



Digital Manufacturing Cloud

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Agenda

SAP Digital Manufacturing Cloud Overview

SAP Digital Manufacturing Cloud for execution

- Solution details
- Execution tasks
- Process industries
- Resource Orchestration
- Artificial Intelligence/Machine Learning
- Extensibility

SAP Digital Manufacturing Cloud for insights

- DKPI Analytics & OEE
- Alert Management

SAP Digital Manufacturing Integration



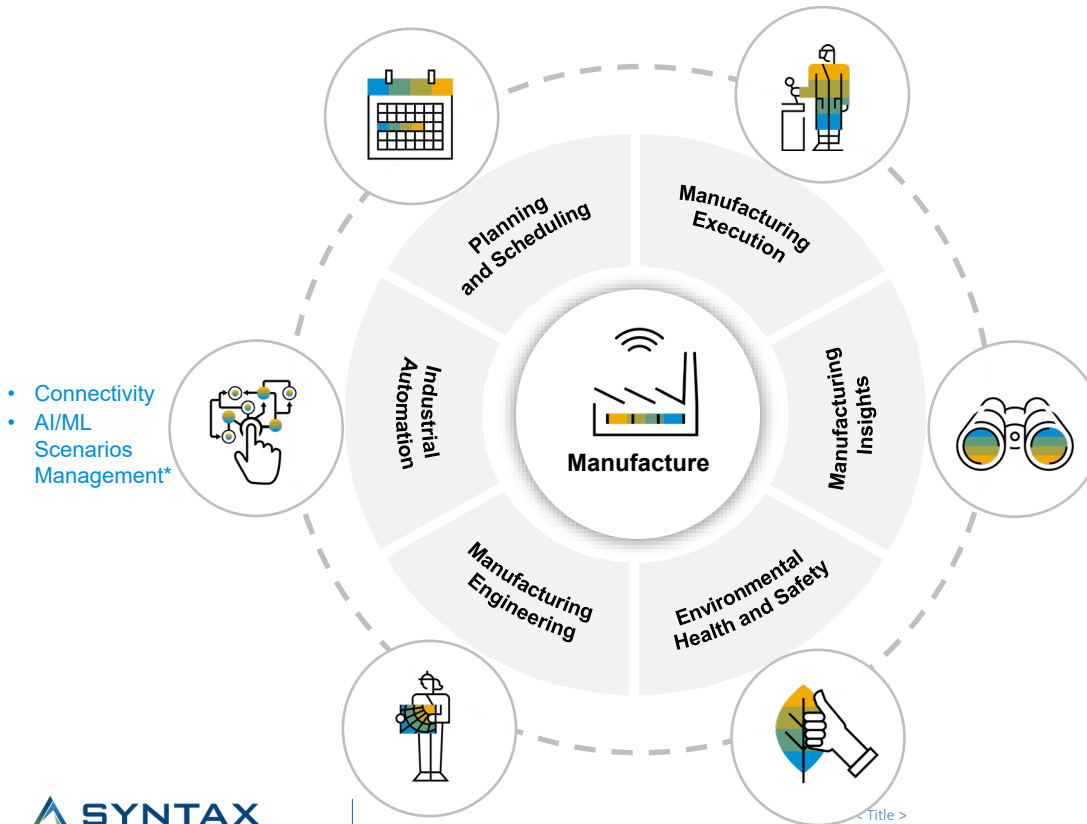
SAP Digital Manufacturing Cloud

Solution Overview



SAP Digital Manufacturing Solutions

A complete portfolio of manufacturing solutions to support digitalization and Industry 4.0



SAP Digital Manufacturing Cloud

- Manufacturing Execution
- Manufacturing Insights
- SAP Plant Connectivity



SAP S/4HANA Manufacturing

- for Production Engineering and Operations
- for Planning and Scheduling
- Environmental, Health & Safety



SAP Manufacturing Suite

- SAP Manufacturing Integration and Intelligence
- SAP Manufacturing Execution

SAP Digital Manufacturing Cloud

Product overview

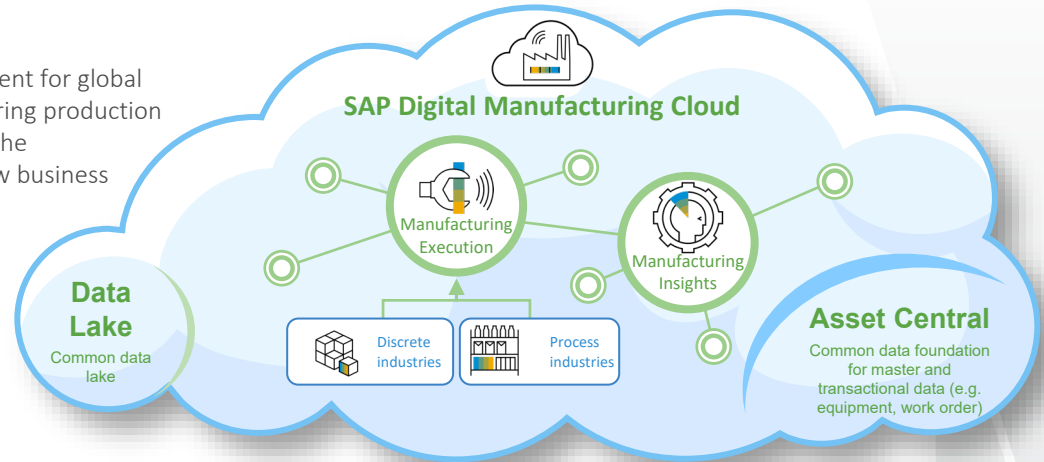
Connect your top floor business systems to your shop floor equipment for global visibility across all plants while orchestrating execution and monitoring production operations down to the individual work center. Take advantage of the manufacturing network to achieve greater flexibility and realize new business models.

Manufacturing Execution*

- Manage your production using the latest technology built on the SAP Cloud Platform
- Orchestrate and control the shop floor with out-of-the box integration to SAP ERP and S/4HANA

Manufacturing Insights

- Take informed decisions to increase productivity and performance of your production systems with real-time insights and root cause analysis
- Detect product quality defects early in production with prediction models using machine learning
- Collaborate with partners in the network to build digital inventories to optimize your offerings
- Act as the digital twin of the physical world, including any equipment as well as any kind of automation devices
- Enables processes and an easy exchange of data between Information Technology and Operational Technology in a manufacturing environment



* The Digital Manufacturing Cloud for execution license includes all functionalities of Digital Manufacturing Cloud for insights.

SAP Digital Manufacturing Cloud

Automate processes and resources to improve manufacturing efficiency, quality and productivity



Paperless production with intuitive user interfaces for production operators, automatic data collections and set machine parameters, thereby lowering cost, increasing productivity and quality.



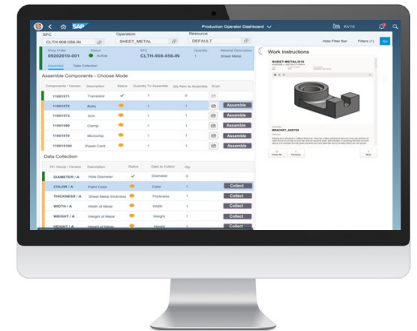
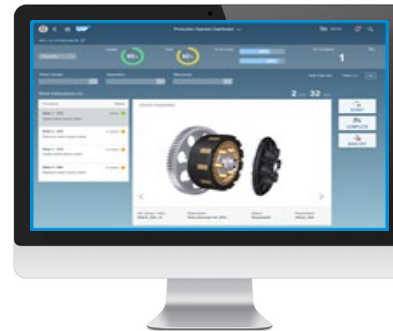
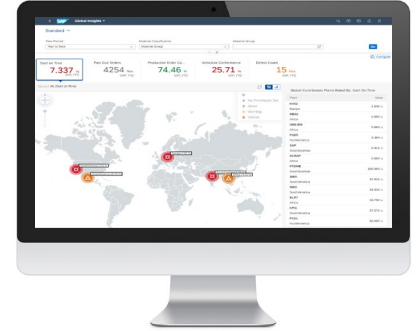
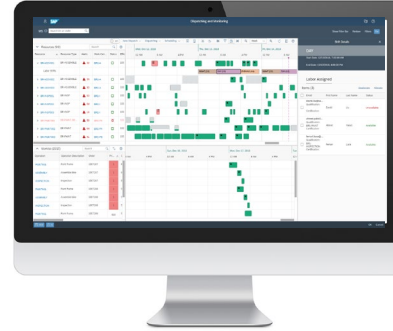
Design, distribute and dynamically control manufacturing shop floor activities enabling a smart factory.



Shift and Labor planning to ensure business operations with right qualifications. Production Order scheduling and dispatching considering labor, resource and maintenance constraints to plan operations and adopt to short term changes.



Cross plant real-time analytics for manufacturing performance e.g. perfect order fulfillment, Overall Equipment Effectiveness, loss analysis along with machine data to identify improvement opportunities.



Manufacturing Insights

Intelligent insights and analysis across global plant operations



Adaption to any manufacturing process and global visibility and analytics for key performance indicators across a single plant or global operations



Full integration to combined business and operational data from ECC, S/4HANA and the Manufacturing Suite for improved decisions



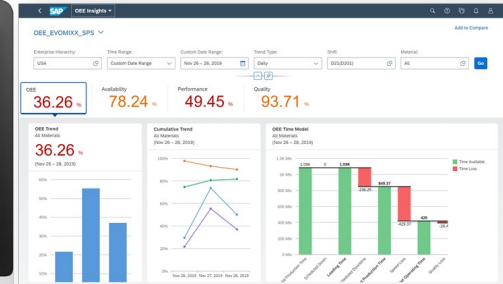
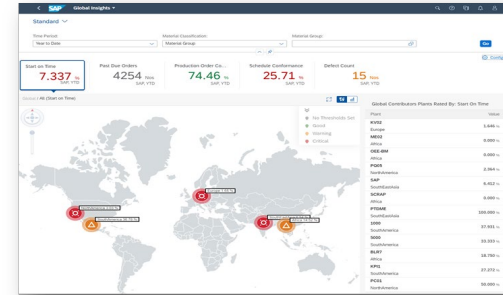
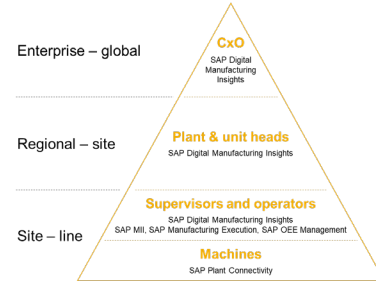
Manage and view harmonized data acquired from disparate sources for better visibility into your plant operations



Business logic orchestration to enable customer-specific processes for planning, execution, maintenance and quality



Manufacturing Performance Management with OEE Energy Management to lower operational costs through an intuitive tailored Worker UI



Benefits of a Public Cloud Solution like Digital Manufacturing Cloud



Lower Total Cost of Ownership (TCO)



