

**"Integrated Excellence: PM-EWM Integration Solution for S/4HANA 2020/2021"**

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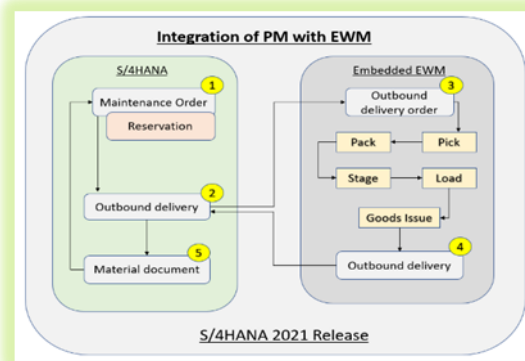
*Abstract*

*Maintaining equipment and machinery is crucial for the majority of SAP clients during production. By integrating systems, strategies, and processes, organizations can efficiently coordinate supply chain execution efforts and meet customer expectations, whether internal or external. SAP provides a comprehensive platform covering both maintenance planning and execution, as well as visibility within the supply chain. Clients can acquire a tailored support package from SAP to configure settings and enable PM-EWM integration. With the release of SAP S/4 HANA 2021, the integration between SAP PM and EWM is now a standard feature, eliminating the need for custom solution installation by SAP. Both PMR (Production Material Request) and delivery-based integration options are readily accessible. This article offers an overview of the PM-EWM Integration solution provided by SAP and explores how industries can fully benefit from leveraging this functionality.*

*Keywords: SAPEWM, SAP PP, Production order, SAP PM, Process orders*

## **I. INTRODUCTION**

In today's business environment, which is dominated by globalization, increased price competitiveness, and more demanding operational and financial performance, the pressure on supply chain management is increasing. For efficient production and supply of goods to the customer, non-stop functioning of machinery is required in most scenarios. This is where preventive and schedule maintenance activities play a major role. Timely maintenance of equipment and machinery is of utmost importance in any production facility to avoid a line halt amounting to major financial losses. Maintenance of equipment and machinery is a common requirement for clients that have a production facility. When equipment breaks down or needs scheduled maintenance the parts required for the maintenance are supplied from the warehouse. In an EWM managed warehouse there needs to be integration between PM and EWM for this process to work seamlessly. However, PM-EWM integration is not available as a standard option in S4 HANA 2020; clients need to opt for an add-on solution from SAP to tackle this issue. In this whitepaper we will be discussing the different integration solutions provided by SAP as an add-on.



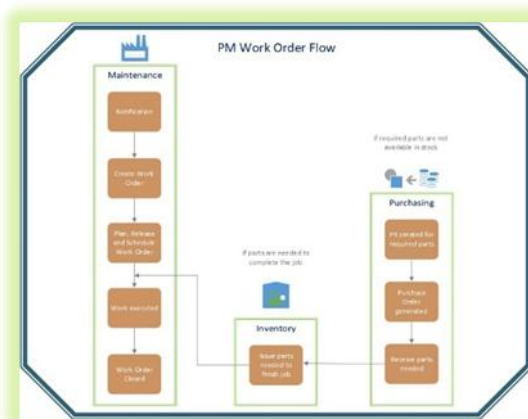
**Figure 1. Integration flow with PP-EWM**

### 1.1. SAP plant maintenance

PM is the Plant Maintenance offering from SAP. PM module assists with planning maintenance resources for enterprises. Businesses may choose to put in place SAP PM to help them maintain their plant operations. PM covers three primary areas:

- Inspection
- Preventive Maintenance
- Repair

Each of these areas is key to keeping plant operations running smoothly. Inspection can flag machines that may need service soon or identify safety issues. Preventive maintenance is just what it sounds like. It includes following up on inspection recommendations. It also includes routine, day-to-day maintenance that helps keep machines running longer. Repair is unavoidable in most factories. Machines break down, sometimes because they are not maintained or if when are worn out. Sometimes it is from misuse of the machine or a faulty part. In any case, the machine needs to be repaired before it can function again. The SAP PM module helps work managers allocate their maintenance resources. They can schedule inspections, so they can make sure machines are looked at on a regular basis. They can assign employees to conduct these inspections, and then keep records of when they are done. This is also true of preventive maintenance tasks. An employee can be assigned to conduct any outstanding maintenance tasks. Repairs can also be logged in the system, creating reports. Using this information, it is possible to see how many repairs the plant is dealing with on a regular basis. We can also see how long those repairs take. SAP system facilitates the creation of work orders. Components are assigned to the work order post which the work order is released and then scheduled. If parts are needed to complete the job those are either acquired internally or procured externally based on the availability. It is then assigned to a team member, who finishes the task and closes the work order.



