

Transform Manufacturing with SAP

The Business Value for Manufacturing with
SAP S/4HANA, Cloud/ Line-of-Business
Applications and SAP Leonardo



PUBLIC

Jabil Goes Digital with SAP



Jabil is one of the largest and most technologically advanced manufacturers, working with more than 250 of the best-known global brands. Now they're going digital with SAP Leonardo, using 3D printing to create personalized products, closer to where consumers live.



White Paper Background and Key Definitions

The information outlined below will help you understand the contents of this value proposition white paper. It gives details on the objectives and scope of the paper. Key definitions are also provided.

DELIVERABLE OBJECTIVE

Provides information on the value in moving from an ERP on a traditional database to SAP S/4HANA, Cloud/ Line-of-Business (LoB) applications and SAP Leonardo solutions.

KEY DEFINITIONS

Within the **process and subprocess deep dives**, there is detailed content in table format articulating the following:

Typical Pain Points

Major customer business and IT challenges

Current State with ERP on Traditional Database

ERP capabilities that are available on a traditional database.

SAP S/4HANA (including standard SAP Leonardo capabilities)

Capabilities shipped with the latest release of SAP S/4HANA, including apps that are optimized for SAP Leonardo, such as an app for contract consumption.

Cloud/ LoB and SAP Leonardo Solution Capabilities

Solutions that can be integrated with SAP S/4HANA and provide business value – for example, the SAP Manufacturing Execution solution or SAP Connected Goods software. These solutions are not embedded in SAP S/4HANA but they can be integrated.

2018: Planned Innovations*

New functionalities planned for the 2018 release of SAP S/4HANA, Cloud/ LoB applications and SAP Leonardo solutions.

Business Benefits

Key value drivers that are impacted by the adoption of SAP S/4HANA, Cloud and LoB applications, and SAP Leonardo solutions.

With the **value proposition section**, all quantified benefits are conservative, estimated improvement ranges tied to the top value drivers. They are based on early adopters or new developments and enhancements of SAP S/4HANA, Cloud/ LoB applications, and SAP Leonardo capabilities that can drive value. Keep in mind that these benefits should be used as a guide. We recommend working together to assess your current maturity and the value of moving to SAP S/4HANA, Cloud/ LoB applications and SAP Leonardo solutions to develop a personalized business case.

Last Update







SAP S/4HANA 1709 release. All Leonardo capabilities are highlighted in bold.

*Detailed road map available on [SAP.com](https://www.sap.com)

(customer login required)

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Manufacturing in a Digital Economy

TRANSFORM MANUFACTURING WITH SAP

The market is experiencing a disruptive shift in customer demand for new, extensive, smart, and personalized products. Sellers are constantly reducing buffer inventory with obsolescence risk in mind. Manufacturers are competing to meet this challenge and provide individualized products in similar lead times and cost as off-the-shelf products. This creates tremendous complexity for the manufacturing operations team, yet at the same time, companies are looking for growth and profitability while maintaining high quality and sustainability.

To meet these demands, manufacturing is being used as a strategic pillar, becoming more collaborative, localized, automated, integrated, and highly adaptive. Companies are adopting digital manufacturing strategies and solutions to seamlessly connect relevant business stakeholders, information and operational processes in real time. Digital manufacturing simultaneously improves responsiveness and efficiency which drives growth, while decreasing cycle time and cost. Leveraging technologies like 3D printing, cloud, machine learning, and the Internet of Things (IoT) is increasing agility and extending the manufacturing network. Digital manufacturing has become a strategic differentiator.



Constraint-Based Planning – Enabling Live MRP

- Enable constraint-based planning (capacity and resource) with SAP S/4HANA, using various heuristics and optimizers to generate precise production plans
- Schedule your production plan quickly using SAP Fiori mobile as a graphical scheduling tool



Manufacturing Execution – Enabling a Lot Size of One

- Visualize, control and execute shop floor processes, and manage Bill Of Materials (BOM) better with enhancements to SAP S/4HANA
- Deliver individualized customer requirements through real-time "lot size of one" production in high-volume production scenarios by leveraging the integrated SAP Manufacturing Execution application



Manufacturing Network

- Empower manufacturing leadership with intuitive and preconfigured analytics to analyze global and plant level manufacturing performance and associated causes
- Connect to manufacturing service providers in the manufacturing network using SAP Distributed Manufacturing
- Collaborate with suppliers on inventory planning, just-in-time deliveries and get visibility across multi-tier supplier network using SAP Ariba Collaborative Supply Chain



Quality Management

- Enable integrated, simplified, and real-time quality management capabilities with easy-to-use user experience (UX)
- Perform quality inspections, providing inspection results through SAP Fiori apps



Environment, Health, and Safety

- Identify and control EHS risks pro-actively to reduce likelihood and severity of incidents
- Detect and resolve safety issues and learn from incidents
- Leverage native integration of incident management, health and safety management, and environment management as part of SAP S/4HANA digital core

SAP MANUFACTURING VALUE PROPOSITION SUMMARY

SAP solutions enable companies to integrate and embed intelligence in manufacturing processes facilitating Industry 4.0 principles with one source of live information. They provide an optimal coordination of planning and execution processes, covering all aspects of the manufacturing cycle from planning to shop floor and beyond.

Reduce manufacturing cost by increasing output and gaining real-time visibility into quality and costs

Increase plant output with improved planning and visibility into equipment utilization while also reducing the inventory held for manufacturing. Have a real-time and drillable view of the performance metrics of all the production facilities globally. This enables identifying and implementing global manufacturing best practices.

Reduce revenue loss due to plant fulfillment issues by agile planning and production orchestration

Gain the ability to respond to demand and confirmed order changes. Live inventory data and drastically reduced material requirements planning (MRP) processing time improve transparency and responsiveness. The planning system simplifies constraint based capacity planning by bringing together material and capacity constraints. Improve production tracking, labor shortage, first pass yield, and equipment availability to ensure on-time delivery.

Increase revenue growth by mass manufacturing of individualized products and 3D printing

Produce personalized products ordered by customers with minimal human intervention. Product genealogy for every unit is maintained in the system for service and compliance needs. Collaboration with Origin Equipment Manufacturer (OEM) and contract service providers enables fulfillment of custom orders faster, while reducing inventory levels, time to market, and waste.

