Welcome to Session 304

Bridging the Gap Between Legacy and Best-of-Breed WMS

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Norm Saenz, VP of Supply Chain Group

Sponsored by:
TranSystems
Agenda

- WMS Levels
- Functionality Walk
- Is ERP an Option?
- Latest and Greatest
- Why & How to Modify your Legacy WMS?
- BOB Landscape
- APL Logistics – Case Study (keep legacy)
WMS Levels
Warehouse / WMS Levels

**Low Volume**
- Tier 3 WMS
- Picking-paper directed
- Rider truck / cart picking
- Hand picking from flow rack, shelving or decked racking
- Discrete order picking
- 1+ storage fixture types
- Manual consolidation

**Medium Volume**
- Tier 2 WMS
- Radio frequency
- Pick & pass (zone route)
- 2+ storage fixture types
- Small batch picking
- Pick to light or voice directed
- Carousels
- Sliding shoe sorter

**High Volume**
- Tier 1 WMS
- More automation-hybrid
- Radio frequency
- Wave picking
- Higher speed conveyors
- Increased versatility
- 3+ storage fixture types
- Greater accumulation
- Cross belt & tilt tray
WMS – Memory & Tier 3

Memory
➢ No location address
➢ No automated sorting of orders

Tier 3 - Paper/Stock Locator
➢ Location address
➢ Record putaway location
➢ Typically fixed forward pick locations
➢ Batch processing
WMS – Tier 2

Tier 2 - RF / Stock Locator / ERP Level

➢ Real-Time
➢ Auto-ID
➢ Operator directed putaway
➢ May have pre-routed pick lists
➢ May have cycle counting

Radio Frequency allows the Stock Locator / WMS to process information real-time.
WMS – Tier 1

Tier 1 - RF / Best of Breed WMS

- System directed tasks
- Task-interleaving
- Continuous cycle counting
- Labor planning
- Cross docking
- Cartonization
- Re-warehousing
More Tier 1 Functionality

- Order Planning & Scheduling
- Unit of Measure Conversion
- Location Management / Slotting
- Inventory Allocation
- Shelf Life Monitoring
- Lot & Serial Number Tracking
More Tier 1 Functionality

- Cycle Counting
- Replenishment & Consolidation
- Task Assignment & Monitoring
- Reverse Logistics
- Scalability & Configurability
- Upgrade Support
Ramp-Up Your WMS

- Provide real-time view of inventory by SKU, quantity, lot number, serial number & shelf life by location.
- Facilitate a quick match of available resources to current & expected inbound, replenishment & outbound workload.
- Select the best operators & equipment for tasks based upon proximity, skill sets and task priority.
- Direct operators to immediately store or cross-dock receipts.
- Support returns processing & reverse logistics.
- Use task interleaving to minimize deadheading.
- Optimize order consolidation, wave planning, inventory allocation & pick sequencing.
Ramp-Up Your WMS

- Identify consolidation opportunities to free space and reduce outside storage requirements.
- Support bill of material, work order and value-added processing.
- Update inventory records as events occur.
- Provide accuracy that allows replacement of full physicals with scheduled and anomaly-triggered cycle counts.
- Time stamp each transaction and identifies the operator who performed it.
- Measure workforce performance and provides input for incentive programs.
- Support supplier and carrier performance measurement.
Functionality Walk
Receiving

- Operator Assigned to Receiving
- Bar Coded Pallet ID (Scan or Key-Enter)
- (Verify Product, Quantity & Condition)

- Key-Enter Order #, Product ID, Quantity & Condition
- (Pre-Printed License Plate)

RFDC
- Match LP to ASN or Retrieve PO
- Validate Receipt
- Resolve Exceptions
- Check Demand
- Issue Task
- Update Inventory Records

WMS
- Stage
- Crossdock
- QC Move
- Putaway

RFDC
- (Print & Apply LP)
- Stage
- Crossdock
- QC Move
- Putaway
Putaway / Move

- Operator Assigned to Putaway / Move
- Scan License Plate

- Move to Designated Location
- Scan Location Bar Code

- Storage
- Crossdock
- Quality
- Returns
- Other

✓ Validate Location
✓ Resolve Exceptions
✓ Issue Drop Instruction
✓ Update Inventory
✓ Issue Next Task

