Beyond Bolted Down: The Shift to Flexible Warehouse Automation

Presented by:
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Presenters

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About Swisslog

Swisslog shapes the future of intralogistics with robotic, data-driven and flexible automated solutions that achieve exceptional value for our customers.
Evolution of the Warehouse

1920s
- Manual
  - Labor-Intensive, Limited Number of SKUs, Limited Throughput

1960s
- Mechanized
  - Capital-Intensive, Inflexible, High Throughput

2010s
- Automated
  - Data-Intensive, Flexible, Robotic
The Mechanized Warehouse

Mechanization provided throughput at the expense of... 
- Scalability
- Flexibility
- Maintainability
E-commerce has Changed Everything

- Double-digit growth
- Volatile demand
- Limited labor pool
- Increased service requirements
- Omni-channel complexity
The Automated Warehouse
Becoming Future-Ready
Managing with Data

- Enhanced inventory management
- Predictive inter-weaving wave management
- Balanced approach of push/pull from predictive demand
- Visualizing the flow and proactively removing problems
Turning the Supply Chain into a Competitive Weapon

- Meet peak demand
- Scale incrementally to support growth
- Reconfigure based on product/process changes
- Re-purpose based on moves/expansion
Employing Robotics

- Alleviate labor shortages
- Increase operating flexibility
- Improve productivity
Goods-to-Person Robotic Systems
### Goods-to-Person Picking

<table>
<thead>
<tr>
<th>Benefit</th>
<th>CTP</th>
<th>PTG</th>
</tr>
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<tbody>
<tr>
<td>Order Picking Travel Time</td>
<td>Greater benefits for larger facilities</td>
<td>Employees travel to picking locations; significant amount of order picking labor is spent traveling to and from pick locations</td>
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<tr>
<td>System Scalability</td>
<td>Highly scalable</td>
<td>Highly scalable</td>
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<tr>
<td>Order Accuracy</td>
<td>Systems exceed 96 percent</td>
<td>Routinely realize 99 percent order accuracy</td>
</tr>
<tr>
<td>Smaller Footprint/Better DC Cube Utilization</td>
<td>Automated retrieval systems can be condensed horizontally; unparalleled vertical space utilization – can be constructed up to 100 ft. high</td>
<td>Limited vertical space utilization</td>
</tr>
<tr>
<td>Single Point of Failure</td>
<td>If automated storage and retrieval system goes down, access to inventory is nearly impossible</td>
<td>Despite a loss in automation, pick facings can allow fulfillment operations to continue</td>
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<td>Productivity Optimization</td>
<td>Pickers can achieve 500-plus lines per hour, but depending on the operation, post-picking labor requirements can significantly affect productivity rates</td>
<td>Pickers can achieve 250 lines per hour</td>
</tr>
<tr>
<td>Capital Expenditure</td>
<td>GTP systems with AGS are typically more expensive because of the level of automation, equipment and software required</td>
<td>PTG systems are typically less expensive because they require less automation, equipment and software</td>
</tr>
<tr>
<td>Business Seasonality</td>
<td>Large capital expense requirements and high automation might be unnecessary for businesses with significant order volume spikes during short peaks but relatively low order volumes the rest of the year</td>
<td>Allows for effective and inexpensive productivity scaling by adding or removing labor, as required</td>
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<tr>
<td>Ergonomics</td>
<td>Exception</td>
<td>Requires significantly more lifting, bending, reaching and bending to complete order picking</td>
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<td>Product Sequencing</td>
<td>GTP systems with AGS are unmatched; can automatically store, stage and retrieve product in an intelligent and systematic manner</td>
<td>The need for significant manual intervention increases labor requirements</td>
</tr>
</tbody>
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Source: Envisa
Mobile, Autonomous Robots
Mobile, Autonomous Robots: Data Driven and Flexible

- Add robots or pick stations to support higher throughputs
- Reconfigure storage racks to support product changes
- Repurpose robots to a new location
Automated Storage and Retrieval Systems

Source: MHI
Automated Storage and Retrieval Systems: Data-Driven and Flexible

– Add robots or pick stations to support higher throughputs
– Expand the grid to increase capacity
– Disassemble and move to a new location
Automated Picking
Robotic Case Picking
Robotic Item Picking
Robotic Item Picking Integrated with ASRS
Robotic Sorting

Source: Kindred.ai

Source: Tomkins Robotics
What’s Next?
The Future of Distribution

- Increasing urbanization
- Faster delivery times
- Intermingling and collaboration of solutions
The Container-Based Warehouse
Key Takeaways
Key Takeaways

• Bolted-down warehouse systems lack the flexibility and intelligence to deal with the speed and unpredictability of today’s distribution requirements
• Software unlocks the potential for system collaboration
• There are a variety of solutions today that are data-driven, flexible and robotic that better meet today’s needs
• As we move forward, these solutions will increasingly be deployed in modular containers that can be configured to create pop-up distribution centers
For More Information

Thank You

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