Understanding Warehouse Management Systems and Automation

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Warehouse management systems (WMS) and other types of warehouse technologies offer distributors many opportunities for improving productivity and customer service.

This session, presented by a neutral third party, will provide tips on how to manage the WMS selection process and insights on what a WMS can and cannot do. Participants will hear about the factors a distributor has to consider when justifying a WMS installation and help attendees answer a number of important questions:

What do you want a WMS to accomplish in your distribution environment?
What are the most important factors in the decision process?
How can you find out what other companies have accomplished in the installation of similar systems?
Can you expect the same results?

This session will also provide an overview of the market and a background on major vendors.
What Do Food Distributors Want?

Why Invest in a WMS?

Drivers to invest in a WMS…

- More efficient use of space and racking
- Improved labor productivity
- Better selection accuracy
- Better product rotation
- Minimal dock crowding and congestion
- Improved work prioritization
- On-time truck departures
- Improved labor control
- Elimination of lost product
- Clean Invoices
- Better warehouse integration with Purchasing and the rest of the supply chain
- Ability to measure results to continuously improve the operation
What Makes Food Distribution So Different?
Unique Functional Requirements From a WMS Perspective?

- Requirements
  - Appointment Scheduling
  - Cross Docking
  - Labor Standards
  - Load sequencing
  - Slotting
  - Voice Integration
  - Yard Management
  - Mixed Pallets
  - Mixed Products in Slots

- Requirements Cont’d
  - FIFO & FEFO Tracking
  - Multiple Pick Strategies
  - Regulatory Compliance
  - Catch-Weights
  - Customer-specific item-specific shelf life requirements (wholesale)
  - Configurable putaway/letdown optimization centric to the pick slot
  - Aisle Flooding Controls
What a WMS Can Do

Standard Features in a WMS

- Receiving
- Directed Putaway
- Directed Replenishment / Letdown Order Selection
- Inventory Control
- Loading / Shipping
- Task Interleaving
- Labor Management
- Management Reporting
- Radio Frequency for all Functions
WMS Features or Add-Ons

Depth of These Features Will Vary by Vendor-Solution

- Cross Docking or Flow Through
- Appointment Scheduling
- Engineered Labor Standards
- Slotting
- Yard Management
- Voice Interface or Integration
- Interfaces to material handling subsystems (e.g. automation)
What a WMS Can Not Do
Other Solutions Typically Required

- Transportation Planning, Optimization & Execution
- Labor Force Scheduling & timekeeping
- Outside Storage Optimization
- DC Capacity Planning & Forecasting
- Warehouse Layouts
- EDI
- Labor Incentives
WMS Market Overview
WMS Market has been relatively flat since 1999.

The market was $1.067 Billion in 2004 and is forecasted to grow 5%/year to 2009.

Source: ARC Advisory Group
## Consolidating Market Place

### 20+ Recent Supply Chain Software Acquisitions

<table>
<thead>
<tr>
<th>Year</th>
<th>Acquirer</th>
<th>Acquired Company</th>
<th>Type</th>
<th>Date</th>
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<tr>
<td>2005</td>
<td>Oracle</td>
<td>TMS vendor G-Log</td>
<td>Sep 2005</td>
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<td>Foodservice vendor IDS</td>
<td>Apr 2005</td>
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<td>ERP vendor PeopleSoft</td>
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<td>Infor</td>
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<td>2004</td>
<td>ClickCommerce</td>
<td>WMS vendor Optum</td>
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<td>2004</td>
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<td>Grocery Distribution/WMS vendor OMI International</td>
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<td>2004</td>
<td>Infor</td>
<td>Wholesale Distribution vendor NxTrend</td>
<td>June 2004</td>
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<tr>
<td>2004</td>
<td>RedPrairie</td>
<td>European WMS vendor LIS</td>
<td>Feb 2004</td>
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<tr>
<td>2004</td>
<td>Comvest Investment Partners</td>
<td>WMS vendor Highjump Software</td>
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<td>2004</td>
<td>Oracle</td>
<td>Retail vendor Retek</td>
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<td>2003</td>
<td>SSA Global</td>
<td>WMS vendor EXE Technologies</td>
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<td>2003</td>
<td>Sterling Commerce</td>
<td>OMS/WMS vendor Yantra</td>
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<td>2003</td>
<td>PeopleSoft</td>
<td>ERP vendor</td>
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When Best of Breed companies are acquired by private investment houses or companies with few roots in the software industry, customers can question how well they understand software in general and their particular industry in particular.