**Figure 2: Work order Process Flow**

1.2. SAP Extended Warehouse Management (SAP EWM)

Warehouse management functionality has been part of SAP since its inception. However, with increasing complexity of global supply chain demanding more efficiency, lesser cost, increased throughput SAP too has expanded and adjusted the solution design to meet ever growing customer demands. Originally developed under the ambit of SAP Service Parts Management, SAP Extended Warehouse Management is a standalone application that can work independently to manage logistical activities of any complex warehouse today. From a functionality standpoint, SAP Extended Warehouse Management can support distribution centers, supply warehouses and transit warehouses for below processes:

Inbound processes: Support yard management, put-away strategies, expected goods receipt, cross-docking, value-added services, and quality management.

Outbound processes: Goods Issue against PM / SD orders, perform picking with waves for both internal and external customers, picking strategies and replenishment processing.

Storage-bin and stock management: Manage handling units, fixed bin assignments, perform slotting, rearrangement, serial number management, batch management and process physical inventory.

Distribution center processes: Support radio frequencies, resource management, labor management, and material flow systems.

1.3. Types of integration between SAP EWM and PM

Until SAP S/4 HANA 2020 release, integration between SAP PM with EWM was achieved via obtaining a custom solution from SAP. Only from SAP S/4 HANA 2021 release, SAP provided direct integration between SAP EWM and SAP PM available as a standard option.

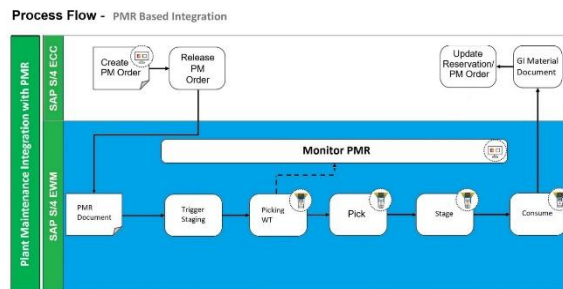
Integration of SAP Plant Maintenance with Extended Warehouse Management can be implemented in two ways:

- PMR based Integration
- Delivery based Integration

In SAP S/4 HANA 2020 release with the custom PM-EWM integration add-on/solution from SAP there is the option to implement both the options. SAP provides a working version of the product for customers to test and then choose which integration option to work with. It is important to note that only one of these integration options will be implemented based on the business requirement.

**II. PMR BASED INTEGRATION BETWEEN SAP PM AND SAP EWM**

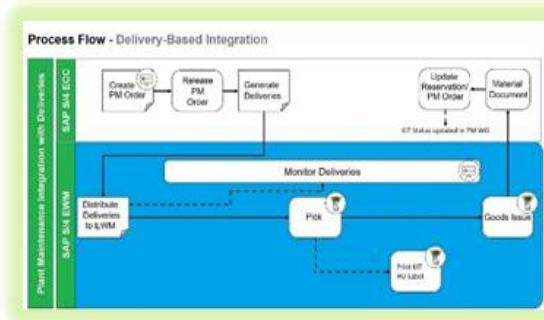
In PMR based integration there are no outbound deliveries involved. Once the PM Work Order is released a PMR (Production Material Request) is created in EWM.



**Figure 3. Integration between PP/EWM-1**

Warehouse / stores can then complete the picking activity, stage the parts and post Goods Issue. This will then update the Work Order (WO) and Reservation in S/4 ECC. Delivery Based Integration between SAP PM and SAP EWM

Delivery based integration between PM and EWM takes a more traditional approach with the involvement of outbound deliveries. Once the PM WO is released, users can create outbound deliveries using the custom transaction provided by SAP.



**Figure 4. Integration between PP/EWM-2**

Once the delivery is created all the subsequent steps like picking and Goods Issue (GI) can be performed from EWM.

