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Efficient Labor (Workforce) Management - Harnessing SAP EWM's Built-in Tools

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ABSTRACT

Managing a warehouse revolves around efficient organization, ensuring that products are allocated to spots that best suit their attributes. Retrieving products promptly and safely when customer orders are received is a fundamental aspect of warehouse operations. Many companies turn to specialized software like SAP Warehouse Management or Extended Warehouse Management (EWM) for seamless task execution tailored to diverse warehouse needs.

Human involvement is crucial in tasks such as unloading trucks, deconsolidating cargo, and placing products in the warehouse. Whether aided by machines or not, personnel are responsible for picking, kitting, packing, and shipping items. Traditional warehouse management software has often overlooked resource planning, but recent challenges, especially during pandemic-induced understaffing, have underscored the importance of efficient employee planning for smooth operations.

Beyond planning, motivating and appropriately rewarding warehouse staff is essential for fostering a positive working environment and ensuring continuity. Implementing a fair and objective grading system enhances overall dynamics and boosts the effectiveness of performance reviews.

While Labor Management (LM) in SAP EWM addresses these challenges, it remains underutilized. However, I firmly believe it can be an asset for warehouse management. This paper delves into the history of LM in SAP EWM, highlights key functionalities, and outlines the system configuration.

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Introduction

A labor management system (LMS), also known as a workforce management (WFM) system, is a software application specifically designed for managing employee records, monitoring time and attendance, and creating work shift schedules. These systems vary in complexity, ranging from basic functionalities like clocking in and out at scheduled times to more advanced features such as fully automated schedule creation and enforcement. They serve as a modern alternative to traditional methods such as pen-and-paper time tracking, printed schedules, and Excel-based approaches.

Modern labor management systems go beyond mere time tracking; they provide data-driven insights that empower managers to make informed decisions regarding their workforce. This, in turn, leads to reduced labor costs and improved employee productivity. Utilizing artificial intelligence and machine learning, contemporary LMS enables employers to track key performance indicators (KPIs), ensure compliance with labor laws, and forecast labor demand.

Labor management systems come equipped with a range of features catering to businesses of various sizes and industries. While specific functionalities may differ, there are common features shared by most systems, including:

Time and attendance management
Scheduling
Payroll integration
Reporting
Basic analytics

These fundamental features form the core capabilities of labor management systems, providing comprehensive support for workforce administration and optimization.

SAP Extended Warehouse Management (EWM) serves as a robust solution for the effective management of warehouse inventory and facilitates the streamlined processing of goods movement. This system empowers companies to exert control over both inbound and outbound warehouse processes, ensuring the seamless flow of goods within the warehouse. SAP EWM plays a pivotal role in orchestrating all goods movements through a warehouse management system, providing comprehensive tools for monitoring warehouse activities. Beyond basic inventory control, SAP EWM encompasses a range of additional warehouse functions, including the creation of serial numbers, batch numbers, vendor management inventory, resource optimization, value-added services, Quality Inspection and Built in Labor Management [1]. This system not only monitors the quantity of goods within

the warehouse but also efficiently manages critical functions, ultimately enhancing the delivery of goods.

In SAP Extended Warehouse Management (EWM), effective labor management revolves around the strategic coordination and optimization of labor resources within warehouse or distribution center operations. SAP EWM offers a comprehensive suite of tools and functionalities dedicated to managing various aspects of labor processes. This includes labor demand forecasting, task assignment, real-time performance monitoring, and labor cost analysis. By leveraging these capabilities, organizations can precisely estimate labor requirements, assign tasks based on skills and availability, monitor workforce productivity in real time, and analyze labor-related costs to inform decision-making. Utilizing SAP EWM for labor management enables businesses to streamline warehouse operations, enhance workforce productivity, and ultimately improve operational efficiency and cost-effectiveness.

Key Components and Functionalities of SAP EWM for Labor Management

Workforce Planning

SAP EWM facilitates planning and allocating the appropriate amount of labor resources to different tasks and areas within the warehouse. The platform, combined with a labor analytics dashboard, provides powerful tools for workforce planning and capacity management [2].