Depending on the research cited, 50 to 80 percent of acquisitions never produce the anticipated benefits.

The WMS market withstood the surge in acquisitions this year; the true test will be to see how well the acquired companies’ revenues hold up in coming years.

*Steve Banker – ARC Advisory Group 2005 WMS Market Outlook Study*
# Top 20 WMS Vendors in 2004

## WMS Software Sales Only

<table>
<thead>
<tr>
<th>WMS / SCE Vendors</th>
<th>2004 Revenue ($M)</th>
<th>2001 Revenue ($M)</th>
<th>3-Year Growth</th>
</tr>
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<tbody>
<tr>
<td>Manhattan Associates</td>
<td>$215</td>
<td>$133</td>
<td>62%</td>
</tr>
<tr>
<td>RedPrairie (Including LIS acquisition)</td>
<td>$130</td>
<td>$62</td>
<td>110%</td>
</tr>
<tr>
<td>SSA Global (Estimate)</td>
<td>~$74</td>
<td>$100</td>
<td>(26%)</td>
</tr>
<tr>
<td>SAP AG</td>
<td>$50</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Daifuku</td>
<td>$48</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>HighJump Software</td>
<td>$43</td>
<td>$25</td>
<td>72%</td>
</tr>
<tr>
<td>Provia</td>
<td>$40</td>
<td>$28</td>
<td>43%</td>
</tr>
<tr>
<td>MARC Global Holdings</td>
<td>$37</td>
<td>$36</td>
<td>3%</td>
</tr>
<tr>
<td>Catalyst</td>
<td>$28</td>
<td>$42</td>
<td>(33%)</td>
</tr>
<tr>
<td>Optum</td>
<td>$26</td>
<td>$37</td>
<td>(30%)</td>
</tr>
<tr>
<td>Logility</td>
<td>$23</td>
<td>$32</td>
<td>(28%)</td>
</tr>
<tr>
<td>HK Systems/ Irista</td>
<td>$22</td>
<td>$32</td>
<td>(31%)</td>
</tr>
<tr>
<td>Integrated Warehousing Systems (IRMS)</td>
<td>$18</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Swisslog</td>
<td>$15</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Oracle</td>
<td>$15</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Epicor</td>
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<td>NA</td>
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<td>Foxfire Technologies</td>
<td>$8</td>
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<td>Yantra</td>
<td>$6</td>
<td>$NA</td>
<td>NA</td>
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<tr>
<td>Radcliffe</td>
<td>$6</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Radio Beacon</td>
<td>$6</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
WMS Market Trends

- SAP and Oracle making in-roads into WMS Market and capturing market share
- RFID adoption has been slower than expected and has not yielded a major windfall of revenue to WMS suppliers
- Market consolidation
- Heightened competition for new sales opportunities
(Acquired Exe Technologies – WMS, Standards)

(WMS, TMS, Slotting, Standards)

(Acquired OMI and IDS – both are food-centric distribution packages with WMS offerings)

(Labor Standards – ex-Gagnon)

(Food-centric distribution package with WMS)

(WMS, Standards)

(food-centric distribution package with WMS for smaller/foodservice firms)
IPO 1998 (Nasdaq: MANH)
15 consecutive years of sales growth
Only 1 of 5 software companies profitable 10 years in a row
1400 employees
900 customers; 1,600 facilities
268 new installations & upgrades in 2004
With Evant acquisition - Target revenue for CY 2005 is in the order of $235 Million (est. only)
Manhattan Solution Map

Performance Management

- Distributed Order Management

- Appointment Scheduling
- Transportation Procurement
- Yard/Dock Management
- Warehouse Management
- Delivery Verification
- Stores
- Store Locator
- Distribution
- Logistics Hub Management
- Labor Management/Slotting Optimization
- Reverse Logistics Management

