WM View in SAP Material Master and WM Structure
LOG-MD-005
September 23, 2008

LaGOV

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Agenda

- Logistics, Ground Rules & Introduction
- Workshop Objectives
- Project Overview/Timeline
- Business Process Review
  - As Is Process Discussions
  - SAP terms glossary
  - Process improvement opportunities
  - SAP concepts & functionality
  - Leading practices
  - Enterprise readiness challenges
- Action Items
- Questions
Logistics

Before we get started ...
Ground Rules

- Has everybody signed in?
- Everybody participates – blueprint is not a spectator sport
- Silence means agreement
- Focus is key – please turn off cell phones and close laptops
- Challenge existing processes and mindsets
- Offer suggestions and ideas
- Think Enterprise
- Ask questions at any time
- One person at a time please
- Creativity, cooperation, and compromise
Introduction

- **Roles**
  - **Process Analyst and Functional Consultant (IBM)** – lead and facilitate the discussions and drive design decisions
  - **Documenter (State Employee)** – take detailed notes to support the formal meeting minutes to be sent by the Process Analyst to all participants for review and feedback
  - **Team Members (LaGov)** – provide additional support for process discussions, address key integration touch points
  - **Subject Matter Experts** – advise team members on the detailed business process and participate in the decisions required to design the future state business process

**Round the Room Introductions**

- Name
- Position
- Agency
Project Phases

Five Key Phases

- **Project Preparation**
  - Strategy & Approach Defined
  - Project Team Training

- **Business Blueprint**
  - Business Process Definition
  - Development Requirements

- **Realization**
  - Development & Unit Testing
  - Integration Testing
  - End-User Training Materials

- **Final Preparation**
  - User Acceptance
  - Technical Testing
  - End-User Training
  - Conversion

- **Go Live and Support**
  - Go-Live Support
  - Performance Tuning
**Tentative Project Timeline**

- Tentative implementation dates are planned as follows:

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Tentative Implementation Date</th>
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<tbody>
<tr>
<td>Budget Prep</td>
<td>October 2009</td>
</tr>
<tr>
<td>DOTD</td>
<td>February 2010</td>
</tr>
<tr>
<td>Core Modules All Agencies</td>
<td>July 2010</td>
</tr>
<tr>
<td>Additional Modules</td>
<td>January 2011</td>
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**Phased deployment will be confirmed/updated before completion of Blueprint activities!**
Blueprint Schedule - Tentative

- Please refer to the handout for the upcoming Blueprint Sessions
Blueprint Objectives

1. Review and discuss the current or As-Is Business Processes:
   • Which helps to drive out the business requirements
   • As well as the integration points with other processes

2. Define Master Data
   • Address key integration points
   • Support organizational requirements
   • Consistent and appropriate use of data fields
Blueprint Objectives

3. Define Future or To-Be Business Processes based on:
   • Best Practices inherent in SAP
   • Intellectual capital from other SAP implementations
   • State business requirements

4. Identify Development Requirements:
   • Forms
   • Reports
   • Interfaces
   • Conversions
   • Enhancements
   • Workflow
Blueprint Objectives

5. Understand and communicate any Organizational Impact / Enterprise Readiness Challenges

6. Gather system Security Authorizations and State-wide Training Requirements
Today’s Workshop Objectives

TOPICS TO BE DISCUSSED

- Warehouse Management vs Inventory Management
- Basic Warehouse Management (WM) topics
- WM structure
- WM views of Material Master Records
KEY DECISIONS

- Storage Locations that require Warehouse Management
  - Storage Types
  - Storage Sections
  - Storage Bins

- Key fields in WM Material Master View
  - Bin Numbering
  - UOM
  - Min/Max Levels
Project Scope
Systems to be Replaced

- **DOTD**
  - PIMS (Purchasing Inventory Management System)

- **DPS**
  - VENICE

- **WILDLIFE & FISHERIES**
  - PARADOX
AS-IS Process Flow
Verify material against PO & Packing slip

Is material correct?

No

Contact Vendor & obtain return information

No

Return material to vendor

Yes

Send material to Lab

Does material require testing?

Yes

Pull Samples according to sampling procedures & prepare a sample I.D.