Modern User Experience - Latest technology



Speed of Implementation



Expanded Portfolio



Speed of Subsequent Rollouts



Always on the Latest release



Return On Investment(ROI)



Quicker Rollout of New Functionality



Resource Driven, not by Plant



Labor Flexibility

SAP Digital Manufacturing Cloud for Execution

Solution Details



Manufacturing Execution

Orchestrate and control the shop floor

Key capabilities

- Implement top-floor to shop-floor scenarios to achieve rapid return-on-investment through out-of-the-box integration to SAP solutions
- Utilize intuitive user interfaces (UI) for production operators and transform to paperless production
- Dispatch and sequence operations to reflect the real world in the short term
- Monitor the entire manufacturing process to optimize resources and execution
- React quickly to unexpected events



Manufacturing Execution (ME)

Automate processes and resources to improve manufacturing efficiency, quality and productivity



Enable resource orchestration by dispatching and sequencing operations to compress the manufacturing lifecycle and provide real-time production performance tracking



Implement top-floor to shop-floor scenarios to achieve rapid return-on-investment through out-of-the-box integration to SAP solutions



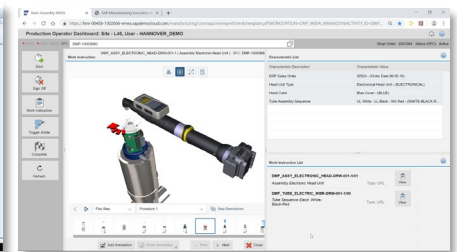
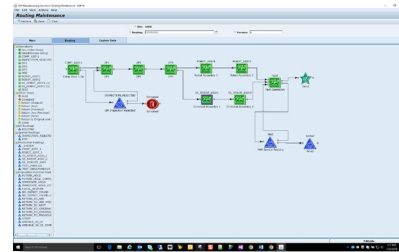
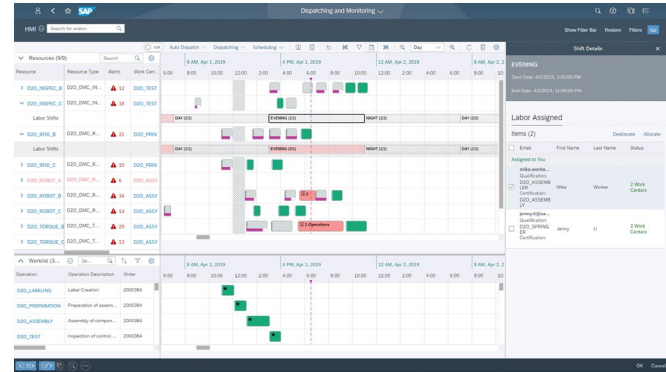
Utilize intuitive user interfaces (UI) for production operators and transform to paperless production, lowering cost and increasing productivity.



React quickly to unexpected events by monitoring the entire manufacturing process to optimize resources and speed execution utilizing built-in intelligence



Collaborative integration to allow you to respond quickly to unexpected events



SAP Digital Manufacturing Cloud for Execution

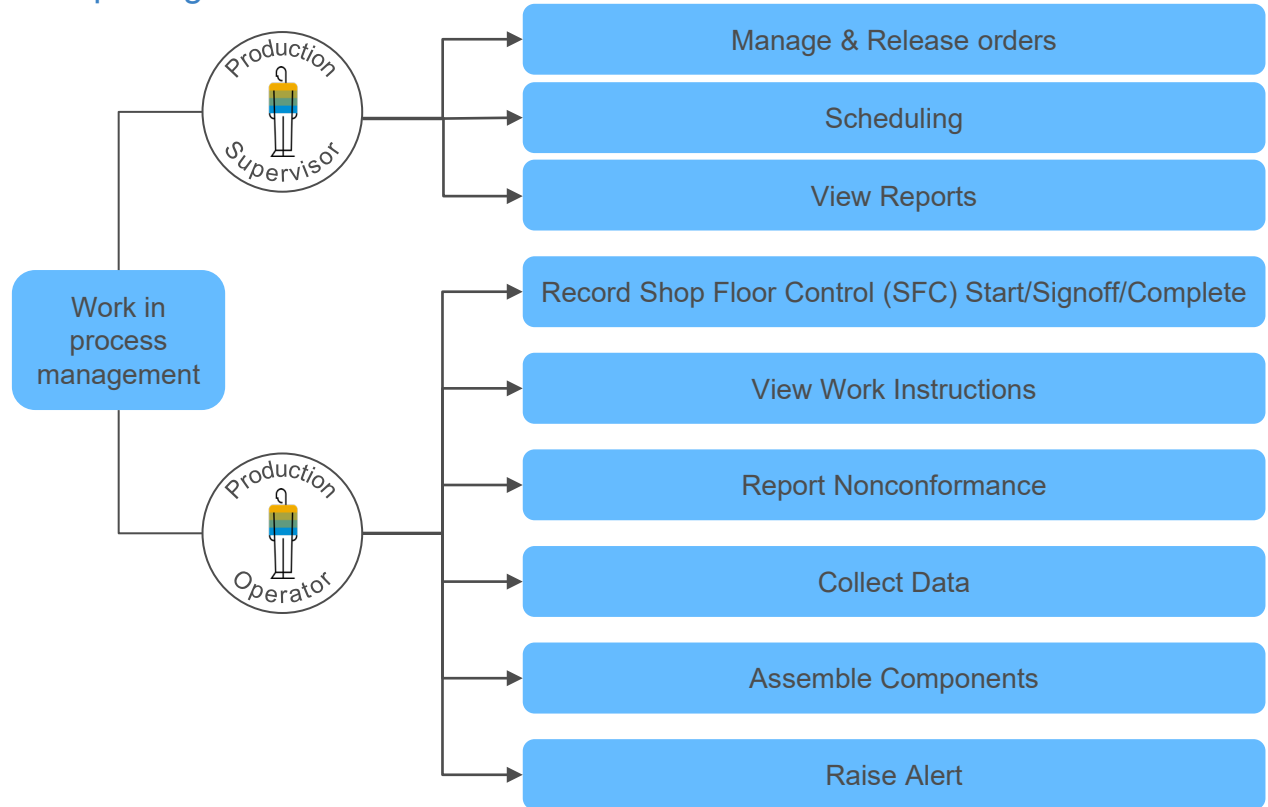
Execution Tasks



SAP Digital Manufacturing Cloud for Execution

Work in process management and reporting

- Manage and release orders for execution on the shop floor
- Production operators use the configurable PODs (Production Operator Dashboards) that were created in the POD Designer to capture and report execution data
- An SFC is a unique WIP identifier representing a specific instance of the material being built during the manufacturing process and allows for full traceability of the product.
- The SFC represents a quantity of the product to be produced, depending on the lot size of its material. An SFC can be a serialized or non-serialized (lot).



SAP Digital Manufacturing Cloud for Execution

Discrete Industry - Production Operator Dashboard (POD)

- Support operators with a highly flexible and **intuitive user interface (POD)**
- Configure and **design the POD** based on user requirements
- Display execution-relevant information of production orders
- Guide operators through work instructions** in the POD
- Support of **data collections**
- Logging of defects and subsequent rework and repair actions using the **nonconformance** functionality
- Provides product serialization and re-identification
- Recording of assembled components for traceability and to trigger **goods movements**
- Monitor **OEE** using established **KPIs** in the POD
- Post operation activity-level **yield confirmations** happen automatically as well as **goods receipts** as units are completed

The screenshots illustrate the SAP Digital Manufacturing Cloud for Execution interface, showing various views and data for production orders. The top view displays a 'DME WORK CENTER POD' with search filters for SFC, Work Center (BENCH), and Resource (BENCH1). Below it is a 'Work List (25)' table with columns for SFC, Order, Material Description, SFC Qty, Status, Order Planned Start Date, and Order Planned Completion Date. The middle view shows a 'Default Work Center POD' for 'FABRICATION49' with a 'Main / Activities' section and an 'Operation Activity List (5)' table. The bottom-left view shows a 'POD POD' with a 'Production Summary' table and a 'KPI Summary' section displaying OEE (10%), Availability (100%), Performance (10%), and Quality (100%). The bottom-right view shows a 'Data Collection List (4)' with a table of data collection groups and their parameters. A 3D CAD model of a gear assembly is visible on the right side of the interface.

SAP Digital Manufacturing Cloud for Execution

Execute Production Order in Order POD

- Operator can see the details of the order (including batch) and execute the following activities:
 - Start Operation
 - Report Activities
 - Report Yield and Scrap
 - Report Material Consumption
 - Data Collection
 - Complete Operation
 - Report Goods receipt header material
 - Report Goods Receipt for Co-products and Batch-products
 - Valuate batch during Goods receipt (update batch characteristics)
- Operator can execute the following activities in Post-Production POD:
 - Report Goods receipt for Production Order
 - Report Data Collection for Production Order

The screenshot displays two SAP interface components. The top component is a 'Create New Batch' dialog box overlaid on a 'Main / Details' view for Order ID 1006545. The dialog shows a dropdown menu for 'Material' with 'SG25_PRODUCTION_B' selected, and a list of descriptions including 'SG25_PRODUCTION_CO' and 'SG25_PRODUCTION_BY'. The bottom component is the 'Post-Production Reporting POD (Default)' screen for Order ID 1006574. It shows 'Material Description: SG24_AZSYSHC' and 'Goods Receipt Quantity: 500.000 of 100.000 CCM'. Below this is a 'Goods Receipt' table with columns for Material, Posted Value, Action, Batch Number, Storage Location, and Quantity.

