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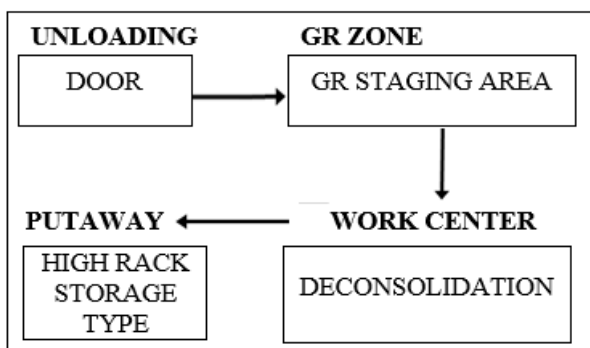
Unloading Process:
- **Arrival of Goods:** The process begins when goods arrive at the warehouse, typically delivered by a truck or other transportation method.

- **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.
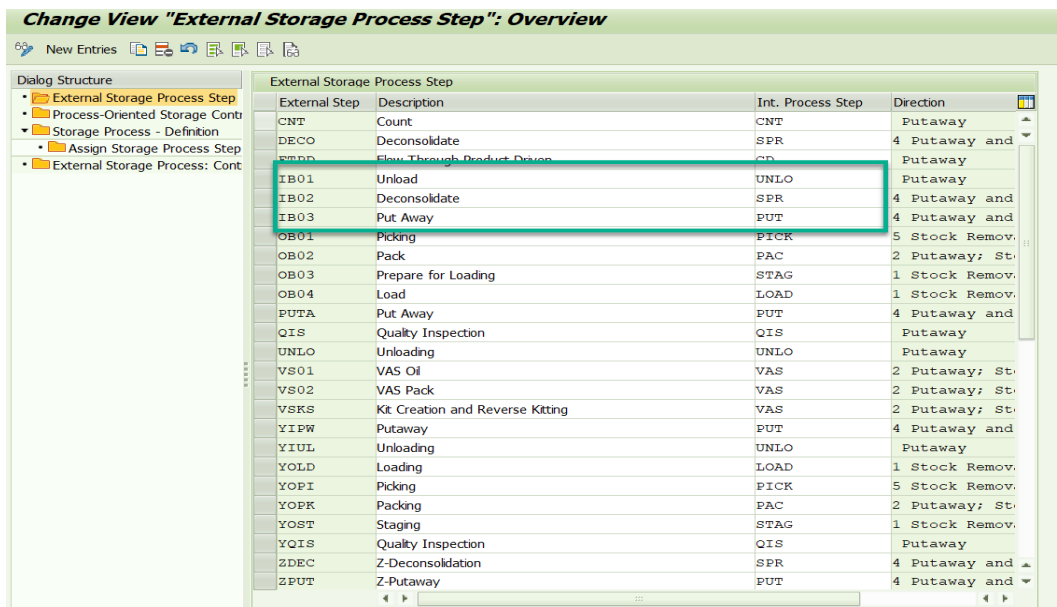
Deconsolidation at Work Center Process:
- **Movement to Work Center:** Mixed-material Handling Units (HUs) or pallets are transported from the GR staging area to a designated work center for deconsolidation.
- **Deconsolidation:** The mixed-material HUs are opened at the work center, and the individual 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.
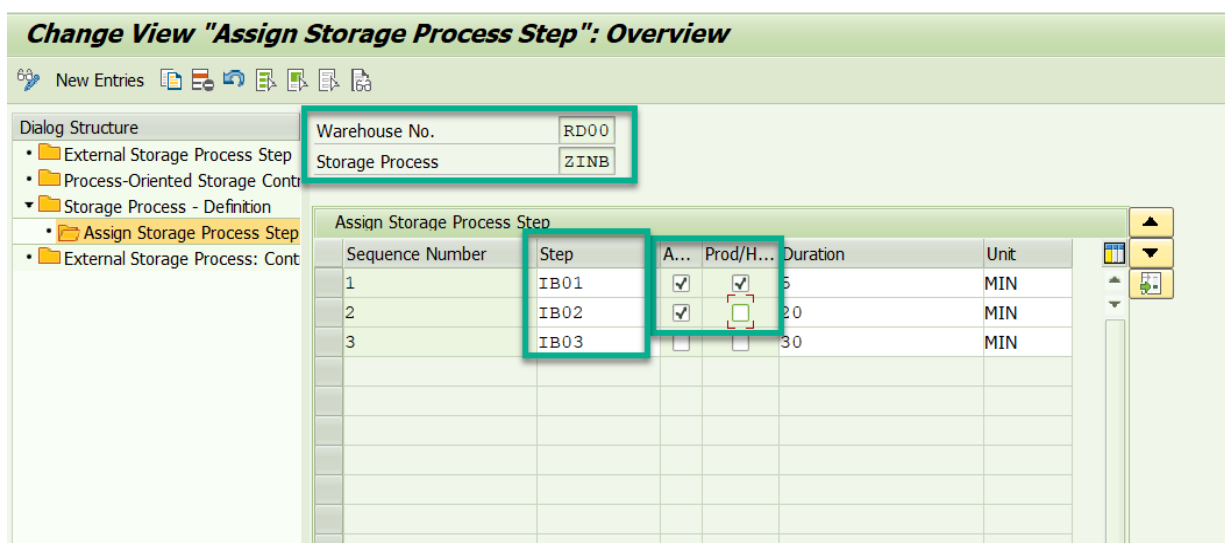
4. Product Design

