

Decentralized Warehouse Management



Release 4.6B



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Decentralized Warehouse Management

Purpose

This component describes the SAP Warehouse Management System (WMS) as a decentralized stand-alone system that is operated separately from a centrally operated ERP (Enterprise Resource Planning) system.

To achieve a high level of efficiency in the supply chain, all system components involved must:

- interact smoothly
- be flexible enough to adapt to changes
- perform their tasks cost-effectively and quickly

The warehouse, which is used not only for the storage of goods but also particularly for the distribution of goods, represents the link between internal and external logistics. Since warehouse processes constitute an essential integral part of the supply chain, the SAP WMS is integrated with the entire logistics process. In addition, in order to achieve the flexibility required, the SAP WMS is able to carry out these warehouse processes independently.

Implementation considerations

Especially in warehouses characterized by high throughput, the Warehouse Management System must always ensure quick response times. If the Warehouse Management System runs on the same machine as the ERP system, update problems may arise. An additional requirement is that the WMS must be available 24 hours a day - regardless of whether other systems are available or not. This 24-hour availability must be combined with low downtime risk to ensure that it is possible for the WMS to perform all logistics processes which are often closely integrated.

Not only the SAP R/3 WM System but also third-party systems must be able to interact smoothly with the SAP R/3 system.

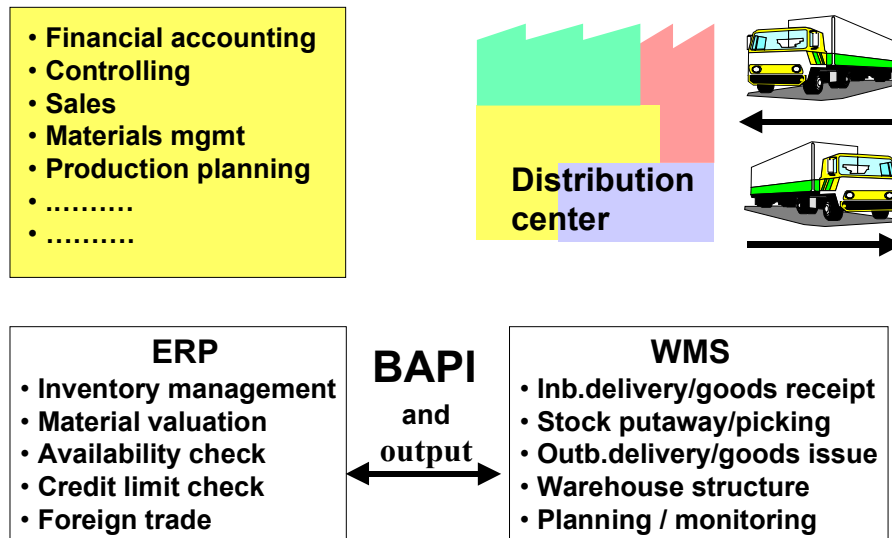
For a complete description on how to configure your system for using the decentralized WMS, refer to the Enterprise IMG documentation under *Logistics Execution → Decentralized WMS integration*.

Integration

You can interface the Warehouse Management System as a stand-alone component with the SAP R/3 system or integrate the SAP R/3 Warehouse Management System with any ERP system you prefer. In both cases, the ERP system and the Warehouse Management System can run on separate machines.

Features

The Warehouse Management System as an independent component



In the first step, the Warehouse Management System has been implemented for the "distribution center" scenario. This scenario describes a warehouse that is primarily used for the distribution of goods and is not linked to a production plant. All business processes, including quantity-based inventory management, are carried out in the ERP system whereas the decentralized WMS is responsible for the necessary processes for goods receipt, warehousing, and distribution.

As a result, this new functionality is split up into two areas:

- [SAP R/3 as an ERP system \[Page 11\]](#)
- [SAP R/3 as a Warehouse Management System \[Page 12\]](#)

(See also: [Processes Between R/3 as ERP System and R/3 as WM System \[Page 7\].](#))

Application Area

You can use the warehouse as a stand-alone component if you plan to implement distribution center control on a separate decentralized machine that is not linked to the business application. You can use SAP R/3 to operate only one or both of these systems.

