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How the Latest WMS Trends Are Responding to Upcoming Supply Chain Challenges

Presented by:

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TecSys
OLD WAYS – 4 MILES
NEW RISKS – 1 MILES
OLD TECHNOLOGY – 4 MILES
UNKNOWNNS – 5 MILES
WMS TRENDS – NEXT EXIT
Major Supply Chain Challenges

• SKU Proliferation
• Government Regulations
• Shifting Global Economics
• Omni-Channel Markets
• Labor Shortages
• Automation Advances
• Cyber Security
SKU Proliferation
From Beer....
…to Amazon adds >1M Products Each Day
Both coming and going at Amazon

Source: ScrapHero.com - Jan to Dec 2016
WMS Trends – SKU Proliferation

• Pattern based on similar SKU’s
  • Setup, handling, slotting

• Ability to manage SKU Variants
  • Packaging Changes (quantities/dims)
  • Minor variants (Version, Promo Packaging, etc.)

• Faster identification
  • Visual guides to Mfg label content
  • Parsing 2D barcodes
  • Only show and prompt for data required
Government Regulations
Chart 3

Trump Keeps Fewer "Economically Significant" Rulemakings

Table 2

Rulemakings Withdrawn in First Sixth Months

<table>
<thead>
<tr>
<th>Administration</th>
<th>Total</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trump</td>
<td>469</td>
<td>19</td>
</tr>
<tr>
<td>Obama</td>
<td>156</td>
<td>4</td>
</tr>
<tr>
<td>Bush</td>
<td>181</td>
<td>5</td>
</tr>
</tbody>
</table>


Note: Years reflect Fall Agendas, except for 2012, when only a single agenda was issued.

Complex Regulations – Global Variations

• Increased regulatory features / expertise
  • DSCSA, EMVS
  • UID, MDR/IVDR
  • Recall Compliance

• Extensive data validation / reporting
  • Pharma serialization
  • Global trade compliance

• Multi-system data gathering for reporting
  • Merging of data without integration
  • Multi-system integrations
WMS Trends – Government Regulations

• Partnering with User Community for Roadmaps
  • Leveraging frontline regulatory knowledge base
  • Decreases risks of incorrect interpretations

• Collaborating with Eco-System Vendors
  • Data merging
  • Application merging

• Active Participation in Advocacy Organizations

• Generic Support in Advance of Deadlines
Shifting Global Economics
Trade Agreement Impacts

Collateral damage
United States, impact of $50bn of proposed Chinese tariffs, by product

High
- Organic chemicals
- Military hardware
- Consumer electrical goods
- Sub-assemblies
- Appliances
- Medical devices
- Hardware and plastics
- Scrap metal
- Spare parts

Low
- Diodes, LEDs
- Pharmaceuticals
- Surgical instruments
- Railway carriages
- Soybeans, sorghum
- Ethanol
- Pork
- Cars

Source: Resilinc Economist.com

DEPENDENCE
Ability to source from or sell to another country

More alternatives
Fewer alternatives
Transportation Impacts

Figure 1. Net Energy Imports as a Share of U.S. Consumption: 2000-2035

U.S. Energy Information Administration (EIA) - Annual Energy Outlook 2018
Politics vs Global Trade

• Protectionism vs Free Trade
  • Changing trade agreements

• Rapid economic changes in emerging countries
  • Low wage advantages diminish
  • Local demand for goods increase

• Transportation speed vs cost
  • Swings in cost advantages for local vs remote
Impact of Shifting Global Economics

• More frequent relocations

• Shifting demand patterns

• Changing transportation strategies
WMS Trends – Shifting Global Economics

• Cloud, On-Prem, Hybrid Deployments
  • Ability to switch based over time

• Rapid Facility Replication and Start-Up
  • Templates for standard configurations
  • Automatically extract / import both data and config changes

• Consumer Equipment Friendly
  • Cellphones / tablets – locally sourced

• Regional Controls
  • Centralized processes – e.g. wave planning / release
  • Remote staff management – global dashboards, alerts
Omni-Channel Markets
Purpose Built Facilities – Case / Pallet

Pros
- Storage for high cube/volume SKU’s
- Self adjusting for seasonality
- Efficient pallet/case picking

Cons
- Inefficient for high volume eFulfillment
- Limited in absorbing rapid SKU growth
- Poorly located for parcel operations
Purpose Built Facilities- eFullfillment

**Pros**

- Extremely efficient for piece operations
- Controlled small order consolidation

**Cons**

- Difficult to manage large case / pallet volume orders
Adaptive Facilities

Multi-Purpose DC

- Low Volume Piece Pick
- Case / Pallet Pick

Drop Box

Customer Pickup

Customer

Retail Store

High Volume Piece Pick
WMS Trends - Omni-Channel

• Shared inventory, optimized picking
  • Pick by profile, not by end customer
  • In-Line custom labeling / printing (Amazon, Retailer, Private Label)

• Wave-less execution
  • Dynamic prioritizations
  • Single step Pick & Ship
  • Single or Multiple UOM’s per bin location

• Mirrored, semi-mirrored pick lines
  • Fast movers duplicated
  • Auto spike locations

• Automated pick line re-slotting
Growing Labor Shortages
Unemployment rates by State, seasonally adjusted, February 2005

Unemployment rates by State, seasonally adjusted, February 2015

Unemployment rates by State, seasonally adjusted, February 2018

When you need them the most!
“We expect that by the end of 2019, the labor market will be historically tight.”