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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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
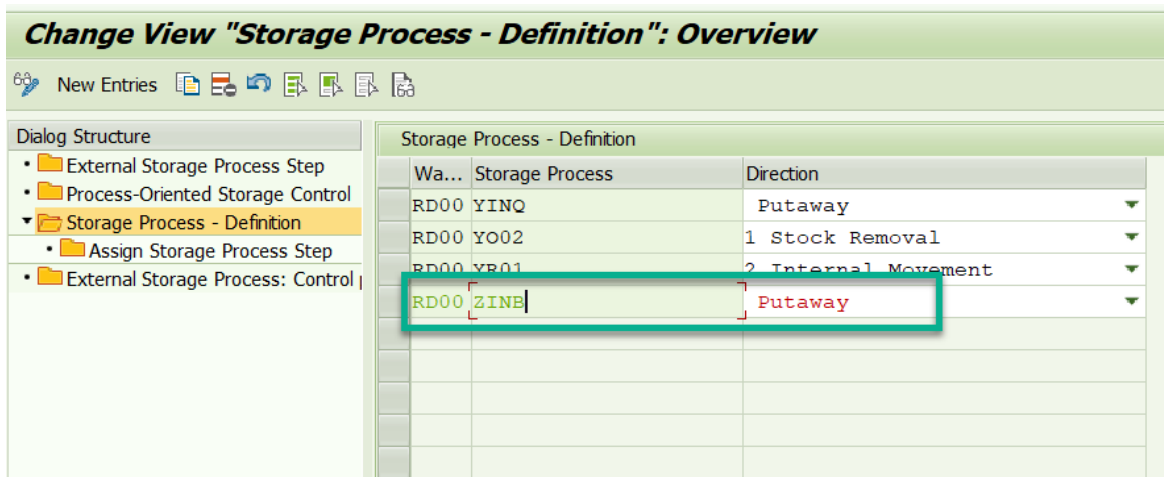