WMS vs. WCS vs. WES

Presented by:
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Today’s Agenda:

- WMS, WCS and WES Defined
- Day in the Life of an Order
- Standard Interface Architecture
- Case Studies
- Questions
What is a WMS?

- A highly specialized business application whose purpose is to control the flow of inventory into, within and out of a company’s distribution center (DC)
  - Four Walls
  - Between Multiple DCs
  - Enterprise Visibility

- WMS knows where all orders/inventory is at all times (Four Walls)
A Real Time Environment

- Verify Receipts
- Ship to Customers
- Track/Control Inventory
- Allocate Orders
- Balance On Hand Amounts
Supporting a Real-Time Environment

Most WMSs incorporate

- Wireless Data Terminals (RF Devices)
- Bar-Coded Pallets, Cases and Item Labels
- Radio Frequency Identification Tags (RFID)
- Conveyor Systems / Material Handling Equipment
- Voice Enabled RF Devices
What is a WCS?

• A Warehouse Control System (WCS) is a **real-time integrated control** solution that manages many types of automated equipment: conveyor, sorters, ASRS, Pick to Light, Carrousels, Print and Apply.

• WCS exchange real-time communications (milliseconds), command processing, discrete equipment signals, and the optimization of material (multiple UOML: units, cartons and pallets).
What is a WES?

• Warehouse Execution Systems optimize and balance how work is performed on automated equipment

• Warehouse Execution Systems dynamically allocate orders based upon WCS inputs (machine language)
WMS vs. WCS vs. WES Analogy

5 Senses:
- Sight
- Sound
- Touch
- Taste
- Smell

WMS (Brain)

WCS (Central Nervous System)

Tilt Tray Sorter (Bones)

ASRS (Bones)

Conveyor (Bones)

WES?
Feed Back Mechanism
Warehouse Management Systems

- WMS Do Not control machine language (ladder logic and PLCs)
- WMS Do Not control machine controls (starters and motors)
- WMS Do Not control Put to Light, Sorters, Conveyors, Print and Apply and ASRS
- WMS Do Not track carton level LPNs on automation equipment
- WMS Do Not provide a GUI (ACAD) layout of your automation system
- WMS Do Not dynamically allocate or balance orders and replenishment inventory across an automated facility (typically no integration to automated equipment)
Warehouse Control Systems

- WCS Do Not interface with Your ERP (typically, there are exceptions)
- WCS Do Not hard allocate inventory in reserve or forward pick locations
- WCS Do Not support wave management strategies
- WCS Are Not your inventory of record (4-walls inventory)
- WCS Do Not support extensive cycle counting and physical inventory Processes
- WCS Do Not support labor management and allocation
- WCS Do Not support Transportation Planning and Shipping Execution
Warehouse Execution Systems

- WES Do Not manage all inventory locations within 4 Walls *(typically, there are exceptions)*
- WES Do Not support Transportation Planning and Shipping Execution *(typically, there are exceptions)*
- WES Do Not support extensive cycle counting and physical inventory processes
WMS, WCS and Now WES Functionality

THE CROSSOVER

WMS
- Transportation management integration
- Order management integration
- ERP integration
- Advanced receiving
- Management reporting
- Reverse putaway
- Slotting
- Shipping management
- Replenishment management
- Small-parcel manifesting
- Non-automated pick management
- Voice data capture
- Inventory management

WES
- Pack sorter management
- Shipping sorter management
- Automated pick management
- Pick-to-light management

WCS
- Fixed scanner integration
- Machine control integration
- Mobile scanner integration
- In-line print and apply
- In-line weight and motion

WMS
- WMS & WES
- WES & WCS
- WCS
WMS, WCS & Now WES Convergence

**WMS**
- User Interface
- Manage Inbound POs & Receiving
- Inventory, Storage & Location Management
- Manage Outbound Orders & Shipping

**WCS**
- User Interface
- Equipment Communication & Control
- Reports
- Alerts
- Host Interface

**WES**
- Dynamically Managing Activity Execution
- Receiving, PutAway, Replenishment, Picking, Packing, Shipping
- With Automated Equipment (Conveyor, Sorter, ASRS, MultiShuttles, Robots)

*Lines are becoming Blurred*
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Day in the Life of an Order (pre WES)
Day in the Life of an Order (w/ WES)

ERP | OMS

Soft Allocation

Hard Allocation

WES

WCS

4 - Walls
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Standard Interface Architecture

- ERP/HOST
- Interface Layer (Point to Point) or (ESB)
  - PO Header Detail
  - Receipt Detail
  - Item Master
  - SO Header Detail
  - Shipment Detail
- Inventory Adjustments
- WMS/WES
  - WCS
  - WES
  - Shipping Execution
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Case Study 1

- $800M Fashion Apparel Company
- Tier 1 WMS
- WCS Required for Put to Light and Conveyor
- However the WCS was used for discrete order picking…
- WCS assumed inventory was always in the forward pick location and did not manage, allocate or control the inventory
Case Study 2

- $4B Shoe Retailer (Highly Automated)
  - Tier 1 WMS
    - Managed IB Receipts
    - Inventory Control
    - Replenishment to the Tilt Tray
    - Forward picking for accessory items
    - Allocation
  - WCS for Conveyor and Print and Apply
    - 8 inbound lanes with 2 to 1 merge
    - Put-away loop with sortation
    - 17 outbound lanes for pool point shipment
  - Separate Controls for the Tilt Tray
Lessons Learned

• Understand which (WMS vs. WCS) and now WES does best for your business...lines are getting blurred

• Understand how the physical movement of inventory (UOM) moves through your facility

• Manual vs. automated facility

• Use a solutions architect that knows both technologies....
  – Happy Path work flows but more importantly.....
  – Exception Management
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