SAP® SCM EXTENDED WAREHOUSE MANAGEMENT (EWM)

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AGENDA

- About LogiStar
- SAP EWM Overview
- SAP EWM Benefits
- SAP EWM Integration with ERP
- SAP EWM Functionality Summary
  - Inbound Demo
- LogiStar Engagements / Customer Success Stories
- Future Release Roadmap (Richard Kirker – SAP)
- Outbound Demo (Optional Time Permitting)
- Questions
# LOGISTAR SERVICES

## Expertise
- SAP Supply Chain Execution is our sole focus
- Average experience 10+ years with SAP

## Certifications
- SAP Select Partner
- SAP Services Partner
- Third Party Consulting Partner
- Pre-Release Test Partner
- RDS Partner
- EWM EEP Reseller
- Certified Products

## Solution Focus
- SAP SCM EWM
- SAP LES WM

## Industry Experience
- Medical Devices
- Pharmaceuticals
- Food & Beverage
- Service Parts
- Wholesale Distribution
- Automotive
- Consumer Products
- Retail
SAP SUPPLY CHAIN EXECUTION SOLUTIONS

• RF & Barcoding
• Voice Picking

• Small Parcel Shipping – XPS
• Transportation Management

• Labor Management
• Warehouse and Labor Analytics

• SAP SCE Strategy
• SAP Logistics Facility Design
Prior to the release of SCM Extended Warehouse Management (EWM), SAP had continued to build on its original R/3 Warehouse Functionality with each release.
TERMINOLOGY

- **SAP ERP WM**
  - Any SAP ERP or ECC Release without EE 2.0 (extension set) activated
  - TRM Introduced with EE 1.0 of Release 4.7

- **SAP ERP EWM**
  - Yard Management, Cross-Docking, and Value Added Services
  - Must be on at least ERP 4.7
  - Included in EE 2.0

- **SAP SCM EWM**
  - SCM 2005, SCM 2007 or SCM 2008 (5.0, 5.1, 7.0, 7.1, 9.0)
  - Decentralized in nature, but can exist on the Central Server
EWM – WHAT IS IT?

- The SAP Extended Warehouse Management system (EWM) provides flexible, automated support in processing all goods movements and in managing stocks in your warehouse complex. The system supports scheduled and efficient processing of all logistics processes within your warehouse.

- EWM was developed from the ground up as a new Warehouse Management System option for SAP customers delivering enhanced functionality over ERP WM for more complex distribution processes.
BENEFITS OF SAP EWM

- Integrated SAP Application
  - Seamless, out of the box integration with SAP ERP, CRM, APO, GTS and BI applications
- Advanced Features and Functionality (in this presentation!!)
- Standard SAP Technologies and Tools
  - Security is controlled using standard SAP security roles and authorization objects
  - Development of enhancements, custom programs, user exits, reports, etc. is all done using standard ABAP
  - Configured via IMG customizing
  - Runs on SCM Basis
SCM EWM integrates to SAP ERP releases from R/3 4.6c to ERP 6.0
- R/3 4.6c, 4.7 and ECC 5.0 integrate via IDoc
- ECC 6.0 integrates via qRFC
- Master data for all releases uses SCM CIF (Core Interface)
- Decentralized installation of EWM from ERP

SCM EWM can also be deployed centralized
- Central installation requires ECC 6.0 with EhP3 and SCM 5.1
- SCM Basis components are deployed on the ERP server
- Provides one single login and system for users
SAP EWM FUNCTIONAL AREAS

- Loading/Unloading
- Receiving
- Quality Inspection
- Putaway
- Replenishment
- Picking
- Packing
- Value Added Services
- Kitting
- Palletization/Container Management
- Yard Management

- Production Supply/Receiving
- Task Interleaving
- RF Processing
- Labor Management
- Slotting
- Batch Management
- Serialization
- Units of Measure
- Monitoring
- Reporting
- Analytics
- Security
Master Data
ERP AND EWM MASTER DATA ELEMENTS

- Relevant ERP Master Data
  - Material masters
  - Batches
  - Customer masters
  - Vendor masters
  - Plants
  - Shipping Points
  - Classes and Characteristics

- Key EWM Master Data
  - Product
  - Batch
  - Business Partner
  - Supply Chain Unit
  - Storage bin
  - Pack spec
The Material Master from ERP becomes the Product Master in EWM

- Some core data elements are copied from ERP
- Other data elements are EWM specific and maintained only in the EWM system
  - Similar in concept to the various views of the ERP material master
- Maintained via transaction /SCWM/MAT1
- 5 EWM views
  - Packaging data
  - Storage
  - Warehouse data
  - Slotting
  - Storage type data
BUSINESS PARTNERS

- ERP Customers, Vendors and Plants become Business Partners in EWM
  - Maintained via transaction BP
  - All business partners are created with a General Role assignment
    - Contains name, address, partner type
  - Other BP role types are also created for the various purposes of Vendor, Sold-to, Ship-to, Plant, etc.
  - Creation of the business partner is taken care of automatically by the CIF interface
  - Changes to the business partner data (i.e. address change) are not replicated back to the ERP system
  - Any change to ERP-source data in ERP will result in overwriting of any values that were changed in EWM
Supply Chain Unit is an EWM-specific concept for organizational hierarchy

- Maintained via /SCMB/SCUMAIN
  - Carry-over concept from SCM APO, so not all elements are fully utilized for EWM
- Assigned a category or type
  - Plant, shipping point, receiving point, customer, vendor, etc.
- Linked to a Business Partner
- Assigned a Business Attribute
  - Door, stock location, warehouse, planning location, shipping office, etc.
- Mandatory to set up for:
  - Plant, shipping point, warehouse
- Establish a hierarchy
  - Plant → Warehouse → Shipping point
A master data document containing information on how to package a product for storage or pack a product for shipping. It contains:

- Product and quantities
- Combination of packing materials and work steps

Can contain multiple levels with specified target quantities for each level. The packaging specification describes in which quantities you can pack the product into which packaging materials in which sequence.