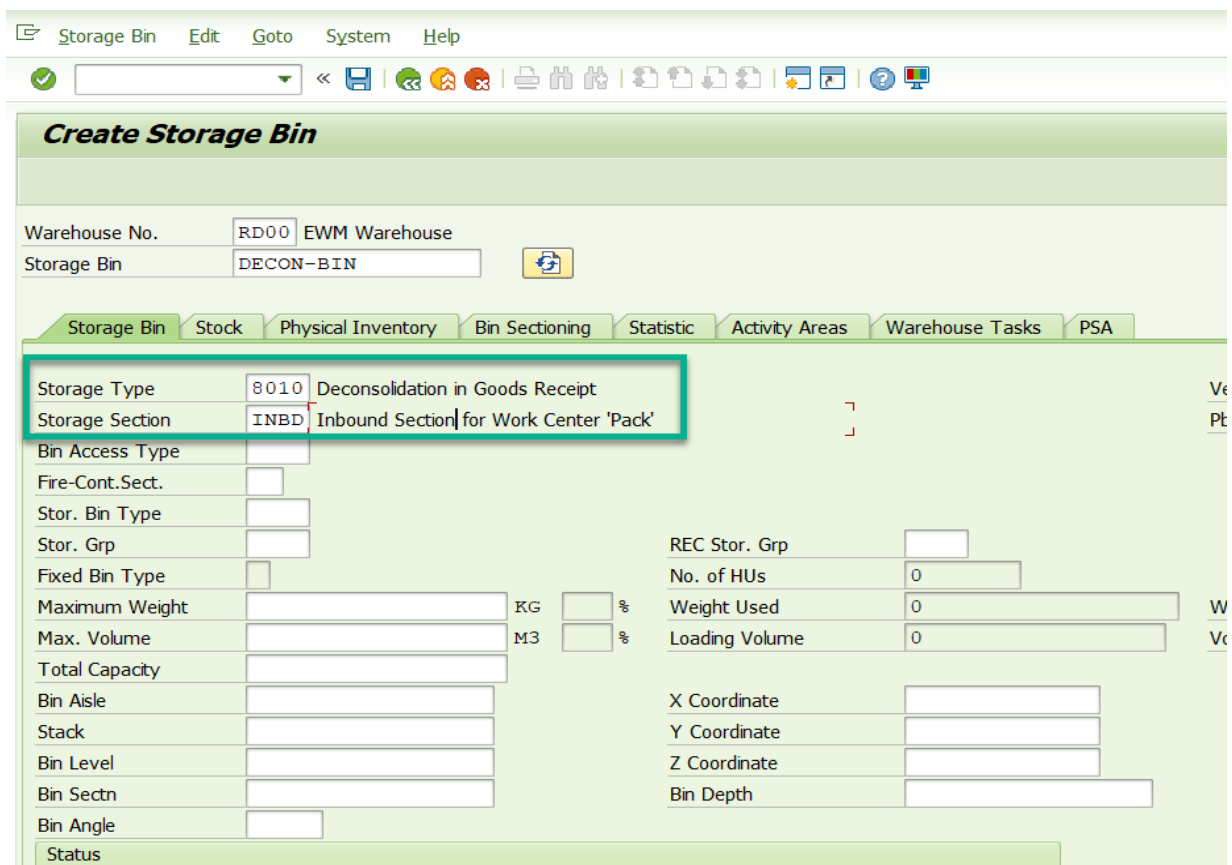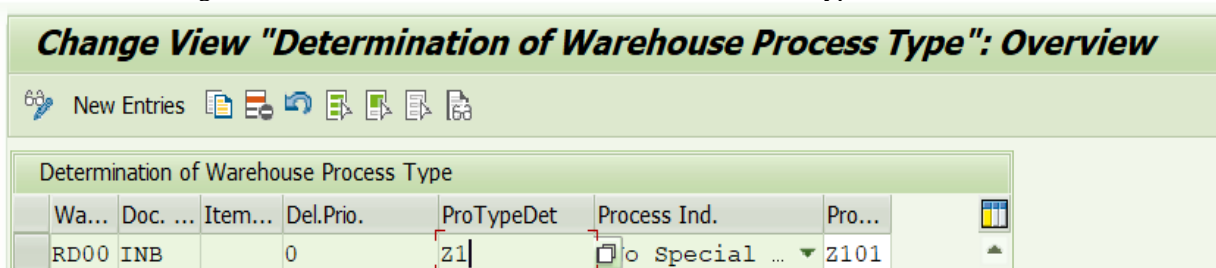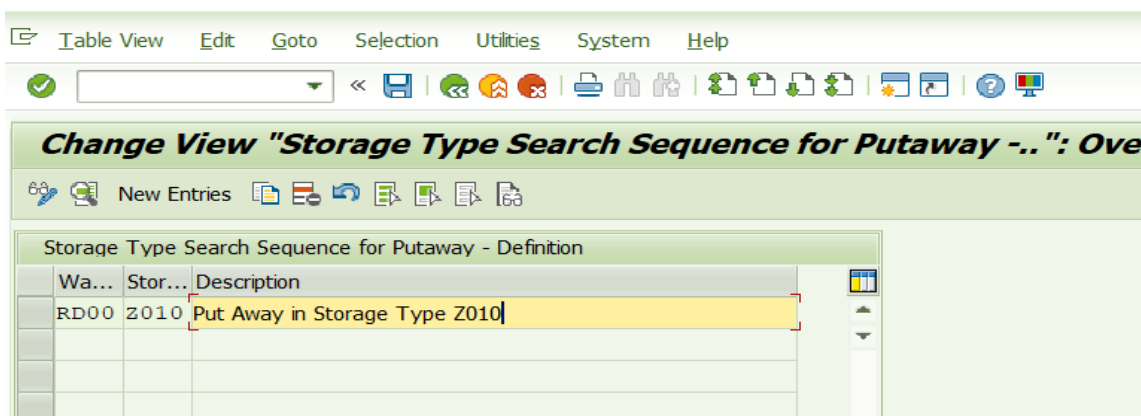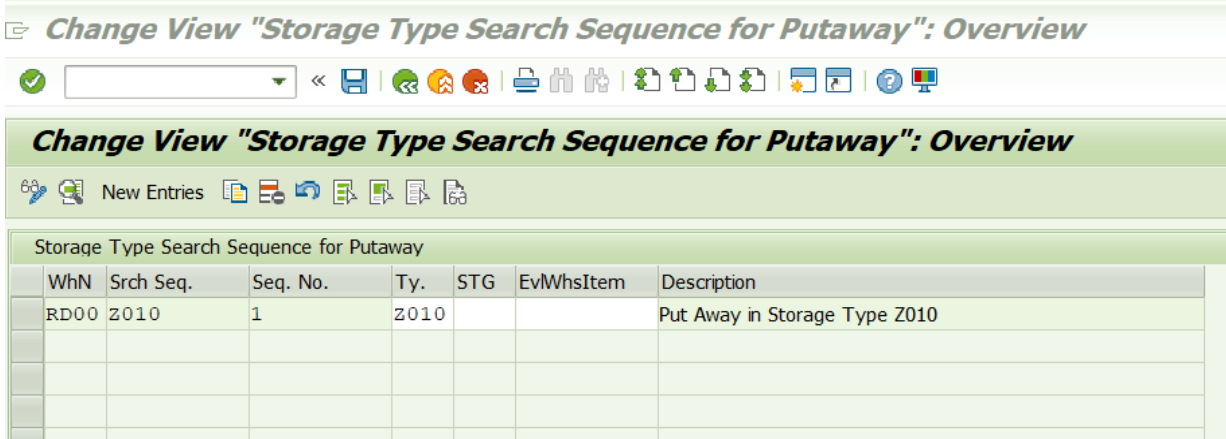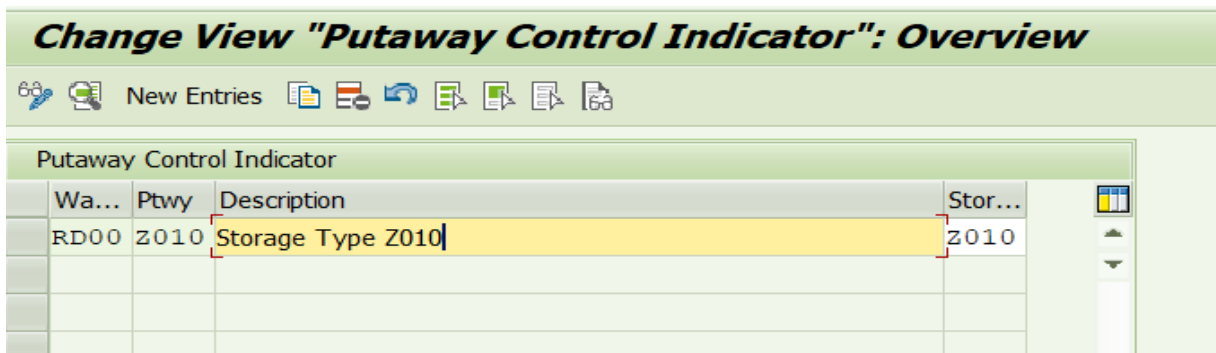

