

Production integration within SAP EWM

The integration of manufacturing processes into the logistical flow gets more and more important. So what are the solutions for an integrated Material flow.

The way to a merger of two intracompany success factors

Since the beginning of the industrial revolution in the late 18th and early 19th century the biggest share of industrialized products has been produced in mass production. As clients have become more demanding, not least since the internet has globally grown up, the production is more and more developing towards mass customized products.

This leads to a rising demand in batch-size 1.

All the processes that contain the supply, the logistical communication and the Inbound process of finished goods are affected by these changes. They can be summarized in the term production logistics.

The revolution began within old factory buildings with people all around, exhausted from the physical effort at the machines from day and night shifts. In the 19th century then the way of production changed. Automated machines were used to produce products with exchangeable parts. Finally reaching a breakthrough by the deployment of IT-Systems within the factory environment with nowadays highly automated solutions merging machines and intelligent computer systems.

To manage the customer requirements and the material flows within the plant it's getting more and more important to support the processes with suitable IT-Systems.

Current challenges in production logistics

Routine processes along the supply chain, as they have been in the past, have changed. This doesn't only affect the production process itself but also the material flow within and beyond the plant as well as all stakeholder processes supply chain surroundings.

Typical requirements for a modern production logistics are as follows: solution variants to enable an efficient material flow within the intralogistics.



More flexibility not only in the production process but also in the supply process.



Flexible process design to deliver single as well as mass products



Reduce manufacturing costs by increasing quality aspects



Reduce stock capacity in the production to reduce quality issues



Communication between different systems

To get prepared for the next century Deloitte, a recognized leader in helping large global enterprises modernize supply chain management, has insights that can help. Each day, Deloitte is working across industries to help organizations transform the enterprise with SAP® solutions. That experience—plus an SAP relationship that extends back decades—provides Deloitte with a deep understanding of the needs for integrating the logistical production processes.

Production integration within SAP

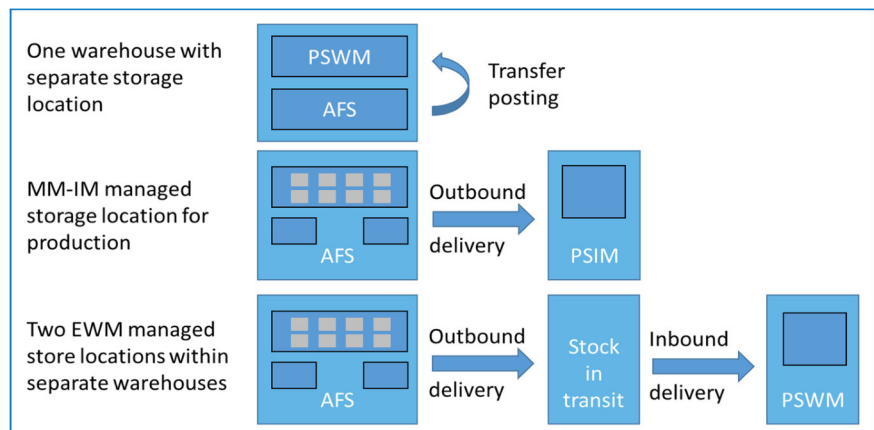
In order to map the increasingly complex processes between logistics and production, SAP offers several

Production integration within SAP EWM







Since release 7.0. SAP provides the opportunity to integrate logistical processes within SAP EWM related to a manufacturing process.

First of all a manufacturing order, process order, or a repetitive manufacturing order has to be created and released in the ERP system. Based on the selected storage location strategy the ERP system creates a transfer posting document or an outbound delivery.

Afterwards the document is replicated to the EWM system via the SAP standard interface qRFC. In EWM this document is used to start the staging process. Therefore a picking process takes place. Thereby only the required quantity for the manufacturing order is picked. This staging process is also called single order staging in EWM. After the picking process the products are staged to the destination storage bin which is located in the production supply area (PSA). If a transfer posting document is used for the staging process the stock in EWM is moved from one storage type to another. If an outbound delivery is used for the staging process a goods issue posting takes place in EWM. This information is replicated to the ERP system where a goods received posting on a ERP storage location takes place.



The manufacturing process takes place. Afterwards the manufactured quantity for the order is conformed in the ERP system. A goods issue takes place for the provided products. Based on the selected storage location strategy the good issue posting takes place within the ERP or the EWM system. Furthermore a inbound delivery is created for the goods received posting which can take place in the ERP or in the EWM system.