Can be used in inbound, outbound, or internal processes.
In printed form, a packaging specification can provide exact instructions for the warehouse employee on how to pack a product (i.e. where to place a label on the box or how to stack on a pallet).

Ability for multiple packaging specifications per material which allows for flexibility with packaging specification determination. EWM uses the condition technique to determine packaging specifications (i.e. based on ship to, route, etc)
A packing profile can be used during warehouse order creation which enables you to control how warehouse order creation determines pick-handling units for a warehouse order.

- Uses a simple or complex algorithm within the packing profile to determine the appropriate packaging specification.
  - The simple algorithm uses exactly one packaging material in order to determine the required pick handling units. You define one packaging material in one packaging specification.
  - The complex algorithm uses multiple possible packaging materials to determine the optimum pick handling units based on weight, volume and dimensions of the products being picked.
**STORAGE BIN**

- Represents an individual location or “slot”
- Minimum assignments:
  - Storage type
  - Storage section
  - Storage bin type
- 18 character naming
- Can be addressed by
  - Aisle
  - Stack
  - Level
  - Section
- Assigned XYZ coordinates (if using TRM functionality)

- Can be constrained by capacity
  - Max number of HU’s
  - Max weight
  - Max volume
- Can be assigned a bin access type
  - Used in Resource Management to control task assignments
    - i.e. Level height for floor vs fork truck access
- Maintained via /SCWM/LS01 (LS02/LS03)
Inbound
Goods Receipt postings in EWM are communicated back to ERP.
RECEIVING

- Multiple Goods Receipt Options
  - Goods Receipt for PO (Expected Goods Receipts)
  - Goods Receipt for Inbound Delivery (ASN)
  - Goods Receipt via Handling Unit (LPN)
  - Goods Receipt via Dock Door or Trailer ID

- Real-time Integration and Validation of SAP ERP Documents and Master Data
  - Real-time validation against PO, material master
  - Create batches and/or serial numbers directly during GR processing via Desktop or RF transactions
  - Ability to check remaining shelf life against allowed tolerances
  - Check against over/under delivery tolerances on the PO
RECEIVING

- Standard SAP QM Integration
  - Ability to post into Quality Inspection status
  - SCM Quality Inspection Engine (QIE) for inspection processing and usage decisions with integration back to ERP QM module
- Available-to-Promise Control
  - Ability to perform putaway before IM Goods Receipt is posted so that inventory is not ATP until putaway
  - Option to post Goods Receipt into a non-ATP storage location and transfer to an ATP location upon putaway confirmation
- Able to generate LPNs (HU) on the Fly or use Vendor LPNs
EWM STORAGE CONTROL OPTIONS

- **Process Oriented Storage Control**
  - Used to map complex putaways, removals or internal movements
    - Combine storage process steps into one storage process
    - Trace the status of individual process steps
  - Works with packed Handling Units

- **Layout Oriented Storage Control**
  - Used when stock movements do not move from a source to a destination directly, but rather through one or more intermediates
    - Solution for Pick Points or ID Points
    - Used for defining conveyor segments with MFS
  - Works with packed Handling Units

- Can combine Process Oriented with Layout Oriented Control
- Unpacked inventory moves via Direct Movements
Process Oriented Storage Control in Inbound Process - Example
Layout Oriented Storage Control in Inbound Process - Example
PUTAWAY

- SAP EWM supports system-guided putaway strategies
  - Addition to existing stock – putting new receipts into bins (with suitable capacity) that contain the same material
  - Next empty bin
  - Fixed bin
  - Near picking bin – putting a reserve of stock near a fixed bin used in picking, allowing for faster/easier replenishment
  - Manual stock placement
  - Open storage – used for defining floor storage areas
  - Bulk storage – structuring of floor storage into blocks and rows
- Capacity management is possible for storage bins, allowing the system to propose only those bins with space
Determination of destination storage bins:
Putaway transactions can be executed via RF for real-time verification of putaways and validation via barcode scanning of product attributes (material, batch, quantity) and bin locations (bin name or check digit).

Putaway sequencing can be optimized to reduce travel time in the warehouse through bin sort sequences and cross-line putaway techniques.