Reduce scrap and rework cost by empowering the workforce to take informed decisions

Gain immediate insights on planning, execution, quality, with analysis at the finest level of granularity available on mobile devices. Supervisors can analyze and take immediate actions on their mobile devices.

Protect people and the environment and reduce manufacturing downtime by proactively managing operational risk

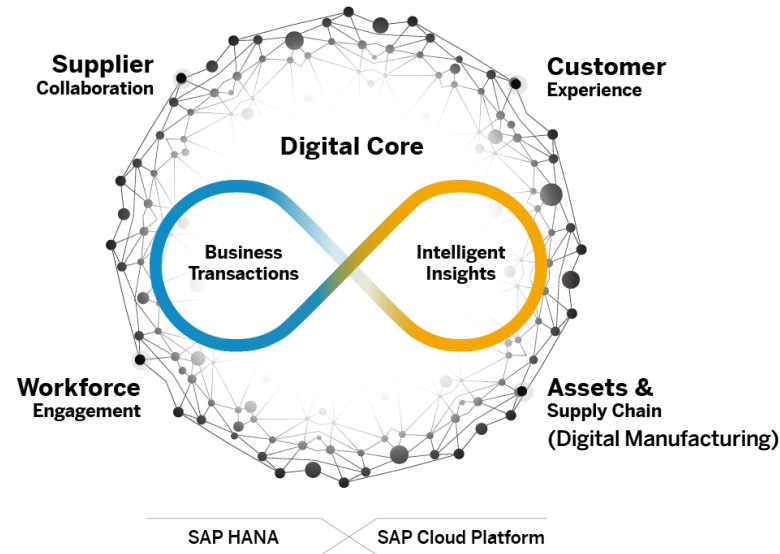
Provide critical safety information to all employees – top floor to shop floor – to create an effective safety culture. Establish a holistic approach to embed safety and operational risk management into all of your operations.

Reduce manufacturing-related IT cost by using an integrated set of solutions

With SAP S/4HANA as the digital core, integrate seamlessly with the manufacturing execution suite and manufacturing network solutions (digital manufacturing insights, distributed manufacturing). This reduces the cost to develop and maintain digital manufacturing capabilities.

SAP's Digital Business Framework for Manufacturing

SAP solutions enable organizations to drive business value across their end-to-end digital value chain.



SUPPLIER COLLABORATION ●●●● WORKFORCE ENGAGEMENT ●●●● S/4HANA DIGITAL CORE ●●●● DIGITAL MANUFACTURING ●●●● CUSTOMER EXPERIENCE

SAP Ariba 

- Supply Chain Collaboration - Forecast, Quality and Inventory (Ariba)



- Distributed Manufacturing

SAP Fieldglass 

- SAP Fieldglass solutions

SAP SuccessFactors 

- SAP SuccessFactors solutions




- Manufacturing Engineering and Process Planning
- Production Planning
- Quality Management
- Environment, Health, and Safety



- Digital Manufacturing Insights
- Digital Manufacturing Execution Suite
- Distributed Manufacturing
- Visual Enterprise
- Quality Issue Management
- S/4 Planning and Scheduling Extension
- S/4 Production Engineering and Operations Extension

SAP Hybris 

- Hybris Commerce
- 
- Configure, Price, and Quote

End-to-End Business Scenarios

Outlined below are the end-to-end processes that are important to a manufacturing organization that wants to win in the digital age.



- **'Demand to Production Plan'** is an end-to-end manufacturing planning scenario where an optimal and executable production plan and schedule is generated based on multiple constraints (demand, capacity, inventory, etc.) and preferences (cost, quality, priority, etc.)
- One MRP with S/4HANA simplifies planning and responding to changes: create finite production plan according to the available capacity situation, schedule available resources with precision.
- This enables manufacturers to drive production on 'actual demand' rather than 'forecasts': increases production throughput, reduces production costs, reduces order cycle time, increases on-time deliveries and reduces shortages.
- **'Personalized Order to Production (Industry 4.0)'** is an end-to-end manufacturing execution scenario where personalized "lot size of one" orders are produced with minimal human intervention.
- SAP Leonardo capabilities enhance automation with machine-to-machine communications, industry 4.0 frameworks, and IoT capabilities across global manufacturing facilities. This enables seamless manufacturing with digital collaboration of manufacturing master data, design structure handovers, process planning, and intelligent change management.
- This enables manufacturers to increase revenue growth, lower costs, and collaborate across global manufacturing and supply chain networks.
- **'Global Manufacturing Network – Insights to Action'** is an end-to-end scenario for analysis and improvement of manufacturing processes.
- Enable digital collaboration within manufacturing and supply chain network with SAP Leonardo. Cloud-based manufacturing collaboration*, digital manufacturing insights, and global track-and-trace capabilities take manufacturing to the next level of responsiveness.
- Proactively identify and resolve issues in the manufacturing network, increase fulfillment of delivery commitments and lower total manufacturing costs with scalable, flexible, cost-effective deployment options.

* The collaboration extends to 3D printing and other manufacturing processes

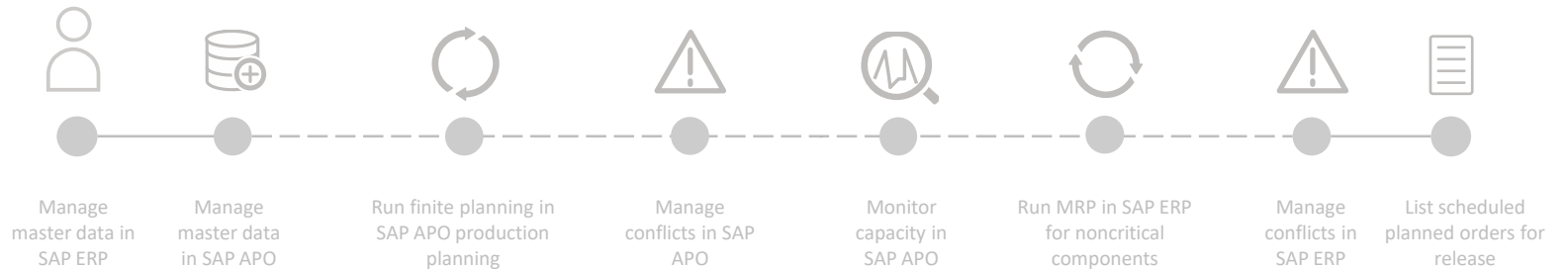
Reimagine Demand to Production Plan

SAP S/4HANA provides next-generation production planning (MRP live) optimized on the SAP HANA platform for faster planning cycles and synchronization to demand changes, resulting in fewer material shortages and delays, and less safety stock.