Enterprise Integration Services

Analysis & Reporting
from source to consumption
Retalix Offices:

United States
- Plano, TX (HQ)
- Philadelphia, PA
- Pittsburg, PA
- Detroit, MI
- Sacramento, CA
- Dayton, OH
- Omaha, NB
- Tucson, AZ
- Phoenix, AZ

United Kingdom
- UK
- Europe
- UK & Europe

France
- France

Italy
- Italy

Israel
- Israel
- International HQ

South Africa
- South Africa

Australia & New Zealand
- Australia
- & New Zealand

USA
- American HQ

United States
- Plano, TX (HQ)
- Dayton, OH
- Omaha, NB
- Tucson, AZ
- Phoenix, AZ
Retalix WMS Solutions

- **Power Warehouse**
  - Originally developed by IDS (Now Retalix)

- **Triceps**
  - Originally developed by OMI (Now Retalix)

- **Warehouse Management Features:**
  - Support for Voice, RF, Labels
  - Slot Optimization
  - Labor Optimization

- **Labor Management**

- **Yard Management**

- **Delivery Automation**
Retalix Optimization Capabilities:

- **Computer “Optimized / Directed” Task Assignment**
  - Software knows equipment constraints
  - Software supports task interleaving
  - Software is fully real-time
    - Example – real-time let-downs / replenishment

- **Computer “Optimized / Directed” Location Management**
  - Software optimizes warehouse cube utilization
    - “closest to the pick slot” or “closest to the dock” on putaway
SSA Global/EXE Grocery Customers
### SSA Warehouse Management Capabilities

#### Core WMS Capabilities
- Receiving
- QA/Inspection
- Putaway
- Inventory Management
- Wave Management
- Replenishment
- Order Picking
- Order Consolidation
- Physical Inventory/Cycle Counting
- Cross Docking
- Value-Added Services
- Truck Loading
- Parcel Manifesting

#### Extended WMS Capabilities
- Slotting
- Labor Management
- Yard Management
- RFID/Voice
- Transportation Management
- Visibility/Collaboration
- Analytics
- Event Management
SSA Warehouse Management Capabilities

- **Slotting and Optimization** –
  - Product placement: the most advantageous arrangement of SKUs within a range of pick faces or slots

- **Value-Added Services** –
  - Personalization, assembly, and kitting of products and sub-assemblies: mass customization of products closer to the point of sale

- **Yard Management** –
  - Coordination of yard movement with receiving and order fulfillment: visibility into inventory sitting in trailers

- **Billing for 3PLs and Distributors**
  - Billing accuracy and service: fulfillment billing charges and costs

- **Voice-Directed Distribution**
  - Worker productivity and accuracy: advanced speech recognition technology

- **RFID for Distribution**
  - Compliance and automated shipping and receiving: tracking the movement of goods with Radio Frequency Identification

- **Event and Performance Management**
  - KPI
  - KEM
RedPrairie Offices

United States
- Waukesha, WI (HQ)
- Eden Prairie, MN
- Raleigh, NC
- Charlotte, NC

Europe:
- Stokenchurch, UK
- York, UK
- Brussels, Belgium
- Paris, France
- Oosterhout, Netherlands
RedPrairie Growth Analysis

2001 2002 2003 2004 Projected 2005

$62M $130M

23% 0% 70% 13%

2001 2002 2003 2004 Projected 2005
WMS Selection Process
Standard Approach to Selecting a Solution:

1. Gain executive commitment
2. Business Process Reengineering
3. Business Requirement Definition
4. Vendor Solution Research
5. Product Demonstrations
6. Vendor Solution Evaluation
7. Test driving the software
8. Due Diligence
9. Final Negotiation
Justifying a WMS through savings:

- Code date losses
- Damages
- Fork Labor
- Chase Labor
- Data Entry / Clerical Functions
- Energy Consumption
- Lost Sales
- Miscellaneous Assignments
- Reduced Dock Congestion

