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## Optimizing Yard Logistics in SAP: A Comprehensive Analysis

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**Abstract** Yard logistics play a pivotal role in the efficiency and effectiveness of supply chain operations. This paper provides a comprehensive analysis of the methods and strategies for optimizing yard logistics using SAP (Systems, Applications, and Products) solutions. It examines the challenges faced in yard management, explores the features of SAP Yard Logistics, various deployment options, integration options, and presents case studies to illustrate successful implementation strategies.

**Keywords** SAP (Systems, Applications and Programs), Yard Logistics, Extended warehouse Management (EWM), Features, Integration, Deployment

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### 1. Introduction

Efficient yard management is essential for streamlining the flow of goods within warehouses and distribution centers. With the increasing complexity of supply chains, companies are turning to advanced technologies like SAP to optimize their yard logistics processes. This paper aims to delve into the intricacies of yard logistics optimization using SAP, highlighting its benefits, and providing insights for successful implementation.

In today's fiercely competitive global arena, businesses operating with yards must prioritize streamlined logistics processes to enhance their efficiency. Achieving this requires a seamlessly integrated and user-friendly system capable of supporting the entire supply chain. This is where SAP Yard Logistics (YL) and SAP Yard Management (YM) come into play. These Yard Management services offer comprehensive support for transportation units, covering everything from check-in to check-out procedures, with a strong emphasis on critical functions like Planning, Execution, Yard Operations, Yard Monitoring, and Billing. By incorporating SAP Yard Logistics and SAP Yard Management, businesses can optimize their supply chain processes, boost operational efficiency, and maintain a competitive edge.

SAP YL plays a crucial role in transforming logistics operations by offering a complete solution for efficient yard management. In the intricate logistics environment, where the smooth handling of goods and streamlined processes are essential, SAP YL emerges as a game-changer. At its essence, SAP YL is crafted to streamline and automate yard operations within organizations. Traditionally, these operations have been prone to manual errors, delays, and a lack of real-time visibility. SAP YL tackles these issues head-on by providing a centralized platform that empowers companies to efficiently manage and monitor their yard activities.

A fundamental aspect of SAP YL is its capability to boost visibility and control over yard operations. By offering real-time tracking and monitoring, businesses can gain valuable insights into the movement of assets within the yard, facilitating informed decision-making. This heightened visibility not only mitigates the risk of errors but also enhances overall operational efficiency.

Another critical role played by SAP YL is in optimizing resources. Through the automation of yard processes, organizations can allocate resources more effectively, minimizing idle time and maximizing productivity. The system assists in managing the allocation of space, equipment, and labor, ensuring optimal utilization of these resources.



Moreover, SAP YL fosters improved communication and collaboration within the logistics ecosystem. Serving as a central hub, it enables stakeholders such as carriers, suppliers, and internal teams to access real-time data and updates. This transparency promotes collaboration, reduces communication gaps, and enhances the overall coordination of yard activities.

Furthermore, SAP YL contributes to sustainability efforts in logistics. By optimizing yard processes and minimizing unnecessary movements or delays, organizations can reduce their environmental footprint. This aligns with the increasing focus on sustainable and eco-friendly practices within the logistics industry.

## 2. Literature

**A. SAP Yard logistics (YL) Overview:** SAP Yard Logistics operates on the SAP HANA/Legacy Database and seamlessly integrates with SAP Transportation Management (SAP TM) and SAP Extended Warehouse Management (SAP EWM) applications, forming a comprehensive logistics fulfillment platform. This solution aids in prioritizing shipment arrivals, identifying trailer contents, managing yard jockey activity, standardizing yard processes, reducing vehicle allocation time, and minimizing unnecessary vehicle movements. Our SAP solution caters to mobile users and is tightly integrated with charge calculation and settlement functions in SAP TM. A graphical layout provides real-time monitoring and visualization of the yard's status. With an intuitive desktop and mobile user interface, business users are empowered to make informed decisions and take immediate actions, following the principle of "see and act [1]."