Putaway can be executed before Goods Receipt so that stock is not Available-to-Promise for sales until it is confirmed in its final warehouse location.
Demo
INBOUND PROCESS IN EWM – DEMONSTRATION

**ERP System**
- **Vendor's ASN**
- **Create Purchase Order** → **Create Inbound Delivery** → **Stock Posting in MM / IM**

**EWM**
- **Confirm Unloading Tasks** → **Automatic Task Creation** → **Deconsolidation** → **Confirm Putaway Tasks**
  - **EWM Inbound Delivery** → **Task Creation**

**EWM Yard Management**
- **Check in Transportation Unit / Move to Door** → **Unload HU's from Transportation Unit** → **Remove Transportation Unit from Door / Check Out**
PURCHASE ORDER IN ERP (ME21N)
Vehicle identification - captured from vendor's ASN
Inbound delivery is saved and replicated to the EWM system.
CHECK IN TRANSPORTATION UNIT (/SCWM/CICO)

Truck ID:
- Vehicle/TU Number: DSIR-0022
- License Plate Number: ABC 4321
- Planned Arrival Period:
  - Start: 10/24/2011 15:00:00
  - End: 10/24/2011 15:30:00
- Planned Departure Period:
  - Start: 10/24/2011 16:00:00
  - End: 10/24/2011 18:00:00
  - Actual Departure: 00:00:00

Yard Bin: 0905 YARD CHGO NORTH CHECKPOIN
MOVETU TO DOOR (/SCWM/YMOVE)

Creation of Warehouse Tasks in Yard 0905

Moving the TU from the checkpoint to the warehouse door.
CREATION OF UNLOADING TASKS (/SCWM/UNLOAD)

Unloading for Warehouse Number 0905 (10/24/2011-10/24/2011)

<table>
<thead>
<tr>
<th>Doc. C.</th>
<th>Document No.</th>
<th>Doc. Type</th>
<th>Whn</th>
<th>StgAreaGrp</th>
<th>StgAr.</th>
<th>Whse Door</th>
<th>Load/Unid.</th>
<th>G/L/G Pstd</th>
<th>Incoterms</th>
<th>Inco. 2</th>
<th>Creation Date</th>
<th>Crea. Time</th>
<th>Create</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDI</td>
<td>6061</td>
<td>INB</td>
<td>0905</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10/24/2011</td>
<td>15:17:46</td>
<td>EWML</td>
</tr>
</tbody>
</table>

Handling Unit: VE00000006

- Wise Proc. Type: 101K
- Storage Process: INBK
- External Step: 

System Status: PLAN

/SCWM/UNLOAD awarep1 OVR
 WM MONITOR: UNLOADING TASKS (/SCWM/MON)
CONFIRMATION OF UNLOADING TASKS

Begin by identifying the TU to be unloaded ...

Then scan the HU’s being unloaded.
CONFIRMATION OF UNLOADING TASKS

Destination location is scanned into the verification field.

Confirmation when all HU’s have been unloaded.
### Material Documents in ERP (MB51)

#### Material Document List

<table>
<thead>
<tr>
<th>Material</th>
<th>Material Description</th>
<th>Plnt Name 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSM-0001</td>
<td>Power supply</td>
<td>0905 LogiStar Demo Plant</td>
</tr>
<tr>
<td>0005 101</td>
<td>5000001651</td>
<td>1 10/24/2011 16:01:42</td>
</tr>
<tr>
<td>DSM-0004</td>
<td>Cable, 1m HS HDMI</td>
<td>0905 LogiStar Demo Plant</td>
</tr>
<tr>
<td>0005 101</td>
<td>5000001651</td>
<td>2 10/24/2011 16:01:42</td>
</tr>
</tbody>
</table>
AUTO CREATED WAREHOUSE TASKS
System-guided selection of inbound tasks to be processed. Verification of source bin and HU (pallet ID).
CONFIRM TRANSFER TO DECO WORK CENTER

Verification of destination bin and HU (pallet ID).

Repeat for other pallets to be transferred.
DECONSOLIDATION (/SCWM/RFUI)

First identify the pallet to be deconsolidated.

Then select one of the open putaway tasks.

List open WT's for this HU
Selecting one of the open tasks.

Need to create another Handling Unit to represent a new pallet ...
DECONSolidation (/SCWM/RFUI)

SAP

Cnsl. Grp  0000040002
Pack. Mat.  PALLET01DS
Dest. Bin  DECON

F1 Save

New HU created
DECONSOLIDATION (/SCWM/RFUI)
DECONSOLIDATION (/SCWM/RFUI)

SAP Screen with HU 1000000048

F1 Delete  F2 Close  F3 Cond  F4 Conv

S: Handling unit 1000000048 completed
Two open putaway tasks.
Scan the pallet ID number to begin the putaway confirmation.

Verification scans are possible for product number, destination bin, and handling unit.
PUTAWAY CONFIRMATION ON RF (/SCWM/RFUI)
STOCK POSTINGS IN ERP (MB51)

Material Document List

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</table>

Stock posted to new IM Storage Location upon putaway confirmation.
MOVE TRANSPORTATION UNIT TO CHECKPOINT (/SCWM/YMOVE)

Creation of Warehouse Tasks in Yard 0905

Moving the TU from the door back to the yard checkpoint.
CHECKOUT FROM YARD (/SCWM/YMOVE)
Outbound
Goods Issue postings in EWM are communicated back to ERP.
Pick preparation:

- ODO’s
- WT’s
- WO’s

Pick confirmation:

