Automating and Operating the Intelligent Warehouse

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AUTOMATING AND OPERATING THE INTELLIGENT WAREHOUSE

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Agenda

- Introduction to Swisslog
- Market challenges and trends
- Where does automation bring value?
- Automation solutions
- Cold storage case studies
About Swisslog Logistics Automation

- Robotic, data-driven and flexible automated solutions
- Consulting, concept studies, project implementation, and technology implementation
- State-of-the-art WMS with integrated automation control
- Extensive food and beverage experience, including cold storage automation.
- Over 2,000 customer deployments
1. Operational Expenses
2. Working Environment
3. Market Requirements

Challenges & Trends
1. Operational expenses
Challenges & trends

- Carbon footprint
  - RISING ENERGY COSTS
- Sustainability
- Urbanization
  - INCREASED REAL ESTATE COSTS
- Reduced space
- High labor costs
  - LABOR AVAILABILITY & COSTS
- Reduced labor force
2. Working environment
Challenges & trends

Monotone tasks

REDUCED LABOR FORCE

Working time

ERGONOMICS

HARSH WORK ENVIRONMENT

Fast operation

Goverment regulations

STRICT REGULATIONS

Fast operation
3. Market requirements
Challenges & trends

- Local & ethnic food
- Fresh but convenient
- Smaller order volumes
- More frequent delivery
- Packaging
- Crossovers

INCREASING SEGMENTS
- Farm to fork
- Bio / gluten lactose free

FASTER DELIVERY
- Cost of poor quality
- E-Commerce

GREATER VARIETY
- No best before
- Food quality

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Key Trends in Cold Storage

Global cold chain market size, by product, 2014 - 2025 (USD Billion)

Growing Demand

- Crates
- Insulated Containers & Boxes
- Cold Packs
- Labels
- Temperature-controlled Pallet Shippers

SKU Proliferation

Labor Challenges
WHERE DOES AUTOMATION BRING VALUE?
Which warehouse processes can be automated?

Considering conventional warehouse processes...

- Unloading
- Receiving
- Transport
- Put away
- Replenishment
- Picking
- Transport
- Despatch Staging
- Loading
Which warehouse processes can be automated?

Increasing levels of automation...

0. Conventional - Person to Goods

1. Auto Pallet Storage & Retrieval

2. Auto Storage & Integrated Pick

3. Auto Storage & Pick to Belt

4. Goods to Person (Full & Split Case)

5. Fully Auto Case Pick

Conventional storage & pick

Automated pallet storage

Conventional pick

Automated pallet storage

with integrated pick to pallet

Automated pallet storage

with integrated pick to belt

Case sortation

Case buffer

Automated Palletising
## Automating warehouse processes

Where will automation deliver most value in labor reduction?

<table>
<thead>
<tr>
<th>Warehouse Process</th>
<th>Variable Labor Costs</th>
<th>Automated Solutions</th>
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<tbody>
<tr>
<td>1. Receiving</td>
<td>8%</td>
<td>Roll on - Roll off (RORO)</td>
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<td>Automated Guided Vehicles (AGVs)</td>
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<td>RF ID express receipt</td>
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<td>2. Transportation/ Putaway</td>
<td>12%</td>
<td>Pallet conveyors</td>
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<td>Monorail</td>
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<td></td>
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<td>Shuttle cars</td>
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<tr>
<td>3. Replenishment</td>
<td>14%</td>
<td>AGVs</td>
</tr>
<tr>
<td>4. Picking</td>
<td>35-40%</td>
<td>Shuttle based satellite systems</td>
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<tr>
<td>5. Transportation/ Loading</td>
<td>12%</td>
<td>ASRS</td>
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<tr>
<td>6. Auxiliary tasks</td>
<td>5-10%</td>
<td>Miniloads</td>
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<td>Auto Case Pick</td>
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<td>Sortation systems</td>
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<td>Goods-to-person pick</td>
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<td>Pallet conveyors</td>
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<td>Auto Pallet wrap</td>
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<td>AGV loading</td>
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<td>Layer picking</td>
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<td>Full Pallet Outfeed</td>
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<td>Empty Pallet stackers</td>
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Automating warehouse processes
Savings in energy costs and footprint

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<tr>
<th></th>
<th>Manual</th>
<th>Automated</th>
<th>Change</th>
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<tbody>
<tr>
<td>Footprint</td>
<td>375%</td>
<td>-275%</td>
<td>100%</td>
</tr>
<tr>
<td>Roof and Wall</td>
<td>130%</td>
<td>-30%</td>
<td>100%</td>
</tr>
<tr>
<td>Cube</td>
<td>125%</td>
<td>-25%</td>
<td>100%</td>
</tr>
<tr>
<td>Energy p.a.</td>
<td>140%</td>
<td>-40%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Example: deep-freeze warehouse with 17,000 pallets

Labor 100,000 pal p.a.

-500%     -400%
INDUSTRY LEADING SOLUTIONS
AUTOMATION SOLUTIONS
INDUSTRY LEADING SOLUTIONS
COLD STORAGE CASE STUDIES
Lineage, Sunnyville, TX | USA

Reaching New Heights

- Deep freeze storage (-20F) for 24,000 pallets
- Increasing building height was key to lowering costs
- Requires automated solution for storage and retrieval using Swisslog’s PowerStore
- Saves on power consumption and overall costs, with increased storage density
Intelligent operation in cold storage
Focusing on user experience
Storage Allocation Strategies

PowerStore Flexible Row Depth

- Fixed Row Depth: Standard Implementation
- Flexible Row Depth: LIFO Scenario 1
- Flexible Row Depth: LIFO Scenario 2
- FIFO CHANNEL: LIFO Shuffle mode
- RAPID FIFO DISCHARGE: FIFO Shuffle mode
- JACKPOT LANE: Slow movers/Small lots Two-way access
Stemilt Growers, Wenatchee, WA | USA

Automating to improve efficiency and customer service

Project Information
- 5 modules – 5 levels
- 13 250 Pallet Locations
- 25 Row Carriers & 25 Aisle Carriers
- Supply Carrier loop with 12 Supply Carriers
- 5 Vertical Conveyors
- Pallet Conveyor
FOR MORE INFORMATION:

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