Task Assignment

Allocate tasks to individual workers or groups based on their skills, availability, and location. This functionality ensures that the right individuals are assigned to the right tasks at optimal times [2].

Shift Management

Shift management in SAP EWM allows organizations to define and manage different shifts within warehouse operations. This feature assists in scheduling and tracking work hours, ensuring efficient task completion while adhering to labor laws and regulations [2].

Labor Standards

Establish benchmarks for different warehouse activities, such as picking, packing, and shipping. These standards serve as metrics for measuring worker productivity and efficiency, enabling the identification of bottlenecks and resolution of productivity-affecting issues. The Business Rule Framework Plus (BRFplus) tool in SAP can be utilized to define and manage engineered labor standards, linking predefined labor time or performance metrics to specific tasks or processes [2].

Labor Management Cost Calculation

By tracking labor hours and performance, organizations can manage labor costs more effectively and allocate resources efficiently, ultimately reducing operational expenses [2].

Indirect Labor Tasks

Manage tasks not directly involved in the physical movement of goods but crucial for overall warehouse efficiency. These tasks typically relate to administrative, supervisory, or support functions [3].

Time and Attendance

Crucial for accurately tracking the hours worked by warehouse employees, ensuring compliance with labor regulations, and optimizing workforce productivity. SAP EWM's labor management feature plays a pivotal role in time and attendance management [2].

In summary, SAP EWM's labor management functionalities contribute to strategic workforce planning, efficient task allocation, adherence to labor standards, and effective cost management, enhancing the overall performance of warehouse operations.

Literature

Labor costs reportedly account for up to 60% of total expenses in numerous production and distribution facilities. This substantial increase underscores the importance for businesses to prioritize the implementation of labor management systems (LMS) to optimize returns from their operations.

In essence, an LMS oversees the day-to-day human labor activities within an industrial setting. It consolidates employee data, establishes benchmarks, and evaluates overall productivity in conjunction with costs. These systems offer a range of features, including visibility and reporting tools, and can be tailored to suit various types of businesses.

Ideally, a Warehouse LMS is designed to support and monitor labor productivity within your facility, tracking labor units (workers), inventory, equipment usage, and more. The resulting data allows operations managers or HR staff to analyze outputs, productivity levels, and identify bottlenecks.

So, what does it do?

It extracts data from your Warehouse Management system and other sources, restructuring it in the system for simplified reporting and visualization.

The LMS establishes standards or benchmarks for employee performance, utilizing them to assess their outputs. Supervisory teams can set these standards through observation or rely on existing data-based systems to determine current output levels and select a higher ideal level. With this data in the system, staff can compare actual worker performances to gauge overall productivity. When integrated with the warehouse labor management system, it can predict the required number of workers for a specific time or task.

Labor Management in SAP EWM

The incorporation of labor management into EWM was initiated in version SCM 5.1. Although relatively recent in EWM, labor management has already gained a foothold with certain warehouse vendors. Manhattan Associates, a prominent WM vendor, emphasizes the significance of labor in warehouse operations, citing it as approximately 55% of the total operational costs [3]. Despite being a substantial cost, labor is considered highly manageable through Labor Management, which entails maintaining a database of standards for key tasks. Real-time monitoring of associates' actual task completion times allows for immediate performance feedback at all organizational levels. It's worth noting that, in practice, labor costs might be expected to constitute a higher percentage of total warehouse costs, especially considering the relatively low wages often paid to warehouse workers. However, due to practices such as union busting, companies may keep labor expenses lower than expected.

Labor management, as a software category, extends beyond warehousing applications [3]. For example, Manhattan Associates showcases how their software can effectively manage a workforce in a restaurant setting. Exploring such demos can provide a quick overview of the diverse functionalities offered by labor management software.

The scope of labor management within EWM is currently more confined when compared to specialized vendors that exclusively focus on labor management. These vendors provide advanced functionalities, including detailed scheduling and skill matching. In contrast, EWM's labor management primarily centers around bolstering control over employee activities within the warehouse and pinpointing periods of low productivity.