4.3. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task →Define Process-Oriented Storage Control →Assign Storage Process Step

4.4. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task → Process – Oriented Storage Control
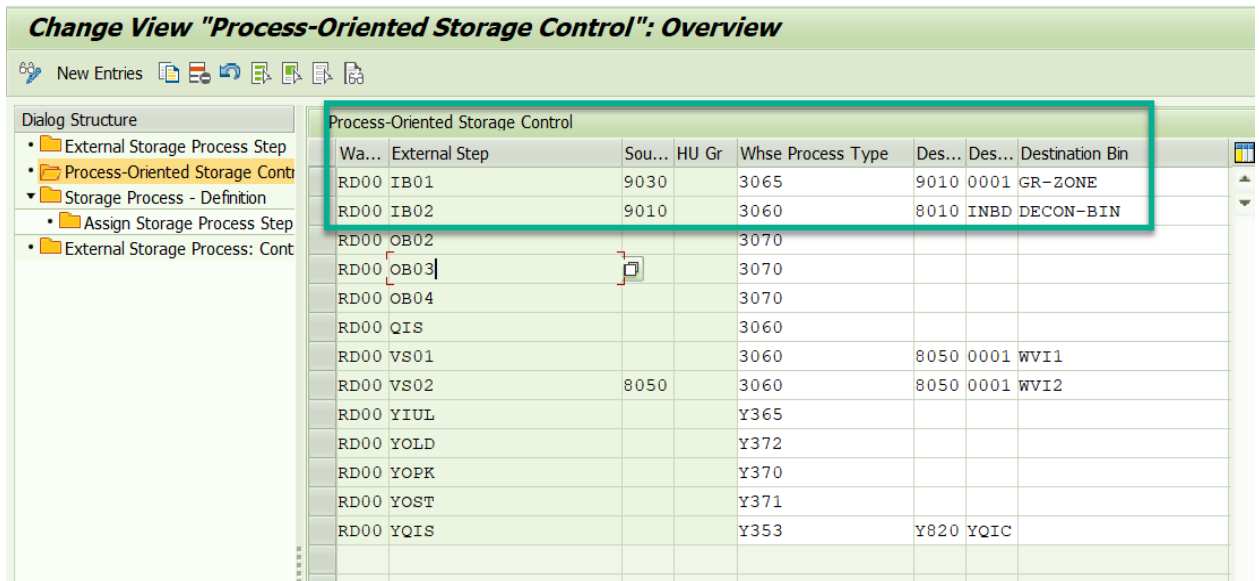
4.5. SAP Menu → Logistics → SCM Extended Warehouse Management → Extended Warehouse Management → Master Data → Storage Bin → /SCWM/LS01 - Create Storage Bin