Material	Posted Value	Action	Batch Number	Storage Location	Quantity
Finished Goods					
SG24_AZSYSHC	0 of 0	View Posts		101B	
Co-Products					
SG24CO_AZSYSHC	0 of 0	View Posts		101B	
By-Products					
SG24BY_AZSYSHC	0 of 0	View Posts		101B	

The screenshot shows a 'Create Goods Receipt' dialog box with the following fields:

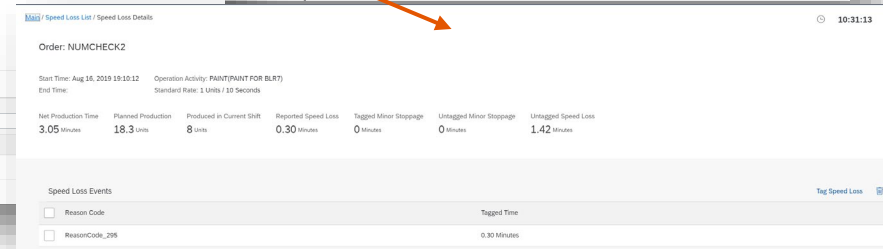
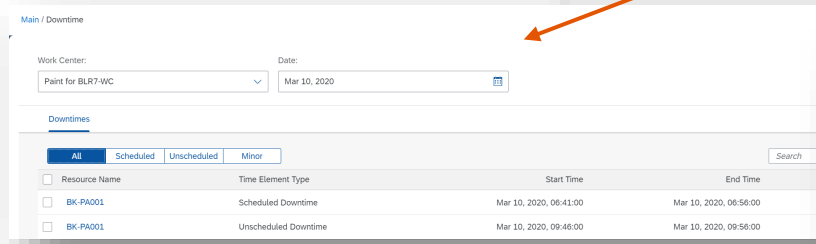
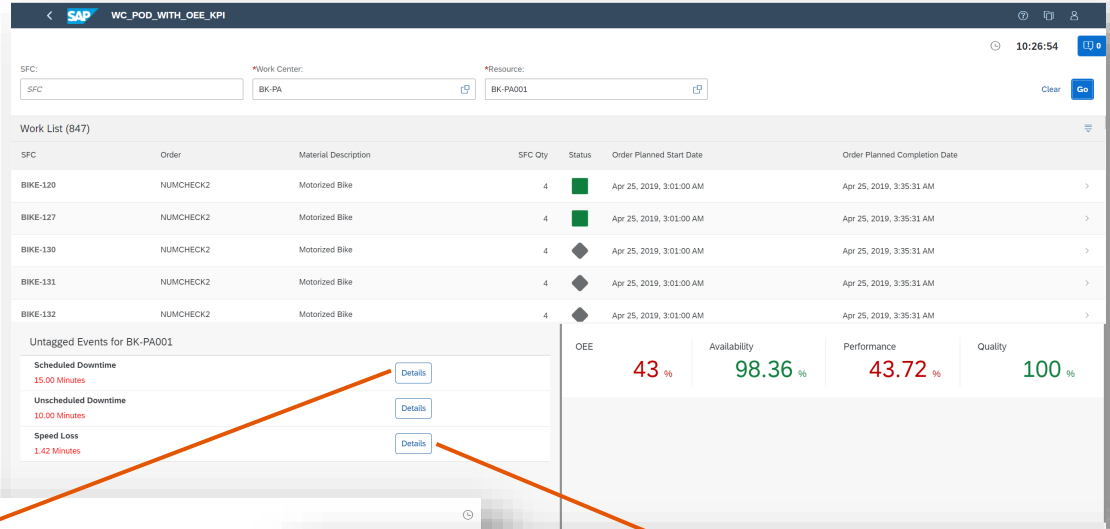
- Material Number: SG_QKJ_01
- Quantity / Unit: 1q CCM...
- Batch Number: 0004342867
- Storage Location: BL6A
- Posted By: Sumanta
- Posting Date: May 12, 2021
- Comments: (empty text area)

 Buttons for 'Confirm' and 'Cancel' are visible at the bottom right.

SAP Digital Manufacturing Cloud for Execution

Overall Equipment Effectiveness

- Optimizing the machine efficiency by utilizing the Overall Equipment Effectiveness (OEE) functionality
- Real-time visibility via related KPIs
- Production Operator Dashboard (POD) is configured showing OEE KPIs.
- Straightforward user interface allows production operators to easily report machine status change
- Detailed OEE insights and root cause analysis



SAP Digital Manufacturing Cloud for Execution

Work in process management and reporting

- Capture the digital twin of the production process presented by the following reports:
 - The *Product Genealogy Report* displays the details of the component data collected for an SFC
 - The *Product History Report** displays the activity of
 - an SFC over a period of time for Discrete Industries
 - a Batch over a period of time for Process Industries ([see more details](#))

* *The two styles of report (Discrete/Process) with different input parameters and report terminology will be set automatically based on the industry type of Plant configured in User profile.*

Sequence	BOM Components	Description	Qty Assembled / Required	Operation Activity
10	M_COMP1	M_COMP1	1/1	M_OPER1
20	M_COMP2	M_COMP2	1/1	M_OPER1
30	M_COMP3	M_COMP3	1/1	M_OPER1
40	M_COMP4	M_COMP4	0/8	M_OPER1
50	M_COMP5	M_COMP1	0/5	M_OPER1
60	M_COMP6	M_COMP6	1/1	M_OPER1
70	M_COMP7	M_COMP7	1/1	M_OPER1
80	M_COMP8	M_COMP8	0/2	M_OPER1
90	M_COMP9	M_COMP8	1/5	M_OPER1

Activity	Start Time	End Time	User
Start	2020-10-19 8:50 AM		chloe.yan@sap.com
Complete		2020-10-19 9:50 AM	chloe.yan@sap.com
SFC Done	2020-10-19 8:50 AM		chloe.yan@sap.com

SAP Digital Manufacturing Cloud for Execution

Process Industries



SAP Digital Manufacturing Cloud for Execution

Capabilities for Consumer and Process Industries

- **Extend Master Recipes** integrated from S/4HANA with Work Instructions, Data Collections and Process Parameters
- **Execute and Split Batch related Process Orders** in the Production Order Dashboard (POD)
- **Create and Value Batches** for Main-Products as well as for **Co-Products and By-Products** during Production and search and **Consume batches** based on characteristics
- **Confirm process order phases** with Yield, Scrap and Activities integrated with S/4HANA
- Post and Cancel **goods movements** for goods issues and receipts seamlessly integrated with S/4HANA
- **Record inspection results with Inspection Points** integrated with S/4HANA QM
- **Integrate with the Shop Floor** in a **bi-directional** way using Equipment Connectivity (Production Process Designer*) and Plant Connectivity (PCo)
- Enable **Post-Production Reporting**
- **Customize** your application with the POD Designer
- Print customized **Labels**
- **View product history report** for produced batches



SAP Digital Manufacturing Cloud for Execution

Process Industry – “Manage Recipe” App

- Integrate **Master Recipes** with S/4HANA
- Maintain execution relevant data such as **Work Instructions or Data Collection** parameters in DMC
- Graphical interface for recipe display
- Integrate **Production Versions** with S/4HANA Cloud

The screenshot displays the SAP Manage Recipes application interface. At the top, there is a search bar and filters for Recipe Name (50000128), Material, Material / Version, Created On, Usager (Master), and Current Version Only (NO). Below this is a table of recipes:

Recipe Name	Description	Material / Version / Description	Production Version / Description	Status	Created On	Usage	Version
50000128-1	SG24UOM-X2 Mixing	SG24UOM-X2 / A	MIX2 SG24UOM-X2 Mixing	Releasable	Feb 7, 2020, 2:00:48 PM	Master	A (Current)
		SG24UOM-X2 / A	MIX1 SG24UOM-X2 Mixing	Releasable	Feb 7, 2020, 2:00:48 PM	Master	A (Current)

Two detailed views are shown below:

Phase Details 0020 (Work Instruction):

Work Instruction Name	Description	Version
PH_PAINT001	Mixing Paint	A (Current)

Work Instruction Elements (1)

Type	Content	Date Created
TEXT	Fill Base Paint into Vessel CARRY EYE PROTECTION Ensure Shovel is cleaned. Set Mixer to 30 rpm Set temperature between 32° and 33° Mix for 30 Min Drain Vessel to Filling Line	10/7/2019, 1:33:06 PM

Phase Details 0020 (Data Collection):

DC Groups (1)

Name	Description
DC_PAINTMIX001	Mixing Paint Parameters

DC Parameters (3)

Parameter Name	Description	Type	Value	Unit of Measure
ROTOR SPEED	Rotor Speed	Numeric		rpm
TEMPERATURE	Temperature	Numeric		°C
SHOVEL CLEAN	Shovel CLEAN	Boolean		

SAP Digital Manufacturing Cloud for Execution

Process Industry - Production Operator Dashboard (POD)

- Integrate process orders with S/4HANA
- Provision of the **new Order POD** to support order and batch-based execution of process orders with batches
- Guide Operators with a highly flexible and **intuitive user interface** (POD)
- Configure and **design the POD** based on user requirements
- Support of **Data Collections** to collect execution related data
- **Record inspection results** for process order operation/phase (inspection lot type 03) and integrate with S/4HANA
- **Log Defects** for an Order which can be viewed in the Product History Report
- Report downtimes from POD to calculate OEE availability

The screenshot displays the SAP Digital Manufacturing Cloud for Execution Production Operator Dashboard (POD) interface. The interface is divided into several sections:

- Process Orders (18):** A table listing process orders with columns for Order ID, Batch, Material, Material Description, Order Quantity, Planned Date Range, Order Status, Charge Default Batch, Charge ID, Charge Quantity, and Charge Status. The table shows three orders, with the first one (1007624) highlighted.
- Order Details (1007624):** A detailed view of the selected order, showing the Order ID, Batch (DEMO-49-A), Phase (0013 - Mixing Phase), Material (D2C_C_004), and Planned Date (May 29 - Jun 2, 2020). It also displays the Goods Receipt Quantity (0 of 300.00 L).
- Phases (3):** A table listing the phases of the order, including Phase ID, Status, and Action. The phases are 0010 - Paint Mixing, 0012 - Add Premix, 0013 - Mixing Phase, and 0014 - Cleaning.
- Components (3):** A table listing the components of the order, including Component ID, Material, and Description. The components are 0010 - Operation_01, 0020 - Phase_01 of Operation_01, 0030 - Phase_02 of Operation_01, 0040 - Operation_02, and 0050 - Phase_01 of Operation_02.
- Phase Details (0013 - Mixing Phase):** A detailed view of the selected phase, showing the Phase ID, Status, and Action. It also displays the Phase Description (Phase_01 of Operation_01), Planned Work Center (MIXING), and Scheduled Start Date and Time (Jun 21, 2021, 11:00:00 PM).

SAP Digital Manufacturing Cloud for Execution

Product History Report for Process Industry

- Existing PHR report has been enhanced to enable using by Process Industry Customers.
- Input parameters and report terminology will be set automatically either to Process or Discrete based on industry type for Plant specified in User profile.
- User can search by Batch, Material or Order after pressing a value help button.