Demand-to-Production Plan

Traditional SAP ERP

with SAP Advanced Planning and Optimization (SAP APO)



SAP S/4HANA

One MRP run for finite and infinite material planning with harmonized master data and one SAP Fiori launchpad for material flow and capacity



More than smarter and faster . . . a reimaged process

SAP Fiori launchpad for material flow and capacity



Harmonized master data and one process for finite and infinite material planning

- Maximized capacity utilization
- Optimally scheduled planned orders
- Real-time inventory management
- Appropriate purchase orders created

Increase

user productivity and efficiency by harmonized master data and one process for finite and infinite material planning

Increase

order-to-delivery and production cycle times

Reduce

inventory and planning cost

TOP VALUE DRIVERS

Increase production planning FTE productivity

Improve order-to-delivery and production cycle times

Reduce Inventory

Reimagine Personalized Order to Production (Industry 4.0)

Personalized customer order is transferred to manufacturing with minimal manual intervention through the integration of SAP S/4HANA with SAP e-commerce solutions. Integration with suppliers enables optimized scheduling and getting the required raw materials at the right production line. There is complete traceability and serialization for the finished goods. A personalized order is executed as seamlessly as mass production.

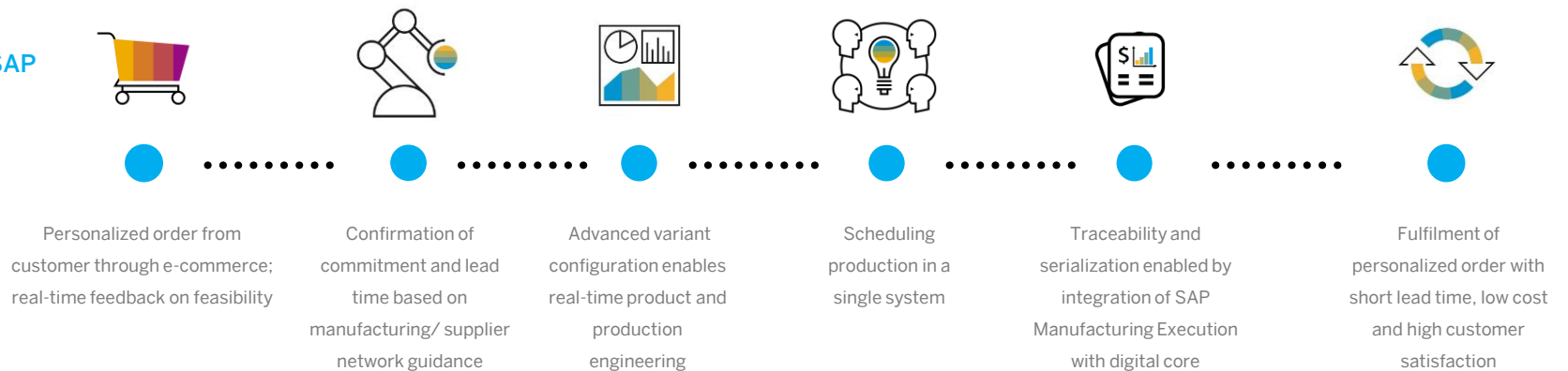
Personalized Order to Production (Industry 4.0)

Traditional SAP ERP



Upgrade to seamless manufacturing of **personalized products** from defined variants

New World with SAP Software



TOP VALUE DRIVERS

Reduce Order Fulfillment Lead time

Reduce Manufacturing Cost

Improve Quality

Improve On-time Delivery

Reimagine Global Manufacturing Networks - Insights to Action

The SAP Digital Manufacturing Insights solution provides the global view of manufacturing operations. SAP Distributed Manufacturing enables digital collaboration with manufacturing service providers. The partners are aligned with the manufacturing process through Ariba Network for forecast, quality, and inventory.

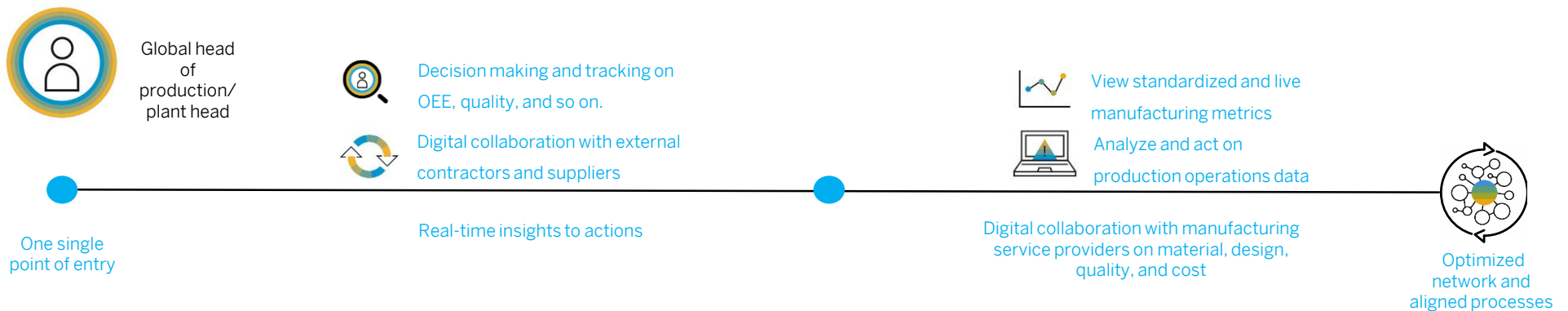
Global Manufacturing Networks: Insights to Action

Traditional SAP ERP



New World with SAP Software

and global view of manufacturing operations



TOP VALUE DRIVERS



MANUFACTURING CAPABILITIES

Outlined below are the primary capabilities for manufacturing where value can be achieved through SAP S/4HANA, Cloud/ LoB applications and SAP Leonardo solutions.