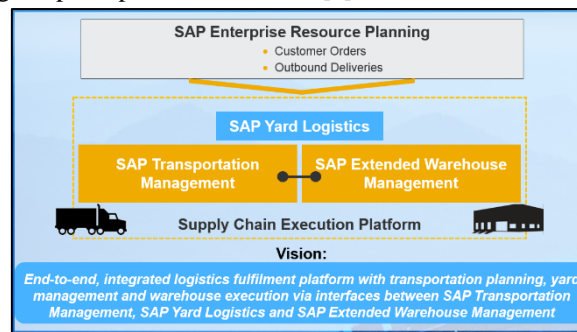


Image Source [1]

SAP Yard Logistics provides seamless integration with SAP EWM and SAP TM, ensuring comprehensive coverage of supply chain execution processes. Through integration with SAP TM, Yard Logistics anticipates the arrival of trucks in the yard by receiving information from Freight Orders. Upon the truck's arrival at the door, SAP Yard Logistics promptly notifies SAP EWM, enabling warehouse processes to commence immediately. Once loading or unloading is completed, SAP EWM updates SAP YL, allowing the truck to proceed to the yard. Upon departure from the yard, SAP Yard Logistics sends an update to SAP TM, facilitating further processing of the truck to its next destination [2].

SAP Yard Logistics, a focused business solution (FBS), efficiently manages entering and leaving, as well as transportation activities within various industrial sites such as distribution centers, production campuses, and complex warehouse sites featuring multiple warehouses or container terminals. Moreover, it effectively oversees operations in ports and rail yards. This solution is tailored to handle dock scheduling for incoming and outgoing loads, coordinate resources responsible for moving transportation assets within the yard and track all assets on-site. Built with flexibility in mind, SAP Yard Logistics accommodates all modes of transport across different types of yards. While particularly beneficial for companies with large and complex yards, such as the Port of Hamburg, it also holds significance for any organization aiming to enhance yard processes, including retail distributors and manufacturing companies [3].

SAP Yard Logistics version 2.0 is instrumental in minimizing waiting times and optimizing space utilization within the yard. Additionally, features such as driver self-check-in, mobile inspection capabilities, and asset tracking via IoT sensors enhance yard efficiency. The system enables the classification and identification of transportation units, allowing for the utilization of customer-specific attributes and order-based asset



determination. As businesses implement and utilize these features, key performance indicators (KPIs), such as yard stay duration, show improvement over time [3].

### B. SAP Yard Logistics vs SAP Yard Management:

SAP Yard Logistics and SAP Yard Management both play pivotal roles in the planning and execution of yard operations within large warehouses. Mismanagement of the yard can significantly impede warehouse processes, making it crucial for warehouse managers to utilize effective solutions [4].

### Yard Management in SAP EWM:

SAP EWM approaches yard management by considering the yard as an extension of the warehouse, handling operations with warehouse tasks. Its main components include Yard Location Management, Yard Movements, and Yard Stock. The business process defined by EWM is straightforward, focusing on seamless integration with warehouse operations [4].



Image Source [4]

### SAP Yard Logistics - approach and salient features:

In contrast, SAP Yard Logistics adopts a highly focused view on the yard and follows the Plan-Execute-Monitor approach. This allows for additional capabilities to cover end-to-end yard processes comprehensively. It facilitates planning for yard activities based on workload and subsequently executing them. Yard requests and yard orders are utilized for managing operations, allowing prioritization and sequencing of tasks. Additional functionalities such as 3D visualization, process templates, and planning capabilities enhance its utility [4].

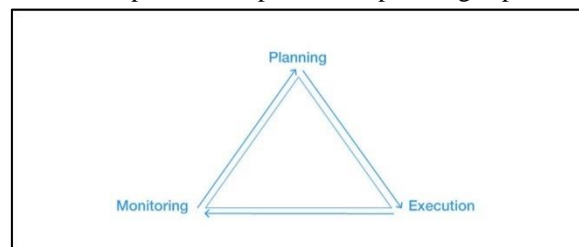


Image Source [4]

There is overlap in process functionality between the two solutions, aiding integration efforts. However, SAP Yard Logistics offers enhanced features, such as self-check-in and automated door assignment. It also provides open interfaces for IoT integration, enabling real-time asset monitoring. Notably, SAP Yard Logistics excels in handling multiple transportation units within a vehicle by defining hierarchical relationships between them. This allows for independent management of different units, enabling scenarios where drivers can leave certain units in the yard while departing with others—a capability not present in SAP EWM's Yard Management [4].

### Monitoring Functionality:

The monitoring functionality in SAP Yard Logistics is intuitive and visually rich, offering virtual yard visualization and real-time tracking of vehicle locations. In essence, while both SAP Yard Logistics and SAP EWM's Yard Management serve similar purposes, SAP Yard Logistics distinguishes itself with its focused approach on yard operations, comprehensive functionalities, and advanced features tailored for efficient yard management [4].