SAP Product History

0000000385

Order: 1004050
Order Type: Production
Work Center: MIXING

Material / Version: S5_MAT3 / A
Description: Copy from SG24-English
BOM / Version: 1004050-S5_MAT3-1-2 / A
Description: S5_MAT3

Routing / Version: 1004050 / A
Description: S5_MAT3

Activity Log | Data Collection | Nonconformance | Work Instructions | Custom Data

Operation Activities / Phase 0040, Operation 1004050-000000-0040

Expand All

Complete
10/09/2020, 01:57:34
Routing / Version: 1004050 / A
Phase: 0040
Work Center: MIXING
User: isabelle.xu01@sap.com

Complete
10/09/2020, 01:11:12
Routing / Version: 1004050 / A
Phase: 0040
Work Center: MIXING
User: isabelle.xu01@sap.com

Complete
10/09/2020, 01:11:12
Routing / Version: 1004050 / A
Phase: 0040
Work Center: MIXING
User: isabelle.xu01@sap.com

SAP Digital Manufacturing Cloud for Execution

Resource Orchestration

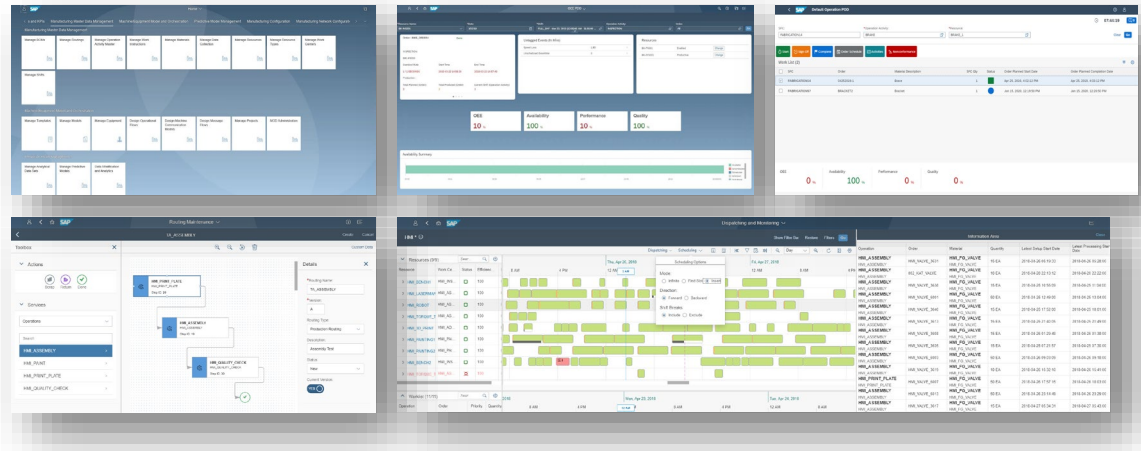
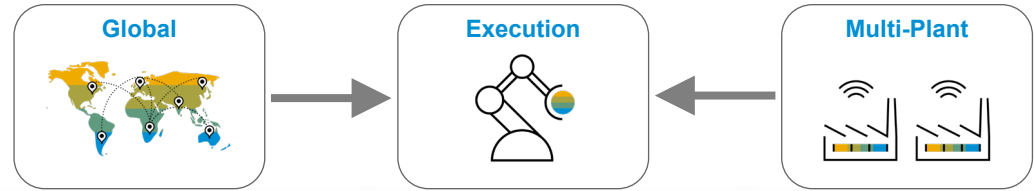


SAP Digital Manufacturing Cloud for Execution

Orchestrate and control the shop floor

Key capabilities

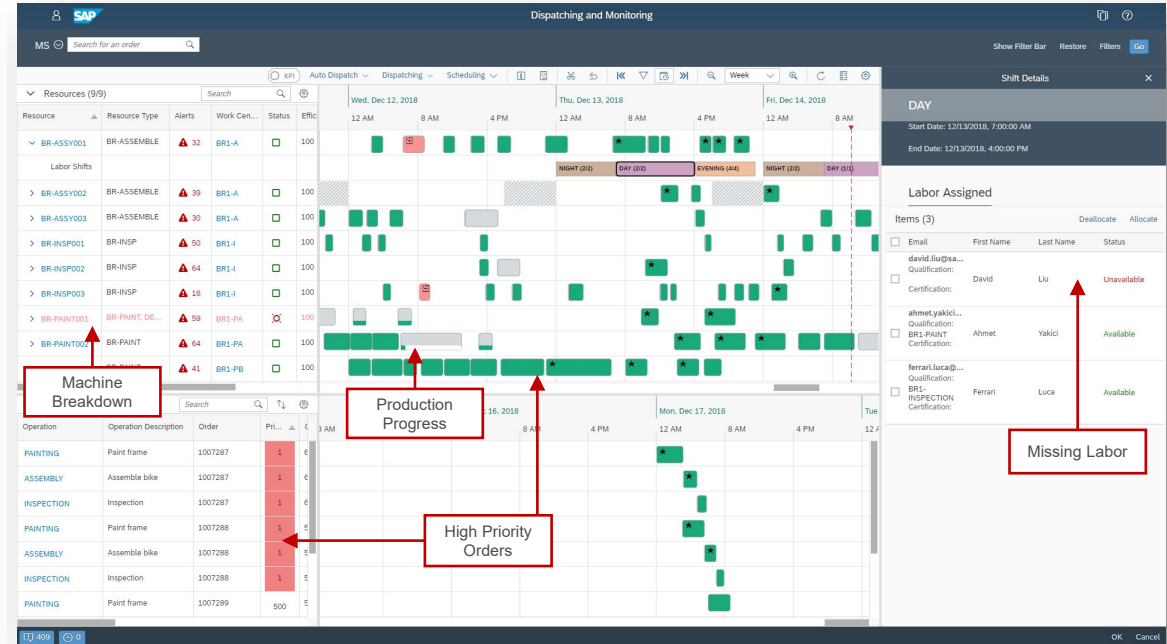
- Monitor the entire manufacturing process to optimize resources and execution
- Role-specific Fiori and operator dashboards
- Fully configurable Production Operator Dashboard (POD) that supports drag & drop and preview
- Monitor OEE and manage downtime events
- Resource Orchestration to manage shop floor workflow and labor assignments
- Automation interfaces to provide for shop-floor-driven manufacturing events and data collection



SAP Digital Manufacturing Cloud for Execution

Resource Orchestration & Dispatching

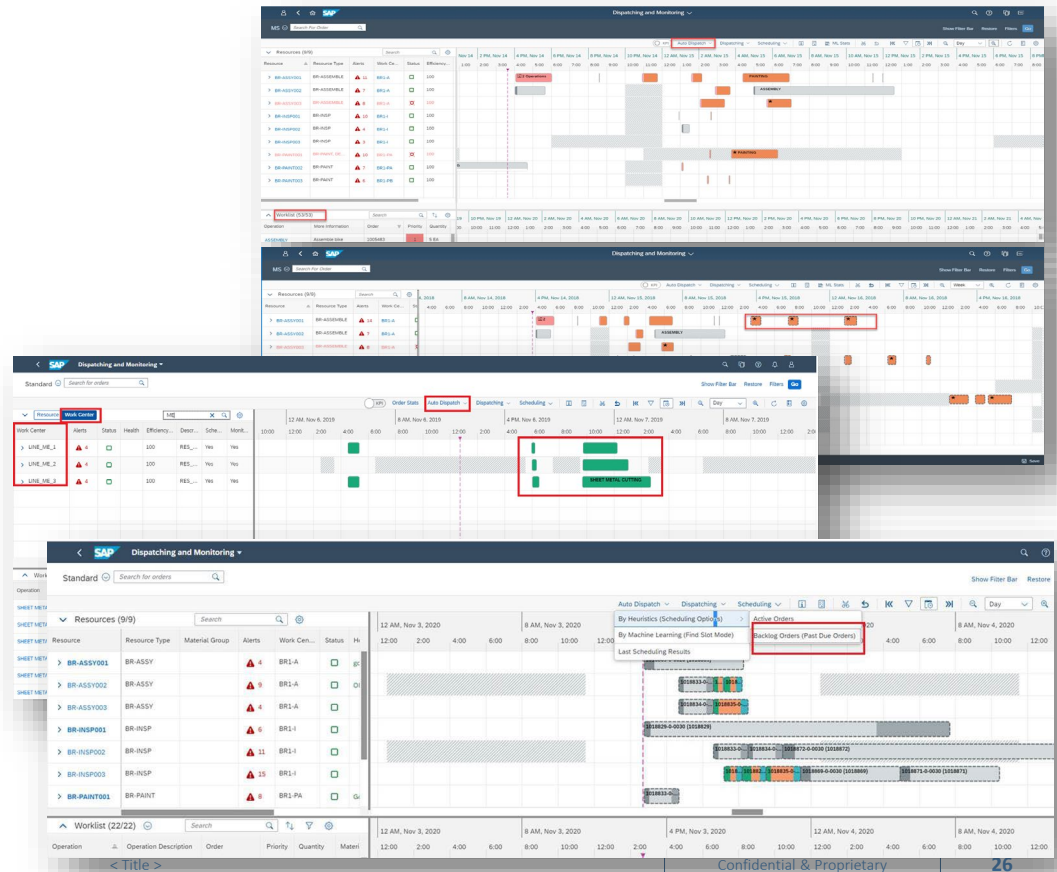
- Orchestrate labor and resources on the shop floor to achieve maximum availability
- React quickly to unexpected events utilizing built-in intelligence
- Dispatch and sequence operations to reflect the “real world” on the shop floor
- Provides multiple options for dispatching
 - Operations can be dispatched on Resource level (e.g. for Job Shop scenarios)
 - Operations can be dispatched on Work Center level (e.g. for Production lines or Production cells)
- Monitor the entire manufacturing process to optimize resources and execution
- Reflect the reality on the shop floor by visualizing high priority orders, machine breakdowns, missing labor and production progress



SAP Digital Manufacturing Cloud for Execution

Resource Orchestration & Dispatching

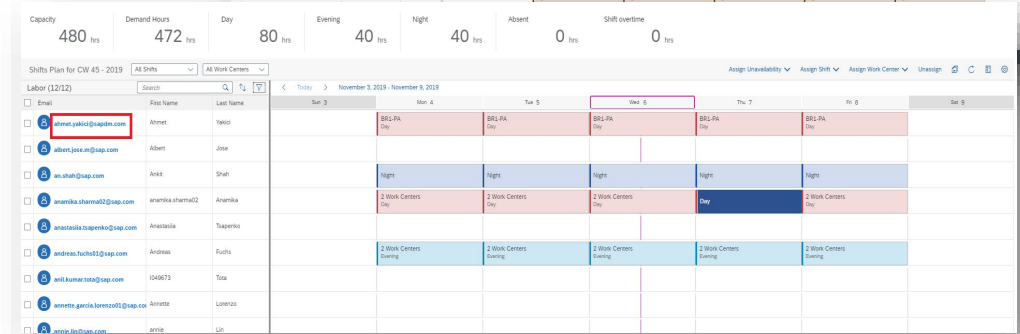
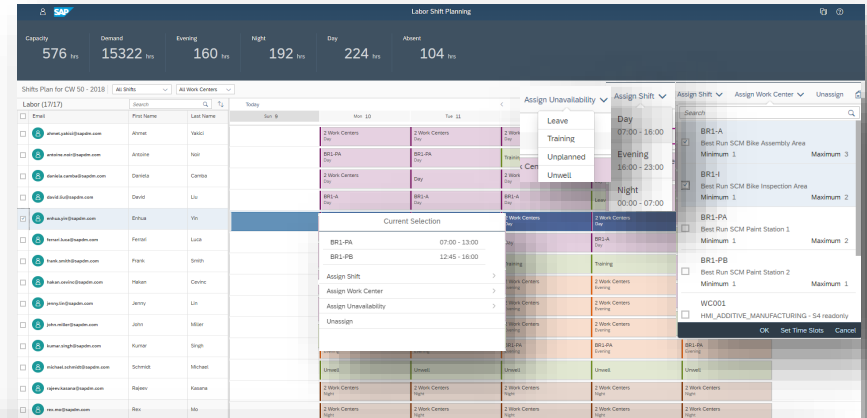
- Automatically dispatch operations from the Work List
- Trigger order release from order view and Gantt Chart and show created SFCs
- Operations can be split, merge and distributed to alternative resources
- Split quantities are shown in the order schedule information of the POD
- Tight POD integration to reflect planning situation on the shop floor and to visualize changes from execution in planning and vice versa
- Automatically or manually dispatch operations using Work Center view
- Check and reserve tools from the planning board
- Automatically schedule the backlog orders with advanced heuristics