Manufacturing Operations and Safety

- Constraint-based production planning
- Production scheduling
- Extended production operations
- Production warehouse
- Quality management and compliance
- Enterprise performance management
- Incident management
- Environment management
- Health and safety management



Manufacturing Execution (Industry 4.0)

- Manufacturing engineering
- Digital manufacturing insights
- Overall equipment effectiveness
- Paperless factory
- Product genealogy
- Nonconformance management
- Predictive maintenance
- Kanban
- Enterprise performance management
- Shop floor control
- Manufacturing automation
- Machine connectivity and orchestration



Manufacturing Networks

- Distributed manufacturing
- Digital manufacturing insights
- Demand and supply collaboration
- Digital inventory
- Manufacturing as a service

Manufacturing Operations and Safety Deep Dive

Planning and Scheduling Deep Dive



TYPICAL PAIN POINTS

- Long and overnight batch runs result in planning inefficiencies
- Cumbersome and time-consuming analysis of planning situation
- Disparate planning and transactional systems lead to data integration latency and errors
- Inflexibility to include real-time, changing demands in the planning run leads to outdated and inaccurate planning



Current State with ERP on Traditional Database

- Planning runs at predefined times with data that first must be consolidated from various systems
- Separate manufacturing planning processes available in planning and ERP systems
- Inventory management and planning systems need integration with ERP for MRP



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Single run supports both detailed scheduling and MRP; no coordination of runs required between finite and infinite planning
- Seamless integration of master data and transactional data in planning
- Optimized material flows by harmonizing requirements to the production schedule together with the supplier – for example, grouping of POs to ensure only full truckload shipments
- Constraint-based planning (capacity and resource) using various heuristics and optimizers to generate a precise production plan by bringing production planning and detailed scheduling on SAP S/4HANA
- Web-based graphical scheduling tool to optimize and plan the resource schedule, order dates, and times as well as to plan critical products and monitor capacity utilization



Cloud/ LoB and SAP Leonardo Solution Capabilities

- Align with demand-driven planning through integration with SAP Integrated Business Planning



2018 Planned Innovations

- Interactive production planning and simulations (SAP Fiori apps)



Business Benefits

- Reduced manufacturing cycle time
- Improved manufacturing planning function efficiency
- Reduced revenue loss due to fulfillment issues
- Reduced total manufacturing costs
- Increased on-time delivery performance

Manufacturing Operations and Safety Quality Management Deep Dive



TYPICAL PAIN POINTS

- Difficulty getting an end-to-end view of quality
- Changing a local or departmental quality management (QM) focus to a company-wide (and later to a supply chain) focus
- Preventing nonconformance within all stages of design to production to delivery



Current State with ERP on Traditional Database

- Quality management-relevant functions are integrated with supply chain, covering the areas of quality engineering, quality inspection, and quality improvement



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Integrated and simplified solution utilizing quality management capabilities
- Simplified user interface and new user setup; core QM processes supported by new roles in SAP Fiori user experience for quality technician, quality engineer, quality planner, quality manager, quality auditor, and calibration technician
- New SAP Fiori transactional app for monitoring inspection lots and making usage decisions
- Overview pages for different roles in QM to have one central place to view all the inspection lots that require action
- While simultaneously presenting the big picture in a glance, business users can focus on the most important tasks, enabling faster decision-making as well as immediate action



Cloud/ LoB and SAP Leonardo Solution Capabilities

- Enhanced quality technician and engineering overview pages with analytical information
- Enabling of stock transfers and quantity splits during usage decision-making
- Ability to view inspection lots that are ready for completion and make a preconfigured usage decision



2018 Planned Innovations

- Management of settings in quality information record for procurement
- Management of quality tasks
- Manual recording and monitoring of defects
- Enhanced analytical information on the existing overview page



Business Benefits

- Reduced revenue loss due to quality and compliance issues
- Reduced scrap and rework
- Transparency on items and domain-specific insight on what needs attention
- Simple and user-friendly option to make usage decisions
- Easy-to-handle user interface

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Manufacturing Operations and Safety

Quality Management Deep Dive



TYPICAL PAIN POINTS

- Time-consuming and inefficient process for recording quality inspection results
- Delay in informing customers of nonconforming products



Current State with ERP on Traditional Database

- Different generic UIs are available for recording quality inspections



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Ability to perform quality inspections, providing inspection results to enable timely, informed release decisions and therefore support product compliance and quality requirements
- Easy-to-use, but comprehensive, user interfaces for recording the results of different types of inspection characteristics
- Simplified inspection process and goods receipt in SAP Extended Warehouse Management within SAP S/4HANA



Cloud/ LoB and SAP Leonardo Solution Capabilities

- Point-of-detection recording with SAP Fiori app (also mobile-enabled) for faster and more efficient recording by quality technicians (role-based)
- Defect recording and automatic display of defects found during quality inspection
- Flexible worklists and graphical representation
- New SAP Fiori transactional app for monitoring inspection lots and making usage decisions
- Search and contextual navigation in SAP Fiori object pages for important QM objects
- Overview pages for quality technicians to provide one central place to view all the inspection lots that require action
- Released integration scenarios to enable extensions for customers and partners



2018 Planned Innovations

- Recording of results during production on a regular basis
- Management of quality level in order to tighten or reduce inspection scope
- Enhanced overview pages containing analytical information as entry points
- Statistical process control to monitor and manage controlled production processes



Business Benefits

- Reduced revenue loss due to quality and compliance issues
- Reduced scrap and rework
- Reduced manufacturing quality labor cost
- Overview page that presents information in a way that is easily read and understood
- Ability to see all important data in QM at a glance, including navigation targets

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Manufacturing Operations and Safety Quality Management Deep Dive



TYPICAL PAIN POINTS

- Analysis based on past performance instead of proactive measures based on asset and production performance
- Lack of real-time simulations or predictive capability to detect quality issues



Current State with ERP on Traditional Database

- Different tools are available for analyzing data in quality management



SAP S/4HANA (including standard SAP Leonardo capabilities)

- New analytics for quantitative results with graphical and statistical parameters
- SAP Fiori apps to improve quality control by monitoring and adjusting processes
- Search and contextual navigation in SAP Fiori object pages for important QM objects.
- Worklist for manage usage decision with information about usage decision, valuation, and quality score