No

Does material meet specs?

Yes

Review Lab report

No

Contact Vendor to discuss

Does Vendor agree?

Yes

Return Material?

Yes

Determine % of payment

No

Obtain agreement from vendor

No

Provide response

End

Lab

Test material & Generate report

Send report to District/Section

District/Section

Complete material receiving report

A

Vendor
DOTD Receiving Process

District / Section

A

Enter into PIMS?

Yes

Enter information into PIMS

End

No

Send material receiving report to Business Office

Business Office

Receive material receiving report

Enter information into PIMS

End
GLOSSARY
Storage Location – An organization unit that allows the differentiation of material stocks within a plant. The storage location is hierarchically situated between the plant and the warehouse number.

Warehouse – An organizational division of a plant for the purpose of maintaining materials that are stored in different places.

Storage Type – A physical or logical subdivision of a complex warehouse, distinguished by the warehouse procedures used or its organization form or function. E.g. Bulk, fixed, high rack, etc.

Storage Section – Logical or physical subdivision of a storage type. A number of storage bins can be grouped together into one storage section according to different criteria (with the same characteristics) selected by the user. E.g. Fast moving, slow moving, etc.

Storage Bin – Smallest addressable unit of space in a warehouse (often referred to as a “slot”). Since the address of a storage bin is frequently derived from a coordinate system, the bin is referred to as a coordinate; for example, 02-04-03 refers to row 02, stack 04, level 03.

Transfer Requirement – Request to transfer materials, at a particular time, from a source storage bin to a destination storage bin within a warehouse complex.
- **Transfer Order** – Instruction to move materials from a source storage bin to a destination storage bin within a warehouse complex at a specific point of time. A transfer order consists of items that contain the quantity of material to be moved and specifies the source and destination storage bins.

- **Storage Unit** – A logical grouping of one or several amounts of material which can be managed within a warehouse as a unit that belongs together. Each storage unit has a number which identifies it.

- **Picking** – The process of issuing and grouping certain partial quantities (materials) from the warehouse on the basis of goods requirements from the Sales or the Production department. Picking can take place using transfer orders or pick lists.

- **Picking Strategy** – A procedure whereby the system searches for a suitable quantity within a storage type for a pick. As a rule, a certain picking strategy is defined for each storage type, for example FIFO or LIFO. These strategies optimize the flow of materials within the warehouse.

- **Pick List** – A document that specifies items to be removed from a storage bin for goods issue. Among other things, it contains pick quantity, item number and description.

- **Posting Change** – Primarily a change in information about the stock itself. A posting change generally refers to a bookkeeping change – a change in information – about a particular material. For most posting changes, the goods themselves remain in the same physical location. E.g. Releasing stock from inspection.
SAP Glossary

- **Putaway Strategy** – A procedure in which the system looks for a suitable bin in a storage type for stock putaway. A putaway strategy can be defined for each storage type to search for the next empty bin that guarantees the optimization of warehouse storage and material flow.

- **Cycle Counting** – A physical inventory procedure in which the materials are counted at regular intervals during a fiscal year. These intervals, or cycles, depend on the cycle counting indicator set for the relevant material.

- **Stock Transport Order** – A purchase order used to request or instruct a plant to transport material from one plant to another (that is, to effect a long distance physical stock transfer) within the same corporate enterprise. The stock transport order allows delivery costs incurred as a result of the stock transfer to be charged to the material transported.

- **Cross-docking** – A procedure for processing goods in a distribution center or warehouse. The goods are brought directly from goods receipt area to goods issue without being put away.
  - One step Process - The goods are moved directly from Goods Receipt (GR) to Goods Issue (GI)
  - OR
  - Two step Process - The goods are first moved to a storage type designated for cross-docking
Interim Storage Location – A storage bin through which the Inventory Management (IM) system communicates with Warehouse Management (WM). The goods issues and receipts posted in the Inventory Management system decrease or increase the stock in the interim storage bins.

Quant – The stock of material stored in a storage bin. Quants are only created through warehouse movements within Warehouse Management.

Blocking – An indicator to prevent any movement of the material from the bin location.