- Desktop or RF screens
- Can select by object identification (e.g., WO number) or use system-guided selection
- Verification scans on key ID fields (bin number, material ID, HU, etc.)
- Pick Denial
- Pick Cancellation
System guided picking strategies including:

- **Stringent FIFO** – searches for absolute oldest inventory by receipt date in the warehouse
- **Partial quantity management** – minimize the number of partial pallets, by removing partial pallets for pick quantities less than a full pallet before breaking a new pallet
- **FIFO** – selects the oldest inventory within a section of the warehouse, with the ability to sequence the section searches
- **Shelf Life Expiration Date (FEFO)** – searches for the item with the least shelf life [but not expired] in a given sequence of sections in the warehouse
- **LIFO** – uses the newest inventory in the warehouse, useful when rotation is not an issue, helps prevent users from having to move new stock to access older stock behind it
- **Large/Small quantities** – used to break each/case/pallet picks going from small to large in appropriate sections of the warehouse based on order quantity
- **Fixed bin** – fixed bin storage, ideally suited for forward picking locations
STOCK REMOVAL STRATEGIES

**EWM Removal Rules**

<table>
<thead>
<tr>
<th>Available Attributes</th>
<th>Removal Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>COO</td>
<td>FEFO from Owner</td>
</tr>
<tr>
<td>Owner</td>
<td></td>
</tr>
<tr>
<td>SC</td>
<td>FIFO from COO</td>
</tr>
<tr>
<td>Exp Date</td>
<td></td>
</tr>
<tr>
<td>Batch</td>
<td>Partial Quantities</td>
</tr>
<tr>
<td>Pick Qty</td>
<td></td>
</tr>
<tr>
<td>Avail Qty</td>
<td></td>
</tr>
<tr>
<td>GR Date</td>
<td></td>
</tr>
</tbody>
</table>

Etc.
2-step picking control

- 2-step picking consolidates picking requirements for multiple deliveries for more efficient removal from bulk or reserve areas
- Products are brought to an interim staging area where bulk quantities are distributed out to each delivery

Wave Picking

- Perform detailed planning for picking by creating work packages for picking
- Wave picks consist of a group deliveries that are to be processed at roughly the same time
- You can create wave picks either manually or automatically according to time criteria
- Capacity restrictions can be taken into consideration when waves are formed according to time criteria
Wave Management

- Significant advantage is that Outbound Delivery Order (ODO) items can be independently assigned to waves
  - ERP WM requires entire delivery to be assigned to a wave
Waves can be managed through the Wave Management screen

- Wave release, lock / unlock, split, merge, delete
- Document assignment / de-assignment
Deliveries processing in SAP supports the concept of packing – systematically and physically constructing shipping containers of single or multiple tier (eaches into cartons, cartons onto pallets).

- Container-level packing lists can be produced.
- Shipping containers can be serialized, such as with SSCC-18 identifiers and labels produced.
- Shipping container and ID information is integrated standard into the outbound ASN for use by customers or downstream plants.
- Perform packing during picking, using Pick-HU’s
- Packing station / Work Center (Also possible on RF)

Drag and drop to pack items into HU's.
Pick and pack functionality is available in SAP EWM

- Allows shipping containers to be built on the warehouse floor during picking in a single step, rather than as a separate outbound process
- Well suited for pick-and-pass or pick-to-belt operations
Process Oriented Storage Control in Outbound Process - Example
SAP EWM - STORAGE CONTROL

Layout Oriented Storage Control in Outbound Process - Example
YARD MANAGEMENT

• Yard Management is an integrated component of EWM
• SAP Yard Management allows for vehicle and container tracking within your yard
• Yard activities integrate with loading and unloading activities within the warehouse

• Activities include:
  – Check in and Check out
  – Load and Unload
  – Yard movements
  – Dock door scheduling and assignment
  – Sealing and Unsealing
  – Weighing
  – Registration of drivers and equipment
SAMPLE WAREHOUSE/YARD LAYOUT FOR OUTBOUND FLOW
SAP EWM supports multiple inventory counting methods:

- Annual inventory count – “wall to wall” full physical count
- Continuous inventory – counting sections of bins on a periodic basis (i.e. daily) until all bins have been counted
- Counting during stock placement – triggers a count upon the first placement into a bin each fiscal year
- Zero stock checks during stock removal – triggers a count when the system calculates a pick from a bin will empty it to verify it is truly empty
- Cycle counting – ABC counting method, with standard ABC analysis/calculation tools
- Inventory sampling – counting only a sample of the warehouse to extrapolate and develop an inventory accuracy estimate for the whole warehouse
Counting activities in SAP EWM can be performed blind
Count results can be recorded using RF devices for efficiency and accuracy
Since EWM stocks are not tied to the General Ledger, inventory adjustments can be made out of bins and set aside in a differences location for analysis and review before clearing with IM in ERP for financial adjustment up or down
SAP supports replenishment of forward pick locations from bulk/reserve stocks

Both fixed-bin and random (multiple bins) replenishment are supported

- Replenishment can be based on min/max quantities in the target bins
- Multiple fixed bins are supported for a material
- Replenishment can be based on forecast of necessary stock for fixed storage bins by considering planned stock removals resulting from existing deliveries with picking from fixed storage bins, along side the current stock situation

Replenishment can be triggered automatically upon stock removal below the minimum stock level, on a scheduled basis, or on an ad-hoc basis
SAP EWM supports production supply
- Staging of pick parts for PP orders in ERP
- Staging of release order parts for PP orders in ERP
- Staging of crate parts
- KANBAN staging
- Goods Issue (Consumption) of staged parts from EWM

SAP EWM supports production receiving
- Goods receipt for production orders can be executed in EWM
- Goods receipt for repetitive manufacturing is supported
SAP EWM has multiple cross dock options

- Transportation Cross Docking
  - Allows the transfer of containers (HU) between facilities in your supply chain network to reach the final destination.

