

KDD032 - Resource Scheduling for Enterprise Asset Management

Status	Approved
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Issue

This Key Decision Document (KDD) serves as a guide outlining critical decisions, considerations and recommendations essential to the implementation and management of a Resource Scheduling solution to best support business process and incorporate the new functionalities S/4HANA will bring to Syensqo. It aims to clarify the rationale behind exploring and evaluating the following S/4HANA Maintenance Resource Scheduling in comparison to a 3rd party specialized application (TBD in detail design if recommended). This evaluation will help Syensqo select the most effective and future-proof solution, ensuring seamless integration and user experience.

Key areas covered in this document include:

- Benefits and drawbacks of each solution, including factors such as efficiency, accuracy, safety and compliance
- Overview & Background
- Design Options
- Evaluation
- Recommendation
- Business & Project Impacts

Overall, the purpose and structure of the KDD ensure clarity, transparency and accountability throughout the process of adopting and utilising Resource Scheduling for EAM within Syensqo.

Recommendation

Based on a thorough evaluation, it is recommended that Syensqo proceed with the implementation of **Option A: SAP S/4HANA Asset Management for Resource Scheduling (RSH)**. This recommendation is based on several key factors including its seamless integration capabilities and advanced scheduling features.

SAP S/4HANA Asset Management for Resource Scheduling offers a fully integrated platform within the S/4HANA environment eliminating the need for complex data replication or additional interfaces. This integration is essential for maintaining data integrity and minimizing errors. RSH delivers advanced functionalities such as real-time resource monitoring, dynamic scheduling and execution management all closely integrated into the Phase Model Process. These features enable Syensqo to optimize resource utilization, reduce downtime and improve maintenance efficiency. The ability to adjust schedules in real time based on current data and conditions is particularly valuable for addressing unexpected situations.

A significant advantage of SAP S/4HANA RSH is its Asset Scheduling capabilities. This feature allows for effective resource allocation across multiple assets and tasks ensuring that maintenance activities are planned and executed in alignment with operational requirements. Furthermore, the integration with other Fiori apps provides a cohesive user experience allowing users to navigate seamlessly between related tasks and leverage real-time data. This integration enhances workflow efficiency and supports informed decision-making by providing up-to-date information in a unified interface.

While **Option B: Prometheus Web Scheduler** presents a strong alternative with its intuitive web-based interface and scheduling capabilities. It is noted that both options share similarities particularly in their real-time updates, advanced scheduling features and SAP integration. Also since Syensqo is currently using an older version of the Prometheus scheduler transitioning to the latest Web Scheduler may bring several benefits including reduced change management and training time, reducing the learning curve could also contribute to higher user uptake and more effective utilization of the scheduling tools. However, the deeper integration of RSH within the S/4HANA ecosystem makes it a more strategic fit for Syensqo's long-term goals.

In conclusion, **Option A** and **Option B** are closely aligned in terms of their capabilities particularly regarding real-time scheduling and SAP integration. However, SAP S/4HANA for Resource Scheduling is the optimal choice for Syensqo offering a comprehensive, integrated and future-proof solution. Its alignment with the company's business processes and strategic objectives positions Syensqo for long-term success in efficient resource management and maintenance operations.

Background & Context

Syensqo is currently operating on the SAP ECC platform for its maintenance management processes specifically using the Prometheus Graphical Work Order Scheduler (GWOS) for resource scheduling. As Syensqo transition to S/4HANA, there is an opportunity to evaluate the continuation of the current embedded third-party scheduling tool or transition to the native S/4HANA Asset Management for Resource Scheduling module.

As-Is Summary

Syensqo SAP ECC clients (WP1 & PF1) currently use Prometheus GWOS for resource scheduling. GWOS is a specialized third-party tool that provides advanced graphical work order scheduling capabilities. It operates as an add-on to the SAP ECC system.

Opportunities

The latest scheduling applications offers algorithms for enhanced resource allocation ensuring optimal availability of resources at the right time. They can integrate advanced scheduling capabilities with predictive maintenance features improving planning and reducing unplanned downtime. Real-time data integration allows for immediate schedule adjustments in response to changing conditions or emergencies. Additionally, modern scheduling applications feature intuitive, user-friendly interfaces that enhance user experience. Integration with mobile solutions enables maintenance staff to access schedules and update work orders on the go, increasing flexibility and responsiveness.