✓ Confirm Drop
✓ Await Next Task

RFDC → WMS → RFDC
Inventory Management

- Lot, Date Code & Serial Number Tracking
- Shelf-Life Monitoring & Rotation
- Catch Weighing
- Routine & Exception Cycle Counting
- Full Physicals
Replenishment

- Forward Pick Locations
- Floating Forward Pick
- Replenishment Trigger Controls
- Demand Replenishment
- Batch Replenishment
- Re-slotting
Picking

- Operator Assigned to Picking
- Ready for Next Pick Task

RFDC

WMS

RFDC

- Move to Location
- Scan Location Bar Code

- Display Pick Location

- Validate Location
- Issue Pick
- Validate Item / Quantity
- Resolve Exceptions
- Update Inventory
- Issue Next Pick

- Scan Item Bar Code/LP
- Pick / Confirm Quantity
- Await Next Pick
Staging / Shipping

- Trailer Scheduling / Processing
- Staging Location Management
- Staged Load Confirmation
- Door / Truck Verification
- Shipping Labels
- Manifests / Bills of Lading
- Shipment Confirmation
Slotting

Use order & SKU activity profiles to deploy upon historical & anticipated volume.

- Improve Space Utilization
- Reduce Travel Times
- Increase Pick Rates & Throughput
- Optimize Replenishment Activity
- Reduce Damage
- Improve Safety
- Simplify Retail Restocking
Slotting – Off The Shelf
Is ERP an Option?
What about our ERP?

Can we get the job done with our ERP? We have heard that it will cost less than a best-of-breed solution and will enable us to avoid all of the hassles associated with interfaces and integration.
The Lines Are Blurring
Latest and Greatest
What’s New?

Simplified Updating & Configuration

SOA & WEB Services
What's New?

Dashboards

Richer
On-Demand WMS

READY FOR PRIME TIME?

- Hosted (SAAS) solutions with basic WMS functionality
- Initially developed to provide affordable solutions for small to medium size warehouse operations
- Now being considered by contract manufacturers & 3PL’s

Pricing models:
- Subscription fee ~ $500/month
- Monthly fee based upon number of users
- Subscription fee plus transaction fees ~ $195/month plus $0.25/transaction
Why & How to Modify your Legacy WMS?
Why Improve your WMS?

- Inventory Accuracy & Turns
- Space Utilization, Stock Rotation
- Order, Lot & Serial Number Tracking
- Backorder Handling/Crossdocking
- Resource Planning & Scheduling
- Labor & Equipment Productivity
- Performance Measurement
- Customer Service
Why Improve your WMS?

- Damage/Shrinkage
- Lost Stock & Safety Stock
- Search Times & Deadheading
- Paperwork/Human Error
- Physical Inventory Taking
- Labor, Equipment & Utility Costs
- Courier/Delivery Costs
- Outside Warehousing
How to Improve? – Start by Mapping

1. Truck Arrives
2. Operator Obtains BOL
3. Operator Signs on to RF Receiving Screen
4. System Validates Operator
5. System Requests Rcvg. Date
6. Operator Inputs Date (Default "Today")
7. System Displays Order Lines
8. Operator Selects Order Line & Enters (reenters) Piece Count
9. System Matches to Order
10. Discrepancy
11. Reenter if Discrepancy
12. System Requests "Heat/Lot#"
13. Operator Enters Heat/Lot #
14. Portable Barcode Tag Printer
15. System Prints Tags
16. System Prompt: "Next Order Line"
17. Operator Enters "Receipt Complete"
18. System Logs Receipt for AP Processing & Updates Inventory & Purchasing Records
19. YES

