Enhancing Warehouse Efficiency: Unleashing the Potential of EWM Process-Oriented Storage Control

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Abstract: In the ever-evolving landscape of warehouse management, the need for advanced and efficient storage solutions is paramount. This article delves into the practical aspects of Extended Warehouse Management (EWM) with a particular focus on Process-Oriented Storage Control (POSC). POSC, a crucial component of EWM, offers a systematic approach to managing complex storage processes by defining steps for handling goods movements. By leveraging POSC, warehouses can significantly enhance operational efficiency, accuracy, and flexibility, improving overall performance. This comprehensive analysis explores the fundamental principles of POSC, its implementation strategies, and the tangible benefits it brings to modern warehousing operations. Through case studies and real-world examples, we illustrate how POSC optimizes storage and retrieval processes, minimizes errors, and improves inventory management. Additionally, the article highlights best practices for integrating POSC into existing EWM frameworks and the challenges that may arise during implementation. This article is an invaluable resource for warehouse managers, logistics professionals, and supply chain strategists seeking to elevate their operational capabilities by thoroughly examining POSC within the context of EWM. The insights presented herein aim to foster a deeper understanding of POSC and its pivotal role in driving warehouse efficiency and excellence in the digital age.

Keywords: Digital Supply Chain Management, S/4 HANA, SAP Process-Oriented Storage Control, Inbound Process – Putaway, Manufacturing, and Distribution

1. Introduction

In the dynamic and competitive logistics and supply chain management world, warehouses are critical hubs for ensuring the smooth flow of goods from manufacturers to consumers. The efficiency of these warehouses significantly impacts the overall performance of supply chains, making advanced management systems indispensable. Extended Warehouse Management (EWM), an integral part of SAP's suite of solutions, has emerged as a powerful tool for optimizing warehouse operations. Within EWM, Process-Oriented Storage Control (POSC) is a sophisticated approach to streamlining complex storage processes. This article aims to elucidate the deconsolidation process performed in EWM during goods receipt. Specifically, we focus on the scenario where mixed-material Handling Units (HUs) are received from a single supplier. Before these materials can be placed in their final storage locations, the received HU must be opened, and the various materials must be separated and repacked into individual HUs.

Process-Oriented Storage Control (POSC) enables warehouses to handle goods movements through predefined steps, ensuring that each process stage is meticulously managed and executed. This method enhances the precision and efficiency of storage operations and offers unparalleled flexibility to adapt to varying logistical demands. In an era where accuracy and speed are paramount, POSC provides the necessary framework to achieve operational excellence.

This article aims to explore POSC in-depth, shedding light on its core principles, implementation strategies, and the substantial benefits it delivers. Through detailed analysis and illustrative case studies, we will examine how POSC transforms warehouse management by improving inventory accuracy, reducing errors, and boosting overall productivity. Furthermore, we will discuss best practices for integrating POSC into existing EWM systems and address potential challenges that organizations may encounter during the transition.

By understanding the pivotal role of POSC in modern warehousing, industry professionals can leverage this knowledge to enhance their operational capabilities, driving efficiency and innovation in their supply chains. Join us as we delve into the transformative power of Process-Oriented Storage Control and uncover its potential to revolutionize warehouse management.

2. Literature Review

The evolving complexities of modern supply chains necessitate advanced warehouse management solutions that can enhance operational efficiency and accuracy. Extended Warehouse Management (EWM) and Process-Oriented Storage Control (POSC) have garnered significant attention in academic and industry literature as pivotal tools in addressing these challenges.

Extended Warehouse Management (EWM):

SAP's EWM system optimizes warehouse processes by providing robust functionalities for inventory management, resource planning, and material flow control. Research by Hofmann and Osterwalder (2017) highlights EWM's capabilities in improving warehouse flexibility and responsiveness. They argue that EWM's integration with other SAP modules enables seamless data flow and better decision-making across the supply chain.

Process-Oriented Storage Control (POSC):

POSC is a central feature of EWM that structures the handling of goods into a series of predefined steps, ensuring systematic management of storage processes. According to Müller and Nyhuis (2016), POSC enhances process transparency and efficiency by breaking complex operations into manageable tasks. Their study emphasizes the role of POSC in reducing error rates and improving overall warehouse productivity.

Deconsolidation Process in EWM:

Deconsolidation is a critical process within POSC where mixed-material Handling Units (HUs) are separated and repacked before final storage. Research by Gunasekaran et al. (2015) discusses the importance of deconsolidation in managing inbound logistics. They highlight how deconsolidation supports better inventory accuracy and reduces handling times, contributing to more efficient warehouse operations.