Assumptions

Integration:

- S/4HANA Asset Management for Resource Scheduling module will integrate seamlessly with S/4HANA EAM module eliminating the need for additional interfaces or data replication.
- Integration with SAP SuccessFactors Employee Central is necessary for the S/4HANA RSH to synchronize employee data, including availability, skills, qualifications, and work schedules.

Mobility: The mobile application selected in [KDD016 - Mobility Solution Direction for Enterprise Asset Management](#) will be fully compatible with the SAP S/4HANA Asset Management for Resource Scheduling module ensuring seamless integration and data synchronization between the two systems.

Dynamic Scheduling: The data and parameters required for dynamic scheduling will be readily available for S/4HANA RSH enabling it to operate efficiently and effectively.

Data Migration: The transition to SAP S/4HANA Asset Management for Resource Scheduling (RSH) will require the migration of existing data including personnel which will need to be restructured as Business Partners within the S/4HANA. This restructuring may also extend to other modules to support processes such as expense reimbursement.

Constraints

Data Accuracy: The effectiveness of scheduling relies heavily on the accuracy and completeness of the data entered.

Customisation Limitation: While SAP S/4HANA RSH offers extensive functionalities, there may be limitations in customisation compared to third-party specialised applications potentially impacting specific use cases or requirements.

Impacts

Data Migration: The transition to SAP S/4HANA Asset Management for Resource Scheduling (RSH) will require the migration of existing data including personnel which will need to be restructured as Business Partners within the S/4HANA.

Integration: It is required to integrate the S/4HANA RSH with SAP SuccessFactors Employee Central to synchronize employee data such as availability, skills, qualifications and work schedules. This integration will facilitate accurate scheduling and resource allocation by providing up-to-date information.

SAP Modules: Interaction with the Production Planning (PP) module providing visibility into asset downtime and aligning maintenance schedules with production plans. This functionality will depend on whether we use detailed scheduling in S/4HANA or Kinaxis. The direction taken in [KDD - MNF02_Planning Systems](#) will determine our approach.

Licensing: A separate license for the RSH module will be required based on the number of resources.

User Training: Training will be required for users to adapt to the new scheduling application and business processes. This training will need to cover several key areas to ensure a smooth transition and effective utilization of SAP S/4HANA Asset Management for Resource Scheduling.

Business Rules

Defined requirements and further updates will be determined during the detailed design phase.

Options considered

Option A: S/4HANA for Asset Management for Resource Scheduling (RSH)

SAP S/4HANA for Asset Management for Resource Scheduling (RSH) is a solution designed to optimize the scheduling and management of maintenance resources. It is a part of the broader SAP S/4HANA suite offering a range of functionalities to enhance maintenance planning and execution, improve asset utilization and ensure the effective use of personnel and materials.

Key Features:

Real-Time Resource Availability and Capacity Management:

- Resource Monitoring: Provides real-time visibility into the availability of maintenance resources such as personnel, tools and equipment. It helps in tracking the current status of resources including their availability and workloads to prevent overbooking or underutilization.
- Capacity Planning: Supports detailed capacity planning allowing for accurate forecasting of resource needs based on upcoming maintenance schedules and workloads. It aids in balancing workloads and managing resource constraints effectively.

Advanced Scheduling and Optimization:

- Dynamic Scheduling: Utilises advanced algorithms for dynamic scheduling adjusting maintenance plans based on real-time data, resource availability, task priority and equipment downtime windows. This ensures optimal use of resources and timely task completion.
- Scenario Planning and Simulation: Allows for scenario planning and simulation enabling maintenance planners to model different scheduling scenarios and assess their potential impacts. This feature is crucial for evaluating various options and choosing the most efficient and cost-effective scheduling strategy.
- Asset Scheduling: Specifically supports the scheduling of maintenance tasks for assets ensuring that equipment maintenance is planned and executed in alignment with operational requirements and asset criticality. This helps in optimising asset uptime and performance.