**C. SAP Yard Logistics offers a range of key features accompanied by significant benefits:****Plan Yard Processes & Prepare Execution Based on Central Workload Information:**

Efficient asset and area utilization reduces idle times, minimizing resource needs and avoiding unnecessary movements and storage.

**Optimize & Simplify Yard Processing:**

Faster gate-in and gate-out processes reduce processing time and staffing requirements, enhancing visibility and customer service.

**Efficient Handling of Internal Processes to Ensure Smooth Flow of Yard Internal Transportation Requirements:**

Accelerated processing of activities such as washing, checking, or measurement enhances satisfaction of both internal and external requirements.

**Track Assets in the Yard & Manage Exceptions by Sensing/Responding to Logistics Insights:**

Gain visibility into goods and assets, enabling fast reactions to avoid critical situations and uphold SLAs with customers.

**Enhanced Visibility & Efficiency:**

Advanced insight and control address unprecedented challenges, facilitating faster product delivery and service enhancement. Improved equipment efficiency lowers additional costs and enhances planning capabilities.

**Seamless Integration:**

Integration with SAP S/4HANA, SAP ERP, and other Supply Chain Logistics Suite applications like SAP EWM and SAP TM ensures smooth data flow and process management.

**Automation using IoT:**

Streamline critical activities with self-registration terminals for drivers, RFID readers for automatic registrations, and GPS location identification for tracking transportation units. Automation also facilitates assigning specific storage locations for cargo types, optimizing yard operations.

Through these features, SAP Yard Logistics not only enhances operational efficiency but also reduces manual efforts, enabling effective management of yard operations and ensuring customer satisfaction.

**D. Deployment options for SAP Yard Logistics:**

When considering the deployment options for SAP Yard Logistics, it's essential to align the choice with the specific needs of your logistics operations.

Let's explore two distinct deployment scenarios:

**Standalone Deployment:** This approach empowers logistics teams with autonomy, placing direct control over yard operations within SAP YL. Manual initiation of yard orders and tasks enables streamlined execution, offering a high level of control suitable for organizations with precise process requirements. Standalone deployment allows Yard Logistics to function independently, without connections to master systems like TM or EWM initially. Integration can be implemented later, or with EWM systems, offering dedicated handling of master data—a potential benefit for standalone implementations.

**Embedded Deployment:** In contrast, embedded deployment seamlessly integrates SAP YL into existing SAP S/4HANA infrastructure. This strategic approach embeds YL functionalities directly within the operational framework, fostering a cohesive logistics ecosystem. With minimized manual intervention, this method promotes automation and efficiency, leveraging S/4HANA's strengths to optimize resource utilization and enhance overall logistics efficiency. Embedded deployment is advantageous for organizations seeking a unified logistics strategy, harmonizing YL within existing technological infrastructure to streamline operations effectively.

By carefully evaluating these deployment options, organizations can strategically leverage SAP Yard Logistics to enhance their logistics processes and achieve operational excellence.

**E. Integration Options for SAP YL:**

Integration options for SAP Yard Logistics (YL) play a crucial role in enhancing operational harmony and efficiency within logistics management. Let's explore the various integration possibilities:



**Integration with SAP ERP for Operational Harmony:**

Organizations relying on SAP ERP for transport planning can seamlessly integrate SAP YL with ERP shipments, especially with the introduction of SAP YL service pack 2 (SP2). This integration enables yard requests to manifest from shipments, facilitating the exchange of master data through the CIF interface. The result is a synchronized logistics ecosystem, promoting operational harmony.

**Seamless SAP TM Integration for Operational Synergy:**

In environments prioritizing SAP Transportation Management (SAP TM), integration ensures a seamless connection between SAP ERP and SAP TM. Through sales orders, purchase orders, or deliveries, transportation planning unfolds, seamlessly transitioning to SAP YL. This integration generates yard requests and ensures end-to-end visibility, facilitating a well-coordinated logistics performance.

**Efficiency Elevation with SAP EWM Integration:**

SAP Extended Warehouse Management (SAP EWM) plays a crucial role in the logistics framework. Integrating SAP YL with SAP EWM synchronizes key events, such as door arrivals and departures, ensuring smooth and efficient execution within the yard.