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

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

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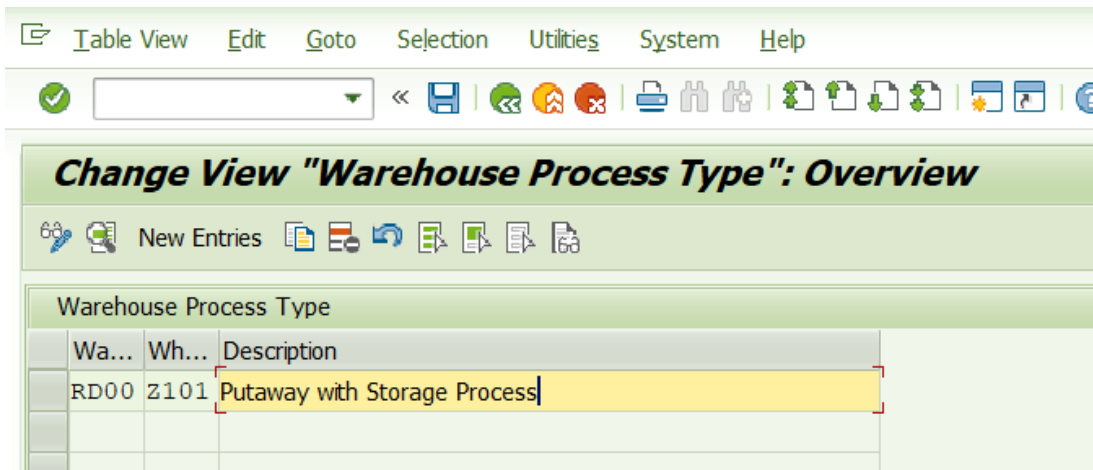
4.9. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management →Cross-Process Settings →Warehouse Task → Determine Warehouse Process Type