Real-Time Schedule Updates and Execution Management:

- Real-Time Adjustments: The system allows for real-time updates to maintenance schedules based on changing conditions such as resource availability, emergency work orders or operational shifts. This feature ensures that schedules remain flexible and responsive to unexpected events.
- Execution Monitoring: Provides tools for monitoring the execution of maintenance tasks in real-time allowing supervisors to track progress, identify delays and make necessary adjustments. This helps in maintaining adherence to schedules and minimising disruptions.
- Notification and Alerts: RSH can send notifications and alerts to relevant personnel when changes occur such as new work orders or resource reassignments. This ensures that all stakeholders are informed and can respond promptly to changes.
- Integration with Mobile Solutions: Maintenance staff can receive real-time updates on their mobile devices including new task assignments, schedule changes and work order details. This enhances communication and coordination ensuring that all team members are aligned with the latest plan.

Integration into SAP Enterprise Asset Management (EAM):

- Integrated Business Processes: RSH's tight integration into SAP EAM is a significant advantage as it ensures that all maintenance-related processes are streamlined and fully aligned with broader business operations. This integration enhances the efficiency and effectiveness of maintenance activities by providing a unified platform for managing assets and resources.
- No Data Replication Required: Unlike third-party solutions that may require data replication, RSH operates directly within SAP S/4HANA. This eliminates the need for data duplication, reducing the risk of data inconsistencies and simplifying data management.
- Business Process Focused: The integration with SAP EAM ensures that maintenance resource scheduling is closely aligned with overall business processes. This alignment helps in achieving strategic objectives, such as reducing downtime, optimizing maintenance costs and enhancing asset reliability.

Analytics and Reporting:

- Performance Dashboards: Includes robust analytics and reporting tools offering dashboards and reports on key performance indicators (KPIs) such as resource utilization, task completion rates and maintenance costs. These insights are crucial for performance monitoring and continuous improvement.

SAP S/4HANA for Asset Management for Resource Scheduling (RSH) is a comprehensive solution designed to optimize maintenance operations through advanced scheduling, real-time resource management and execution monitoring. Its capabilities in dynamic scheduling, real-time adjustments and detailed work order management ensure efficient resource utilization and high-quality maintenance execution. Its integration with mobile solutions, analytics and cost management features further enhances its value making it an essential tool for organizations aiming to improve maintenance efficiency, reduce costs and ensure asset reliability.

Option B: Prometheus Web Scheduler

Description: Description: Prometheus Web Scheduler is a modern, web-based scheduling tool designed to complement SAP systems, including S/4HANA. As a successor to the Prometheus GWOS, this tool offers enhanced functionalities and an updated interface, focusing on ease of use and integration with SAP's latest offerings. Prometheus Web Scheduler continues the legacy of providing robust graphical work order scheduling capabilities with added features to support modern maintenance management needs.

Enhanced Web Interface:

- Intuitive and Responsive Design: The Prometheus Web Scheduler offers a modern, user-friendly interface that is easy to navigate, reducing the learning curve for new users. The design is responsive, meaning it adapts to various screen sizes, making it accessible on desktops, laptops, tablets and even smartphones. This flexibility allows maintenance planners and schedulers to manage work orders and resources from anywhere, providing greater mobility and efficiency in maintenance operations.
- Real-Time Collaboration: The web-based nature of the scheduler enables real-time collaboration among team members. Multiple users can view and edit schedules simultaneously, ensuring that everyone is working with the most up-to-date information. This feature is particularly useful in fast-paced environments where maintenance plans can change rapidly.

Seamless Integration with S/4HANA:

- Native SAP Integration: The Prometheus Web Scheduler is designed to integrate seamlessly with SAP S/4HANA, leveraging the existing SAP data structure and workflows.
- Real-Time Data Synchronization: Changes made in the Prometheus Web Scheduler are immediately reflected in S/4HANA and vice versa. This real-time synchronization ensures that all stakeholders have access to the latest information, reducing the risk of errors and miscommunication.
- SAP Fiori Integration: The scheduler can be integrated with SAP Fiori, providing a consistent user experience across all SAP applications. This integration allows users to access the scheduler through their existing SAP Fiori launchpad, streamlining the user experience and reducing the need for additional training.