Cloud/ LoB and SAP Leonardo Solution Capabilities

- SAP Fiori apps to improve quality control by monitoring and adjusting processes
- Newly designed object pages with charts to display results history and single values in graphical form
- New SAP Fiori apps for capturing and monitoring defects
- Enhancements to the overview pages for quality technicians and quality engineers with analytical information, such as deviations that can be used as entry points
- Real-time monitoring and exception management of quality deviations
- While simultaneously presenting the big picture in a glance, business users can focus on the most important tasks, enabling faster decision-making as well as immediate action



2018 Planned Innovations

- Evaluate and analyze key figures for quality management data
- Statistical process control to monitor and manage controlled production processes
- Cloud analytics for predictive quality management



Business Benefits

- Reduction in revenue loss resulting from quality and compliance issues
- Reduced scrap and rework
- Flexibility to analyze different values and quantitative characteristics
- Faster decision-making and immediate action

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Manufacturing Operations and Safety Quality Management Deep Dive



TYPICAL PAIN POINTS

- Difficulty getting an end-to-end view of quality due to distributed systems
- Changing a local or departmental quality management focus to a company-wide (and later to a supply chain) focus
- Preventing nonconformance within all stages of design to production to delivery



Current State with ERP on Traditional Database

- Quality management-relevant functions are integrated with supply chain, covering the areas of quality engineering, quality inspection, and quality improvement



SAP S/4HANA (including standard SAP Leonardo) capabilities

- Simplified quality processes utilizing QM and quality issue management capabilities
- Simplified user interface and new user setup; core QM processes supported by new roles in SAP Fiori user experience for quality technician, quality engineer, quality planner, quality manager, quality auditor, and calibration technician
- Enhanced and simpler user experience for the quality technician to improve productivity
- Ability to run in a mobile environment with significant reduction in the number of clicks required



Cloud/ LoB and SAP Leonardo Solution Capabilities

- SAP Distributed Manufacturing allows collaboration on quality criteria and inspection results with suppliers



2018 Planned Innovations

- SAP Distributed Manufacturing to allow integration of supplier part data like QM and genealogy
- Additional object pages in SAP Fiori for a wide range of quality objects



Business Benefits

- Reduced revenue loss due to quality and compliance issues
- Reduced scrap and rework

Manufacturing Operations and Safety

Environment, Health, and Safety (EHS) Deep Dive



TYPICAL PAIN POINTS

- Difficulty in developing one common view of process risks related to workers, assets, or the environment results in high cost for environment, health, and safety compliance



Current State with ERP on Traditional Database

- Multi-tiered landscape consisting of ERP, ERP component extension, and business intelligence makes it challenging to access single source of truth for all EHS- related information



SAP S/4HANA (including standard SAP Leonardo) capabilities

- Native integration of incident management, health and safety management, and *environment management* are available as part of SAP S/4HANA digital core
- New app to create risks, perform a quick assessment of risk levels, define needed controls, and specify impacts



Cloud/ LoB and SAP Leonardo Solution Capabilities

- Live data on EHS risks including a real time status tracking of the control implementations to CxOs via Digital Boardroom
- The SAP Connected Worker Safety solution allows to demonstrate compliance at all times and foster real time awareness on hazardous situations in order to ensure worker safety



2018 Planned Innovations

- Management of change functionality based on SAP S/4HANA
- Integrations with EHS content providers
- EHS as part of SAP S/4HANA Cloud suite
- Lean risk assessment process
- SAP Connected Worker Safety - real-time monitoring of worker exposure and health condition



Business Benefits

- Reduced EHS management cost
- Improvements in operational efficiency
- Ensure Compliance at all times

- Limited ability to effectively analyze EHS data to reduce workplace risk
- Inability to develop proactive safety measures, which leads to low EHS maturity

- Analysis is based on past performance, which limits the scope of proactively driving EHS risk reduction
- Data is processed in batches, which increases the time required to analyze EHS-related information

Embedded analytics based on live data that help EHS practitioners act in the moment

- Live data on incident, environment, risk, energy to CxOs via Digital Boardroom

- Additional in-memory analytics and enhanced task management

- Overall improved efficiency of EHS operations
- Reduced EHS management cost

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Manufacturing Operations and Safety

Environment, Health, and Safety (EHS) Deep Dive



TYPICAL PAIN POINTS

- Limited ability to investigate and follow-up on incidents in an effective manner, which leads to a reduced understanding of root causes, deficit of learning from incidents / near misses and an overall lack of insights to leading safety indicators



Current State with ERP on Traditional Database

- The incidents can be recorded and reported to compliance regulators



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Gain role-based access to the application to manage context-specific work and gain visibility into results
- SAP Fiori mobile app for recording incidents in an offline mode
- New analytics app to perform analysis of incident records by type (incidents, near misses, and safety observations), and by incident related cases (injury/illness, asset-related, release-related and notice of violation)



Cloud/ LoB and SAP Leonardo Solution Capabilities

- Live data on incident, environment, risk, energy to CxOs via Digital Boardroom
- The SAP Connected Worker Safety solution allows to demonstrate compliance at all times by giving real time insights on workplace exposure information
- Live data on environmental incidents, emissions and energy to CxOs via Digital Boardroom



2018 Planned Innovations

- Determine location based on geo-position within the SAP Fiori mobile app
- Capture incident and deviation in a single record
- Additional analytics represented as Smart Business app to illustrate the further incident rates and KPIs
- Additional business process support for water and wastewater management
- EHS content provider integration
- Capture environmental releases (materials) within the report incident app



Business Benefits

- Gain insight into root causes of near misses, safety observations and incidents
- Efficient management of corrective and preventive measurements
- Reduced compliance penalties and fines
- Reduced emissions
- Reduced EH&S compliance penalties and fines

- Difficulty in developing a real-time view of environmental impact of business operations hinders the process of complying with environmental regulations

- Data monitoring and data reporting followed by automated emissions calculations can be done

- New app to monitor and perform analysis of environmental data stored in the system
- Simplified process to track substances that are subject to legal or industry specific regulations and manage operational exposure limits to such substances

Manufacturing Execution (Industry 4.0) Deep Dive



TYPICAL PAIN POINTS

- Inability to manage “lot size of one” in a cost-effective manner

- Limited system flexibility and automation available to cater to the mass customization demands in a cost-effective manner

- Interrupted material flows result in inefficient operations



Current State with ERP on Traditional Database

- SAP Business Suite software provides solutions for variant configuration and make-to-order and assemble-to-order scenarios

- Limited integrated mechanism to support mass customization efficiently

- Support for just-in-time production with Kanban as well as JIT inbound and outbound material flows



