Optimized Wave Picking and Sortation:
Beyond Connecting the Dots

Sponsored by:

ISC
Integrated Systems and Controls

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Agenda

- What is ISC?
- Optimized wave picking and sortation basics
- Connecting the dots
- Beyond connecting the dots – optimization & transition
- Recommendations
- Case studies

What is ISC?

- **Integrated Systems & Controls Council**
- MHI Industry Council
- Leading providers of *integrated* material handling & control solutions
- 33 member companies

- ISC Solutions:
  - Improve customer service
  - Reduce inventory and delivery time
  - Lower overall costs of
    - Manufacturing
    - Distribution
    - Transportation

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Optimizing Picking Efficiency

- Why optimize?
  - Reduce labor and fulfillment costs
  - Increase throughput / reduce cycle times
  - Improve customer service levels

- Key variables
  - Facility layout / travel times
  - SKU counts
  - Order volume, complexity and variability

Wave Picking

- What is wave picking?
  - Grouping of orders to optimize efficiency
  - Group by customer, carrier, ship time, etc.
  - Used for piece and case picking

- Requirements
  - Accurate map of SKU locations / counts
  - Sophisticated algorithms to optimize waves
  - Knowledge of sortation capabilities / capacity

Sortation

- Why sortation?
  - High speed automated sorting solution consolidates wave-picked items into discrete orders
  - Benefits
    - Increase productivity
    - Increase throughput
    - Increase order accuracy
    - Increase flexibility
    - Increase service levels

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WMS Wave Picking Process

- Group orders and create wave(s)
  - Align to sortation capacity
- Allocate inventory to waves
- Replenish inventory, if necessary
- Pick inventory for all waves
- Sends waves:
  - In general sequence directly to sorter
  - For high volume operations, to a wave buffer
- Check diagnostics & recreate waves, if necessary

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Wave Information Flow

- Waves generated by WMS are either:
  - Sent to Warehouse Control System (WCS)
  - Or sent directly to Sorter Control System (SCS)
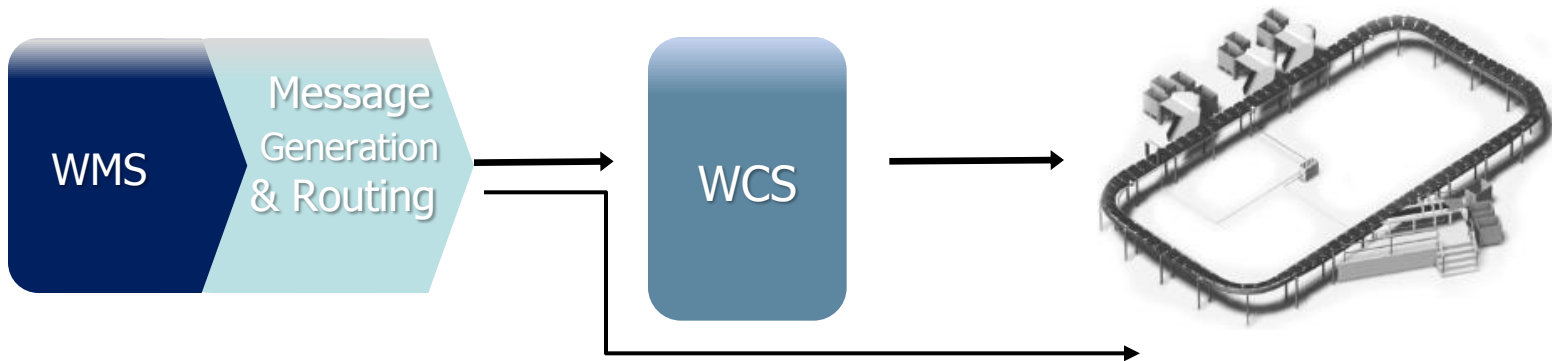
Connection Interfaces (TCP/IP, Active MQ, SAP remote call, etc.)

Connecting the Dots

- Warehouse Management System
  - Manages the order fulfillment information
  - Creates the wave pick

- Wave Buffer (high volume operations)
  - Allows optimization of WMS and sortation system