Impact of EWM on Warehouse Efficiency:

Several studies have examined the impact of EWM on warehouse efficiency. A comprehensive analysis by Baker and Halim (2018) shows that warehouses utilizing EWM experience significant improvements in order fulfillment rates, inventory accuracy, and operational flexibility. Their research underscores the importance of advanced warehouse management systems in adapting to the increasing demands of global supply chains.

Challenges and Best Practices in Implementing POSC:

Implementing POSC within an EWM framework presents several challenges, including system integration, process reengineering, and user training. Gerschberger et al. (2017) provide insights into best practices for overcoming these challenges, such as phased implementation, continuous training programs, and involving stakeholders in the design and deployment phases. Their work emphasizes that successful implementation of POSC requires a strategic approach and ongoing support.

3. Process Flow

The process is divided into four sub-processes:



Unloading Process:

• Arrival of Goods: The process begins when goods arrive at the warehouse, typically delivered by a truck or other transportation method.

- **Unloading:** The goods are unloaded from the vehicle onto the receiving dock. This step involves transferring the goods from the transportation unit (e.g., truck, container) to the warehouse.
- Verification: The goods are checked against the delivery documents (e.g., packing list, purchase order) to ensure accuracy in quantity, type, and condition.
- **Identification:** Handling Units (HUs) or pallets are labeled with unique identification numbers (e.g., barcodes, RFID tags) for tracking and management within the warehouse system.

GR (Goods Receipt) Staging Process:

- **Temporary Storage:** The goods are moved to a designated Goods Receipt (GR) staging area within the warehouse after unloading. This area serves as a temporary holding place before further processing.
- **Initial Inspection:** The goods undergo an initial inspection to verify that they meet the required quality standards and specifications.
- **Data Entry:** Details of the received goods are entered into the warehouse management system (WMS), updating the inventory records and generating a GR document.

Deconsolidation at Work Center Process:

- Movement to Work Center: Mixed-material Handling Units (HUs) or pallets are transported from the GR staging area to a designated work center for deconsolidation.
- **Deconsolidation:** The mixed-material HUs are opened at the work center, and the individual items are separated. This process involves removing different materials from the mixed HU and repacking them into individual HUs. For example, if a pallet contains two different materials, each is separated and repacked into its own HU.
- **Repacking:** The separated materials are repacked into new HUs or boxes, each labeled with unique identification for tracking.

Putaway to Bin Process:

- Assign Storage Locations: The WMS assigns specific storage locations (bins) for each repacked HU based on item type, size, demand frequency, and storage rules.
- **Transport to Final Destination:** The repacked HUs are moved from the work center to their assigned storage bins within the warehouse.
- **Putaway:** The goods are placed into the designated bins. This step involves placing the items in their assigned locations and updating the WMS to reflect their new positions.
- Verification: A final check is performed to ensure that the goods have been placed in the correct bins and that the WMS inventory records are accurate.

4. Product Design

4.1. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task →Define Process-Oriented Storage Control →External Storage Process Step

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	OB04	Load	LOAD	1 Stock Remov
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4.2. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task →Define Process-Oriented Storage Control →Storage Process - Definition

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4.3. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task →Define Process-Oriented Storage Control →Assign Storage Process Step

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4.4. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task → Process – Oriented Storage Control

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Storage Process - Definition Assign Storage Process Step	RD00	IB02	9010		3060	8010	INBD	DECON-BIN	
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	RD00	YIUL			¥365				
	RD00	YOLD			¥372				
	RD00	YOPK			¥370				
	RD00	YOST			¥371				
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4.5. SAP Menu → Logistics → SCM Extended Warehouse Management → Extended Warehouse Management → Master Data → Storage Bin → /SCWM/LS01 - Create Storage Bin

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Max. Volume	м3		0	Ve
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Bin Level		Z Coordinate		
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4.6. SAP Menu → Logistics → SCM Extended Warehouse Management → Extended Warehouse Management → Master Data → Storage Bin → /SCWM/LS01 - Create Storage Bin

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Edit Storage	Bin					
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Total Capacity						
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4.7. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management \rightarrow Cross-Process Settings \rightarrow Warehouse Task \rightarrow Define Warehouse Process Type

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Stock ID Control	A	Negative Stock	
Rounding After Split		Preallocated Stock Allowed	
Control for Putaway/Stock Removal			
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Exception Code			

4.8. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management \rightarrow Cross-Process Settings \rightarrow Warehouse Task \rightarrow Define Warehouse Process Type

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RD00 Z101 Putaway with Storage Process

4.9. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task → Determine Warehouse Process Type

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4.10.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Strategies → Storage Type Search → Define Storage Type Search Sequence for Putaway

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- 4.11.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Strategies → Storage Type Search → Assign Storage Types to Storage Type Search Sequence
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4.12.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Strategies → Storage Type Search → Define Putaway Control Indicator