Preparatory Steps

- Document and map a thorough study of your current operations
- Business reengineering process review
  - Define where you want to get to
- Develop the RFI and RFP to reflect realistic needs – not a universal wish list
- Interview prospective vendors to gain insight
- Get help if you need it – this is time consuming!
Establish a team of empowered “change agents”
- Include Sales, Procurement, Finance, Merchandising for political buy-in

Develop process flows
- Especially exception handling
- Don’t automate the bad

Allow vendors to visit your operations
- Invest time up front to prevent back-end scope creep
Vendor Solution Research

- **Rules of thumb:**
  - Software sales reps are not the most reliable source of accurate information
  - RFP responses tend to be wildly exaggerated
  - Promised future releases of functionality may never happen – don’t buy into them

- **Steps to take before signing:**
  - Get all commitments in writing
  - Insist on system documentation
  - Conference room pilot to test drive the software
  - Basically – be paranoid at all times!
**Manage the Demo**

- **Steps to take:**
  - Do not allow the software vendor control the agenda
  - Provide scripted demos with your data
  - Videotape the demo
  - Take notes on all issues
  - Watch presenter behavior patterns
  - Watch for multiple sessions being open
  - Expect the vendor to use their top talent therefore too many “I don’t knows” is not a good sign
Research the Vendor

Steps to take:

- Evaluate the software development methodology and release cycle
- Visit their office and review support desk logs
- Service and support – meet your staff
- Investigate implementations done by VARs
- Check for user groups, user conferences
- Seek out as many discussions with customers as possible
Test Drive the Software

- **Steps to take:**
  - Insist on a conference room pilot – at your place at your expense
  - You should enter your data into their system
  - Flow through a scripted set of processes
  - Document all bugs and issues in writing and include this in your contract
  - Only you should man the keyboard!

- **Would you buy a car without a test drive first?**
Steps to take:

- Investigate open litigation
- Recognize most site visits are loaded
- Reference calls – many, detailed and prepared
- Demand detailed company financials (e.g. DSO)
- Study the revenue breakdown
- Evaluate head count distribution
- Visit head office – meet executive team
Steps to take:

- Everything is negotiable – license fees, services rates, custom enhancements, support costs, warranty, legal, down-payment, etc.
- You are only in a position of power prior to contract signing
- Research quarter-end or year-end milestones to increase your leverage
- Minimize your up-front skin in the game in case you have to back out (e.g. down-payment)
Just a few examples of the work that has to be done before go-live:

- Develop a cutover strategy
- Develop a system failure strategy
- Reengineer existing operating methods
- Document warehouse procedures for the new system
- Capture or validate product Hi x Ti data, dimensions and weights with a “CubiScan”
- Train “Super Users” (i.e. dedicated resources) throughout the project
- Integrate Purchasing people before the cutover
- Train the warehouse crew (e.g. 2 weeks before implementation)
Warehouse Automation
Will New Automation Solutions Change the WMS Landscape?
Automated Food Distribution

- Full Case Grocery Automation at Albert Heijn in Netherlands:
  - ASRS Putaway
  - Automated Depalletizing
  - Automated Replenishment
  - Automated Order Selection

- Only Receiving and Loading are done by people
- 70% Workforce Reduction
- 100% store-specific sequenced output
The Albert Heijn (Ahold) Case

- 504 Lanes per Module
- 7 Levels per Module
- 1800 Dry Grocery SKUs per Module
- 4 Modules Per DC
- 10,000 cases/hr Output per Module
- Case Loading at 700/hour
Automated Food Distribution

Sample Facility Layout

1. Goods reception
2. Pallet storage
3. Depalletiser

4. Input lanes (several levels)
5. Storage lanes
6. Output lanes (several levels)
7. Shipping

Order Release Module
Automated Food Distribution

- Automated Retail Grocery DCs are now at work here in North America
- As these facilities become more affordable, more companies will deploy them for strategic advantage

European firms are now migrating automation solutions over to North America. Reduced building footprint and labor forces will be required in future as more companies buy into this strategy.
Thank You…

Questions / Comments?