- Sortation System
  - Order consolidation
  - Pack-out at the sorter or remote

Picking & Sortation in Motion

Beyond Connecting the Dots

- Wave Sortation for Order Fulfillment
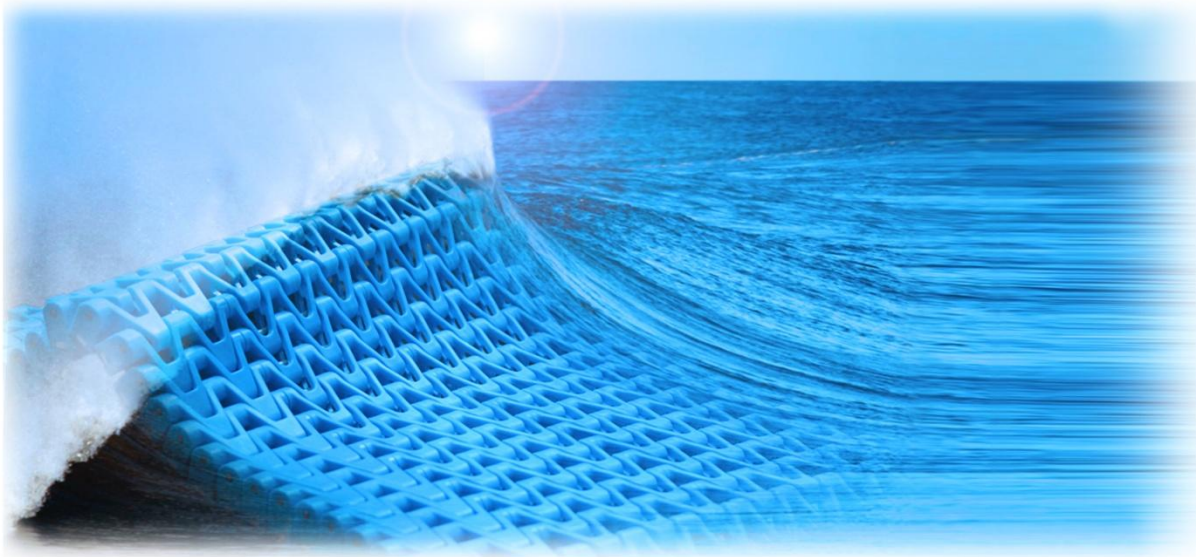
Pick Waves > **Sort/Pack Waves** > Shipping Waves
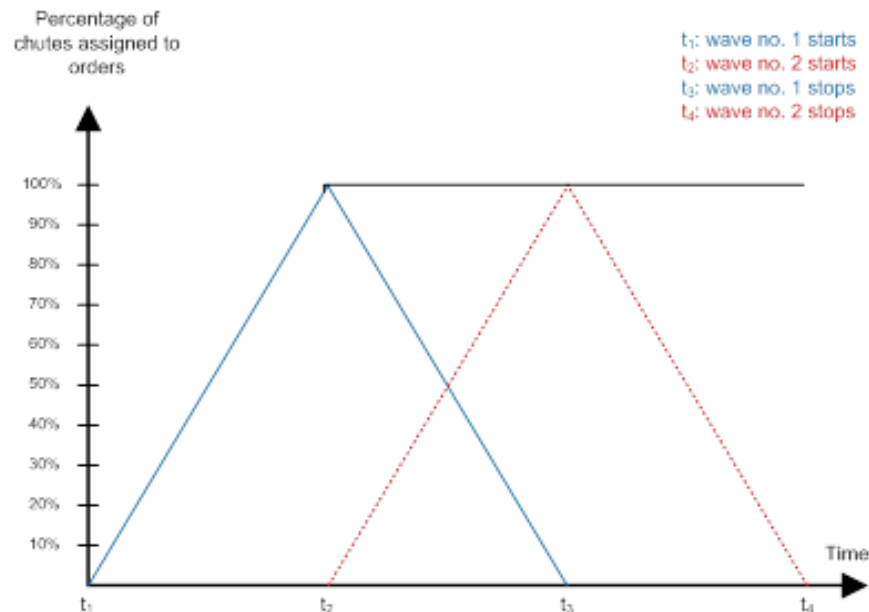
Wave Optimization

- WMS & sorter system form integrated solution
  - Critical both software and physical sorter are designed together during the planning phase
    - Wave size directly linked with size of sorter to optimize productivity
  - Independent & dependent operations
    - *The most highly optimized systems in terms of throughput allow both picking and sorting to operate independently, but are linked in real time to efficiently handle exceptions (e.g. rush orders, shorted items)*
  - It's all about wave transition

Wave Transition

- Operational benefits are directly linked to wave transition
    - Throughput
    - Operator productivity
    - Customer service levels

- Smoother wave transition = higher overall efficiency of order fulfillment
    - Picking, sorting and packing

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Wave Transition Optimization

- The traditional methods to optimize wave transition are:

  – Installing mechanical wave dividers in the sorting chutes

  – Allowing multiple waves on the sorter

  – Large wave buffer conveyor systems

Wave Transition Optimization

- Present Day Enhancements:
  - Closer integration of WMS/WCS to the sorter control system (SCS):
    - *allowing the sorter to look ahead at the items being sent, resulting in optimized sorting a wave closure*
    - *Results in smaller conveyor wave buffer, allows mini-shuttle buffer options*
  - Waveless picking (i.e. mini-wave picking)

Information and Knowledge

- Today's modern sorter control system (SCS) offers significant diagnostic and operational tools:
  - Tracking of order complete time for labor management
  - Providing diagnostic reasons for re-circulation of items on the sorter, allowing throughput optimization
  - Wave transition monitoring
  - Work zone sorter chute groups to optimize operator productivity

Recommendations

- Get IT group involved from beginning

- Consider a WCS to work with your WMS

- Develop function specification
  - Data analysis
  - Interface requirements

- Insist on teamwork and cooperation
  - WMS supplier
  - WCS supplier
  - Sorter supplier

Retailer – Explosive Growth

Productivity √

Throughput √

Flexibility √

Accuracy √

Service Levels √

- Significant reduction in "touches" due to accuracy of the sorter

- Optimized pack-out times by eliminating steps in the pack-out process

- Intelligent routing of cartons to the sorter significantly optimizes throughput

- New sorters provide 4X the capacity of legacy sorters

- Sorter control system allows sorting via manually keyed PO (legacy) or individually barcoded items

- Sorter accuracy coupled with 100% item verification at pack-out provides industry leading order fulfillment sort accuracy and efficiency

- The low maintenance sorters reduce downtime and therefore significantly increase system availability

High Volume E-Commerce

Productivity √

Throughput √

Accuracy √

Flexibility √

- 30% Labor reduction across DC operations (1,200 vs. 800 people)

- Significant capacity for growth – 35,000 units/hr

- Picking accuracy increased from 99.2% to 99.7% at unit level

- Results achieved with significant SKU proliferation (25,000 to 40,000)

- Space Optimization

Multi-Channel Retailer

Productivity √

Throughput √

Flexibility √

Accuracy √

Service Levels √

- 35% increase in picking efficiency

- Significant reduction of 'unique' situations that required special departments

- New order fulfillment systems doubles the capacity of legacy system

- Order processing flexibility across all channels

- Optimized floor space

- Automation = fewer touches = fewer operator errors = higher accuracy

- Order processing times cut by 50%

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QUESTIONS?

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