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

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

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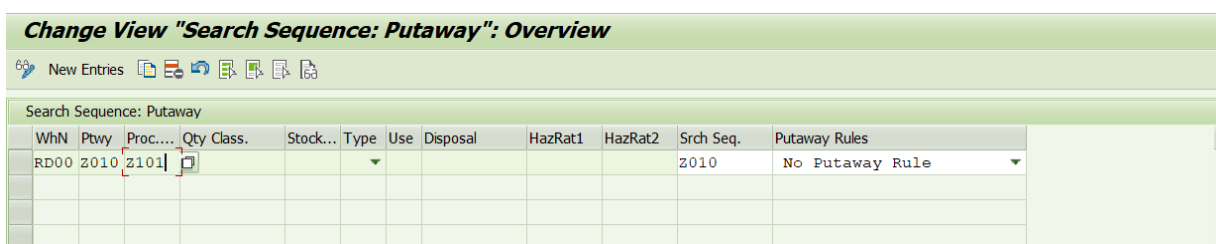
4.14.SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Master Data → Work Center → Specify Work Center Layout
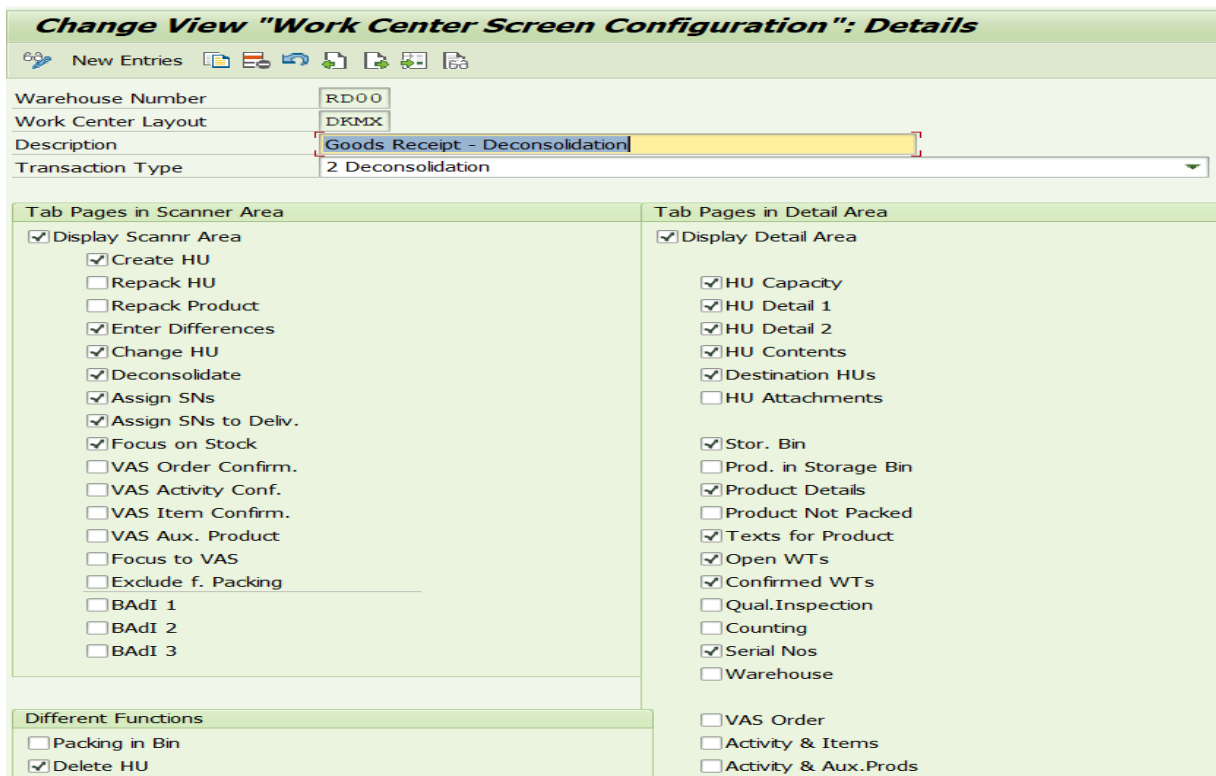
4.15. SPRO → SAP Reference IMG → SCM Extended Warehouse Management →Extended Warehouse Management → Master Data → Work Center → Define Work Center

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

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

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

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

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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5. Solution