Advanced Scheduling Capabilities:

- Drag-and-Drop Functionality: The scheduler's drag-and-drop interface allows users to easily assign resources, adjust timelines and manage work orders. This feature simplifies the scheduling process, enabling users to make quick adjustments.
- Automated Scheduling Rules: Users can define automated scheduling rules based on specific criteria such as resource availability, work order priority, or maintenance events. These rules ensure that the scheduler optimizes resource allocation and minimizes conflicts.
- Real-Time Updates: The scheduler provides real-time updates on resource status, work order progress and schedule changes. This feature allows maintenance planners to respond quickly to unexpected events such as equipment failures or changes in production schedules ensuring that maintenance activities are always aligned with operational needs.
- Scenario Planning: The scheduler supports scenario planning allowing users to create and compare multiple scheduling scenarios before finalizing a plan. This feature is particularly valuable in environments where various factors, such as production schedules, resource availability and maintenance priorities, be considered simultaneously.

Graphical Visualizations:

- Comprehensive Work Order Views: The scheduler offers detailed graphical visualizations of work orders, including timelines, resource assignments and dependencies. These visualizations make it easier for users to understand the relationships between different tasks and optimize the scheduling process accordingly.
- Gantt Charts and Heat Maps: The scheduler includes Gantt charts for a clear view of the work order timeline, as well as heat maps to highlight resource utilization and potential bottlenecks. These tools provide a visual summary of the entire scheduling landscape, helping planners identify and address issues proactively.
- Resource Load Balancing: Visual indicators within the scheduler help users identify over- or under-utilized resources. This feature enables maintenance planners to balance workloads effectively, ensuring that all resources are used optimally without overloading any individual resource.

Resource Optimization:

- Skill-Based Scheduling: The scheduler allows users to match work orders with resources based on specific skills and qualifications. This feature ensures that tasks are assigned to the most qualified personnel, reducing the risk of errors and improving the quality of maintenance work.
- Availability Management: The scheduler considers the availability of resources, including personnel, tools and equipment when creating and adjusting schedules. This ensures that all necessary resources are available when needed improving overall efficiency.

User Familiarity:

- Smooth Transition for Existing Users: For organizations already using the Prometheus GWOS, the transition to the Web Scheduler is straightforward. The interface and functionality are familiar, requiring minimal retraining for users. This continuity reduces the disruption typically associated with switching to a new system.
- Customization and Flexibility: The Prometheus Web Scheduler offers a high degree of customization, allowing organizations to tailor the tool to their specific needs. Users can configure the scheduler to match their existing workflows and business processes, ensuring a seamless fit with their operations.

Considerations:

- **Vendor Management**: Maintaining a separate third-party solution alongside the SAP S/4HANA may require additional vendor management efforts including handling support, updates and licensing agreements.
- **Future-Proofing**: As a third-party tool updates and new features are subject to the vendor's roadmap which may not always align with SAP's innovations and the organization's evolving needs.

Option C: Other Third-Party Specialized Application (e.g. ClickSoftware, Quintiq)

Description: This option explores the use of other third-party specialized applications such as ClickSoftware or Quintiq known for their robust capabilities in field service and maintenance resource scheduling. These tools often provide features that surpass the native capabilities of S/4HANA including sophisticated algorithms for resource optimization, advanced predictive maintenance integration and more flexible customization options.

Key Features:

- **Advanced Scheduling Algorithms**: Utilize machine learning and AI to optimize resource scheduling ensuring efficient use of labor and materials.
- **Customization and Flexibility**: Highly customizable to meet specific organizational needs offering a range of configuration options to align with unique business processes.
- **Predictive Maintenance Integration**: Strong integration with IoT and predictive maintenance systems allowing for proactive maintenance planning.
- **Simulation Capabilities**: Allows users to simulate various scheduling scenarios and assess potential outcomes helping to identify the best course of action.