-  Triggered by different order types
-  Goods issue posting based on outbound delivery
-  Goods received posting based on inbound delivery
-  Transfer posting document or outbound delivery needed
-  Different storage location strategies available
-  Single staging process

Advanced production integration







SAP provided within the release 9.2. a new opportunity for a better integration of the increasing intra-logistics demands of staging products for manufacturing processes. To enable a better integration of this steps SAP provided a new document type – the production material request (PMR).

To start the manufacturing process, a manufacturing order has to be created and released in the ERP system. The information from the order is replicated to the EWM system via SAP standard interface qRFC. Based on the replicated information a production material request is created in EWM. The PMR is used to start the staging process. Different from the classic production integration the advanced integration allows to stage the consolidated quantity including different PMR within one picking

process. This staging process is called cross-order staging in EWM. After the picking process took place the products are staged to the destination storage bin which is located in the production supply area (PSA). In EWM the stock is posted now from one storage type to a another. One of the advantages of the advanced production integration is, that the different storage types helps to keep the overview of the stock in the warehouse as well as in the PSA.

The manufacturing process takes place. Based on the PMR the manufacturing order has to be confirmed in the EWM. The confirmation causes two thinks. First of all a goods issue posting for the provided products takes place in EWM to reduce the stock on the PSA. Second a inbound delivery is created in EWM to book goods received for the manufactured products.

Parallel the information of the PMR confirmation as well the GR posting is send to the ERP system to update the corresponding manufacturing order.

-  Triggered only by manufacturing orders
-  Goods issue posting based on the production material request in EWM
-  Goods received posting based on inbound delivery in EWM
-  In EWM production material request are used
-  Different storage type for PSA used
-  Single or Cross-order staging can be used

“An optimal integration between production and logistics ensures more reliability in deliveries and less need for stock in the Warehouse.”

Manufacturing Execution

While SAP EWM is the responsible system for the management of all warehouse processes in big plants, with SAP ME it is possible to control and evaluate production processes. The solution offers various functions to integrate corporate processes into the production area. Within these functions more transparency on component and material layer can be ensured from the development up to a finished product.

In Order to receive the optimal process flow between production and logistics, SAP offers a solution that integrates both systems and lets them exchange data regarding stock demand and staging.

Since EWM 9.3 SAP has created this interface that allows SAP EWM to communicate with the Manufacturing Execution System SAP ME and vice versa. This offers a range of opportunities for an integrated production process. But as this version didn't offer a standard integration, SAP enhanced the communication interface since EWM 9.4. With Advanced Programming Interfaces the gap between the systems can be covered by simple developments.

In order to ensure a fully integrated process, SAP launched a standard integration between the two systems without customer development within EWM 9.5. As connector between the systems, SAP MII offers a range of integration options. Within this environment the most important production logistics processes have been automated.

Staging request

By a Single Order Staging Request ME can request stock from the Warehouse. This request triggers the automated supply of Handling Units in EWM from the shelf to the Production Supply Area as described earlier within the Advanced Production Supply.

Staging confirmation

The Single Order Staging Confirmation is the confirmation from EWM to ME with the information that the requested material has been staged and the production process can start. This confirmation triggers the creation of Inventory IDs in SAP ME.

Component consumption

ME can then send information about Component Consumption to EWM. The consumption will directly be posted to the PMR with the result of a goods issue posting in both EWM and ERP.

Goods receipt

The goods receipt message closes the process. Whenever in ME a Container gets closed, EWM posts goods receipt for the existing expected goods receipt document.

The future of production integration

The continuously increasing requirements within a lean material flow through the warehouse and

production to achieve reducing production costs and increasing quality, it will get more and more important to have an integrative IT Landscape in the future.

This landscape will not only include the communication between EWM and the used production integration model, it will also include material flow systems, like automated guided vehicles (AGV), as well as machine learning systems.

Using automated warehouse systems for more efficiency

“The optimal process can only be driven by machines”

In order to ensure the most efficient production supply, SAP EWM provides SAP Material flow system (MFS). A system with the ability to directly communicate with a Programmable Logic Controller (PLC). SAP EWM can offer a reliable production supply via automated systems (f.i. an automated High Bay or Mini Load) in connection with a conveyor belt technology. The result is speeding up the physical process and reducing human errors while dropping labor cost to a minimum.

In the future, the processes will get more and more autonomously.

To archive this all machines will capture relevant information using specific interfaces and sensors. These information will be stored decentral in a cloud to have them available within all steps in a supply chain. Via this Information staging, manufacturing or other processes within a plant will take place autonomously.

“In the future autonomously manufacturing take place using Big Data, Cloud and SAP Leonardo”

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