Note the following [limitations \[Page 13\]](#).

Processes between R/3 as the ERP system and R/3 as the WM system

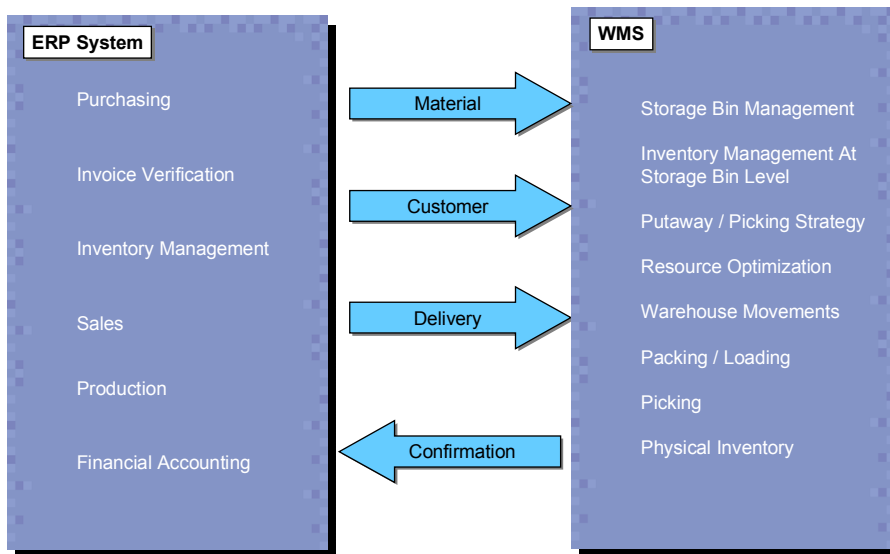
Purpose

If you use R/3 both as the ERP system and the WM system, this means that you interface an external warehouse management system with an R/3 system. The stand-alone system that executes all warehouse management functions is an R/3 system.

Prerequisites

In this scenario, two systems are involved. The first system is an ERP system that performs inventory management, purchasing and sales tasks and distributes existing master data and movement data to the WMS. The second system is a WMS that performs warehouse management tasks such as putaway/picking, goods receipt/goods issue and is responsible for carrying out the physical material transfers.

Process And Data Flow



General Inventory Postings:

If the decentralized scenario is used, inventory postings are not directly processed in Inventory Management (IM). If a goods movement is created in IM, the system generates inbound or outbout deliveries and distributes them to the WMS. In the WMS, the goods are put away or picked based on the existing delivery. As a result of the goods movement posting in the WMS delivery, the system sends the completion verification to the ERP system and then posts the

Processes between R/3 as the ERP system and R/3 as the WM system

actual goods receipt or goods issue in Inventory Management based on the delivery. Deliveries with a purchase order or a sales order as a source document are handled in the same way.

Goods Receipts Based on a Purchase Order:

You use the ERP system to create purchase orders and send them to the vendors. To give notification of the due delivery, the vendor returns a shipping notification that is recorded in the ERP system as an inbound delivery. The inbound delivery is distributed to the WMS using a BAPI and represents a request to put away or pick goods. When the goods are physically delivered by the vendor, a transfer order is generated in the WMS which is used to place the goods into stock. After the transfer order is confirmed, goods receipt is posted for the inbound delivery. This clears the interim storage bin. As a result, the completion confirmation is sent to the ERP system and the goods receipt is processed in Inventory Management.

An inbound delivery based on a purchase order can be created in different ways, depending on the confirmation control key in Purchasing. If the vendor usually sends a shipping notification, the inbound delivery is created when the shipping notification is recorded in the system. In all other cases, you have the option of creating inbound deliveries automatically using multiple processing.