Dynamic Bin – Dynamic storage bins are used in many cases to define as an interim storage area. The system generates these storage bins depending upon the activity and they only exist for the duration of the relevant activity. For a goods receipt, this would be the number of the purchase order or the work order.

Physical Inventory – Actual counted material in a warehouse at a particular time period.
WM Unit – It is the unit of measure in which materials are managed (moved) in Warehouse Management.

e.g. An item is picked from a picking area in a box qty instead of a piece.

- In the above example a material is normally managed using each as the base unit of measure, but several thousand items (pieces) are contained in a box. It may be more appropriate to define a WM unit that is the lowest most manageable unit for WM purposes.

- The relationship between the base unit of measure and alternate units of measure is illustrated below:
Warehouse Management
WM Introduction

- What is Warehouse Management?
- Define the difference between Warehouse Management and Inventory Management
- Basic WM topics
What is WM? - Key Concepts

- WM is used to manage complex warehouse structures (high rack, bulk storage, block storage, fixed bin storage, etc.)

- WM is an extension of Inventory Management (IM)

- WM is tightly integrated with Materials Management (MM), Quality Management (QM), and Production Planning (PP)

- Configuration provides WM with a great deal of flexibility
Integration Concepts

- Warehouse Management and Inventory Management are in sync
  - They each serve a distinctly different purpose
  - All WM managed sites also have Inventory Management
  - Not all Inventory Management sites have WM
  - Warehouse Management integrates with other SAP modules
SAP ECC Integration

SAP ERP Central Component (ECC) 6.0
Difference Between Warehouse Management & Inventory Management

- Inventory management oversees the aggregate inventory position and item status
- Inventory management does not calculate bin positions or replenishments; that is WM
- MRP looks at Inventory Management, not Warehouse Management
- WM and IM interact primarily on an inventory control and receiving perspective
- Other modules (MM, PP, etc.) operate at the inventory management storage location level – not at the bin level
- Anything related to inventory financial value is IM’s domain
Warehouse Management & Inventory Management

- Inventory management works with WM
Warehouse Management and Inventory Management as per our Current Practice

Purchase Order / Picking Slip

Inbound Delivery

IM Inventory Updated

Product Placed in Interim WM Location

Receiving Info in Current System

DOTD / DPS Inventory Management (IM)

Testing Of Item

DOTD / DPS Warehouse Management (WM)

Submits Aisle/Bin Location

WM personal puts Item in Warehouse

Product Placed in Interim WM Location

IM Inventory Updated

Inbound Delivery

Purchase Order / Picking Slip
Logistics Is More Than WM

- Warehouse Management (WM)
  - Bin-level inventory management, strategies, etc.

- Inventory Management (IM)
  - Tracks overall inventory at a location

- Task and Resource Management (TRM)
  - Warehouse Workforce Management and Equipment Management

- Sales and Distribution (SD) – Prison Enterprise /DOTD
  - Captures customer orders

- Production Planning (PP) - DOTD
  - Production processes
Basics of Warehouse Management
Basics of Warehouse Management (WM)

- Provides the ability to:
  - Define and manage multiple storage bins for a material
  - Automate stock placement and removal based on predefined strategies
  - Check capacity of storage bin
  - Perform a confirmation for actual placement and removal of stock
  - Take inventory at the storage bin level
  - Manage hazardous materials
  - Allow extensive reporting capabilities
WM Business Process Overview

Interim Storage
(Transfer Requirement)

Receive Goods

Stock Placement
and Removal Strategies

Issue Goods

Interim Storage
(Transfer Order)

Placement
(Transfer Order)

Warehouse

Store/Remove Inventory

Removal
(Transfer Order)
“Going In” IM Structure

Guiding Principle: If a given organization maintains inventory AND it wants to track the financial costs of that inventory at a given level, then the organizational level = Plant

Note: Physical inventory taking (conducting an inventory and cycle counting) takes place at the Storage Location level!
How WM Org Structure Relates to ERP Structure

- The company code dictates high-level planning and reporting
- Plants are an organizational unit for dividing an enterprise according to production, procurement, maintenance and materials planning
How WM Org Structure Relates to ERP Structure

- Storage locations denote subsets within plants and are a link to warehouse management
How WM Org Structure Relates to ERP Structure

**Plant A (DPS)**
- Storage loc A001
- Storage loc A002
- Storage loc A003
- Warehouse 001
  - Storage Type 001
    - Bin AA01
    - Bin AA02
    - Bin BB01
  - Storage Type 003

**Plant B (DOTD)**
- Storage loc B001
- Storage loc B002
- Warehouse 002
  - Storage Type 006
    - Bin CC01
    - Bin CC02
    - Bin DD01

Two Storage Locations are linked to one warehouse, in order to separate ownership, even if the materials are stored in the same areas.