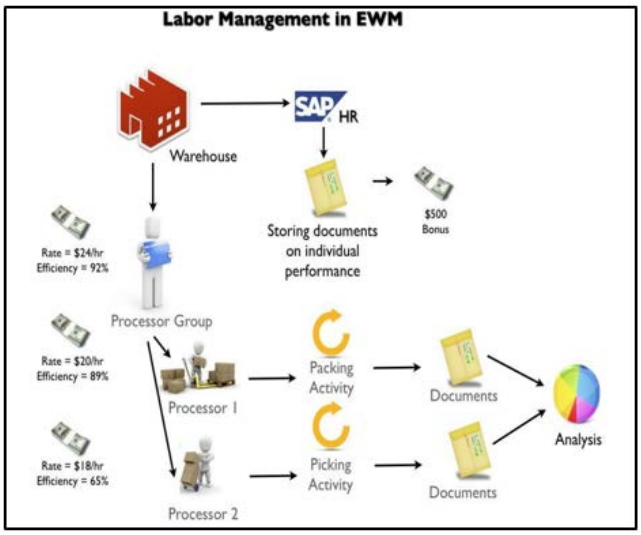


Image Source [3].

Labor Management Architecture (Configuration) in SAP EWM

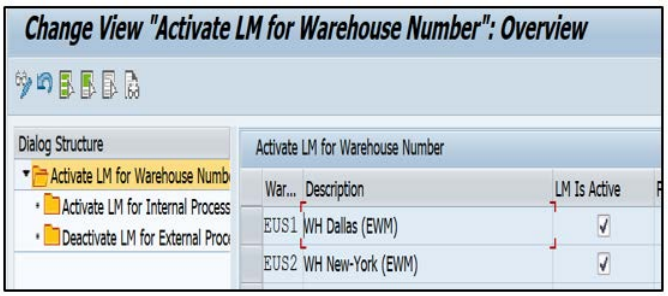
Activating Labor Management

You have the flexibility to enable Labor Management either at the initiation of an Extended Warehouse Management implementation or in a warehouse already utilizing Extended Warehouse Management. Once activated, Labor Management empowers you to strategically plan, monitor, and gauge labor times for various processes, including:

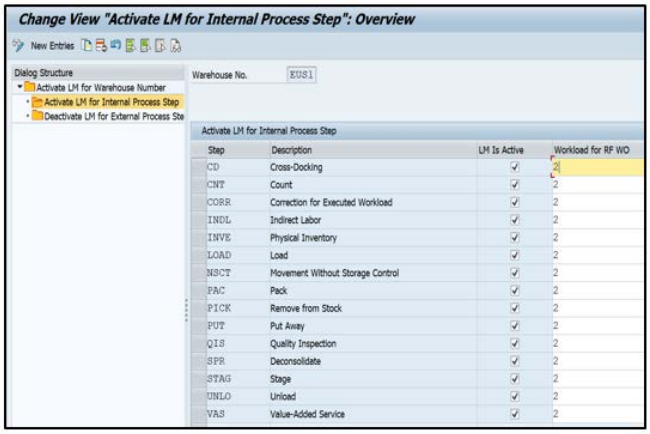
Warehouse order processing
Physical inventory
VAS (Value-Added Services) order processing
Receiving handling units (HU) from vendors or from production using radio frequency (RF)
Indirect labor tasks

Customizing Path

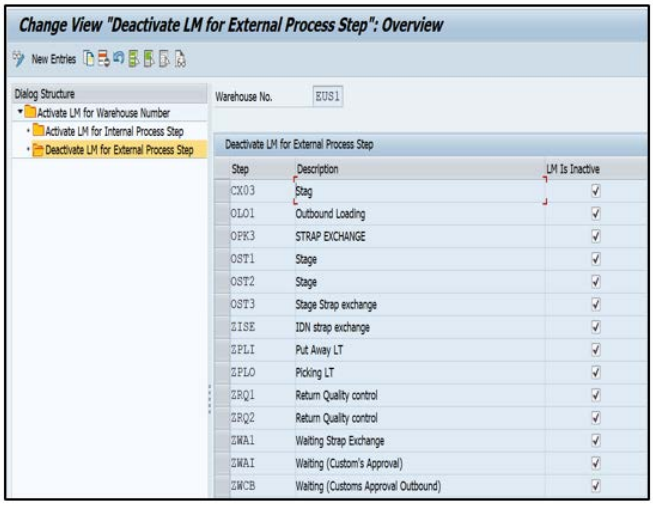
SPRO - SCM Extended Warehouse Management Labor - Management - Extended Warehouse Management - Activate Labor Management