SAP Digital Manufacturing Cloud for Execution

Resource Orchestration- Labor Scheduling

- Manage shifts and labor considering labor qualification and certification
- Assign labor to work centers and if required to time intervals
- In the situation where workers are not available, the unavailability of the worker(s) can be entered for the corresponding day or week
- Unavailability can also be entered in time slices if the unavailability is only for few hours
- Assignments are considered during dispatching in the Gantt Chart of the scheduling and dispatching app
- KPIs visualize the status for selected week:
 - Capacity reflects available labor capacity
 - Demand reflects demand coming from the orders
- Send emails to operators using the Schedule Labor app



SAP Digital Manufacturing Cloud for Execution

AI/ML Scenario Management



SAP Digital Manufacturing Cloud for Execution

AI/ML Scenario: Visual Inspection - Assist Nonconformance Logging

Machine learning models **assist operator** on the shop floor to **execute visual inspection tasks** of manufactured products. Using a **Production Operator Dashboard**, it **simplifies the identification of defects** and **logging** the right **Nonconformance** to ensure defective parts are handled as business requires.

Key Capabilities

- Upload pre-trained machine learning model and deploy it to shop floor supporting the operator on visual inspection tasks.
- Operator can capture images with connected cameras or can inspect images from industrial cameras provided by the data collection API
- Assist operator to identify defects and log the right Nonconformance code using the machine learning model
- Allow the machine learning model to log the Nonconformance automatically based on the prediction and under operator's control
- Automated collection of images and inspection results which can be reviewed, analyzed and downloaded as analytical data sets to train new machine learning models.

The screenshot displays the SAP Visual Inspection POD interface. At the top, it shows the SAP logo and 'Visual Inspection POD'. Below this, there are fields for SFC (1 SFC), Operation Activity (Inspection), Resource (Xplanar Test), Status (green square), Quantity (1), Order (1145), and Material (CONTROL_HEAD_KIT). A dropdown menu shows 'DMC_Control_Head_1192'. A 'Play Live Feed' button is visible. The main image shows a production order card with a QR code and a red box highlighting a defect. A red notification bar at the top right states 'DMC_Control_Head_1192 is most likely Non-conformant.' Below this is a table of nonconformance codes:

NC Code	Probability	Action
Defective Sticker	99.3%	Log NC
QR Code Missing	0.3%	Log NC
Card Missing	0.2%	Log NC
Wrong Sticker Position	0.2%	Log NC

At the bottom, there are buttons for 'Mark as Conformant', 'Mark Nonconformance', and 'Cancel'.

SAP Digital Manufacturing Cloud

Extensibility



SAP Digital Manufacturing Cloud

UI Extensions (Custom POD Plugin, Custom Application)

- Provides mechanism to allow customers/partners to develop custom SAP UI5 based POD plugins using SAP Web-IDE
- Step by step guide is available in sap help portal
- Custom POD plugin becomes available inside POD Designer thereby allowing them to be consumed inside POD
- Alternatively, the customer/partner might make use of the public API's available in the SAP Business API Hub to create a full SAPUI5 Custom Application in customer/partner PaaS tenant.
- Template Assembly POD is provided by SAP including step by step guide on sap help portal

The image shows two overlapping screenshots from SAP Web-IDE. The top screenshot is the 'New SAPUI5 Application Template Selection' page, which includes search filters for Environment (Neo), Category (Featured), and SAPUI5 Version (SAP Innovation (4.75)). It lists several application templates, with 'SAPUI5 Application' selected. The bottom screenshot shows a 'Work Center: BENCH' view for 'SFC / Assembly' with a table of components. A sidebar on the left shows details for 'SFC: FABRICATION26 Bracket Assembly', including a production order, material, and active SFC quantity.

Sequence	Description	Type	Action
10	BRACKETA 1 1	SERIAL_NUMBER	⊗
20	NUTPLATE/A 1 1	LOT_NUMBER	⊗
30	SHIMA 2 2	COMMENTS	⊗
40	RIVET/A 4 4	NONE	⊗

SAP Digital Manufacturing Cloud Machine Learning Extensions

Bring your own model for Visual Inspection Scenarios

- Download image and inspection results collected through usage of POD Plugin Visual Inspector
- Train your own classification or defect detection model using preferred machine learning tools and convert it to Tensorflow Javascript model files
- Upload you own model files using wizard for creation of new visual inspection scenarios
- Activate visual inspection scenarios with the own model to be used by POD Plugin Visual Inspector

```
In [42]: print(params)
print('Number of trained epochs: ', len(history.history['loss']))
{'params_optimizer': 'adam', 'params_model': {'layers_shape': (12, 32), 'filter_size': 3, 'pool_size': (1, 1), 'activation': 'relu', 'batch_normalization': True, 'categorical_crossentropy': 'optimal'}, 'optimizer': 'adam', 'best_model_name': 'data/models/20190214_BestModel.h5', 'experiment': ''}
Number of trained epochs: 12

In [43]: # plot training history
from matplotlib import pyplot
plt.plot(history.history['acc'], label='train')
plt.plot(history.history['val_acc'], label='test')
plt.legend()
plt.show()
```

Visual Inspection: Predictive Quality (BYOM)

1 Scenario Definition | 2 Scenario Configuration | 3 Scenario Deployment | 4 Scenario Testing

PREDICTION: DZO_WORKBENCH_A

2. Scenario Configuration

Please upload model files (model.json and one or more model.bin files) and define model input.

Model File Uploads (2) Clear All +

- weights.bin 2.1 MiB
- model.json 89.7 KiB

Define Model Input

Input Type	Height (Pixels)	Width (Pixels)	Mode	Scale Ratio
Image	224	224	RGB color (3...)	-1 to 1 Scaling

Step 3 Cancel



SAP Digital Manufacturing Cloud for Insights

Solution Details



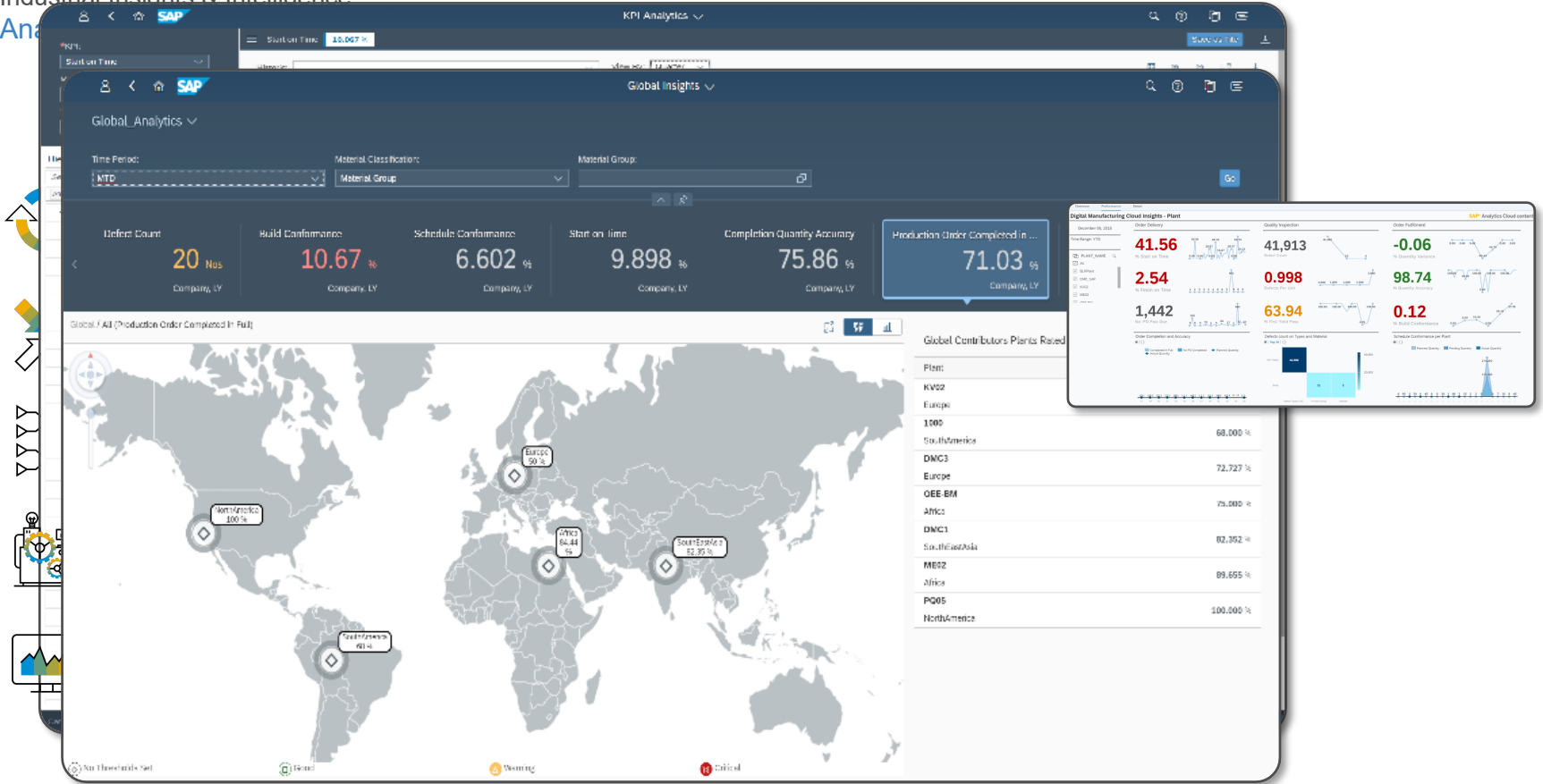
Manufacturing Insights

Digital system to gain real-time visibility of production performance with business context across the enterprise

Key capabilities

- Gain insights on performance and productivity across different levels of the enterprise hierarchy (i.e. across regions, plants, work centers, resources, etc.)
- Take informed decisions by combining and utilizing data from shop floor systems, execution systems, along with contextual information from business sources (i.e. ERP)
- Use pre-delivered interactive dashboards filled with standardized key performance indicators (KPI) based on harmonized data
- Incorporate data from non-SAP sources, build customized KPI's and personalize your dashboards & reports
- Perform root cause analysis, drill -down and -up across different levels of the enterprise hierarchy