Receiving

5.2.1
9.4.1
9.6.1
4.2.1

Modex 2022
Tran Systems
How to Improve? – Do a RoadMap

- Don’t overlay WMS on flawed layouts & processes - it’s a certain prescription for disaster.
- Do the homework necessary to build a detailed, defensible value proposition & business investment case.
- Get back to basics – look at how WMS can improve receiving, storage & picking – add functionality as confidence grows.
- Avoid customization – it adds cost, lengthens implementation time & increases risk.
- Depending upon your in-house background & expertise, recognize that the “educating the prospect” component of the supplier’s sales cycle is not free.
- There are few shortcuts – successful deployment requires solid preparation, commitment & management.
BOB Landscape
<table>
<thead>
<tr>
<th>FEATURE</th>
<th>ADVANTAGE</th>
<th>BENEFIT</th>
<th>RISKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>System-directed, interleaved put, pick, consolidation, relocation &amp; replenishment</td>
<td>Reduced deadheading, increased throughput &amp; efficiency</td>
<td>Better labor tracking; lower labor &amp; equipment costs per task</td>
<td>Worker acceptance of system-directed mode of operation</td>
</tr>
<tr>
<td>Client personalization &amp; functional tailoring</td>
<td>Meet specific needs without “force fitting” generic solution</td>
<td>Clients receive the functionality they specify</td>
<td>May deliver sub-optimal answers for certain tasks; added cost, possible delay.</td>
</tr>
<tr>
<td>Scheduled &amp; exception-driven cycle counting.</td>
<td>Real-time inventory management</td>
<td>Increased inventory &amp; storage location content accuracy</td>
<td>Balancing &amp; prioritizing cycle counting with other tasks.</td>
</tr>
<tr>
<td>FDA, NAFTA &amp; other regulatory compliance functions</td>
<td>Field proven modules as opposed to custom development</td>
<td>Lower costs to comply; shorter deployment time.</td>
<td>Completeness of fit with client’s specific needs; staying current with regulations.</td>
</tr>
<tr>
<td>User Training &amp; Certification</td>
<td>Depending upon the supplier, comprehensive programs for ensuring operator readiness</td>
<td>Self-evident</td>
<td>Trainer familiarity with client environment &amp; application</td>
</tr>
</tbody>
</table>
The WMS Market

TOTAL WAREHOUSES: 597K

TARGET MARKET: 63K to 90K

CURRENT USERS: 35K Sites

# Warehouses (000's)

<5,000
<10,000
<25,000
<50,000
<100,000
<200,000
<500,000
>500,000

Sq. Feet

<5,000
<10,000
<25,000
<50,000
<100,000
<200,000
<500,000
>500,000

MODEX 2002 Solutions for Warehousing Industry

Tran-Systems
APL Logistics – Case Study
APL Logistics – Project Scope

- APL/Bobcat commissioned TranSystems to conduct a distribution center assessment to determine:
  - Is overall worker performance at or near 100%
  - Can a new WMS, or LMS, or integrated WMS / LMS provide the tools to improve worker performance such that the labor savings can justify the capital investment for the new technologies

- APL also wishes to understand if there are any areas of the operation where improvements in productivity or accuracy are available
Benefits of a New WMS / LMS

- The existing APL WMS Application is delivering many of the benefits that a new WMS would provide because many of the fundamental inventory controls with bar code scanning are already in place.

- An optimistic labor reduction for a new WMS would be a head count reduction of 5 FTEs and similarly, an optimistic reduction of 3 FTEs would be associated with a new tier 1 LMS application.

- Accuracy would improve marginally but not enough to place a hard dollar value on it.
## 5-Yr Cash Flow Analysis for a New WMS