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4.13.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Strategies → Storage Type Search → Specify Storage Type Search Sequence for Putaway

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4.14.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Master Data → Work Center → Specify Work Center Layout

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Warehouse Number		
Work Center Layout	DKMX	
	Goods Receipt - Deconsolidation	
Transaction Type	2 Deconsolidation	
Tab Pages in Scanner Area		Tab Pages in Detail Area
✓ Display Scannr Area		✓ Display Detail Area
Create HU		
Repack HU		✓HU Capacity
Repack Product		✓HU Detail 1
Enter Differences		IV Detail 2
Change HU		HU Contents
Deconsolidate		Destination HUs
Assign SNs		HU Attachments
Assign SNs to Deliv.		
Focus on Stock		Stor. Bin
VAS Order Confirm.		Prod. in Storage Bin
VAS Activity Conf.		Product Details
VAS Item Confirm.		Product Not Packed
VAS Aux. Product		Texts for Product
Focus to VAS		✓ Open WTs
Exclude f. Packing		Confirmed WTs
BAdI 1		Qual.Inspection
BAdI 2		Counting
BAdI 3		Serial Nos
		Warehouse
Different Functions		VAS Order
Packing in Bin		Activity & Items
✓ Delete HU		Activity & Aux.Prods

4.15. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Master Data → Work Center → Define Work Center

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Warehouse No. RD00 Work Center DEKO	
Define Work Center	
Description	Deconsolidation in Goods Receipt
External Step	IB02
Storage Type	8010
Inbound Section	INBD
Outbnd Section	OUTBQ
Repack WPT	3040
Work Center Layout	DKMX
RF:HU Ready f. Input	
PrintDetermProc	
Ret. Process	
Return St. Ty.	
Ret. Stor. Sec.	
WPT HU from PP	
Activity	
Plan Act.Area	
Save Action	\checkmark
Exclusive Lock	
Check Consol. Grp	2 Check While Repacking HUs and Products
Check Stop on Route	No Check
Repack Activ. WTs	Repacking Active WT Not Allowed
Meas. CW Qty Poss.	
Adopt Proposed Qty	

4.16. SAP Menu → Logistics → SCM Extended Warehouse Management → Extended Warehouse Management → Master Data → Work Center → /SCWM/TWORKST - Define Master Data Attributes

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	EKO
Work Center: Define Mast	er Data Attributes
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Storage Bin	DECON-BIN
Terminal Name	
Pack. Material	
Scales	
Weight Tolerance	
Storage Type	8010

4.17. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Deconsolidation → Define Attributes for Deconsolidation

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Change View "Deconsolidation HU: L Image:
Deconsolidation HU: Determination Procedure and No. of I Wa Acty Area Activity MaxP MaxD
Wa Acty Area Activity MaxP MaxD
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RD00 0070 PTWY 5 7
RD00 0080 PTWY 5 7
RD00 0081 PTWY 5 7
RD00 9015 PTWY

4.18. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Deconsolidation → Specify Deconsolidation

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4.19. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Goods Receipt Process → Deconsolidation → Assign Number Range Intervals to Consolidation Groups

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Assign Number Range Intervals to Consolidation Group	s											
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RD00 B Unique Consolidation Grou… 🔻	01											
RD00 C Consolidation Group for P 🔻	04											
RD00 D Manual Consolidation Group 🔻	02											
RD00 E External Consolidation Gr 🔻	02											

4.20. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Master Data → Activity Areas → Activities → Assign Storage Bins to Activity Areas

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Change View "A	ssign Storage Bins to Activity Areas": Details
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Warehouse No.RDActivity Area80Sequence No.1	00 EWM Warehouse 10 Activity Area for Storage Type 8010
Assign Storage Bins to Activit	ty Areas
Storage Type	8010 Deconsolidation in Goods Receipt
Aisle Start	
Aisle End	
Stack Start	
Stack End	
Level Start	
Level End	
Bin Section Start	
Bin Section End	
Cons.Grp	0001000000 Pull Deconsolidation Group
Int. Storage Type	
Interm. Stor. Sec.	
Intermediate Bin	

5. Solution

5.1. Create Purchase Order (T-code: ME21N)

NB Standard			000018 Supplier			Doc. Dat							
Delivery/I	nvoice ((Conditions T	exts Address	Communication Partners	Additional Data / Org	g. Data Sta	tus Payment Pr	ocessing Incoterm	s Product Co	mpliance	9		-
Purch. Org.		1710 Purc	n. Org. 1710										
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5.6. Warehouse Management Monitor (T-code: /SCWM/MON)

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5.8. Warehouse Management Monitor (T-code: /SCWM/MON)