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Change impact analysis and change record apps allow for more efficient integration between engineering and manufacturing

- Support for just-in-time production with embedded Kanban as well as JIT inbound and outbound material flows



Cloud/ LoB and SAP Leonardo Solution Capabilities

- **In combination with SAP S/4HANA, the SAP Manufacturing Execution allows for end-to-end process integration from sales order to shop floor**
 - Process enforcement
 - Machine orchestration
 - Data collection
 - Nonconformance management
 - Touch and mobile UI

- **SAP Manufacturing Execution and SAP Plant Connectivity extend S/4HANA with more than 900 Web services to connect shop floor equipment and IoT devices to SAP software**
- **Activity hook points in SAP Manufacturing Execution increase the flexibility of execution while SAP Plant Connectivity facilitates machine orchestration for unprecedented flexibility of manufacturing processes**



2018 Planned Innovations

- Further enhancements to the integration between SAP Manufacturing Execution and SAP S/4HANA

- Simplified configuration of machine integration scenarios using SAP Plant Connectivity



Business Benefits

- New revenue potential through individualized products or new business models
- More streamlined and efficient handover process

- Improved process agility

- Reduced inventory cost

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Manufacturing Execution (Industry 4.0) Deep Dive



TYPICAL PAIN POINTS



Current State with ERP on Traditional Database



SAP S/4HANA (including standard SAP Leonardo capabilities)



Cloud/ LoB and SAP Leonardo Solution Capabilities



2018 Planned Innovations



Business Benefits

- | | | | | |
|---|--|--|--|---|
| <ul style="list-style-type: none"> Inefficient or ad hoc handover of bill-of-material information and design changes from engineering to manufacturing | <ul style="list-style-type: none"> Visual manufacturing planner for leveraging 3D CAD information, thereby simplifying the handover process | <ul style="list-style-type: none"> Manufacturing engineering provides new user experience to create manufacturing-relevant master data and efficiently handle handover to manufacturing | <ul style="list-style-type: none"> Enhancements for managing complex assembly structures | <ul style="list-style-type: none"> Reduction in unnecessary costs through enhanced engineering change management |
| <ul style="list-style-type: none"> Inability to handle engineering or manufacturing-driven changes on manufacturing master data and production orders efficiently and consistently | <ul style="list-style-type: none"> Manual process to go into list of production orders and run multiple reports | <ul style="list-style-type: none"> Comprehensive change impact analysis which extends to the shop floor with possibility to hold production orders in addition to assessing stock quantities prior to change implementation | <ul style="list-style-type: none"> Enhanced capabilities of the change impact analysis to include more detailed information on impacted objects | <ul style="list-style-type: none"> Reduced manufacturing production costs by reducing scrap |
| <ul style="list-style-type: none"> Inefficient application proximity to shop floor workers to make entries results in delays and errors | <ul style="list-style-type: none"> Shop floor workers go to the central terminal to make required entries | <ul style="list-style-type: none"> SAP Fiori apps for production supervisor and production operator also on mobile devices | <ul style="list-style-type: none"> Enhancements to the SAP Fiori apps | <ul style="list-style-type: none"> Reduced manufacturing direct labor cost |
| <ul style="list-style-type: none"> Complex and expensive system landscapes with multiple shop floor systems in distributed plants, resulting in high total cost of ownership (TCO) | <ul style="list-style-type: none"> SAP Business Suite software provides an integrated solution from enterprise planning to shop floor execution | <ul style="list-style-type: none"> Fundamentally new data models and functions reduce the number of systems required, for example, single material master for ERP and supply-chain management-relevant materials | | <ul style="list-style-type: none"> Simplified IT landscape and lower TCO |

Manufacturing Networks Deep Dive



TYPICAL PAIN POINTS

- Complicated manufacturing partner ecosystem; collaboration requires every manufacturer, service provider, or equipment operator to link up with each business partner separately to exchange data on equipment and components



Current State with ERP on Traditional Database

- Manual effort to collaborate with business partners



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Manage the subcontracting process from planning to execution; monitor and integrate your business network
- Integrate the external workforce into production execution; manage time and material handovers



Cloud/ LoB and SAP Leonardo Solution Capabilities

- **SAP Distributed Manufacturing is a cloud-based collaborative platform that connects customers with (additive) manufacturing service providers – for example, suppliers of 3D printing services, material providers, original equipment manufacturers, and technical certification companies**
- Manage the product lifecycle as a “digital twin” from “as-designed” in SAP Product Lifecycle Management to “as-built” in SAP Manufacturing Execution to “as-maintained” in SAP Asset Intelligence Network



2018 Planned Innovations

- **SAP Distributed Manufacturing extends the network and collaboration scenarios to:**
 - Include further supplier types like CNC or injection molding
 - Exchange further information like QM and product genealogy



Business Benefits

- Reduced manufacturing technology cost
- Reduced unplanned downtime or outages
- Higher visibility into asset use

(continued next page)

Manufacturing Networks Deep Dive



TYPICAL PAIN POINTS

- Lack of visibility into production processes, status, and performance in enterprise systems, leads to inaccurate decision making



Current State with ERP on Traditional Database

- Manufacturing insights available with support from IT department using analytical tools such as SAP BusinessObjects business intelligence solutions



SAP S/4HANA (including standard SAP Leonardo capabilities)

- Real-time alerts based on bottlenecks in production, such as time or component delays, and in resources
- Plant performance analytics
- SAP Fiori apps for the production supervisors and operators to provide live production visibility, orchestration, and confirmation capabilities



Cloud/ LoB and SAP Leonardo Solution Capabilities

- **In combination with SAP S/4HANA, SAP Manufacturing Execution empowers the customer to create dashboard without coding to gain real-time insights into all shop floor operations**
- **SAP Digital Manufacturing Insights is a centralized, cloud-based, data-driven manufacturing performance management solution that enables key stakeholders of manufacturing operations to take tactical and strategic decisions to achieve best-in-class manufacturing performance**



2018 Planned Innovations

- Overall equipment effectiveness in SAP Manufacturing Execution and SAP Digital Manufacturing Insights
- SAP Digital Manufacturing Insights allows for the combination of business information and shop floor data in analytics to analyze performance of machines
- Further enhancements to provide insights and predictive quality analytics based on Big Data coming from the shop floor



Business Benefits

- Reduced total manufacturing costs
- Ability to drive manufacturing performance according to organizational goals with possibility of intracompany benchmarking

Reimagine Distributed Manufacturing

Manufacturers can efficiently handle variable customer demands and compress manufacturing cycles using SAP Distributed Manufacturing solution. Manufacturers identify which components of their products are best suited for 3D printing* and help find the right partners for printing. The result is a new level of supply chain agility to meet fast-changing customer needs.