Activate Labor Management for Internal steps



De-activating Labor Management for External process Steps



When Labor Management is activated for a specific warehouse number and external process steps, certain functions exhibit distinct behavior compared to an EWM system without Labor Management activation. If the original document is relevant to Labor Management, the system automatically generates workload documents for both planned and executed workload. The impact of activation varies depending on whether the data entry occurs in a radio frequency (RF) environment or on the desktop.

In the RF environment, the system autonomously determines the times. In work centers, the system either automatically sets the processor, start and end times, or you manually input the data. In desktop applications used for posting work done by processors, you manually input the processor, start and end times. It is advisable to utilize RF transactions instead of desktop applications for more effective and streamlined processes.

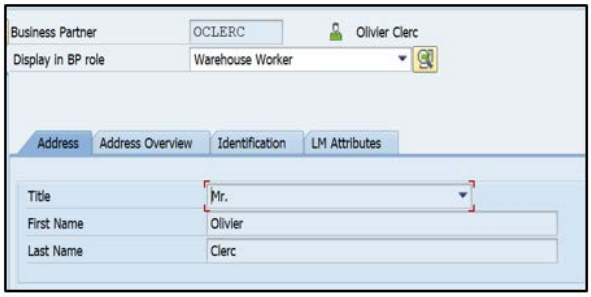
Master Data Setup

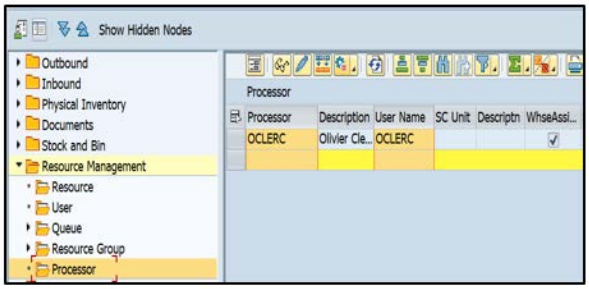
Labor Management in EWM relies on master data defined within the system, including processors, processor groups, team leads, and shifts. While using processors is mandatory, the utilization of processor groups, team leads, and shifts is optional.

Processors play a crucial role in all warehouse processes where Labor Management is activated.
To create a processor, follow these steps using the Easing access menu:
SAP menu → Logistics → SCM Extended Warehouse Management

→ Extended Warehouse Management → Master Data → Resource Management → Create processor.

It's important to note that with S4 Hana EWM, there has been a change in the description of Processor Role LM001, now referred to as "warehouse worker". Additionally, the SAP user assignment to a processor should be added via the warehouse monitor in S4 Hana EWM. In earlier EWM versions, users could be directly assigned while creating processors using the above menu path.