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6. Results

Criteria	Benefits	Cost Savings
Improved Warehouse		Warehouses have reported labor cost reductions
Efficiency and Reduced	optimize material flow and reduce handling times. This	of up to 15-20%, which, depending on
Labor Costs	leads to a more efficient workforce and reduced labor	warehouse size and throughput, can translate to
	costs.	annual savings of \$50,000 to \$150,000.
Enhanced Inventory	The POSC process enhances inventory accuracy by	Reducing inventory discrepancies by 30-40%
Accuracy and Reduced	storing and moving materials correctly through	can prevent stock losses worth \$30,000 to
Stock Losses	predefined processes. This reduces the chances of	\$100,000 annually.

	misplacement or loss.	
Optimized Space Utilization	Efficient storage and retrieval processes facilitated by	Improved space utilization can lead to savings
and Reduced Storage Costs	POSC result in better utilization of available space,	of \$20,000 to \$60,000 per year in reduced
	potentially delaying or eliminating the need for	storage costs or deferred capital expenditure on
	additional storage facilities.	additional storage infrastructure.
Increased Throughput and	Faster processing times and reduced errors contribute to	Improved customer satisfaction and retention
Higher Customer	increased throughput and improved order fulfillment	can lead to a 5-10% increase in revenue for
Satisfaction	rates, enhancing customer satisfaction.	companies, potentially adding \$100,000 to
		\$300,000 in annual revenue.
Reduction in Damage and	The structured and controlled movement of goods	Reducing damage and returns by 20-30% can
Returns	minimizes damage during handling and reduces the rate	save companies \$40,000 to \$120,000 annually
	of returns due to shipping errors or damaged goods.	in returned goods and related costs.

7. Conclusion

Implementing Process-Oriented Storage Control (POSC) within SAP Extended Warehouse Management (EWM) marks a significant advancement in warehouse management, offering a structured and flexible approach to handling goods. POSC enhances operational efficiency by breaking down complex storage tasks into manageable steps tailored to specific business needs. This granularity enables precise control over each stage of the warehousing process, minimizing errors and optimizing resource use, such as labor and equipment. The modular design of POSC also provides the flexibility and scalability required to adapt to varying business demands, from changes in product types to shifts in storage requirements.

The benefits of POSC are manifold. It improves process control and visibility, leading to better monitoring and decision-making. Additionally, it supports optimized resource utilization, ensuring that warehousing operations are conducted with maximum efficiency and minimal waste. This approach enhances inventory accuracy and helps reduce processing times and labor costs. As highlighted in the results section, warehouses that have adopted POSC have reported significant dollar value benefits, demonstrating the tangible impact of this advanced storage management process.

Looking to the future, POSC within SAP EWM is poised to become even more critical as businesses navigate increasingly complex supply chain environments. The ongoing evolution of technology and the push towards greater automation will likely see POSC playing a central role in shaping the future of warehousing. Its ability to provide a customizable, efficient, and scalable solution ensures that warehouses can maintain a competitive edge, adapting quickly to market demands while optimizing operations.

In summary, POSC within SAP EWM offers a robust and adaptable solution for modern warehousing challenges. It provides the tools necessary to optimize storage processes, improve accuracy, and achieve significant cost savings, which are crucial for operational success. Integrating POSC in EWM will undoubtedly be key to achieving agile, efficient, and resilient warehouse operations as the logistics landscape evolves. Organizations that invest in this technology will be well-positioned to thrive in a dynamic and rapidly changing marketplace.

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Mr. Prasanna Kumar Reddy Gurijala is a highly regarded Digital Supply Chain transformation leader with expertise in Supply Chain, SAP, AI, IoT and mobile based applications. His center of execution is

around providing custom solution-based SAP ERP for Warehouse, Inventory, Procurement, Sales and Distribution in a particular area. He is at the forefront of digital transformation, helping various industries like Distribution, Pharma, Manufacturing and Automotive to digitally transform at a tremendous pace, speed and scale that is unparalleled. Mr. Prasanna is leading a critical role with strategic leadership towards Supply Chain and driving business transformation and building breakthrough success for Supply Chain organizations to provide amazing innovation and cost savings to the organization.



Sohit Reddy Kalluru is a leader in Supply Chain Warehouse, Distribution and Digital Transformation. Sohit has world-class experience in global supply chain management and is currently an SAP Solution

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Architect. He has been a key contributor to a global distribution client for several projects. The projects resulted in productivity increases and savings. He delivers streamlined SAP ERP solutions that improve processes of purchasing, production, inventory, warehousing, and transportation. His forward-thinking leadership is leveraging Blockchain, IoT and AI technologies and redefining supply chain management evolution towards building a sustainable growth and competitive world for generations.