Distributed Manufacturing

Traditional ERP



New World with SAP Software



TOP VALUE DRIVERS

Increase revenue growth

Reduce time market for new products

Reduce order fulfillment lead time

Reduce logistics cost

* The collaboration extends to 3D printing and other manufacturing processes

Digital Priorities in Manufacturing

Live Planning



To fulfill customer orders in time, demand needs to be prioritized over forecast in real time. Optimal planning and faster response to demand changes based on live visibility of constraints enables higher production (lowers manufacturing costs) while increasing on-time delivery performance.

Live planning enabled by SAP S/4HANA provides constraint-based planning (capacity and material flow) in one system that addresses requirements of all major manufacturing industries. Manufacturers can manage advanced planning and scheduling scenarios directly integrated with SAP S/4HANA material and order management environment.

Distributed Manufacturing



To leverage the global manufacturing and logistics partner network, manufacturers need to quickly and efficiently connect them through supply chain and manufacturing solutions with the 3D printing and other manufacturing capabilities. Manufacturers can improve on-time delivery performance by effectively planning inventory replenishment and optimizing trade-offs between inventory.

SAP Distributed Manufacturing solution enables digital collaboration with manufacturing service providers. End-to-end process from design, costing, approvals, quality checks to production status is supported. This increases local and central operational visibility, and flexibility in production of components/ products with personalized / complex designs, and variable/ low demand (e.g. new launches, spare parts etc.)

Production Engineering and Operations (PEO)



To manufacture personalized products ordered by customer, the need to efficiently and accurately synchronize data across designing/ formulating, manufacturing engineering, and production execution processes is required.

SAP S/4HANA Manufacturing for production engineering and operations expands core SAP S/4HANA manufacturing capabilities, delivering enhanced visualization with newly developed and enriched BOM management, process planning, change management, and shop floor execution feature sets. New digital manufacturing capabilities streamline production planning and shop floor operations within global production environments utilizing the power of SAP S/4HANA with proven integrations.

Digital Manufacturing Insights



For manufacturing leaders to drive insights to action, access is required into live information about global production operations based on a common definition to drive continuous improvement across the organization.

SAP Digital Manufacturing Insights solution provides standardized manufacturing process view for the SAP S/4HANA software environment and is future-proof in design by running analytics directly from the digital core. SAP delivers a unique perspective of analytics that is tied to core business processes and functions. This enables tracking of efficiency and ties dollar figures to variances of these processes.



SAP's Value Proposition for Digital Manufacturing

STRATEGY ENABLEMENT

- Run Simple (master complexity) – Simplified and efficient production engineering, production planning, and execution processes
- Run live – Decision-making with automated transfer of production results and real-time updates on performance
- Automation that enables business process transformation

RISK MANAGEMENT

- Distributed manufacturing that enables reduction of inventory and risk of revenue loss due to stock-outs
- Integration of execution and planning systems that reduces risk of revenue loss due to cancelled orders
- Reduced accident and incident rate
- Lower cost of risk mitigation
- Reduced compliance penalties and fines by 5% - 10%*



BUSINESS BENEFITS*

- Reduction in total manufacturing costs up to 10%
- Reduction in manufacturing cycle time up to 10%
- Reduction in scrap value up to 25%
- Reduction in order fulfillment lead time by 10% - 15%
- Increased material posting throughput from 5x - 25x
- Improved labor utilization with "live" production monitoring by 5% - 10%
- Reduced environment, health, and safety management cost by 1% - 5%
- Distinct systems consolidation effort reduced by 20% - 30%

EMPLOYEE ENGAGEMENT

- Increase in productivity through tailored UX
- Higher throughput
- Easier-to-use interface and simplified workflow
- Improved technician productivity
- Reduced lost-time accidents by 1% - 5%*
- Reduced training costs

*Benefits are based on early adopters of SAP S/4HANA or conservative outside-in benefits due to moving from a traditional ERP to enhanced SAP S/4HANA, Cloud/ LoB applications and SAP Leonardo solutions. As each enterprise is at a different level of maturity, our recommendation is to work with you to determine the value proposition for your enterprise.

★ Customers Are Achieving Value from SAP Software



BRP-Rotax

- **Production design, measured data, and services are seamlessly connected**
- **Throughout the process material movements are recorded in real time**

BRP-Rotax produces unique, customized engines for its customers.

Using Industry 4.0 technologies and SAP Connected Manufacturing software, its manufacturing machinery automatically adapts to the production workload and sequencing, using marked parts arriving at each workstation.

[Click here for BRP-Rotax source reference](#)

Company
BRP-Rotax

Industry
Automotive

SAP Solutions
SAP S/4HANA Enterprise Management, SAP Connected Manufacturing

Customer Web Site
www.rotax.com



Landis+Gyr

- **>15% improvement in product throughput**
- **2% improvement in first-pass yield**

Landis+Gyr is a Swiss producer of energy management solutions, including smart meter products, for utilities. The company reimagined its manufacturing processes to automate production steps and improve product quality.

Leveraging SAP ERP and SAP Connected Manufacturing software, the company enabled full product genealogy and process controls. With the engineering team's ability to monitor shop floor processes through a real-time analytical dashboard, the team was quick to sense, analyze, and respond to product quality issues.

[Click here for Landis+Gyr source reference](#)

Company
Landis+Gyr

Industry
High Tech

SAP Solution
SAP Connected Manufacturing

Customer Web Site
<https://www.landisgyr.com/>

★ Customers Are Achieving Value from SAP Software



ebm-papst

- **Control and documentation of complete production process through permanent component identification**
- **Real-time detection of deviations through active process control**
- **Continuous traceability from the final product to the batch of each recorded component**

ebm-papst, a German ventilation and drive engineering firm, reimagined its production processes to meet Industry 4.0 requirements, focusing on process optimization, process control, and transparency.