Process for Goods Receipts Based on a Purchase Order:

1. Creating the purchase order in the ERP system
2. Generating the inbound delivery (automatically/manually)
3. Distributing the inbound delivery from the ERP system to the WM system using BAPI method 'InboundDelivery.SaveReplica' (this process is automatically executed in the background)
4. Physically receiving the goods into the warehouse (WMS)
5. Creating the transfer order
6. Placing the goods into stock
7. Confirming the transfer order
8. Posting goods receipt for the inbound delivery (as a result, a completion verification is sent to the ERP system using BAPI method 'InboundDelivery.ConfirmDecentral')
9. Goods receipt for the inbound delivery is automatically posted in the ERP system (in Inventory Management) when the completion confirmation is recorded.

Other Goods Receipts:

All other goods receipts are recorded in the ERP system. When the document is saved, the system creates an inbound delivery and sends it to the WM system using a BAPI. The inbound delivery is then processed in the WM system as described above. When the completion confirmation for the inbound delivery is sent to the ERP system, the goods receipt posting is automatically initiated in Inventory Management.

Stock Transfers:

A stock transfer usually involves two storage locations (plants): the issuing storage location (plant) for picking and the receiving storage location for putaway. If the stock transfer is recorded in the ERP system as a two-step procedure and if one of the storage locations involved is a WMS-relevant storage location, the system creates a delivery for this posting and sends it to the

Processes between R/3 as the ERP system and R/3 as the WM system

WMS. Both storage locations involved are copied into the delivery to allow the actual posting to be executed after the completion confirmation is received from the WMS.

One-step stock transfers using a WMS-relevant storage location are only possible if a storage location that is **not** WM-relevant is involved in the posting change (See also: [Limitations \[Page 13\]](#)).

Process for Stock Transfers:

1. Entering the goods movement in the system
2. Automatically creating the delivery
3. Distributing the delivery from the ERP system to the WM system using BAPI method 'InboundDelivery.SaveReplica' (this process is automatically executed in the background)
4. Physically receiving the goods into the warehouse or removing the goods from the warehouse (WMS).
5. Creating the transfer order
6. Putting away or picking the goods
7. Confirming the transfer order
8. Posting goods receipt for the inbound delivery (as a result, a completion verification is sent to the ERP system using BAPI method 'InboundDelivery.ConfirmDecentral') or posting goods issue for the outbound delivery (as a result, a completion verification is sent to the ERP system using BAPI method 'OutboundDelivery.ConfirmDecentral').
9. Goods receipt for the inbound delivery or goods issue for the outbound delivery is automatically posted in the ERP system (in Inventory Management) when the completion confirmation is recorded. When the goods receipt or goods issue is posted in the ERP system, the stock transfer is simultaneously posted in Inventory Management.

Goods Issues Based on a Sales Order:

You use the ERP system to create deliveries for sales orders. The deliveries are then sent to the WMS. You use the WMS to create the transfer order, pick the goods and confirm the transfer order. When goods issue is posted, the picking quantities are passed on to the delivery of the ERP system.

Process for Goods Issues Based on a Delivery:

1. Creating the sales order
2. Creating the outbound delivery
3. Distributing the delivery to the WMS
4. Creating the transfer order for the outbound delivery
5. Physically picking the goods in the warehouse
6. Confirming the transfer order
7. Printing the shipping documents, if appropriate
8. Posting goods issue for the outbound delivery (as a result, a completion verification is sent to the ERP system using BAPI method 'OutboundDelivery.ConfirmDecentral')

Processes between R/3 as the ERP system and R/3 as the WM system

9. Goods issue for the outbound delivery is automatically posted in the ERP system (in Inventory Management) when the completion confirmation is recorded.

SAP R/3 as an ERP system

Purpose

In the R/3 system, the user defines for each plant and storage location whether the warehouse transactions are to be carried out in a stand-alone warehouse management system. All information required by the WMS to perform tasks such as goods receipt or goods issue are transferred to the WMS using a BAPI (Business Application Program Interface). This includes master data such as:

- Customer
- Vendor
- Material

Integration

The master data of the ERP system are transferred to the WMS using the distribution model. This creates the basis in the WMS for processing future inbound and outbound deliveries that are sent to the ERP system.