### Cash Flow Analysis for WMS Investment

<table>
<thead>
<tr>
<th>Financial Summary</th>
<th>Cash Flow Impact by Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Labor Savings</td>
<td></td>
<td>-$</td>
<td>$189,527</td>
<td>$192,844</td>
<td>$196,219</td>
<td>$199,653</td>
<td>$203,147</td>
</tr>
<tr>
<td>Maint. &amp; Support Expenses from WMS</td>
<td></td>
<td>-$</td>
<td>$(94,875)</td>
<td>$(94,875)</td>
<td>$(94,875)</td>
<td>$(94,875)</td>
<td>$(94,875)</td>
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<tr>
<td>Learning Curve Labor Ramp-Up Penalty</td>
<td></td>
<td>-$</td>
<td>$(50,000)</td>
<td>-$</td>
<td>-$</td>
<td>-$</td>
<td>-$</td>
</tr>
<tr>
<td>Depreciation</td>
<td></td>
<td>-$</td>
<td>$(179,583)</td>
<td>$(179,583)</td>
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<td>-$</td>
<td>-$</td>
</tr>
<tr>
<td>EBIT Impact</td>
<td></td>
<td>-$</td>
<td>$(134,931)</td>
<td>$(81,614)</td>
<td>$(78,240)</td>
<td>$104,778</td>
<td>$108,272</td>
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<tr>
<td>Adjust for Non-Cash Items</td>
<td></td>
<td>-$</td>
<td>$(179,583)</td>
<td>$(179,583)</td>
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<td>-$</td>
<td>-$</td>
</tr>
<tr>
<td>Depreciation</td>
<td></td>
<td>-$</td>
<td>$52,488</td>
<td>$31,748</td>
<td>$30,435</td>
<td>$(40,758)</td>
<td>$(42,118)</td>
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<tr>
<td>Income Tax</td>
<td></td>
<td>-$</td>
<td>$97,140</td>
<td>$129,717</td>
<td>$131,779</td>
<td>$64,019</td>
<td>$66,154</td>
</tr>
<tr>
<td>Net Cash Flow Impact</td>
<td></td>
<td>-$</td>
<td>$(1,463,280)</td>
<td>$97,140</td>
<td>$129,717</td>
<td>$131,779</td>
<td>$64,019</td>
</tr>
<tr>
<td>Total Cash Flow Impact</td>
<td></td>
<td>-$</td>
<td>$(1,463,280)</td>
<td>$97,140</td>
<td>$129,717</td>
<td>$131,779</td>
<td>$64,019</td>
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### 5-Year Net Present Value (@ 13%)

- **Net Present Value**: $-$986,066
- **Total 5 Year Cash Flow**: $-$974,471

### Key Assumptions

- WMS will reduce head count by an estimated 5 FTEs
5-Yr Cash Flow Analysis for a New LMS

### Cash Flow Analysis for LMS Investment

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<td>Adjust for Non-Cash Items</td>
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<tr>
<td>Depreciation</td>
<td>$</td>
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<tr>
<td>Net Cash Flow Impact</td>
<td>$</td>
</tr>
<tr>
<td>Capital Investment</td>
<td>$</td>
</tr>
<tr>
<td>Total Cash Flow Impact</td>
<td>$</td>
</tr>
</tbody>
</table>

### 5-Year Key Assumptions

- Net Present Value (@ 13%): $8,085
- Total 5 Year Cash Flow: $64,847

LMS will reduce head count by an estimated 3 FTEs
APL Recommendations

1. A new WMS is not cost justified and should not be pursued on the basis of economic value to the firm.

2. The business case for a new LMS is not compelling enough to justify the investment and should not be pursued unless management decides that there other intrinsic advantages to investing in an LMS.

3. Existing labor standards should be tightened up to reflect the realities of the environment:
   - E.g. A full inbound container of tires may require 4 hours to unload for 2 FTEs which is not related to the number of receipt lines being processed.
# APL Recommendations

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Description</th>
<th>Financial Benefits</th>
<th>FTE Equivalents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eliminate MUIDs</td>
<td>Multiple inventory records based on PO lines cause the picking and packing operation due to slow down to extra pick tickets that need to be processed</td>
<td>$10,712</td>
<td>0.3</td>
</tr>
<tr>
<td>Eliminate commingled SKUs</td>
<td>Renumber the warehouse such that each bin location has a unique location name and bar code to minimize search time and to improve accuracy</td>
<td>$44,520</td>
<td>1.1</td>
</tr>
<tr>
<td>Slot Fast Movers in Golden Zone</td>
<td>Reslot about 2500 &quot;A&quot; and &quot;B&quot; SKUs from the back of the warehouse into the golden zone to ensure that 75% of the order lines are putaway and picked closest to the receiving and shipping dock to minimize travel time</td>
<td>$134,295</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$189,527</strong></td>
<td><strong>4.7</strong></td>
</tr>
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</table>
Questions???

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