The company uses SAP Connected Manufacturing software and Industry 4.0 technologies to automate production and ensure complete traceability of products from order to shipment.

[Click here for ebm-papst source reference](#)

Company
ebm-papst

Industry
Engineering

SAP Solution
SAP Connected
Manufacturing

Customer Web Site
<http://www.ebmpapst.in>



Lukoil

- **90 seconds needed for the examination of one miner, down from 5 minutes**
- **Reduced risk and costs associated with basing a team of medical staff at each location**

Lukoil, one of the world's largest oil companies, uses automated medical terminals that examine and monitor the health of its miners who work in very hard conditions to prevent accidents and human error.

Lukoil uses a prototype examination system developed by SAP and based on SAP Cloud Platform, which can perform analysis of the data in real time and integrate with HR business processes. As soon as an employee passes the examination, medical data is sent to the doctor's workstation and to other SAP business processes, helping the doctor to decide if the employee is allowed to work that day.

[Click here for Lukoil source reference](#)

Company
Lukoil

Industry
Oil and Gas

SAP Solution
SAP Cloud Platform

Customer Web Site
<http://www.lukoil.com/>

★ Customers Are Achieving Value from SAP Software



Faurecia

- Potential savings of millions of euros in working capital
- 20x faster MRP
- More streamlined and timely profit analysis

Manufacturing is a 24x7 process with real-time insight and decisions necessary for planning inside and outside the enterprise. In some plants a large variety of products has to be managed under strict time constraints on production and procurement.

Faurecia transformed work by eliminating manual processes, accelerating manufacturing resource planning (MRP), and delivering planning insight in real time with SAP HANA platform.

[Click here for Faurecia source reference](#)

Company
Faurecia

Industry
Automotive

SAP Solution
SAP HANA

Customer Web Site
www.faurecia.com



Moritz J. Weig GmbH & Co. KG

Moritz J. Weig GmbH & Co. KG chose EHS functionality in SAP S/4HANA to manage its business when it comes to health and safety. Key to this choice were criteria such as the user experience in SAP software and the desire to empower EHS practitioners with live data to act in the moment. The solution will help move the company beyond automation to predictive suggestions.

Company
Moritz J. Weig GmbH & Co.
KG

Industry
Mill products

SAP Solution
SAP S/4HANA
(EHS Functionality)

Customer Web Site
www.weig-karton.de

Your Path to Digital Transformation

Every enterprise is unique, with different starting points and end points. Whether you are starting a net-new implementation or undergoing a digital transformation in an existing SAP landscape, SAP can help. We have been working with enterprises of all sizes and in all industries. Based on the depth of this experience, we offer a robust portfolio of services.

Customer Engagement Methodology

No matter which path applies to your enterprise, SAP has a structured four-phased approach to ensure success – executive alignment, value discovery, validation and executive readiness, and value delivery.

For more details, please see the brochure [Driving Value in a Digital Economy](#)

SAP Value Assurance Service Packages

Take advantage of SAP Value Assurance service packages for SAP S/4HANA to quickly and safely harness the power of next-generation software and in-memory processing.

For all value assurance packages and for the successful and seamless transition to SAP S/4HANA, please visit the link [Transition to SAP S/4HANA](#).

Manufacturing Road Maps

SAP gives customers the transparency to accelerate their transition to an SAP S/4HANA landscape with a three-year detailed road map – [SAP S/4HANA Manufacturing Roadmap](#).

SAP gives transparency to our cloud products with a quarterly view in product road maps:

- [SAP Digital Manufacturing Insights](#)
- [SAP Distributed Manufacturing](#)

Start today with a Trial – [SAP S/4HANA Trials](#)

Key assets for next steps on SAP S/4HANA

www.sap.com/s4next

Innovate with SAP Leonardo

SAP Leonardo is SAP's digital innovation system that makes it easy to innovate with new technologies, integrate them into your business, and scale seamlessly as your company grows.

[Get started today with SAP Leonardo](#)

Explore SAP Leonardo Capabilities

Learn more about SAP Leonardo capabilities – and see how customers in a variety of industries are using the system to realize the promise of new technologies, such as the IoT and Big Data analytics.

For more details, please see the e-book

[Leonardo customer stories](#)

Get an Expert take on Digital Transformation

What are the benefits of blockchain, machine learning, and other transformational technologies – and how are they impacting business?

[Get answers from experts and analysts in this e-book](#)

Assess Your Manufacturing Digital Maturity

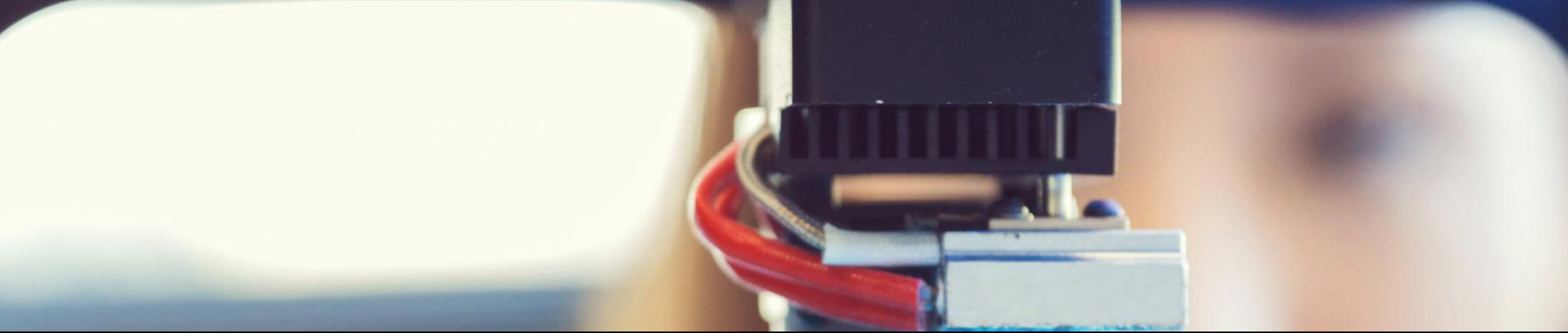
Want to understand your digital maturity?

Click [here](#) to participate and see how you compare to peers in real time

Lay the Foundation for an In-depth Digital Transformation Engagement

Get clear guidance on S/4HANA centric product map through a free self-service for customers and partners

www.sap.com/TransformationNavigator



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