- Push Deployment
  - APO driven scenario allowing STO generation from EWM to another facility based on stocking requirements and backorders. Product skips putaway and is picked from the GR area.

- Opportunistic Cross Docking
  - Updates open picking tasks based on new receipts to pick from the GR area rather than from existing warehouse locations to reduce travel time for picking.

- Merchandise Distribution Cross Docking
  - Specific scenario for IS-Retail
MONITORING

- EWM provides a comprehensive warehouse management monitor
  - Detailed visibility of EWM activities
    - Inbound processes
    - Outbound processes
    - Physical Inventory
    - Resources
    - Labor Management
    - Bin locations
    - Yard Activities
    - Stocks
  - Real-time visibility to workload and processes for planning and control
REPORTING AND ANALYTICS

- SAP EWM includes pre-defined content integrated with SAP BI for analytical reporting
- Real-time reporting of all warehouse activities, documents, stocks, etc. is possible through the Warehouse Monitor
- Graphical cockpit tools using the Easy Graphics Framework can be displayed with more than 15 types of chart formats
- Crystal Reports embedded
The Graphical Warehouse Layout provides a visual overview of the warehouse to verify location configurations.

- Provides drill-down access to bin maintenance.
- Integrated for monitoring of automation/conveyor systems in the warehouse.
LABOR MANAGEMENT

- Capture of Indirect Labor tasks
- Integration to SAP HR for performance based incentives
- Evaluation of Employee Performance
- Visibility of Planned Workload based on tasks
- Visibility of Executed Workload based on tasks
- Integration of Engineered Labor Standards used to calculate Planned Durations for warehouse tasks
- Integrated reporting with SAP BI
- Use of SAP Measurement Services in EWM for graphical reporting
- Travel Distance Calculation for creation and planning of warehouse tasks
Task Interleaving allows for RF work queues to assign work to users to optimize foot travel and minimize so-called “dead heading”

- Reduce travel times
- Reduce travel time without load
- Increase efficiency
TASK INTERLEAVING

Inbound Area

Outbound Area
As a core component of the SAP SCM system, security in SAP EWM is managed just as it is in other SAP applications:

- Users are defined in the SAP system and have unique user ID’s with passwords.
- Users are assigned to security roles which control their authorization to create, change and display data in the system and perform different tasks.
- Security can be controlled at the transaction level as well as by other organizational-level or execution-level security objects, such as warehouse number or movement type.
SAP EWM is fully integrated with Batch Management

- Batch is a key field of all inventory records for batch-managed materials
- Batches are recorded during all inventory transactions – receiving, putaway, picking, physical inventory, etc.
- Batch determination is integrated into WM searches for picking and replenishment for optimal removal according to business rules (i.e. FEFO)
- Drill-down into batch master details in all stock inquiries
Serial numbers can be recorded during receiving and picking transactions via desktop and RF processing.

Serial number capture is integrated into packing:
- Ability to pack multiple serial numbers into a container (HU) and move as a single unit with full traceability on each serial.

Full visibility of serial number history via SAP equipment master providing necessary data to support Pedigree requirements.

SAP EWM provides serial number visibility at the storage bin level:
- Supports directed serial number picking.
RF PROCESSING

- SAP offers two standard native options for integrating mobile data collection in real-time via Handheld RF devices or Vehicle Mount devices in a task-based manner
  - SAPConsole and SAP ITSMobile
- SAPConsole is a telnet based solution for character based display
  - Most widely implemented and mature RF data collection solution
- ITSMobile is a web browser based solution for GUI display
  - Supports touch screen devices
- Standard transactions for full scope of processing from inbound to outbound and all internal processes
SAP EWM uses SAP Handling Unit Management functionality to assign LPNs to track pallets or containers of products

HUM is integrated into the MM, QM, PP and SD modules

- Allows for pallet tracking in WM and non-WM managed storage locations
- Allows for pallet IDs (LPNs) to be shared between plants
- Supports SSCC numbering, tracks weight, volume, etc.

Handling Units can have mixed products or be homogenous
SAP Material Flow System (MFS) enables the connection of warehouse automation equipment to the EWM system without the need for an additional warehouse control unit (WCU) or warehouse control system (WCS)

MFS provides direct control over Programmable Logic Controllers (PLC) from within SAP EWM

Integrates monitoring of PLC’s into the EWM monitoring tools
MFS SUPPORTED PROCESSES

- Putaway
- Picking
  - Full Pallet
  - Pick HU
- Replenishment
- Rearrangement
- Empty Pallet Removal
SAP MFS CAPABILITIES

- Real time integration between EWM and PLC
- Asynchronous data exchange via RFC
- Background execution transparent to human users
- Sub-second response times
  - <100 milliseconds for telegram acknowledgement
  - <1 sec for task dispatch
- Automatic sensing of failed PLCs, blocking of resources, and redirection of tasks
- Integrated monitoring
- Scalable
- BAdI’s available to extend logic and capabilities
SLOTTING AND REARRANGEMENT

- Slotting = Determine the optimal bin, putaway strategy and area of the warehouse for each material. Based on product & packaging attributes, product demand, combined with the physical layout of the warehouse. Effectively, it is putaway indicator determination.
- Affects labor productivity, replenishment efficiency and maximizes utilization of warehouse space.
- Rearrangement can then be executed to create tasks to move products to the optimal position.