Some Storage Locations are not linked to any warehouse. They represent separate areas that are not divided into bins.
WM Organizational Structure
The division of a plant within an organization for the purpose of maintaining materials that are stored in different places.
The warehouse ID (number) contains certain attributes for the site, including unit of measure, material locking logic, etc.

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Warehouse Management

Warehouse (Central Warehouse - DPS)  Warehouse (DOTD)
WM Organizational Structure

Storage Type

- The storage type is a zone and is important for placement sequence, removal strategies, product mixing rules, etc.
WM Organizational Structure
Storage Type

- A physical or logical storage area that can be defined for a warehouse (e.g., bulk storage, fixed bin picking area, hazardous area, goods receipts, interim, etc.)

- Storage type maintains data that controls how materials are to be handled and includes:
  - Placement and removal strategy information
  - Adding to existing stock
  - Mixed storage
  - Capacity check
  - Storage section check
  - Storage unit type check
  - Storage unit management
The storage section is a subdivision of storage types allowing for further differentiation in placement (fast or slow mover, etc.)
WM Organizational Structure
Storage Section

- A physical or logical subdivision of the storage type. A number of storage bins can be grouped together into a storage section (e.g., fast or slow moving sections)

**Section F** (e.g., Fast Movers)

**Storage Type**
**High Rack Bin Area**

**Section S** (e.g., Slow Movers)
WM Organizational Structure
Storage Bin

- The bin is the most granular addressable element most users encounter
WM Organizational Structure
Storage Bin

- Purpose: Smallest addressable unit in the warehouse used to store material (exact physical location)
- Created specifically for a storage type and section
- Contains maximum weight and total capacity information for the bin
- Can be created in configuration or in application
- Created automatically or manually
  - Automatic bin creation can create a range of bins with the same naming format (max 10 characters)
- Can change or delete bins in a range or singularly
WM Organizational Structure

Picking Areas

- Picking areas allow more visibility and splitting logic during the removal process
WM Organizational Structure Overview

Inventory Management

Warehouse Management

Storage Location

S.Loc. 0001
S.Loc. 0002
S.Loc. 0003
S.Loc. 0004
S.Loc. 0005

Storage Type

Bulk
Fix

Storage Section

Fast
Med.
Slow

Storage Bin

Warehouse

Plant 0001
Action Items / Future Decisions
Warehouse Structure

- Identify current warehouse(s) / yard(s) that will utilize Warehouse Management
- Identify Warehouse Layout (Pick Zone/Fixed Bin/Packing Area)
- Determine Storage Types and Storage Sections
- Determine Bin Attributes
- Propose Warehouse Numbering Convention (Key Decision)
Work Session

- Make a list of your current warehouse(s)/yard(s)

- Analyze one of your current warehouse(s) and break it down into detailed Warehouse Management Structure. Do Fit-Gap Analysis (e.g. Storage Type, Storage Section, Storage Bin, etc.)
Example of Warehouse Structure for DPS

DEPARTMENT OF PUBLIC SAFETY

MANAGEMENT AND FINANCE

MOTOR VEHICLE

LP GAS

FIRE MARSHAL

HIGHWAY SAFETY

STATE POLICE

LEGAL

GAMING CONTROL BOARD

TRAINING ACADEMY

CAFETERIA

Key:

PLANT

Warehouse for All of DPS

Warehouse for storage location attached to

Warehouse for State Police only

Storage Locations

Company State of Louisiana

Central Warehouse

Police Supply Warehouse

FLEET HQ

FLEET TROOP A ETC

CRIME LAB DNA

CRIME LAB CRIMINAL

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

Warehouse

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Warehouse
WM Terms
WM Terms
Transfer Requirement

- A transfer requirement is generated when an item is received prior to the placement of the item into a particular aisle/bin location.