**Leveraging 3rd Party Synergy with Thoughtful Consideration:**

Recognizing the unique nature of SAP YL compared to regular software solutions, organizations can explore integration with third-party software. While this choice opens many possibilities, careful consideration and discussion are crucial in project planning to ensure seamless integration and alignment with organizational objectives.

By leveraging these integration options, organizations can enhance operational efficiency, streamline logistics processes, and foster a well-coordinated logistics ecosystem tailored to their specific needs.

**F. Challenges in Yard Logistics:**

Navigating the complexities of yard logistics presents a myriad of challenges that can impede operational efficiency. Firstly, limited visibility plagues many yard management systems, making it difficult to track the movement and status of assets accurately. This lack of real-time information can result in delays, errors, and ultimately, decreased productivity.

Furthermore, inefficient space utilization compounds these issues. Without optimized layout planning and utilization strategies, yards can quickly become congested and disorganized. This congestion not only hampers the flow of goods but also increases the risk of accidents and damage.

Moreover, manual processes exacerbate these challenges by introducing human error and delays into the workflow. Relying on manual data entry and paper-based documentation leaves room for mistakes, inaccuracies, and communication breakdowns, further complicating yard operations.

In addressing these challenges, organizations must prioritize the adoption of advanced technologies and automated solutions. Implementing robust yard systems, such as SAP solutions, can significantly enhance visibility, streamline operations, and improve overall efficiency. By leveraging automation, organizations can minimize manual intervention, reduce errors, and optimize resource utilization, ultimately paving the way for operational excellence in yard logistics.

**3. Use Case**

Schaeffler's implementation of SAP Yard Logistics at its European distribution center in Kitzingen marks a significant milestone in logistics management. The fully automated yard processes, executed without user input, demonstrate the advanced capabilities of the system. Georg F.W. Schaeffler, Chairman of the Supervisory Board of Schaeffler, emphasized the strategic importance of the new logistics center in aligning with their "Mobility for Tomorrow" strategy during the grand opening.

**Key Highlights of the Implementation [5]:**

The European distribution center boasts approximately 125,000 storage positions for various bearings, divided into high-bay and fully automated small parts storage sections.

The center features a fully automated yard equipped with parking spaces, scales, barriers, and state-of-the-art RFID technology.





SAP Yard Logistics provides full visibility of yard processes, including slot planning and truck weighing, enhancing operational efficiency.

Detailed reporting capabilities help identify improvement areas such as transit times and dock appointment scheduling, facilitated by SAP Fiori technology.

A load securing app allows for documentation of loading operations, ensuring compliance with legal requirements and secure transport.

Automation of yard processes through integration with hardware and RFID sensors streamlines operations and increases efficiency.

Integration with SAP EWM establishes seamless process flow, ensuring that yard processes align with warehouse planning updates automatically.

By leveraging SAP Yard Logistics and integrating it with existing systems, Schaeffler has achieved a highly efficient and synchronized logistics ecosystem at its distribution center in Kitzingen, setting a precedent for future advancements in logistics management.

#### **4 Conclusion**

The exploration of SAP Yard Logistics within the context of optimizing yard operations has revealed a comprehensive landscape of benefits, deployment options, integration possibilities, and real-world implementations. From its pivotal role in revolutionizing logistics operations to its seamless integration with existing SAP solutions such as ERP, TM, and EWM, SAP Yard Logistics emerges as a game-changer in the logistics industry.

Through examples like Schaeffler's implementation at its European distribution center, we witness the tangible impact of SAP Yard Logistics in enhancing visibility, automating processes, and driving operational efficiency. From streamlining yard processes and reducing waiting times to ensuring legal compliance and facilitating real-time asset tracking, SAP Yard Logistics offers a holistic solution for modern logistics challenges.

The varied deployment options, whether standalone or embedded, provide organizations with flexibility tailored to their specific needs. Furthermore, integration with SAP ERP, SAP TM, and SAP EWM enables seamless data flow and process synchronization, empowering organizations to achieve operational harmony and efficiency across their logistics ecosystem.

As the logistics landscape continues to evolve, SAP Yard Logistics stands as a beacon of innovation, offering organizations the tools they need to stay ahead of the curve. By embracing SAP Yard Logistics, businesses can optimize their yard operations, drive efficiency, and ultimately deliver enhanced value to their customers in today's competitive market environment.

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