![Diagram showing storage sections for slow movers and fast movers (Golden Zone)]
PICK ORDER AFTER SLOTTING OPTIMIZATION

Entrance

Exit
Product dimension based slotting
- Evaluates various parameters of the Product Master such as:
  - Dimensional attributes – LWH, Weight
  - HU Type
  - Packing Requirements
  - Shelf Life Requirements
  - Hazard Ratings
  - Target Stock Levels
  - Storage Condition Requirements (ambient, refrigerated, etc.)

Product demand based slotting
- Demand data can be either historical or forecast
- Standard integration is provided to SAP APO for planning data
- Used for optimization of seasonal products or product phase-in/phase-out
SAP EWM supports Kitting processes
- Items which sell together as a combined unit, but which might also be sold separately, and are stocked as the components
  - i.e. Shirt + Tie set

Multiple Kitting scenarios are possible
- Kit to Order
  - Based on Sales BOM in ERP (SD) or CRM sales order
- Kit to Stock
  - Based on Production Order BOM in ERP
- Reverse Kitting
  - Reverting Kit-to-Stock or Kit-to-Order kits back to their components
VALUE ADDED SERVICES

- SAP EWM supports Value Added Services operations
  - VAS is used to apply special packaging, price-tagging, labeling or add-on items such as free samples, promotional items, literature, etc.

- Value Added Services can be executed at any point
  - Inbound VAS
    - Perform VAS operation after receiving, before putaway
  - Internal/Replenishment VAS
    - Perform VAS operation when moving bulk stocks to forward pick locations during replenishment
  - Outbound VAS
    - Perform VAS operation after picking for customer orders
SCM EWM is integrated with SAP AII

- Auto-ID Infrastructure (AII) is SAPs RFID suite for managing EPC data, business events (tag reads) and controlling hardware

Integrated RFID processes in EWM include:

- Vehicle check-in
- Vehicle unloading
- Receiving
- Location to Location (bin to bin) movements
- Packing
- Vehicle loading
- Vehicle check-out
CUSTOMER SUCCESS STORIES

- **Bombardier**
  - Full lifecycle EWM implementation project for a global aerospace manufacturer for 2 spare parts warehouses (Chicago IL and Frankfurt Germany). Converted the customer from SAP ERP WM run by their 3PL to customer-owned EWM system. Scope included complex inbound and outbound processes, RF, batch management, serial numbers, ERP QM integration, supporting FAA documentation requirements, wave planning, slotting, resource management. Successful go-live and stabilization.

- **Global Tire Manufacturer and Distributor**
  - Implemented SAP SCM EWM 7.0 into their North American Tire distribution centers (continuing rollout). The project encompassed all aspects of warehouse management including, inbound processing (Goods Receipts for Purchase Orders/Stock Transport Orders, returns processing), internal movements (resource management, stock status changes, replenishment, scrap and damage processing, physical inventory and cycle counting) and outbound processes (wave management, picking, packing, staging, loading and shipping). In addition, EWM yard management is being deployed to leverage check in and checkout functions as well as dock door scheduling and assignment. All warehouse business functions were designed to run on ITSMobile (SAP Radio Frequency) handhelds and fork truck-mounted units to simplify deployment and execution to the end users. Successful go-live and stabilization.
CUSTOMER SUCCESS STORIES

- **Harry & David**
  - Full implementation of SCM EWM for two distribution facilities, replacing Catalyst and RedPrairie WMS solutions. Design included full EWM functionality including Wave Planning, Labor Management, Value Added Services, and Kitting. High volume operation with over 450,000 orders per day during peak season. Successful go-live and stabilization.

- **Large US-based Multinational Technology Manufacturing Company**
  - Replacement of legacy WMS with SAP EWM. Current operations are in a 3PL environment connected to host SAP system. The 3PL supports 7 different SBU’s within the same facility, each with varied requirements. This engagement will act as the pilot site for additional SAP EWM site rollouts across the globe. Extensive value-added service and kitting operation. Go-Live scheduled for Q1 2014. Currently in blueprint.
Kimberly Clark Healthcare

- KCH is part of the Kimberly-Clark global portfolio of companies with annual revenues exceeding $20 billion. KCH needed a solution to manage its inventory, production, and distribution environment after a period of extensive growth, which created additional liability due to the acquisition of highly regulated product lines.