### III. PROCESSES INVOLVING PRODUCTION AND PROCESS ORDERS

In the area of production and process orders, the following processes are supported by SAP EWM:

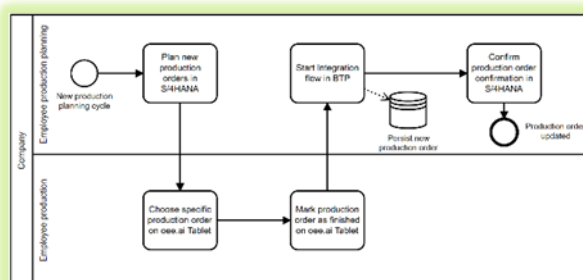
#### Material Staging

If you use SAP EWM to stage materials, the system always generates deliveries as replenishment elements. The storage location you have assigned to the production supply area can be managed either by SAP EWM or Inventory Management (MM-IM). You can start material staging for pick parts from the production order in transaction CO02. You can start to stage pick parts for process orders in transaction COR2. You can stage release order parts using the Pull List (material staging list, transaction MF60). You can also use transaction MF60 to stage pick parts for which the source and destination storage locations are managed using SAP EWM.

#### Confirmation of Production Orders and Process Orders

When your system is integrated with SAP EWM, you can use all of the confirmation transactions at header level and operation level of the order. When you save the confirmation, the system generates an inbound delivery for the confirmed material. This delivery is automatically replicated in SAP EWM. You post the receipt of the confirmed material for this inbound delivery in SAP EWM. This information is then automatically transferred to SAP S/4HANA, where a material document is generated and a goods movement posted.

The goods issue for the consumed components is posted automatically at the time of confirmation. This is the case for confirmations withdrawn from a production storage location managed using SAP EWM, and for confirmations withdrawn from a production storage location managed using Inventory Management (MM-IM).



**Figure 5. Production order confirmation flow**

**Post processing of Faulty Goods Issue Postings**

Transaction COGI displays any goods movements (goods issues) that failed. You can use this transaction to start post processing, whereby the goods movement is reposted once the stock situation has been corrected or any missing data provided (for example, a missing storage location). When your system is integrated with SAP EWM, reposting the goods movement generates a delivery (that is, SAP S/4HANA generates an outbound delivery for the components, and the delivery is then replicated to SAP EWM).

**IV. CONFIRMATION OF PRODUCTION ORDER**

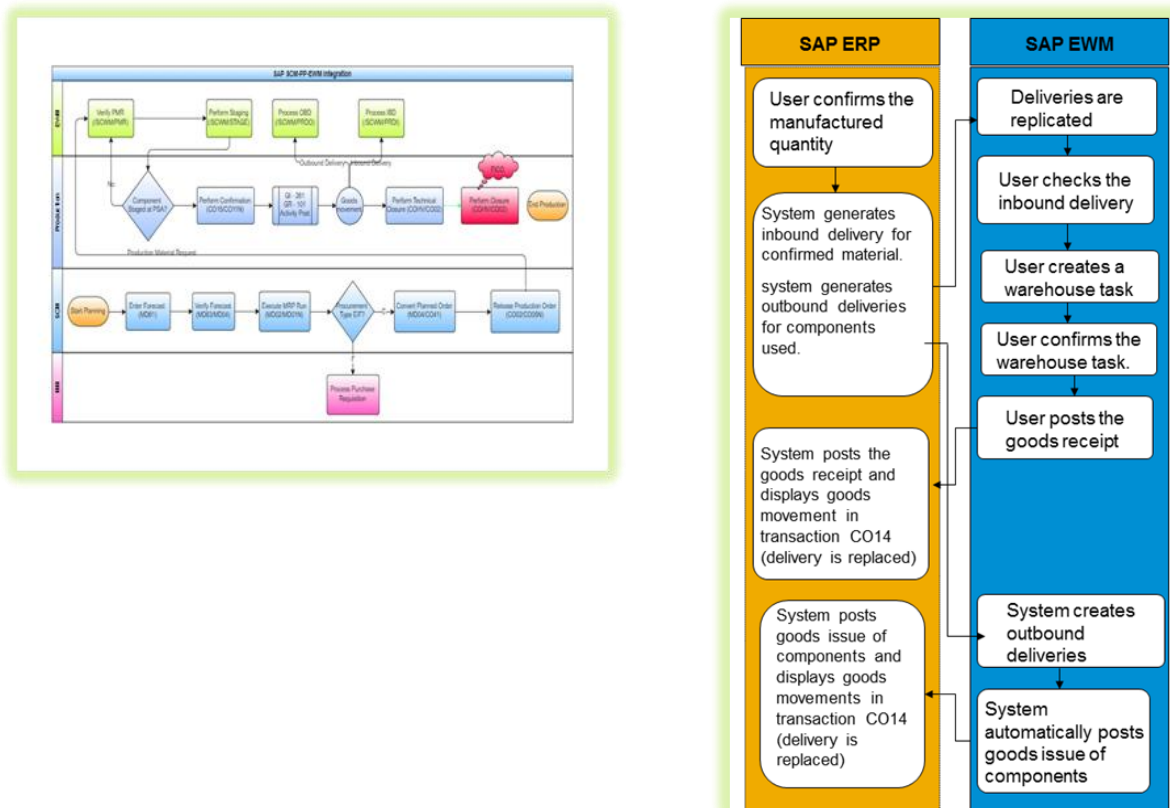
In conjunction with EWM, you can use all confirmation transactions at the level of the order header and the operations. In this example, the production storage location from which the components were withdrawn is EWM-managed. The storage location in which the finished materials are to be stored following production is likewise EWM-managed. The following process shows the course of events in both systems when you confirm a production order using transaction CO15.