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

5.2. Create Inbound Delivery (T-code: VL31N)

5.3. Maintain EWM Inbound Delivery (T-code: /SCWM/PRDI)

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

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

5.6. Warehouse Management Monitor (T-code: /SCWM/MON)
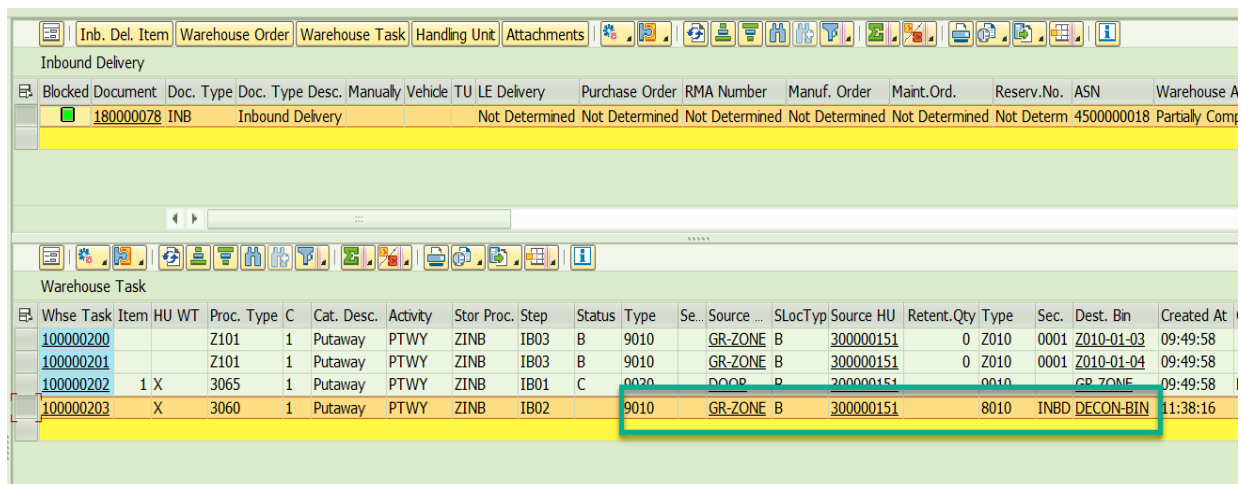