- KCH deployed SAP Extended Warehouse Management (SAP EWM) 7.01 and SAP Global Batch Traceability to separate distribution centers located in Arizona and Mexico. Unique to this project, KCH developed a proof of concept to launch at a combined warehouse distribution and production facility, creating a global holistic prototype for the inbound receipt of raw materials through their outbound shipment process, to later apply to other sites. SAP EWM integration with SAP ERP functionality for materials management; enabling either the staging of materials for production, or direct putaway, or shipment to customer -- from the time the Advanced Shipment Notice (ASN) is received. Kimberly-Clark Health Care’s batch strategy was timed in concert with SAP EWM to enable transparency into product genealogy. A key aspect of this project was how to ensure user adoption, and developing suitable workarounds to prior system customization obstacles. Project had a successful go-live and stabilization and KCH is now looking at other divisions to roll out EWM to.
Liverpool

One of Mexico’s largest full-line consumer department stores, Liverpool is a household name in Mexico, with an established presence in 52 of the 85 largest cities in Mexico (and expanding). Liverpool has a multichannel approach with: bricks and mortar; phone; e-commerce. Operating on a SAP ERP platform since 2000. To meet continued business growth, Liverpool conducted an analysis of SAP EWM, Manhattan, and MARC, and selected EWM as their platform because of its stability, data and processes reliability, and deep integration with other SAP solutions. Liverpool operations is supported by two primary distribution centers – Hard Line (53,000 sq meters) and Soft Line (44,000 sq meters) with a capacity to process up to 1 million pieces/day, supported by 18 smaller regional distribution centers.

LogiStar, in collaboration with SAP Mexico, supported the implementation of SAP EWM 7.01 in a multi-phased rollout.

- Phase I -- Regional Logistics sites: 4 RDC’s, 16 Depots and 15 Regional Warehouses
- Phase II – Implementation of Hard Line Distribution Center supporting 18 Regional Logistic Centers
- Phase III – Implementation of Soft Line Distribution Center supporting 80+ stores
- Phase IV and V are scheduled to commence later this year, (including Voice, RFID, MFS) and LogiStar will continue in our role as primary EWM consultant.
Aviall – A Boeing Company

As one of the world’s largest providers of new aviation parts and related aftermarket operations, Aviall markets and distributes products for more than 235 manufacturers and offers approximately 2,000,000 catalog items from customer service centers located in North America, Europe, and Asia-Pacific. Aviall provides maintenance for aviation batteries, wheels and brakes, as well as hose assembly, kitting and paint-mixing services. The company also offers a complete set of supply chain and logistics services, including order processing, stocking and fulfillment, automated inventory management, and reverse logistics to OEMs and customers.

The decision to leave best-of-breed offerings and implement SAP was made in 2012. With LogiStar’s implementation services, Aviall will go-live with SAP EWM in 67 warehouses around the globe in August of 2013. – Currently in Construction/Testing.
Thank You
Demo
CREATING PICKING TASKS IN EWM (/SCWM/PRDO)
WM MONITOR IN EWM (/SCWM/MON)

Warehouse Management Monitor SAP - Warehouse Number 0905

Outbound Delivery Order

<table>
<thead>
<tr>
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<td>OUTB</td>
<td>Outbound Delivery Order</td>
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<td>WH_0905</td>
<td>C_0001</td>
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Warehouse Task

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<tr>
<th>WT</th>
<th>Item</th>
<th>HU WT</th>
<th>WsePrCTpe</th>
<th>Cat.</th>
<th>Cat. Desc.</th>
<th>Activity</th>
<th>Process</th>
<th>Step</th>
<th>Status</th>
<th>Typ</th>
<th>Sec</th>
<th>Source Bin</th>
<th>Dest Bin</th>
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</table>
EXECUTE WAREHOUSE TASK – RF (/SCWM/RFUI)
EXECUTE WAREHOUSE TASK – RF (/SCWM/RFUI)
EXECUTE WAREHOUSE TASK – RF (/SCWM/RFUI)
EXECUTE WAREHOUSE TASK – RF (/SCWM/RFUI)

**SAP**

- **Src Bin**: 0010-01-03-04
- **Product**: DSM-0001
- **Remain Qty**: EA
- **STyp**: F2

**SAP**

- **ActHUs**: 0
- **DstBin**: 8030 OUTB PACKING
- **SrcCEHU**: HUWH
- **DestHU**: LogPo
- **Prod.**: DSM-0002
- **Monitor, 22" 1920x1080**: 5
- **AQty**: 5

**Summary**

- Execute Warehouse Task – RF using SAP system.
- Destination Bin: 8030 OUTB PACKING.
- Ensure correct quantities and details are inputted in the SAP system.
EXECUTE WAREHOUSE TASK – RF (/SCWM/RFUI)
PACKING IN EWM (/SCWM/PACK)

Work Center Pack in Goods Issue

Sector/Bin/HU/Item | Product | Quantity | BUoM
--- | --- | --- | ---
Outbound Section for Work Center 'Pack' | POWER SUPPLY | 24 EA | DSM-0001
Monitor, 22" 1920x1080 | DSM-0002 | 5 EA | DSM-0012

Pack Material: DSM-0012
HU/Storage Bin: PACKING
Cons.Grp: Monitor
Number of HUs: 1

Execute
PACKING IN EWM (/SCWM/PACK)
WAREHOUSE MONITOR IN EWM (/SCWM/MON)
STAGING PACKED HU’S IN EWM (/SCWM/RFUI)
STAGING PACKED HU’S IN EWM (/SCWM/RFUI)