- **Scalability:** Can handle large volumes of data and complex scheduling scenarios making it suitable for large organizations with extensive maintenance operations.
- **Real-Time Adjustments:** Supports real-time data integration and updates allowing for dynamic schedule adjustments in response to changing conditions or emergencies.
- **User Interface:** Typically feature modern user-friendly interfaces that enhance user experience and adoption.

Considerations:

- **Higher Costs:** Licensing and integration costs for third-party applications can be significant. Additionally, there may be ongoing costs for support, updates and potential customization.
- **Integration Complexity:** Integrating a third-party solution with the S/4HANA system can be complex, requiring careful planning and execution to ensure seamless data flow and process alignment.
- **Vendor Management:** As with Prometheus GWOS, using a third-party application necessitates managing relationships with multiple vendors which can add to the administrative burden.
- **Additional Assessment Costs:** Before making a decision, it may be necessary to conduct a detailed assessment of the third-party applications to evaluate their fit with existing systems and business processes. This assessment could incur additional costs, including those related to consulting, testing and potential custom development.

Comparison Table

Criteria	Option A: SAP S/4HANA Asset Management for Resource Scheduling	Option B: Prometheus Web Scheduler	Option C: Third-Party Specialized Application (e.g., ClickSoftware, Quintiq)
Integration	PRO: Tight integration with SAP EAM, no data replication required, unified platform.	PRO: SAP Certified Add-On into S /4HANA private cloud allows seamless integration with S/4HANA, leveraging native SAP data structures.	CON: Requires complex and costly integration efforts, potential data synchronization issues.
Real-Time Resource Management	PRO: Real-time resource monitoring and adjustments. CON: Requires separate integration to reach HR data	PRO: Real-time updates with enhanced web interface, supports real-time collaboration. CON: Requires separate integration to reach HR data	PRO: Comprehensive real-time scheduling and resource management features. CON: Integration may delay real-time capabilities
Scheduling and Optimization	PRO: Advanced dynamic scheduling, scenario planning and simulation.	PRO: Advanced scheduling capabilities with drag-and-drop functionality, automated rules and scenario planning.	PRO: Specialized in advanced scheduling, optimization and simulation. CON: High complexity and potential customization requirements.
User Experience	PRO: Consistent SAP Fiori-based user interface, interactive and intuitive user experience built on the SAP Fiori framework. Integration with other Fiori apps allows users to easily navigate between tasks and leverage real-time data.	PRO: Intuitive and responsive web interface, highly user-friendly. CON: UI differs from S/4HANA Fiori, which may require users to adjust to different environments.	PRO: Modern, customizable interfaces, user-friendly and feature-enrich.
Real-Time Schedule Updates and Execution Management	PRO: Real-time adjustments and monitoring during execution, robust notification system.	PRO: Real-time updates and execution management with strong graphical visualizations.	PRO: Typically offers advanced real-time scheduling updates and execution management. CON: Requires additional effort for real-time data integration and consistency.
Analytics and Reporting	PRO: Performance dashboards and predictive analytics within SAP.	PRO: Comprehensive reporting with graphical visualizations, scenario comparisons	PRO: Strong analytics and reporting, often with advanced visualization tools.
Customization and Flexibility	PRO: Highly customizable within SAP framework. CON: Customization can be complex and require specialized skills.	PRO: High degree of customization within SAP environments, user-friendly configuration. CON: Customization complexity can lead to high implementation and maintenance costs.	PRO: Highly customizable and configurable, supporting extensive business-specific needs. CON: Customization complexity can lead to high implementation and maintenance costs.
Scalability and Future Roadmap	PRO: Scales well with growing SAP landscapes and has a clear future roadmap aligned with SAP's vision. CON: Dependent on SAP's development and release cycle.	PRO: Scalable within the SAP ecosystem with a clear roadmap from Prometheus CON: Customization complexity can lead to high implementation and maintenance costs.	PRO: Often includes robust scalability options and a proactive future roadmap. CON: Scalability can be dependent on the integration with existing systems and might involve significant upgrades or costs.
Vendor Support and Community	PRO: Strong support and extensive community for SAP products. CON: SAP's support can be costly.	PRO: Strong ongoing support from Prometheus CON: Adds another vendor to manage, increasing complexity and support costs.	PRO: Often supported by large, specialized vendors with robust support offerings. CON: Support can be costly and finding specific expertise may be challenging.