Features

The following tasks are performed in the R/3 (ERP) system:

- Inventory management and valuation
- Purchasing
- Sales
- Shipping
- Availability check (ATP)
- Credit limit check
- Foreign trade controls

This ensures that transactions in the WMS can be carried out without any further checks and the warehouse workers can concentrate on performing the actual processes.

Once the actual warehousing tasks have been carried out, the WMS sends a completion confirmation to the SAP R/3 system. The corresponding process is then completed and, in most cases, results in a stock posting in the SAP R/3 system.

Consider the following [limitations \[Page 13\]](#).

SAP R/3 as a Warehouse Management System (WMS)

SAP R/3 as a Warehouse Management System (WMS)

Purpose

You can install SAP R/3 as a stand-alone warehouse management system (WMS) that receives requests from any ERP system for:

- Goods receipts
- Goods issues
- Posting changes

In addition, the system is able to receive master data such as customer, vendor, and material data from the leading ERP system.

Integration

Planned goods movements are communicated to the WMS using inbound or outbound deliveries that are recorded in the leading ERP system. After the goods are physically put away or picked, goods receipt or goods issue is posted. This clears the storage bins in the WM system. At the same time, the completion verification is created which carries out the updates in the Inventory Management system of the ERP system. This means the physical putaway or pick takes place before the stocks are posted.

Features

The Warehouse Management System performs all warehouse management tasks. These include:

- Storage bin management
- Inventory management at storage bin level
- Storage bin search
- Picking
- Packing
- Printing the required shipping documents

This scenario provides the majority of the standard SAP R/3 functions for goods receipt processing, warehousing and shipping.

Consider the following [limitations \[Page 13\]](#).

Limitations

- Starting with release 4.5A, SAP provides the functionality for interfacing with a distribution center.
 - It is not yet possible to operate warehouses that are integrated with production on a decentralized basis, that is, without a link to the SAP R/3 system.
 - Production supply and goods receipt from production are not supported for stand-alone warehouses in release 4.5A.
- Release 4.5A does not allow you to link the warehouse to Quality Management systems (QMS) as a stand-alone component.
- The distribution center scenario described does not yet account for the integration of a Transportation Management system (TMS) in release 4.5A.
 - Information on inbound and outbound deliveries is sent using the delivery.
- In release 4.5A, SAP R/3-operated warehouses can communicate with a **single** ERP system only.
 - SAP does not yet support service scenarios in which a warehouse services multiple companies.
- It is not possible to process serial number information for goods receipt and goods issue postings.
- Manufacturer part number processing is not supported.
- You cannot cancel a goods receipt or a goods issue that has already been posted.
- For stock transfers, you can only use movement types for the two-step procedure.

Central System

- For goods receipts based on a purchase order, the following postings are not supported:
 - Postings for items that are assigned to an account
 - Postings for special stock other than consignment stock
- Postings related to empties management
- It is currently not possible to distribute batches.
- Posting changes are not supported.
- Inventory postings of structured articles
- You cannot change deliveries that have distribution status **B** (distributed).
- No direct inventory posting is carried out for distribution-relevant deliveries (See also: [Goods Issue Posting \[Ext.\]](#).)
- The following information and data cannot be distributed:
 - Prices in the delivery
 - Export and import data

Limitations

- Configuration data
 - Hazardous material data
 - Change messages
- During the completion verification process, the system does not carry out checks that could prevent data transfer.

Decentralized System

- You cannot process deliveries without reference to a document (unplanned goods receipts/goods issues).
- You cannot change deliveries except for the following data:
 - Quantities
 - Weight
 - Packaging
 - Batch split item
- You cannot delete a delivery that has been distributed. You can only confirm the delivery with a quantity of zero.
- The system does not perform quantity checks to determine overdeliveries or underdeliveries.
- You cannot carry out certain posting changes, for example, if the vendor data is not known. For example, you can convert materials from consignment stock to unrestricted-use stock, but not from own stock to consignment stock.
- The printing functions for shipping documents are available on a limited basis only. It is not possible to print invoices.
- You cannot use the stock determination task.

Solutions to the above limitations will be implemented after release 4.5A. The overall goal is to carry out all functions in a decentralized WMS. These functions will not be limited to specific scenarios.