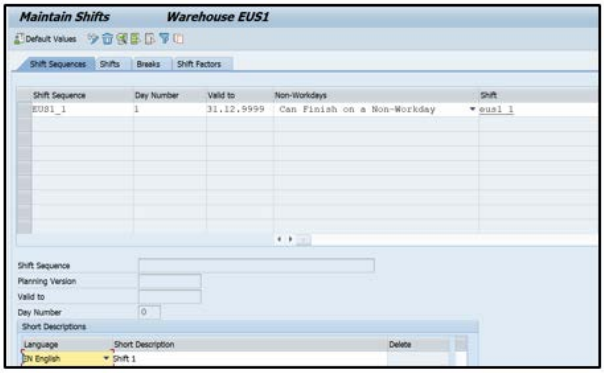




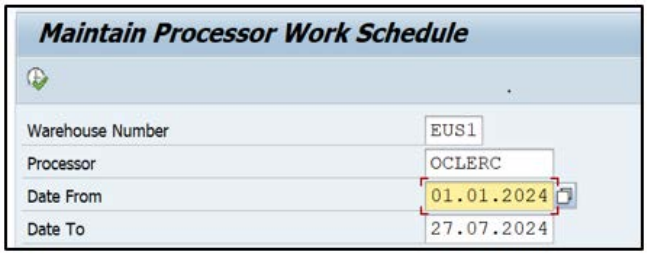
Shift management serves as a valuable tool for planning employee work schedules by centrally defining shifts and shift sequences. This approach streamlines the process of determining employee capacity by establishing structured work schedules. Within this framework, shifts are used to delineate the working hours for processors within a warehouse.

Key features of shift management include the ability to assign breaks and a shift factor to each shift. Breaks and the shift factor play a crucial role in adjusting the overall productive working time of the shift, contributing to a more accurate representation of available workforce capacity. This centralized approach to defining shifts enhances efficiency in workforce planning and management within a warehouse setting.

Create shifts using Easy access menu path - SCM Extended Warehouse Management - Extended Warehouse Management - Master Data - Shift Management - Maintain Shifts



Create work schedule for processor in the transaction – /SCWM/SHIFT_WS



The processor's work schedule encompasses scheduled working times, breaks, and the total productive time. This schedule is adjustable to accommodate changes in working hours, overtime, or absences. However, it's essential to note that before modifying the work schedule for a processor, a prerequisite is to assign the processor to a specific shift within the warehouse. This ensures that the work schedule aligns with the assigned shift and reflects accurate information regarding the processor's availability and expected work hours.

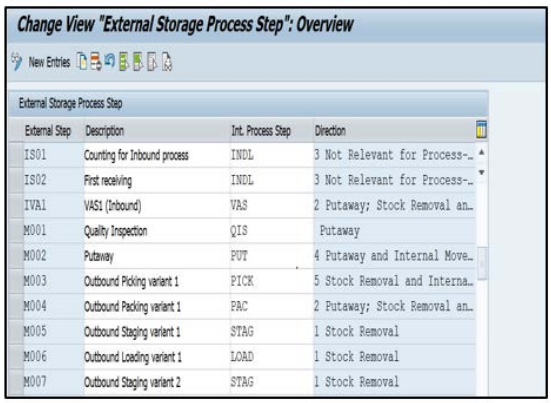
Labor Activities and Duration

A labor activity refers to a series of tasks conducted within a warehouse, varying in complexity from relatively simple activities like changing a battery to more intricate processes such as picking a product, packing it, and transporting it to the loading zone. Notably, labor activities operate independently of external process steps, offering a more detailed classification of work.

While external process steps, like the general "PICK" step, provide a broad categorization for all picking tasks, labor activities allow for a finer level of distinction. For instance, different labor activities can be defined to differentiate between picking in various activity areas or distinguish between case picking and pallet picking. It's worth mentioning that if labor activities are not utilized, external process steps can serve as an alternative.

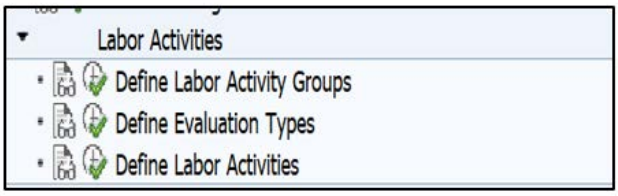
Steps to Setup warehouse for labor activities as follows:

Define external process steps as below (example),

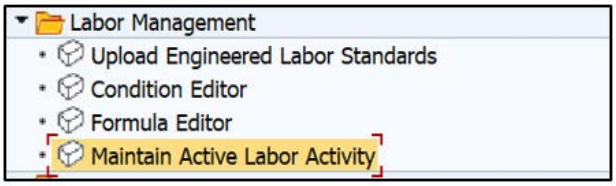


To activate Labor Management for a specific warehouse number and internal process steps and to configure labor activity groups, evaluation types, and labor activities, follow these steps in Customizing (SPRO IMG - SCM Extended Warehouse Management - Extended Warehouse Management - Labor Management - Labor Activities):

Activate LM for Warehouse Number
Activate Labor Management for Internal Process
Define Labor Activity Groups
Define Evaluation Types
Define Labor Activities



And activate labor activities from the catalog for use in your warehouse using the EAM path - Extended Warehouse Management - Settings - Labor Management - Maintain Active Labor Activity.