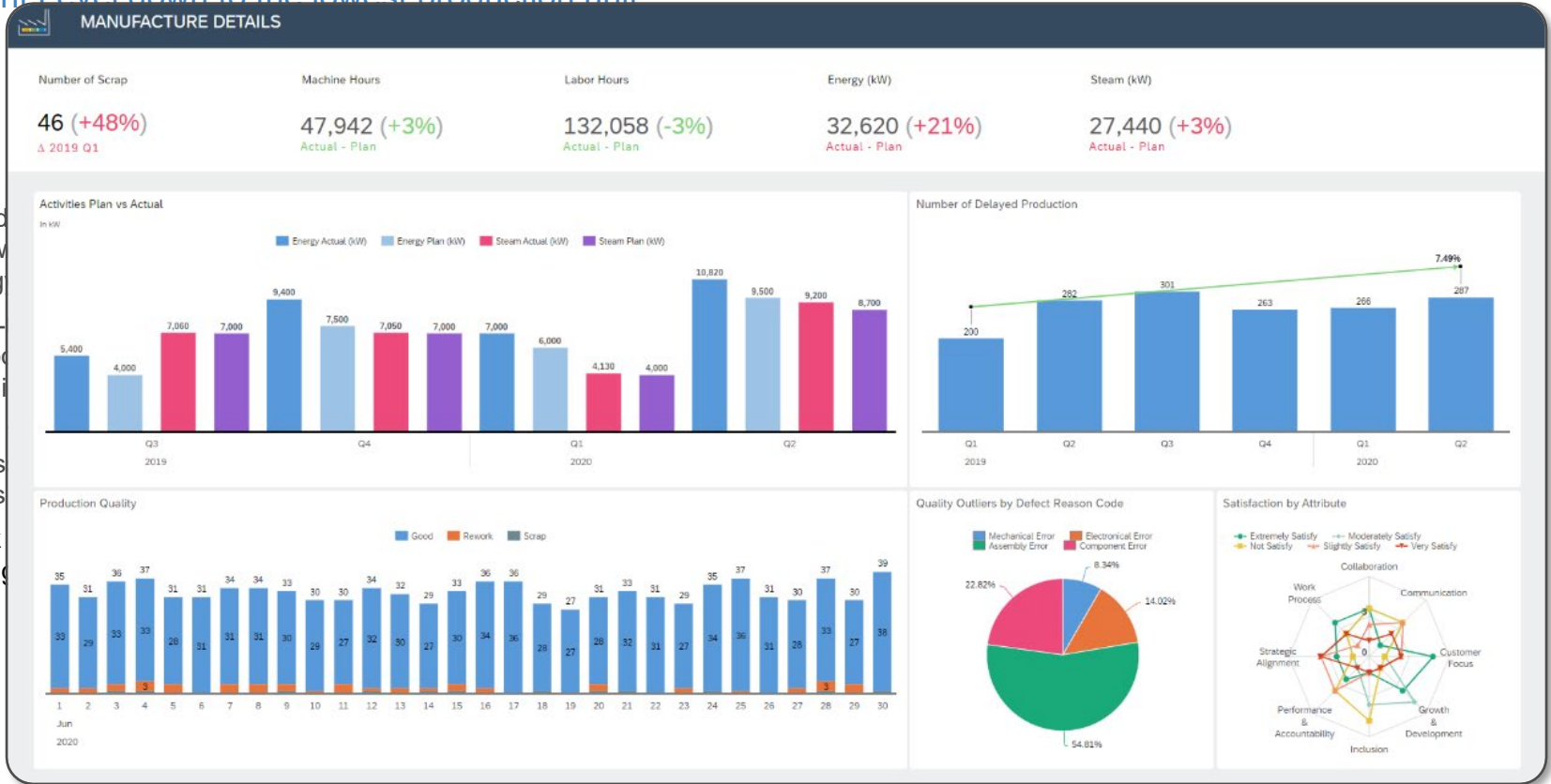




Insights

From Plant Level down to the lowest production unit

- Use standard KPIs fed via technology
- Gain real-time insights of the production geography
- Compare and across resources
- Get quick performing



Deep Dive - KPI Analytics

Exploration of contributors

D
 C
 V
 D
 C
 h
 S

Quadrant 1 - (First Pass Yield %)

Date	First Pass Yield %
28 Jan	100
29 Jan	100
30 Jan	100
03 Feb	90,909
05 Feb	100
06 Feb	100
17 Feb	100
20 Feb	100
21 Feb	80
22 Feb	75
23 Feb	100
24 Feb	83,333
25 Feb	85,714
26 Feb	75
27 Feb	93,023

Quadrant 2 - (Start on Time (in %))

Year / Quarter	Start on Time (in %)
Quarter 1 2020	100

Quadrant 3 - (Past Due Orders)

Date	Past Due Orders
01 Jan	8
02 Jan	23
03 Jan	22
04 Jan	9
05 Jan	7
06 Jan	5
07 Jan	19
08 Jan	6
09 Jan	11
10 Jan	40
11 Jan	8
12 Jan	6
13 Jan	113
14 Jan	24
15 Jan	15
16 Jan	11
17 Jan	8
18 Jan	8
20 Jan	200
21 Jan	8
22 Jan	4
23 Jan	11
24 Jan	10
27 Jan	6

Quadrant 4 - (Finish on Time (in %))

Date	Finish on Time (in %)
01 Jan	0
02 Jan	0

KPI Analytics Configuration Panel

*KPI: Start on Time

Materials (0):

*Time Period: Year to Date

Hierarchy (1): SAP x

Start on Time: 7.311%

Contributors (1000)

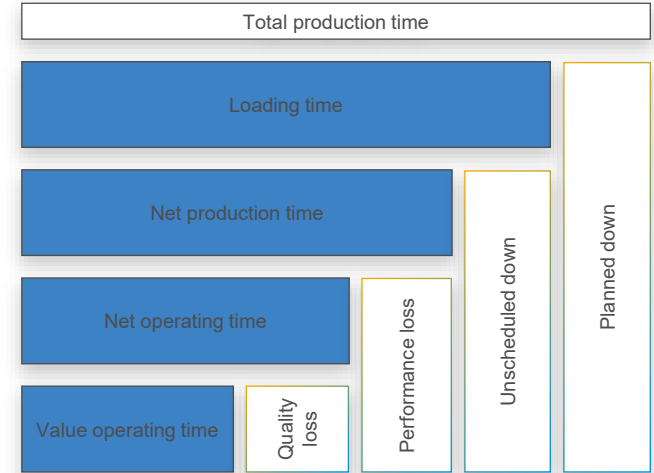
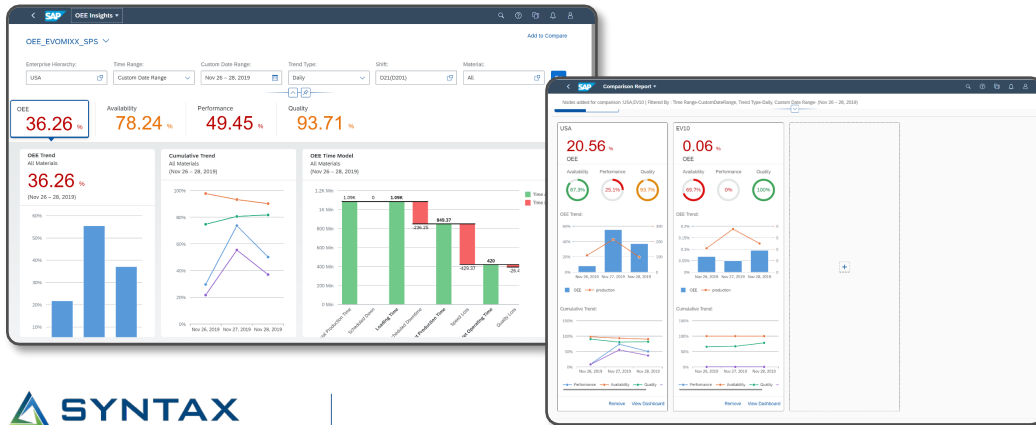
Plant	Material	Material ID	PO Number	Schedule ...	At
SAP	Motorisierte...	BR1-F3000	1007333	1/2/2019, 1...	
SAP	Motorisierte...	BR1-F3000	1007319	1/2/2019, 5...	
PQ05		BODY001	1007415	1/8/2019, 1...	
PQ05		BODY001	1007414	1/8/2019, 1...	
PQ05		BODY001	1007413	1/8/2019, 1...	

Buttons: Cancel, Apply, Add to Compare, Compare KPIs

Insights on Overall Equipment Effectiveness

Standard metric for measuring manufacturing productivity

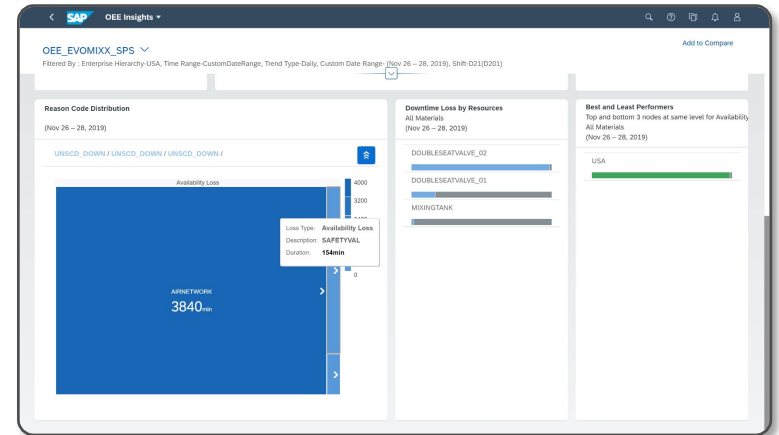
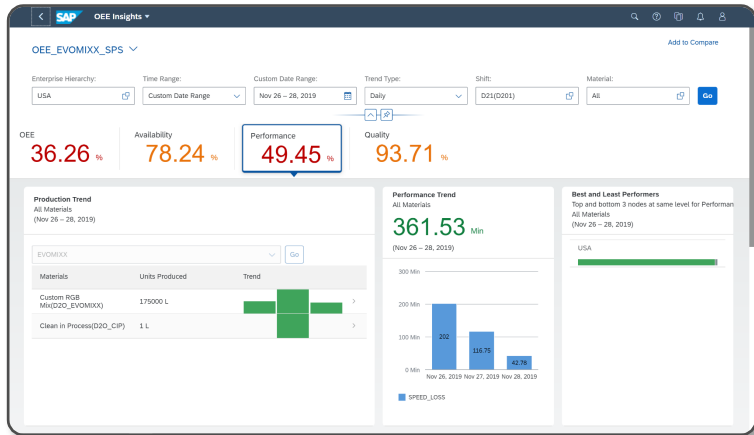
- Measure productivity with standard pre-delivered OEE calculations
- Analytics on identified losses captured during execution
- Normalization of various losses into time lost
- Analyze OEE across a custom time range, across materials, and across shifts
- Root cause analysis for all OEE losses (availability, performance, and quality losses)
- Perform OEE comparison and loss analysis between work centers, resources, and plants across different time zones of the world