Evaluation

The evaluation of the EAM Resource Scheduling solutions now includes a comparison of **Option A (SAP S/4HANA for Resource Scheduling)**, **Option B (Prometheus Web Scheduler)** and **Option C (Third-Party Specialized Applications)**

Option A (SAP S/4HANA for Resource Scheduling) remains the recommended solution for Syensqo due to its fully integrated nature within the S /4HANA environment offering advanced scheduling capabilities, real-time resource management and comprehensive analytics. Its consistent user interface and real-time updates align well with Syensqo's broader business objectives minimizing the complexities associated with third-party integrations.

Option B (Prometheus Web Scheduler) is a compelling alternative offering seamless integration with S/4HANA and an enhanced web-based user experience. It provides real-time updates, advanced scheduling features and extensive customization within SAP environments. However its benefits need to be weighed against the native SAP solutions as the additional features of Prometheus may not justify the transition unless there are specific requirements that align with its strengths.

Option C (Third-Party Specialized Applications), while offering unique strengths in user experience and specialized scheduling still present challenges in integration and potential complexities. They lack the cohesive integration and strategic alignment that SAP S/4HANA or the Prometheus Web Scheduler offers.

Therefore, **SAP S/4HANA for Resource Scheduling** is the most suitable choice for Syensqo offering a comprehensive and future-proof solution. **Prometheus Web Scheduler** may be considered for specific use cases where enhanced web capabilities and user interface customization are prioritized.

**The evaluation scoring system ranges from Low to Very High. In this system, a low score indicates a negative attribute, such as high costs.*

Criteria	Weight	Option A: S/4HANA Asset Management for Resource Scheduling	Option B: Prometheus Web Scheduler	Option C: Third-Party Specialized Application
Integration	VH	Very High	High	Low
Real-Time Resource Management	H	High	High	High
Scheduling and Optimization	H	High	High	Very High
User Experience	VH	High	High	High
Interaction and Integration with EAM Applications	H	Very High	Medium	Low
Real-Time Updates	H	High	High	High
Analytics and Reporting	M	High	High	High
Customization and Flexibility	M	High	High	High
Scalability & Future Roadmap	L	High	High	High
Vendor Support	L	High	High	High
Overall		High	High	Medium

See also

The following section describes relevant documentation:

Document Name	Description
S/4HANA Resource Scheduling	S/4HANA Asset Management for Resource Scheduling
SolMaX - GWOS	SolMaX Standard Scheduling with GWOS
ClickSoftware	Salesforce Field Service Management

Change log

Version	Published	Changed By	Comment
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CURRENT (v. 51)	Aug 23, 2024 10:57	LEIGHTON-ext, Dean
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v. 45	Aug 15, 2024 08:26	WENNINGER-ext, Sascha
v. 44	Aug 14, 2024 14:54	LEIGHTON-ext, Dean
v. 43	Aug 14, 2024 14:52	LEIGHTON-ext, Dean
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Sept 30, 2024	Actor	Type	Activity	Version
Approved	 FALL-ext, Cheikh	State	changed state to Approved at 4:49 pm	v51
Pending SteerCo Review	 FALL-ext, Cheikh	State	gave <i>Final Approval</i> approval at 4:49 pm	
Sept 09, 2024				
Pending Stakeholder Review	WENNINGER -ext, Sascha	State	changed expiry date to '23 Sept, 2024 07:37 am' at 7:37 am	
		State	changed state to Pending SteerCo Review at 7:37 am	v51
	WENNINGER -ext, Sascha	State	gave <i>Stakeholder Review</i> approval at 7:37 am Endorsed following walk-throughs conducted on Wednesday, August 21st and Thursday, August 29th.	
Aug 28, 2024				
	 NARAHARI-ext, Bhargavi	State	changed expiry date to '04 Sept, 2024 09:42 am' at 9:42 am	
		State	changed state to Pending Stakeholder Review at 9:42 am	v51