dynamic pick faces	Only active pick faces slotted
Modular design	Installs in existing warehouse
Installs in existing bldg.	Easy switch to new

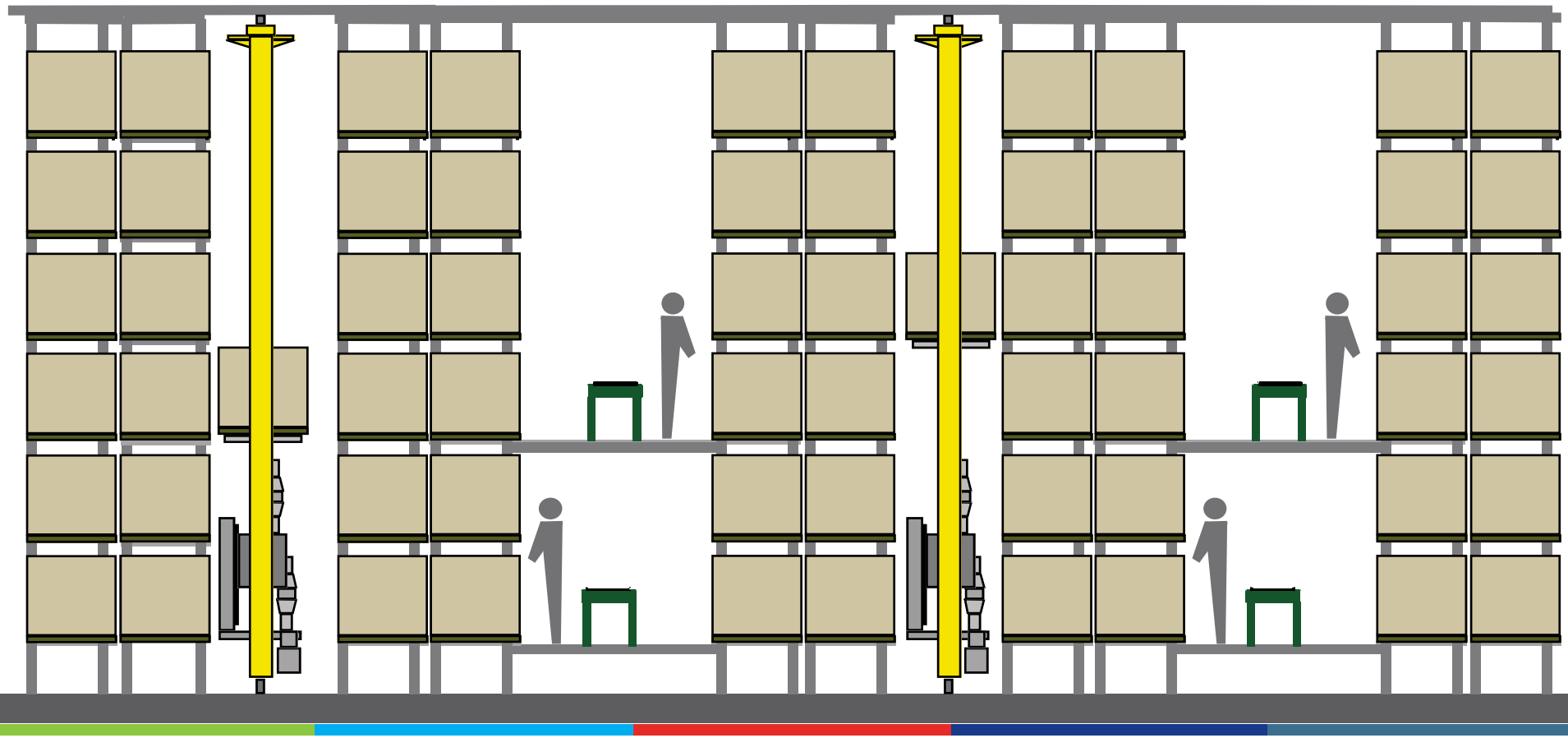
Case Study #12 Retail Grocery

Dynamic Slotting, Pallet Version

Dynamic
Pick Faces

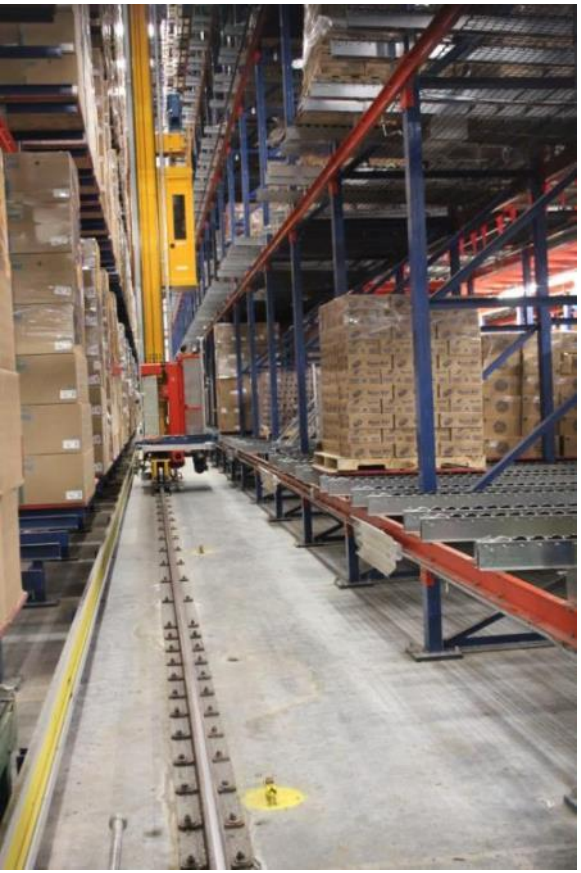
Replenishment
storage
upper levels