Root Cause Identifier for OEE Losses

Helps to focus on the reasons for sub-optimal performance

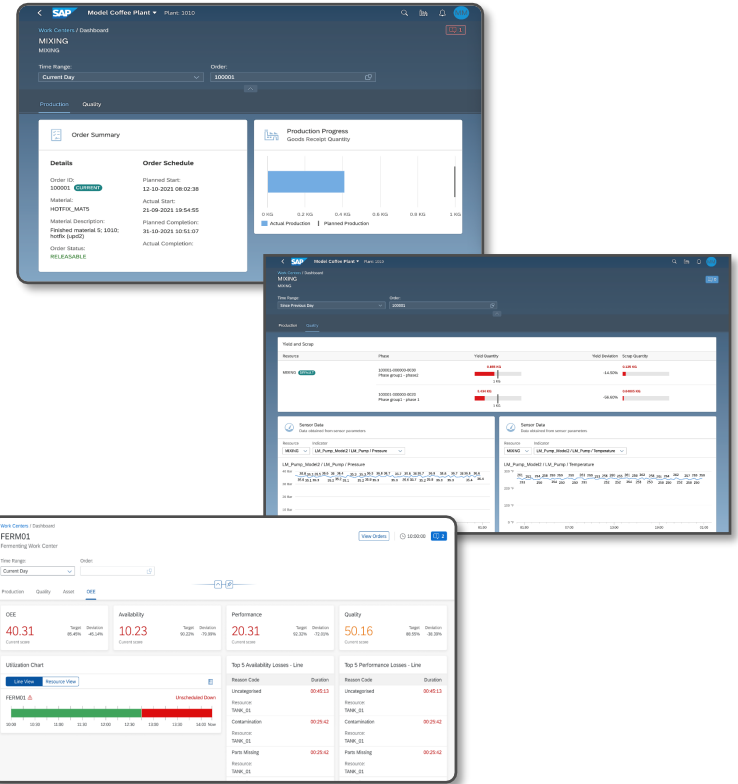
- Root cause analysis for all OEE loss types, e.g. unscheduled down, schedule down, performance loss and quality loss
- Identify major contributors for losses
- Multi-level reason code drill-down to identify root cause of the issue



SAP Digital Manufacturing Cloud for Insights

Live Production Visualization & Monitoring

- Seamlessly design to your wish the details to monitor and track the production line from the Line Monitor plugins provided out of the box from POD designer.
- Track the actual production progress against planned production with order-specific details from the perspective of “Production”.
- Monitor the yield, scrap at every phase level of the order from the perspective of “Quality”. Embed IoT sensor data to help operators to visually identify anomalies and correlate with specific orders.
- Visualize the resource availability summary and associated availability losses from the perspective of “Assets”.
- Monitor and track the effectiveness and performance from the perspective of “OEE”.
- Visualize shop floor 2D layout and overlay information on top

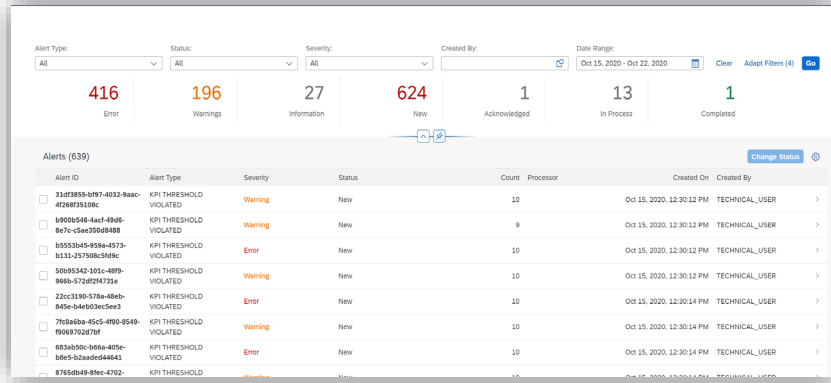


SAP Digital Manufacturing Cloud for Insights Alert Management



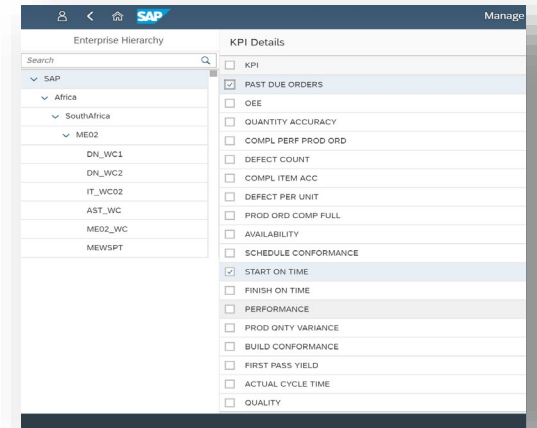
SAP Digital Manufacturing Cloud for Insights

Alert Management – KPI Threshold Violation



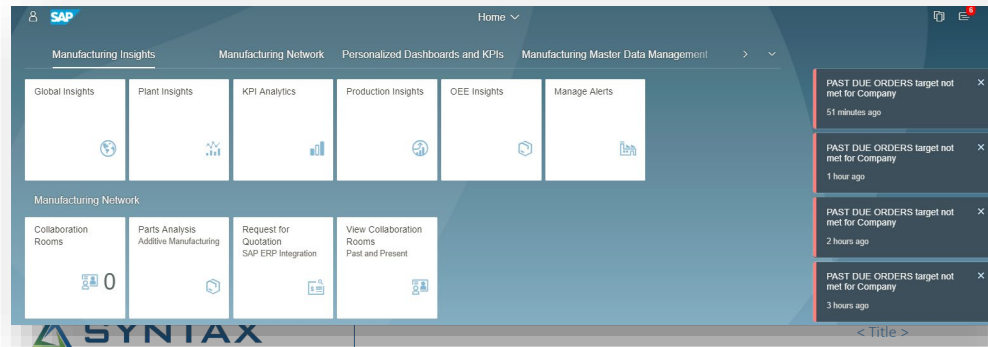
Alert Overview

- Visualize the alerts with appropriate filters
- Complete alert lifecycle to make it in process, acknowledge and complete



KPI violation

- Personalized subscription for alerts on KPI threshold breach at any hierarchy node as per personal responsibility



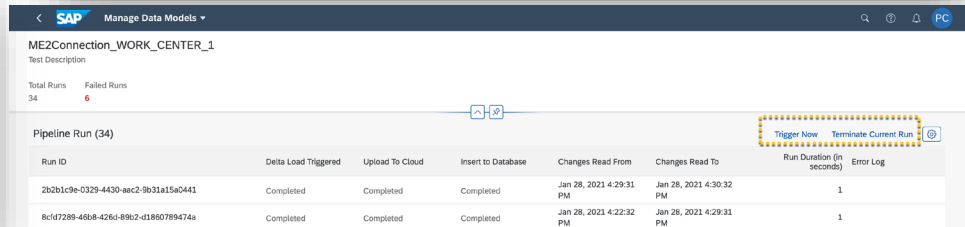
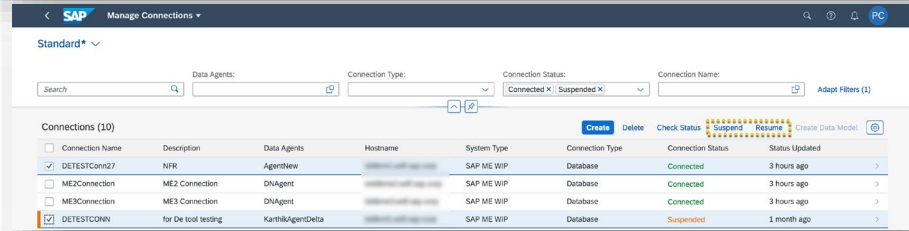
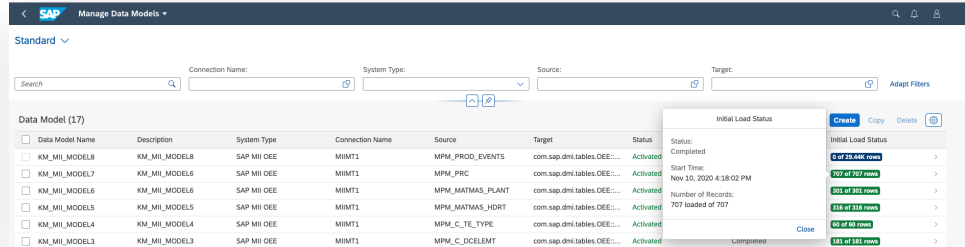
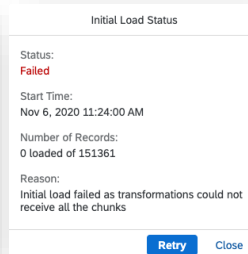
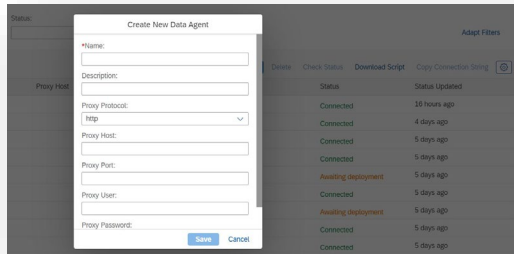
Push Notification

- Contextualize view of alerts; categorized by date, type and priority
- Push notification without refreshing the page