By following these steps, you can configure and activate Labor Management for the specified warehouse number and internal process steps, and define the necessary labor activity groups, evaluation types, and labor activities.

In EWM, the normal duration time has two key technical counterparts:
Planned Duration
The planned duration represents the anticipated time, measured in hours and minutes, required to complete an activity. This duration is calculated when the system generates the planned workload. It serves as an initial estimate of the time needed to perform the task.

Adjusted Planned Duration
The adjusted planned duration reflects the time required for an activity once the related document, such as a warehouse order, has been confirmed. This confirmation identifies the executing resource. The adjusted planned duration is computed when the system generates the executed workload. It provides a refined estimate based on the known resource.

The normal time, or engineered labor standards, is calculated twice in the process:
The result of the engineered labor standards, known as normal time, is stored as the planned duration in the planned workload.

The same result is stored as the adjusted planned duration in the executed workload after the related document is confirmed, and the executing resource is identified.

Furthermore, the standard time is determined by multiplying the normal time (adjusted planned duration) by the PFD (Performance Factor Distribution) factor and then adding the PFD allowance. The resultant standard time is stored as the adjusted planned duration in the executed workload. This process helps refine the estimated time based on performance factors and allowances.

Planning
The system employs this function for each external process step and activity area to automatically generate a document for the planned workload. This document serves as a foundation for resource planning, providing a basis for strategic decision-making. Each task within the warehouse is associated with a specific workload, and planning is feasible only when the task's scope is fixed. This typically occurs when a warehouse order containing various tasks has been created.

The information encapsulated within the planned workload document is invaluable for making informed decisions. For instance, it allows for the strategic planning of resources by utilizing the total of all planned activities within a particular activity area on a given day. This enables the effective planning of the workforce for that day within the specified activity area.

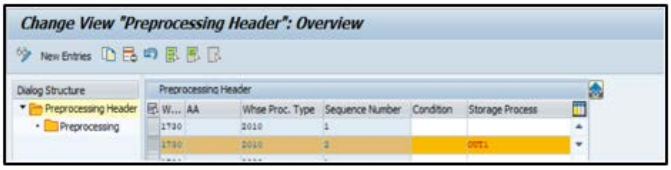
Key data within the planned workload document relevant to Labor Management includes:
Activity area
Activity (external process step)
Quantity (optional)
Planned duration calculated using engineered labor standards
Planned end date
Travel distance (if defined)
Capacity data such as weight or volume
Labor activity, labor activity group, and evaluation type

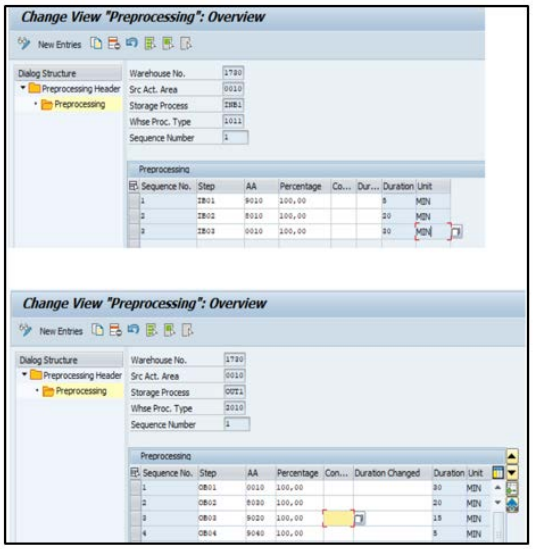
Upon completion of the planned work, the system transfers pertinent information to the executed workload document and subsequently removes the planned workload document from the system. This seamless transition ensures that the executed workload document captures the actual data and outcomes of the completed tasks

Preprocessing is an integral part of the Planning and Simulation function, providing an overview of the workload expected at a specific time for inbound and outbound deliveries, as well as in the context of physical inventory, particularly for Cycle Counting. Importantly, this determination occurs in advance of execution, prior to the creation of warehouse tasks and orders for delivery items or cycle-counting documents.