5.7. Deconsolidation in Goods Receipt (T-code: /SCWM/DCONS)
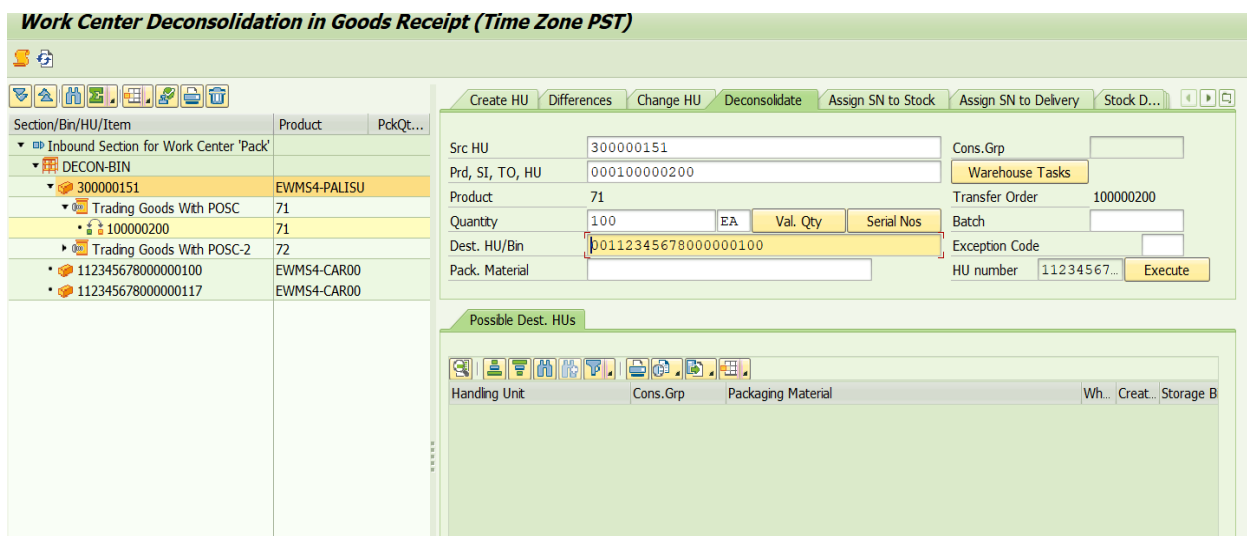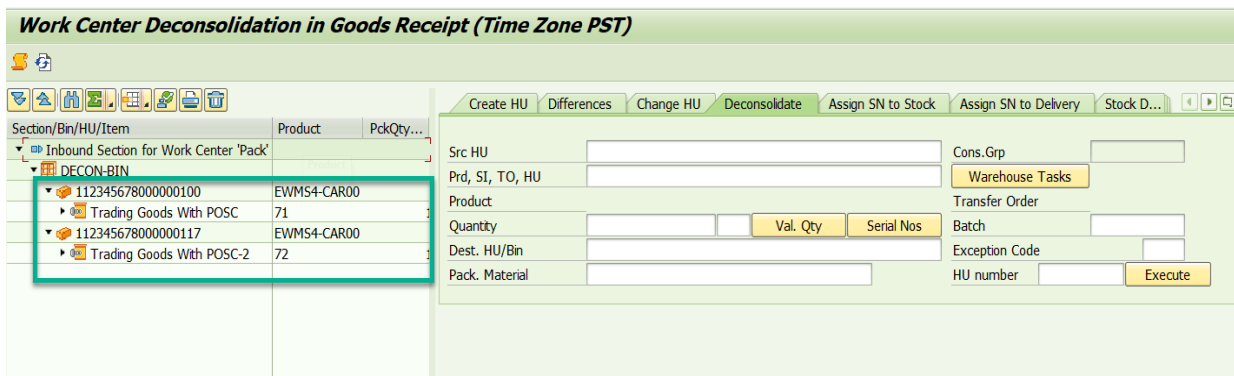
5.8. Warehouse Management Monitor (T-code: /SCWM/MON)
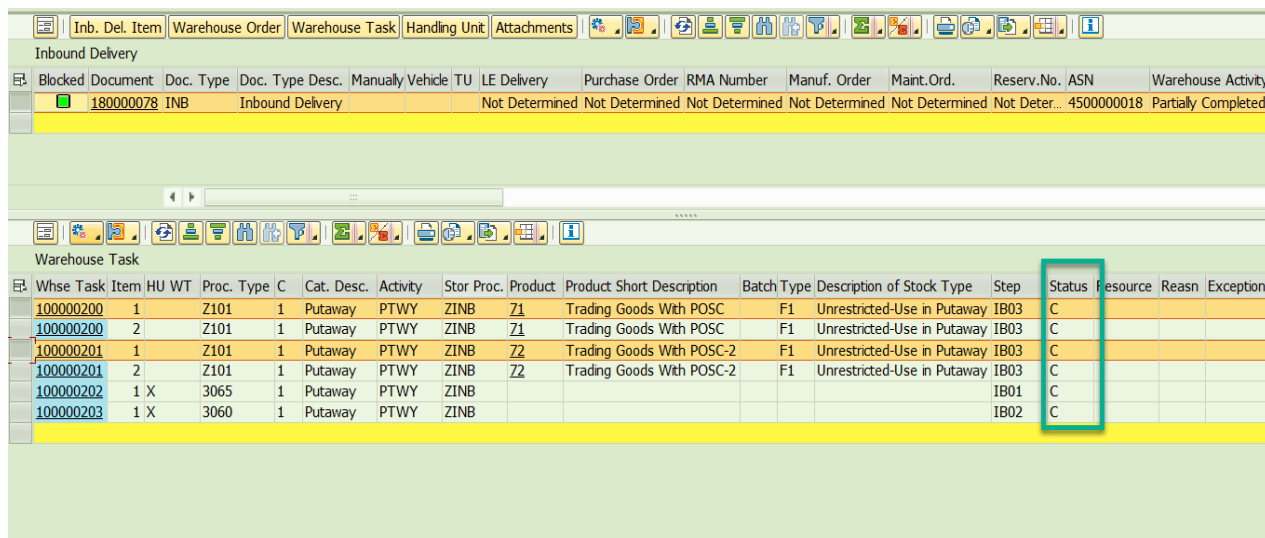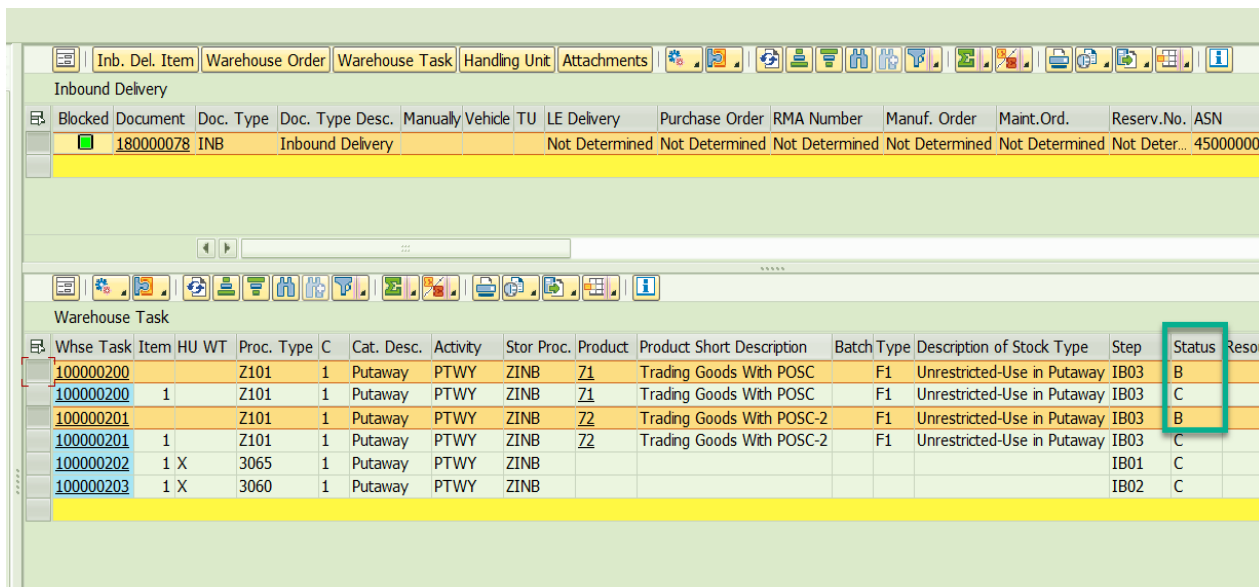
6. Results

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

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