SAP Digital Manufacturing Cloud for Insights Data Engineering

Data Agents, Connections and Data Model for Analytical Insights

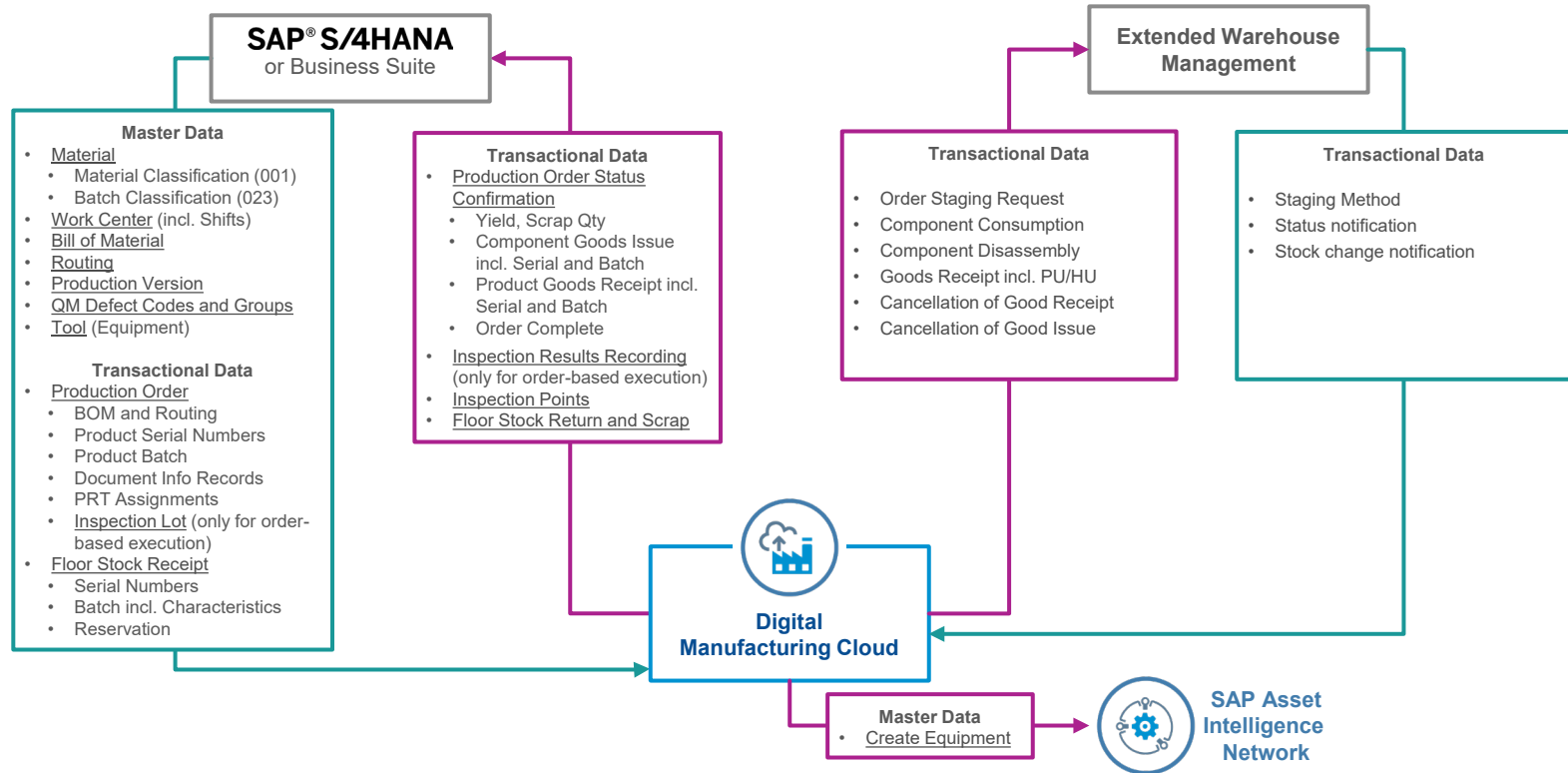
- Acquire data from on-premise systems (ME, ECC and S/4HANA) to the cloud (DMC)
- Enable data replication by defining data agents and connections for corresponding host systems
- Prepare and contextualize the replicated data for consumption by defining data models
- Ensure data integrity, continuity and completeness of replication
 - Qualitatively monitor connectivity status and quantitatively monitor replication status
 - Suspend and resume connectivity to the host system (e.g. in case of database maintenance)
 - Suspend data replication and resume it from the delta load



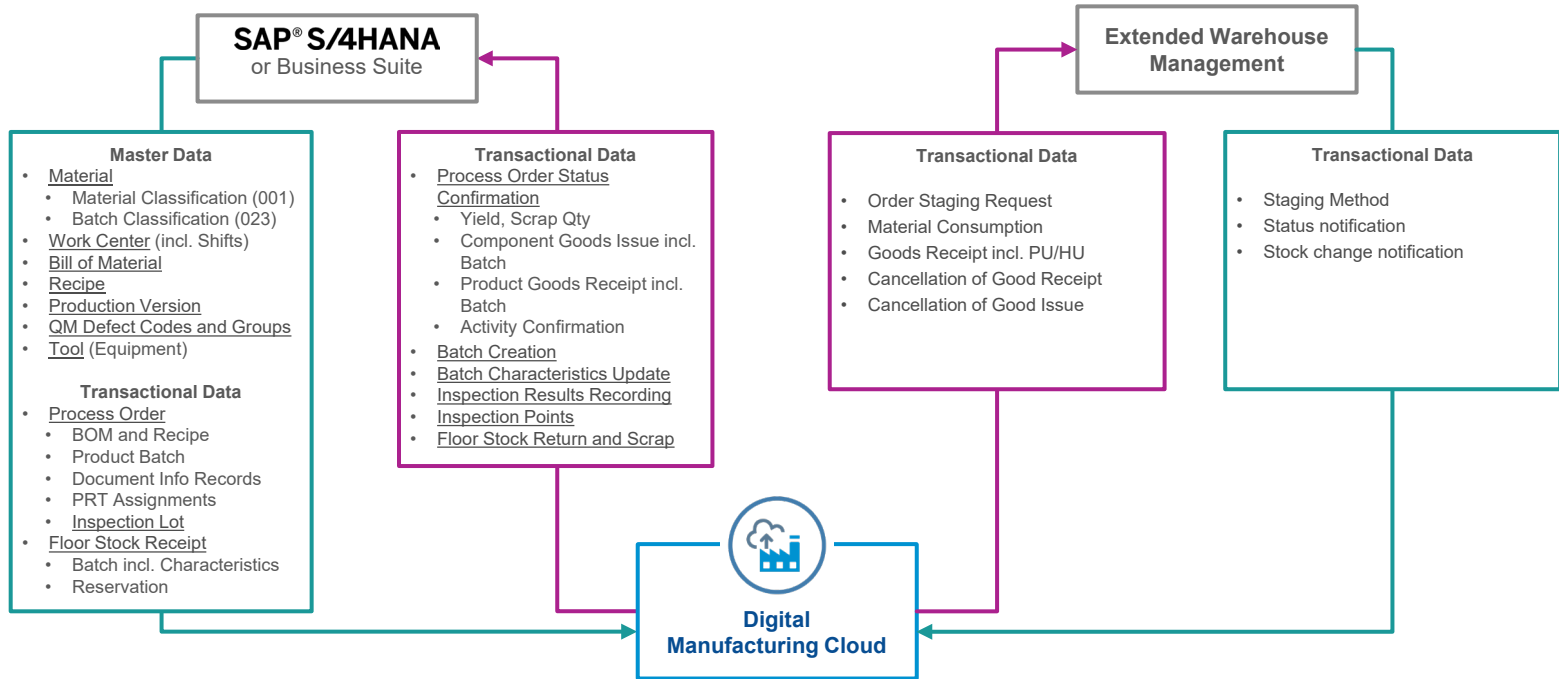
SAP Digital Manufacturing Cloud Integration



Discrete Industries Integration Scenarios for DMC – S/4HANA or Business Suite



Process Industries Integration Scenarios for DMC – S/4HANA or Business Suite

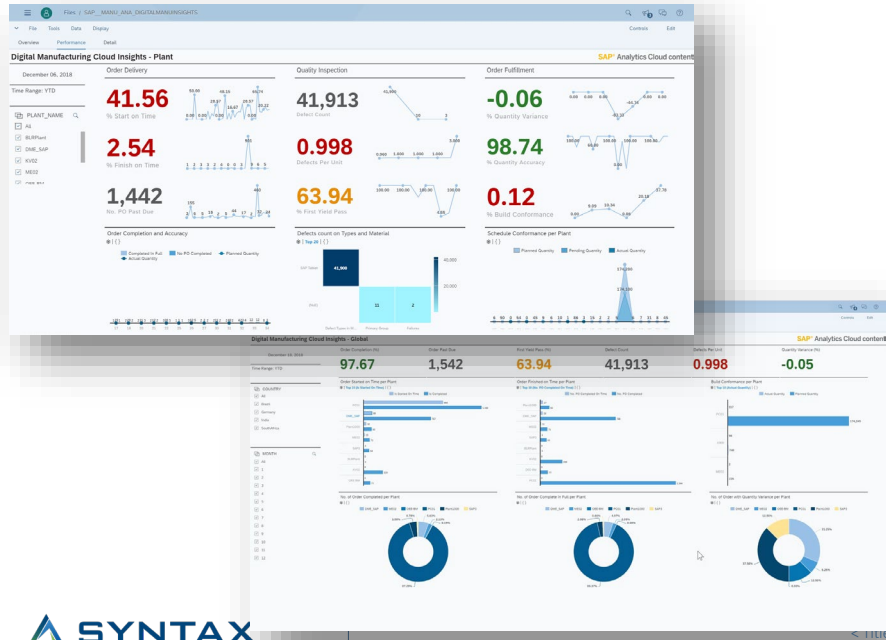


SAP Digital Manufacturing Cloud for Insights

SAP Analytics Cloud Integration

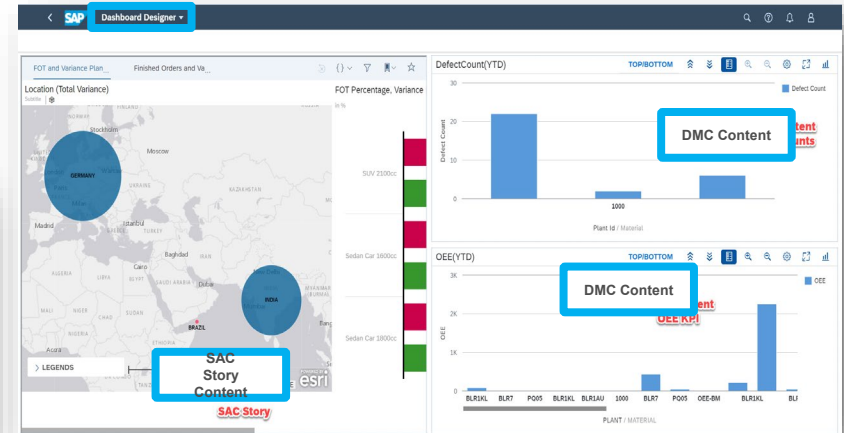
Manufacturing data in SAP Analytical Cloud (SAC)

- Set up live connection from SAC to Digital Manufacturing Cloud for Insights
- Use DMC Insights KPIs in SAC stories and combine with other data in Digital Boardroom



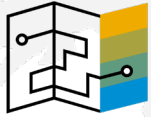
SAC Stories in Dashboard Designer for Enhanced Insights

- Drag-and-drop SAC stories with ease into dashboard designer
- Contextualize SAC story content with production performance management KPI's and content available from DMCi
- Leverage the complementary strengths of SAC and DMCi



Further Information

Key Links:



[SAP Road Maps](#)



[SAP Manufacturing Community](#)



[SAP Support](#)



[SAP Partner Portal](#)



[SAP Innovation Discovery](#)



[SAP Help Portal](#)

Where to go to Provide Product Feedback and Ideas:



[SAP Idea Place](#)



[Influence Programs](#)



[SAP User Groups](#)



| Thank You