Handling Unit: 1000000118

SAP

SBin: PACKING
SrcHU: 1000000118
DestHU: 1000000118

F1 Detail  F2 Query  F3 HUDet  F4 WTLst
STAGING PACKED HU’S IN EWM (/SCWM/RFUI)

Transportation Unit
- TU: DSTR-9010
- Ass.Obj. Changed: 
- Means of Trans.: ZD01
- TU Packaging Mat.: TROCK
- Source Door: 
- Yard Bin: 
- Route for TU: 
- Route Depart. Date: 00:00:00

Assigned Del. Items
- TU: DSTR-9010
- Doc. Cat.: PDO
- Doc. No.: 6313
- Hier. Lev.: Not Unique
- AsmCat.: 
- Obj.Chngd.: 
- Status: OUTB
- Doc. Type: 0905 9020 0301
- StgAreaGrp: GI-ZONE
- StgArea: 
- Staging Bay: 
- Whse Door: 
- Load/Unid.: 
- G1/GR Pstd: 

/SCWM/TU  awarep1  OVR
MOVE TU TO DOOR (/SCWM/YMOVE)
LOAD HU’S ONTO THE TU (/SCWM/RFUI)
LOAD HU’S ONTO THE TU (/SCWM/RFUI)
WAREHOUSE MONITOR IN EWM (/SCWM/MON)

Warehouse Management Monitor SAP - Warehouse Number 0905

Outbound Delivery Order

Warehouse Task

1. Outbound
2. Documents
   - Outbound Delivery Order
   - VAS Order
   - Route
   - Shipping Overview
3. Processes
   - Inbound
   - Physical Inventory
   - Documents
   - Stock and Bin
   - Resource Management
   - Alert
4. Tools

SAP Partner
LOAD COMPLETION (/SCWM/TU)


<table>
<thead>
<tr>
<th>Transportation Unit</th>
<th>Free Deliveries</th>
<th>Free Del. Items</th>
<th>Free HUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU</td>
<td>DSTR-9010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrier</td>
<td></td>
<td></td>
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<tr>
<td>SCAC</td>
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<tr>
<td>TU License Plate No.</td>
<td>ABC 4324</td>
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<tr>
<td>Receiver</td>
<td></td>
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<td>TransPlan Type</td>
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<tr>
<td>S&amp;R Act State</td>
<td>1 Active</td>
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</tr>
</tbody>
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Finish Loading:
- Start Loading
- Reverse Loading End
- Reverse Loading Begin

Assigned Del. | Assigned Del. Items | Assigned HUs | Assigned Vehicles | Status | PPF Actions | Assigned Doors |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>TU DSTR-9010</td>
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<td></td>
<td>S&amp;R Act: TU 575</td>
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</table>

Document: PDO 6313

LogiStar Solutions
MOVE TU TO CHECKPOINT (/SCWM/YMOVE)
CHECK OUT TRANSPORTATION UNIT (/SCWM/CICO)
WM MONITOR IN EWM (/SCWM/MON)
### Outbound Delivery 80001347 Display: Overview

**Outbound deliv.:** 80001347  
**Ship-to party:** C_0001

**Document Date:** 12/13/2011  
**American Engineering Group / 934 Grand Street / Akron OH 44311**

**Picking**

- **Pl. gds mvmt:** 12/13/2011 00:00  
- **Act. gds mvmt:** 12/13/2011 16:56

**Status Overview**

- **Total Gds Mvt Stat:** C Completed

**All Items**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>10</td>
<td>TAN</td>
<td>0905</td>
<td>0010</td>
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<td>CS</td>
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<td>20</td>
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</table>

**Main items**

- **Batch Split**
- **All items**
OUTBOUND DELIVERY IN ERP (VL03N)

Outbound Delivery 80001347 Display: Header Details

Ship-to party: C_0001
American Engineering Group / 934 Grand Street / Akron OH 44311

Processing Picking Loading Shipment Foreign Trade/Customs Financial Processing Administration Partner Texts Conditions

Shipment

ShippingPt: S905
Shipping Point: S905 (E...
Route
RouteSched
Incoterms: FOB
BillOfLad.
GR/GI Slip

MnsTransTy: 2001
TrnsIDCode: DSTR-9010

Weight and volume
Total Weight: 11.860 KG
Net weight: 11.600
OUTBOUND DELIVERY IN ERP (VL03N)

Display Handling Units

All existing HUs (available for packing)

<table>
<thead>
<tr>
<th>Handling Unit</th>
<th>Packaging Materials</th>
<th>Description</th>
<th>Created by</th>
<th>Total Weight</th>
<th>Loading weight</th>
<th>Al.</th>
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</thead>
<tbody>
<tr>
<td>1000000118</td>
<td>DSM-0012</td>
<td>Shipping box</td>
<td>EWMLINK</td>
<td>11.515</td>
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Packed Material

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<th>Partial qty</th>
<th>Total quantity</th>
<th>Un</th>
<th>Plant</th>
<th>Sto</th>
<th>W</th>
<th>Des</th>
<th>Document</th>
<th>Item</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>DSM-0001</td>
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<td>905</td>
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<td>80001347</td>
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<td></td>
<td>80001347</td>
<td>20</td>
<td>Monitor, 22&quot; 1920x1080</td>
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QUESTIONS

Thank You