The results obtained from preprocessing are valuable for planning purposes, offering insights into the workload distribution before the actual execution phase. This information can be utilized, for example, in the strategic planning of employees for specific activity areas and process steps. During the planning phase, you set planning goals for your process steps using the formula editor. It is essential to note that the outcome of preprocessing is exclusively utilized for planning purposes and does not impact the actual execution of tasks. This allows for informed decision-making and resource allocation without affecting the real-time execution of warehouse operations.

Preprocessing is setup in EWM below path: SPRO – SCM EWM – EWM –
Labor Management - Set Preprocessing





Execution

Labor Management provides the capability to record execution information, including the actual duration of labor tasks and additional details such as indirect labor, time events (such as clock-in and clock-out), and time and attendance. The recording of this information can be done through various methods:

Time and Attendance

Used to store and display time events, such as clock-in and clock-out.

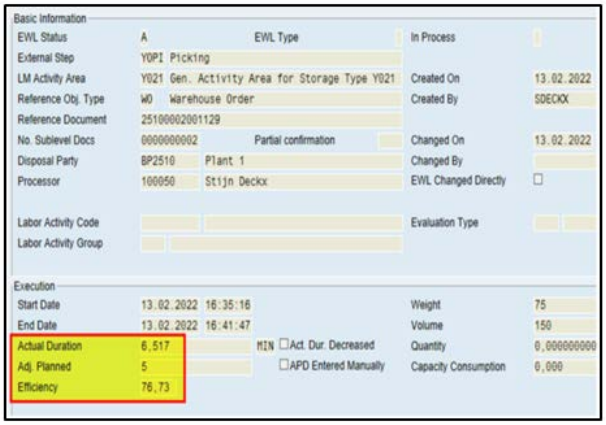
Executed Workload

Utilized to record both direct and indirect labor. For direct labor, the system automatically generates executed workloads when a Labor Management-relevant document, like a warehouse order, is successfully completed. For indirect labor, executed workloads can be created manually or through, indirect labor task documents.

Indirect Labor Tasks

Employed for Planning and Executing Indirect Labor

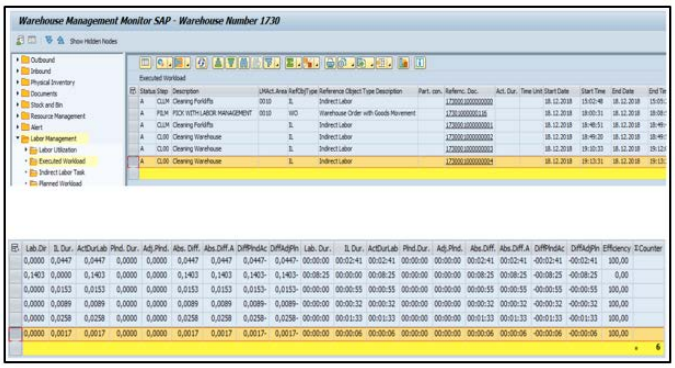
Once the planned workload is completed using a scanner, the planned workload document is replaced by a new document, the Executed Workload. This document includes critical information such as the adjusted planned duration, the actual duration, and efficiency—a derivation from the first two values. The efficiency percentage indicates how closely the work was executed compared to the planned duration. For instance, an efficiency of 76.73% suggests that the work was executed slightly slower than initially planned.



Reporting and Analysis Tools

These tools are designed to assist you in analyzing your business rules and Labor Management outcomes effectively. Specifically, the warehouse management monitor serves as a valuable tool for accessing and viewing Labor-Management-relevant data, such as the executed workload. This feature provides a comprehensive platform for monitoring and analyzing critical information related to labor activities within your warehouse operations.