  - A Transfer Requirement document is the reference to create a Transfer Order when the item is moved to the physical Aisle/Bin location

  - Denotes a need to perform an item movement prior to all information regarding that particular item being determined
WM Terms
Transfer Requirement

- What to move?
- Quantity to move?
- What movement type?
- Who or what caused the movement (i.e., manually or automatically created)?
- Has an amount already been transferred?
WM Terms
Transfer Requirement

- Used to plan material movements

- Identify a requirement to move materials either to or from an interim location

- Usually automatically created by an IM movement (receipt or issue) unless the requirement is generated within WM (e.g., bin replenishment)

- References its source document (e.g., goods receipt / goods issue document number or PO number, cost center, dynamic bin number, etc.)
WM Terms
Transfer Orders

- A transfer order is the basis of all WM movements
  - A document comprising a header and line items requiring a movement to occur
  - Includes source, destination, material/batch, and quantity
WM Terms
Transfer Orders

- A material movement document that identifies the material, source, destination bins and quantities
- Material put-away or removal performed through a transfer order can be confirmed as complete
- Except for internal movements, they are created with reference to other documents (e.g., transfer requirements, material documents, or delivery note)
- Transfer order printouts are used as pick list or put-away documents and can include bar codes if necessary
- Can be created automatically by the system or manually
- Strategies can be based on material attributes, the type of movement, space availability, where other similar materials are stored, etc
WM Terms
Capacity Check

- **Weight**: Material weight is checked with remaining weight capacity of a bin.

- **Storage unit type**: The type of storage unit is checked against what is allowed for a storage type (e.g., small baskets can be stored in a picking area while industrial pallets can only be stored in a high rack area).

- **Maximum quantity**: Material quantity is checked against the remaining quantity allowed for a bin.
Interim Storage

Goods Receipt Movement

Interim Storage
(Transfer Requirement)

Place to Bin Movement
(Transfer Order)

Receive Goods

Issue Goods

Goods Issue Movement

Interim Storage

Remove from Bin Movement
(Transfer Order)

Warehouse Movements

Warehouse

Store/Remove Inventory
WM Terms
Movement Types

- WM movement type (Goods Receipt) is mapped to a MM movement type (PO receipt) via a reference movement type
- Reference movement types connect material movements moving from the Inventory Management system to the Warehouse Management system
- Movement types can be the same or different in Warehouse Management and Inventory Management
- WM movement types are more generic, whereas IM movement types can be specific

<table>
<thead>
<tr>
<th>Movement</th>
<th>Description</th>
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<tbody>
<tr>
<td>WM</td>
<td></td>
</tr>
<tr>
<td>551</td>
<td>Scrap</td>
</tr>
<tr>
<td>IM</td>
<td></td>
</tr>
<tr>
<td>551</td>
<td>Scrap</td>
</tr>
<tr>
<td>553</td>
<td>Scrap to Sale</td>
</tr>
<tr>
<td>555</td>
<td>Block to Scrap</td>
</tr>
</tbody>
</table>
WM Terms
Stock Transfers and Posting Changes

- **STOCK TRANSFER**
  - Transfers material from one location to another

- **POSTING CHANGE**
  - Materials in quality inspection or blocked stock require a transfer to unrestricted the stock
  - Posting changes in WM are similar to a stock to stock transfer in IM
  - Posting changes can be initiated in WM or IM
WM Terms
Storage Unit and Handling Unit

- **Storage unit**
  - A temporary unique number (License Plate) that identifies items packed in a storage container within a warehouse

- **Handling unit**
  - A permanent unique number (License Plate) that identifies items packed within a storage container transferred from a warehouse to another location
WM Material Master
MATERIAL MASTER VIEW

- Basic Data
- Sales Organization Data
- Sales General / Plant Data
- Sales Text
- Purchasing
- Purchase Order Text
- Storage
- MRP 1 and MRP 2
  - Warehouse Management 1
  - Warehouse Management 2
- Accounting
- Costing
- Plant / Storage Location Stocks
WM Material Master

- The material master comprises two views
  - The first view contains the basic WM specific data
  - The second view is specific to the storage type
Stock Removal & Stock Placement
These indicators describe the method that we use to putaway and pick stock. We base these on our storage types.
(e.g. A normal product stored in the main rack is 805. A product stored on the shelf is 802.) These will always be the same.