Case Pick to Conveyor



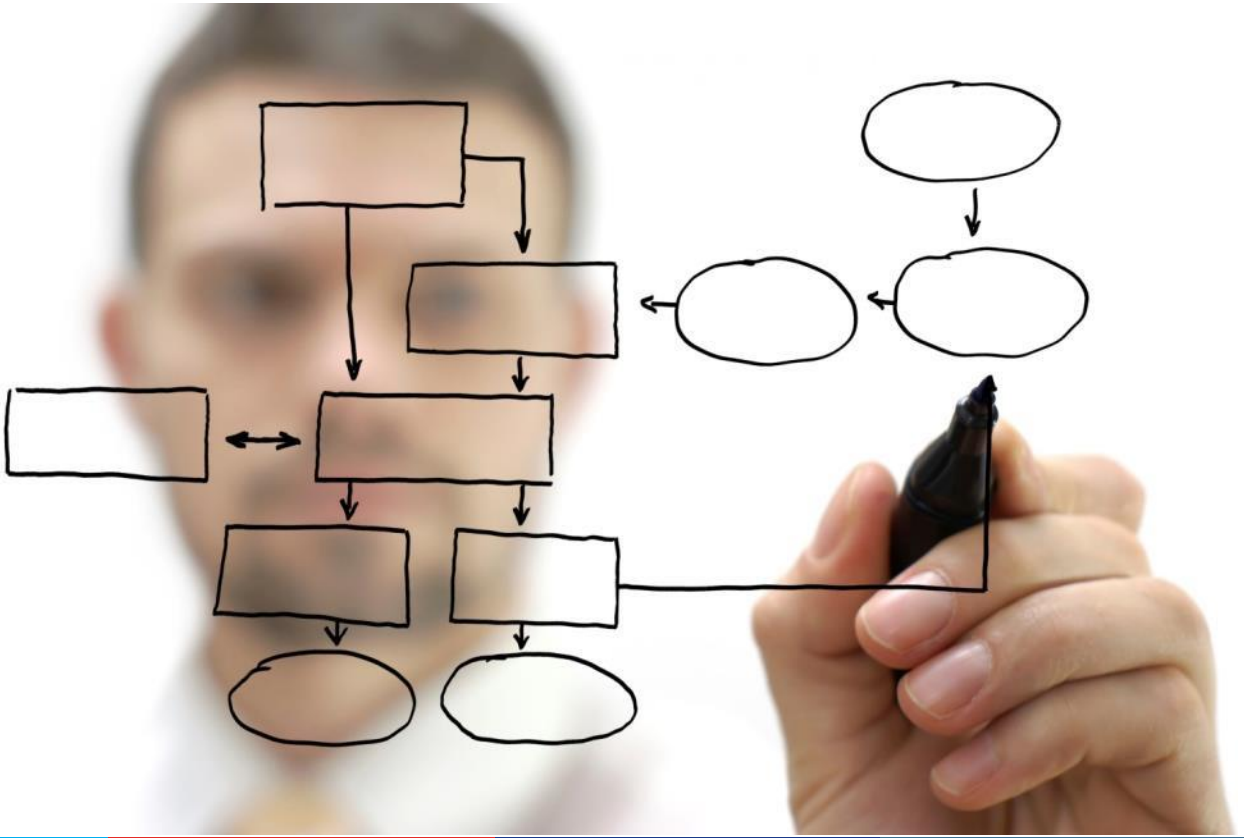
Case Pick to Conveyor

Light Directed



Key Takeaways

- Pre:
  - ✓ defined
  - ✓ engineered
  - ✓ tested
- Predictable performance
- Low risk
- Moderate investment
- Scalable



For More Information:

Speaker email:
kenneth.ruehrdanz@dematic.com

Website: www.dematic.com

Or visit ProMat Booth #S1203