**Prerequisites**

Make the following settings in the IMG activity Determination of Delivery Type:

**Process:** Goods issue of staged parts,

**Delivery Type:** DOG



**Figure 6. Confirmation of production order flow**

## V. CANCELLATION OF CONFIRMATION

**Use:** This process describes what happens in the S/4HANA and EWM systems when you cancel a final confirmation in the S/4HANA system.

**Prerequisites:** You have entered a final confirmation for an order and already posted the goods receipt for the confirmed material in the EWM system. The goods issue of the components consumed has already been posted.

You have determined the number of the inbound delivery that the S/4HANA system recorded for the confirmed material. To do so, you invoke transaction VL06O in the S/4HANA system. Here you call up the list of inbound deliveries and enter the material number and the date on which the system created the inbound delivery (this is the date on which you entered the confirmation). You need the delivery number to subsequently call up the inbound delivery in EWM system.

**Process:** You cancel the confirmation of a production order in transaction CO13. The S/4HANA system issues the message that you still have to reverse the goods receipt in the EWM system. The S/4HANA system automatically reverses the goods issue postings for the components that the system previously made at the time of confirmation. The following cases are possible:

### **IM-managed components:**

When you cancel a confirmation, the S/4HANA system automatically generates the goods movements with the reverse movement type. The S/4HANA system posts the receipt of the components. This increases the stock of the components.

### **EWM-managed components:**

When you cancel a confirmation, the S/4HANA system triggers the cancellation of the outbound delivery and the reversal of the goods movements that were posted for the components. The EWM system posts the receipt of the components and passes on this information to the S/4HANA system. This increases the stock of the components. You can display the updated data on the production order in transaction CO14. The system has now set the Cancellation/Reversal indicator. The EWM-managed components and the EWM-managed finished product are no longer displayed in the Goods Movements overview. In the EWM system, you invoke transaction /SCWM/PRDI and enter the S/4HANA delivery number. You then choose the function Reverse Goods Receipt. In addition, you must cancel the Inbound Delivery that was generated at the time of confirmation in the EWM system. The EWM system reverses the goods receipt and passes on this information to the S/4HANA system. In addition, it passes on the information that the inbound delivery has been cancelled.

The S/4HANA system posts the goods movement for the material and reduces the stock of the material accordingly. The S/4HANA system also cancels the inbound delivery.

The S/4HANA system updates the stock situation for the finished product by posting the goods issue (thus reducing the stock).

### **Processes in Repetitive Manufacturing**

In Repetitive Manufacturing, the following processes are supported with EWM:

**Final confirmation:** In conjunction with SAP EWM, you can carry out final confirmation for a finished product. As a result, the processing steps that the system runs through during final confirmation change. You can display information for final confirmation with EWM in the document log information (transaction MF12).

**Decoupled confirmation:** In conjunction with EWM, in the case of decoupled confirmation, the system generates an inbound delivery for the confirmed finished products. The inbound delivery is then automatically replicated in the EWM system. In the EWM system, you can specify whether or not a goods receipt is automatically to be posted. Immediate GR posting is preset in the standard system. In this case, EWM posts the goods receipt of the finished product at once. In the S/4HANA system, you then manually post the goods issue of the components, as well as the production activities.