The Conference Board, December 2018
Median Employee Tenure

Labor Shortage Impacts

• Difficult to recruit

• Tribal knowledge is lost

• Training curves impact efficiency/accuracy

• Limits operational flexibility – relocations / rapid growth

• *Affects both blue and white collar labor*
Retain Employees

100 Best Companies Voluntary Turnover by Industry

- Manufacturing & Production: 58% (10.5%)
- Healthcare: 6.0% (17.1%)
- Information Technology: 8.0% (16.2%)
- Construction & Real Estate: 8.7% (19.4%)
- Financial Services & Insurance: 10.3% (12.6%)
- Professional Services: 10.4% (25.9%)
- Hospitality: 24.5% (38.0%)

Best Companies experience as much as 65% less turnover

Source: "100 Best" data provided by Great Place to Work Institute, Inc.
Comparative data provided by BLS. "100 Best" data includes FT & PT turnover. BLS data includes the same in addition to turnover for temp/contract workers

Copyright © 2014 Great Place to Work Institute, Inc.
WMS Trends – Retaining Employees

• **Consumer-like user experiences**
  • Familiar smartphone/tablet experiences
  • Incorporation of gaming

• **Visuals makes work easier**
  • Reduce fatigue from redundancy
  • Captures attention to unusual exceptions

• **Advanced dynamic real-time dashboards**
  • Makes supervisors more pro-active
  • Simplifies management trend analysis / forecasting
WMS Trends – New Employee Dynamics

• Online, interactive training tools
  • Independent training
  • Supports extremely short term labor

• Workflows by skill level
  • More informative for new/temp staff
  • Streamlined for experienced operators

• Highly visual
  • Intuitive to reduce learning curve
  • Simplifies confusing data
  • Systematizes tribal knowledge
  • Dynamic warnings of the unusual
Automation Advances
Robotics and automation adoption

- In use today: 34%
- 1-2 years: 19%
- 3-5 years: 20%
- 6+ years: 10%
- Unlikely to adopt: 17%

Source: 2018 MHI Annual Industry Report
Fulfillment Integration

WMS → WCS

WCS → WMS
Fulfillment Orchestration

WMS

WCS
Example - Smart Lift Equipment

- **Weight Verification** – Integrated Scales
- **Location Verification** – RFID Readers
- **Real-Time Status** – GPS Locating
- **Activate Equipment** – Integrated Sensors
- **Automatous Operations** – Retrofit Kits
Shared Responsibilities
WMS Trends – Automation Advances

• Technology designed to share data
  • SOA architecture to interact in real-time
  • Separation of work operation from ‘device’
  • Support simultaneous real-time, near real-time and batch ‘operators’

• New definition of an “operator”
  • Human with RF / Voice
  • Fixed / mobile robot
  • Hybrid team – operator and autonomous vehicle
  • Intelligent vision camera
  • Automated work cell / subsystem

• New division of labor thinking
  • Sensors + Work Queues + Decision Logic
Cyber Security
IOT Hacks Increasing

Mirai - Infected DVD players / Digital cameras

IDC – Global 2000 companies will spend 25% more on IoT security in next 24 months.
IOT Safeguarding – Lessons Learned

1. Never implement devices that do not support password, software and firmware updates.

2. Make changes to default user/password mandatory at installation.

3. Ensure unique passwords per IoT device.

4. Always update IoT devices with the latest software and firmware immediately.

Source: PC Magazine
Growth of Cloud Security Market

Forrester predicts spending on global cloud security solutions will soon exceed US $3.5B...

That's an annual growth rate of 28 per cent.
RaaS – Ransomware-as-a-Service

A $2 Billion Dollar Industry

Source: BitDefender
Rapidly Evolving Treats

91% of IT Security professionals concerned

Source: Webroot survey
WMS Trends – Cyber Security

• Pro-Active Penetration Testing
  • Leverage external resources
  • Customer partners

• Faster, Non-Intrusive Patches
  • Quickly deploy against new threats
  • Rapid deployment Cloud technologies

• Security Advances for All Connections
  • Inside the firewall
  • System Integration Layers
  • IOT Connections
Absolute – Systems Determine End Success

Humans
Rotating
Multi-Culture
Multi-Generation
High Expectations
In Demand

Data
Forecasting
Exception Centric
Traceability
Ease of Analysis
Collaborative
Secure

Systems
Interoperable
Secure
Information Rich
Intuitive
Attractive

MACHINE
Flexible
Adaptable
Sensor Based
Lowering Costs

HUMANS
SYSTEMS
DATA
MACHINE
WMS Trends Making Your Future Possible

• Flexibility / adaptability is now built-in

• User experience has radically evolved

• Multi-system, multi-vendor environments increasing

• Regulatory compliance has become standard

• Security has taken priority
For more information

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