Example below

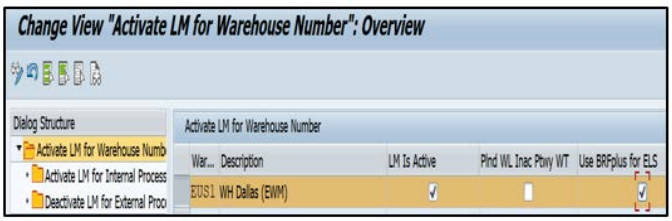


To provide you with an in-depth understanding of the data associated with EWLs, executed workload analysis makes use of aggregated data. You can retrace how the data was determined and calculated per executed workload if you use BRFplus for your engineered labor standards (ELS).

Pre-Requisites

Activate Labor Management,
Activate Trace in BRFplus,

Activate BRFplus for ELS while activating Labour management [1-4].



Benefits of Implementing Labor Management in SAP EWM Built-in Functionality

Labor Management is an integral component of the 'advanced' version of SAP EWM, utilizing the objects and concepts inherent in everyday EWM processes. In addition to the standard setup, configuring master data is crucial. Warehouse workers must be registered as business partners, and the system allows the maintenance of Engineered Labor Standards, offering time estimations for each step in the process [4].

Advanced Planning
Labor Management addresses the key challenge of planning, catering to both long- and short-term requirements. Long-term planning employs 'preprocessing' to estimate future workloads based on incoming and outgoing deliveries or cycle counts. Short-term planning utilizes more detailed information on specific warehouse tasks, creating a planned workload [4].

Execution and Reporting
Beyond planning, Labor Management proves invaluable post-completion of tasks. Its simplicity shines when evaluating work efficiency. Whether comparing planned duration with actual time spent or calculating a planned duration that considers resource speed for tasks like picking, no additional configuration work is necessary [4].

Built-in Shift Management
SAP LM includes a built-in solution for workforce scheduling with Shift Management and Time & Attendance modules. Users design a general schedule, incorporating specific shift patterns, start times, end times, and breaks, and then assign these patterns to warehouse workers [4].

Flexibility
Labor Management provides a high degree of customization when recording metrics. Users can tailor the scope by utilizing formulas and conditions. For instance, tracking only high-priority warehouse processes or high-value goods is possible. Additionally, indirect labor tasks, such as meeting or cleaning, crucial for warehouse functionality, can be registered and managed. This flexibility ensures that all tasks contributing to smooth warehouse operations are acknowledged and recorded [4].

Conclusion
Utilizing labor management in SAP EWM on S/4HANA can bring several benefits to businesses including,

Streamlined Warehouse Operations
Labor management in SAP EWM helps streamline warehouse operations by optimizing the allocation of labor resources. Efficient planning and task assignment ensure that the right personnel are engaged in the right activities, reducing bottlenecks, and enhancing overall workflow.

Enhanced Workforce Productivity
The system empowers organizations to accurately estimate labor requirements, allocate tasks based on skills and availability, and monitor workforce productivity in real time. This leads to improved efficiency, as tasks are executed with greater precision and timeliness.

Improved Operational Efficiency
Labor management in SAP EWM contributes to overall operational efficiency by providing tools for workforce planning, task assignment, and real-time performance monitoring. This enables businesses to make informed decisions, adapt quickly to changing demands, and maintain a smooth workflow.

Cost-Effectiveness
Accurate labor demand forecasting and the ability to analyze labor-related costs enable businesses to allocate resources more efficiently. This, in turn, contributes to cost-effectiveness as labor is utilized optimally, reducing unnecessary expenses.

During periods of elevated labor costs, a Labor Management tool proves invaluable for warehouse managers seeking to streamline workload planning and resource allocation. The Labor Management functionality embedded in SAP EWM serves as a powerful tool for enhancing warehouse productivity through efficient resource planning. This feature encompasses a diverse set of capabilities, facilitating the scheduling of warehouse activities and providing robust tools for tracking resource performance.

SAP EWM organizes all necessary information in a structured manner, simplifying the decision-making process for managers. The system allows for the easy monitoring of self-defined Key Performance Indicators (KPIs), enabling swift identification of negative trends. This timely insight empowers managers to implement prompt recovery plans. The combined functionalities of SAP EWM's Labor Management contribute to making the warehouse manager's daily responsibilities more manageable and efficient, ultimately serving as an essential tool for optimizing warehouse operations.

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