**Document-neutral cancellation:** Document-neutral cancellation is the reversal of the final confirmation process. In this case, the S/4HANA system generates a correction delivery (outbound delivery) for the confirmed finished product. On the basis of this correction delivery, all quantities and activities are backed out. However, the S/4HANA system cannot update the planned order after cancellation.

**Document-related cancellation:** Use transaction MF41 (Document-Specific Cancellation of Confirmation) or MF12 (Display Document Log Information) to select and cancel a material document of a finished product. The S/4HANA system then generates a reversal (cancellation) document for the finished product. The system determines the quantity to be cancelled on the basis of the material document. At the same time, the S/4HANA system generates a correction delivery (outbound delivery) for the finished product. This correction delivery is automatically replicated in EWM and the goods receipt posted. This posting trigger the following in the S/4HANA system:

- Goods issue posting for the finished product
- Goods receipt posting for components
- Resetting of production activities
- Resetting of LIS
- Updating of the planned orders

The S/4HANA system generates a new document log containing all current documents in Material staging.

You can use an EWM system in conjunction with Repetitive Manufacturing and carry out the final confirmation for a finished product as well as for the components that are withdrawn from an EWM-managed storage location. For decentralized EWM system, you can carry out the final confirmation for a finished product only. Only the finished product can be managed using a decentralized EWM. The components that are built into the finished product must be withdrawn from an MM-IM- or WM-managed storage location.

## VI. CONCLUSION

The adoption of integrating SAP PP and EWM, Industries can create a more efficient and transparent production environment. This translates into reduced costs, improved on-time delivery, and a more decisive competitive edge. By integrating production processes with SAP EWM, the precision of inventory management has been enhanced, enabling improved tracking of raw materials, components, and finished goods. Furthermore, it facilitates real-time monitoring of production activities, leading to informed decision-making based on up-to-date data.

## REFERENCES

1. Hung, Yi-Feng, and Robert C. Leachman. "A production planning methodology for semiconductor manufacturing based on iterative simulation and linear programming calculations." *Semiconductor Manufacturing*, IEEE Transactions on 9.2 (1996): 257-269.
2. Solberg, James J. "Capacity planning with a stochastic workflow model." *AIIE Transactions* 13.2 (1981): 116-122.
3. "SAP EWM 9.5 - Die wichtigsten Neuerungen im Überblick". [www.serkem.de](http://www.serkem.de) (in German). 6 February 2018. Retrieved 2018-06-27.
4. [https://help.sap.com/saphelp\\_sfin100/helpdata/en/cc/4a25a7af134439b900753868478cc1/frameset.htm/](https://help.sap.com/saphelp_sfin100/helpdata/en/cc/4a25a7af134439b900753868478cc1/frameset.htm/)
5. What Is SAP PM? A Quick Guide To SAP Plant Maintenance ([clariongr.com](http://clariongr.com))
6. [https://help.sap.com/saphelp\\_sfin100/helpdata/en/cc/4a25a7af134439b900753868478cc1/frameset.htm](https://help.sap.com/saphelp_sfin100/helpdata/en/cc/4a25a7af134439b900753868478cc1/frameset.htm)
7. [https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/cc4a25a7af134439b900753868478cc1.html](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/cc4a25a7af134439b900753868478cc1.html)
8. [https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/7fc0b7cdea7448cfa5f0a9312df709a7.html](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/7fc0b7cdea7448cfa5f0a9312df709a7.html)  
[https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/7fc0b7cdea7448cfa5f0a9312df709a7.html](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/7fc0b7cdea7448cfa5f0a9312df709a7.html)
9. [https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/17755d86406e4cc9811e4d523ada3ba1.html](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/17755d86406e4cc9811e4d523ada3ba1.html)
10. <https://www.tcodesearch.com/sap-tcodes/CO14/resources>

11. [https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/17755d86406e4cc9811e4d523ada3ba1.html#:~:text=In%20the%20EWM%20system%2C%20you,confirmation%20in%20the%20EWM%20system.](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/17755d86406e4cc9811e4d523ada3ba1.html#:~:text=In%20the%20EWM%20system%2C%20you,confirmation%20in%20the%20EWM%20system.)
12. [https://help.sap.com/docs/SAP\\_S4HANA\\_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/cb29072510584c79be38bdc1f15ca7d2.htm](https://help.sap.com/docs/SAP_S4HANA_ON-PREMISE/2d95c3180a974e0aad07556ee4d28e94/cb29072510584c79be38bdc1f15ca7d2.htm)