Allow addn to stock
Allows more stock to be added to a material already sitting in a bin. Recommended always active.

Capacity Usage
For capacity planning purposes, how much room does this item occupy? Can be set to 1.
LE quantity (Logistics Execution)
This is the number of this material that make up a FULL pallet.
This HAS to be set to a value of 1 or greater.
UN = Unit of measure = EA

SUT (Storage Unit Type)
This describes the type of container normally used for this material.
Values are -

<table>
<thead>
<tr>
<th>SUT</th>
<th>Description</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>Z01</td>
<td>Single Pallet</td>
<td>1.4m</td>
</tr>
<tr>
<td>Z02</td>
<td>Double Pallet</td>
<td>1.4m</td>
</tr>
<tr>
<td>Z03</td>
<td>Triple Pallet</td>
<td>1.4m</td>
</tr>
<tr>
<td>Z04</td>
<td>Single Pallet</td>
<td>1.6m</td>
</tr>
<tr>
<td>Z05</td>
<td>Single Pallet</td>
<td>2.0m</td>
</tr>
</tbody>
</table>

Storage Bin
This is the name of the bin that is the FIXED (picking) bin for this material.
It must be set to a valid bin that has been created in the warehouse.

Replenishment Qty
This is the qty of the material which will move from a high rack to a fixed bin when replenishing that bin.
This will always be set to the same as the LE quantity.

Max bin quantity
This is the maximum qty of a material that can fit in it’s fixed bin.
This will normally be set to slightly higher or the same as the LE quantity.
Material Master Review

- **Warehouse view data**
  - Hazardous material record number
  - Capacity usage (e.g., 1 piece = 30 lbs)
  - Fixed bin number, when applicable
  - Fixed bin control data (minimum, maximum and replenishment quantity)
  - Palletization information (e.g., 84 units per pallet)
  - Storage type indicators for this specific material
  - Storage section indicators for this specific material (Fast Moving, Slow Moving, etc.)
Action Items / Future Decisions
WM Material Master View

- Warehouse Unit of Measure
- Storage Type for each item
- Storage Section for each item
- Placement Strategy and Removal Strategy for each item
- Pallatization Data
WM Functionalities
How Do Handheld Devices (RF) Work with SAP?

- The SAPConsole allows RF users to connect to SAP in real time

- It can be extremely powerful in mobile enablement within your ERP solutions

- There are two forms of the SAPConsole
  - SAPConsole
  - SAPWebconsole
Batch picking is possible

- Groups several orders into a single allocation
- Pick the aggregate quantity and stage in a central location
- Allocate the individual orders from the staged material
- Significantly reduce travel time
WM Functionality
Capacity Management

- There are several forms of capacity management
  - Number of pallets
  - Volume of product
  - Volume of product and the pallet volume
The type of container can influence the putaway

- Placement preference can be assigned
- Certain container types can be excluded from certain zones
WM Functionality
Counting Methods

- There are many inventory methods for counting bins
  - Zero stock check
  - Ability to count bins with open picks
WM Functionality

Reporting

- WM offers many reports
  - Warehouse activity
  - RF activity

- These reports can be further modified, without development, via variants and dynamic selections
WM Functionality Infostructures

- There is some material placement and removal analysis available

**Analysis: Mat.Stock Placements + Removals: Drilldown**

| Stor type | Stck Rmv Quantity | Av. stock removal qty | Putaway qty | Av. stk placement qty | Plc.
|-----------|-------------------|-----------------------|-------------|-----------------------|------
| Total     | 800 000 ***       | 114 286 ***           | 800 000 *** | 114 286 ***           |      |

This is a zone-based query of placements and removals
Review
What Does WM Touch?

WM interacts with many modules

- Inventory Management
- Sales and Distribution
- Production Planning
- Quality Management