SAP Digital Manufacturing Cloud Road Map

March 2021

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For all recent and planned innovations, potential data protection and privacy features include simplified deletion of personal data, reporting of personal data to an identified data subject, restricted access to personal data, masking of personal data, read access logging to special categories of personal data, change logging of personal data, and consent management mechanisms.

About SAP road maps

Companies today are planning their digital journeys – transforming business models, reengineering business processes, and reimagining work.

SAP road maps highlight innovations that may help you plan and implement your digital journey. They span products relevant to lines of business in your industry and explain how our innovations may add value to your business.

In our road maps, you can learn about our innovations along four different timelines:

1. **Recent innovations** for our products that have been launched in the past weeks or months and can already be purchased
2. **Planned innovations** for our products that are intended to be launched in the short term or midterm
3. **Product direction**, providing a long-term perspective on high-level development plans for innovations for our solutions – inspired by your requirements
4. **Product vision**, providing a high-level and long-term business perspective on innovations for our products

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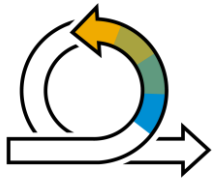
The Goal for our Customers: Resilient Supply Chains from Design to Operate | The WHY



Agility

Sense, predict, and respond to insulate from disruption

Productivity

Meet market demands in a highly demanding market

Connectivity

Collaborate and provide visibility across your networks

Sustainability

Ethically sourced with zero waste and carbon neutral processes

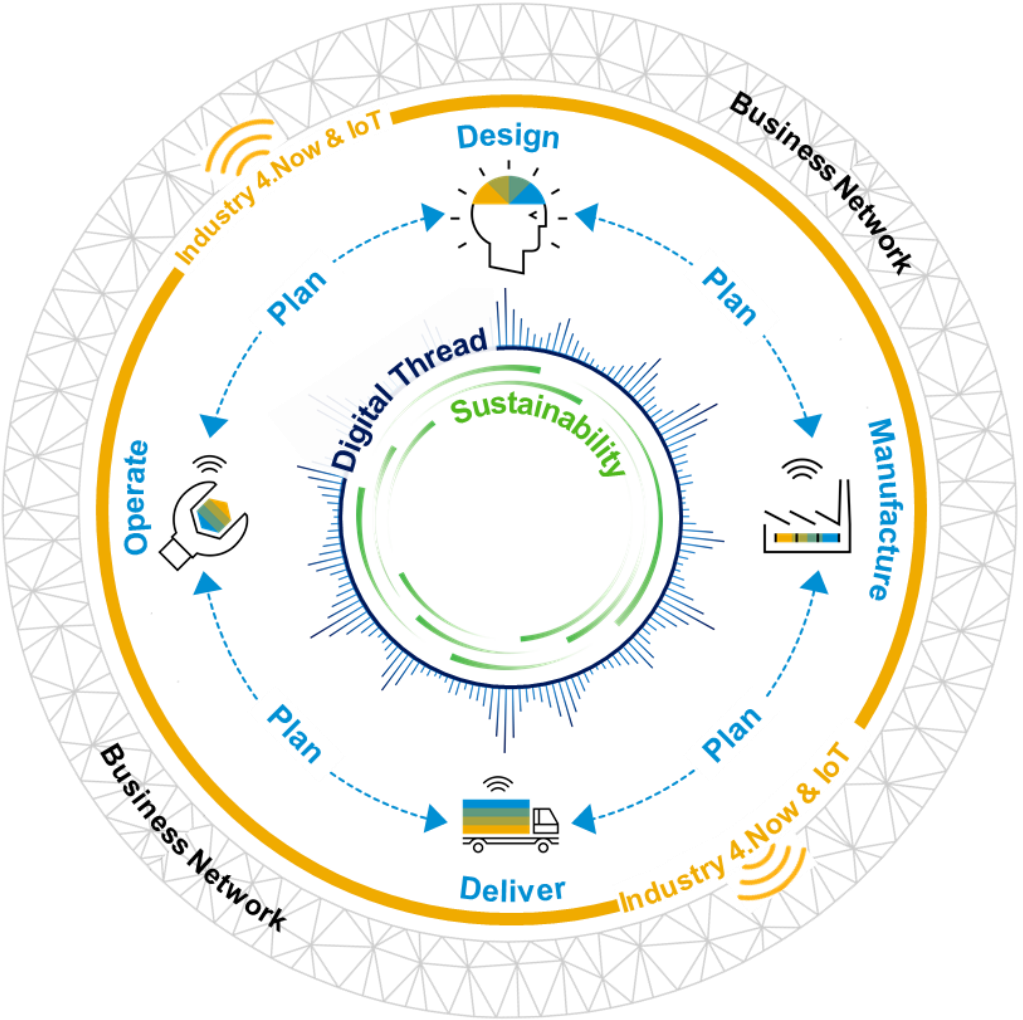
Evolve to a Resilient Supply Chain with Four Winning Strategies in a Holistic Design to Operate Offering | The How

Synchronized Planning
Planning as a continuum across the supply chain

Industry 4.Now
Automate for productivity

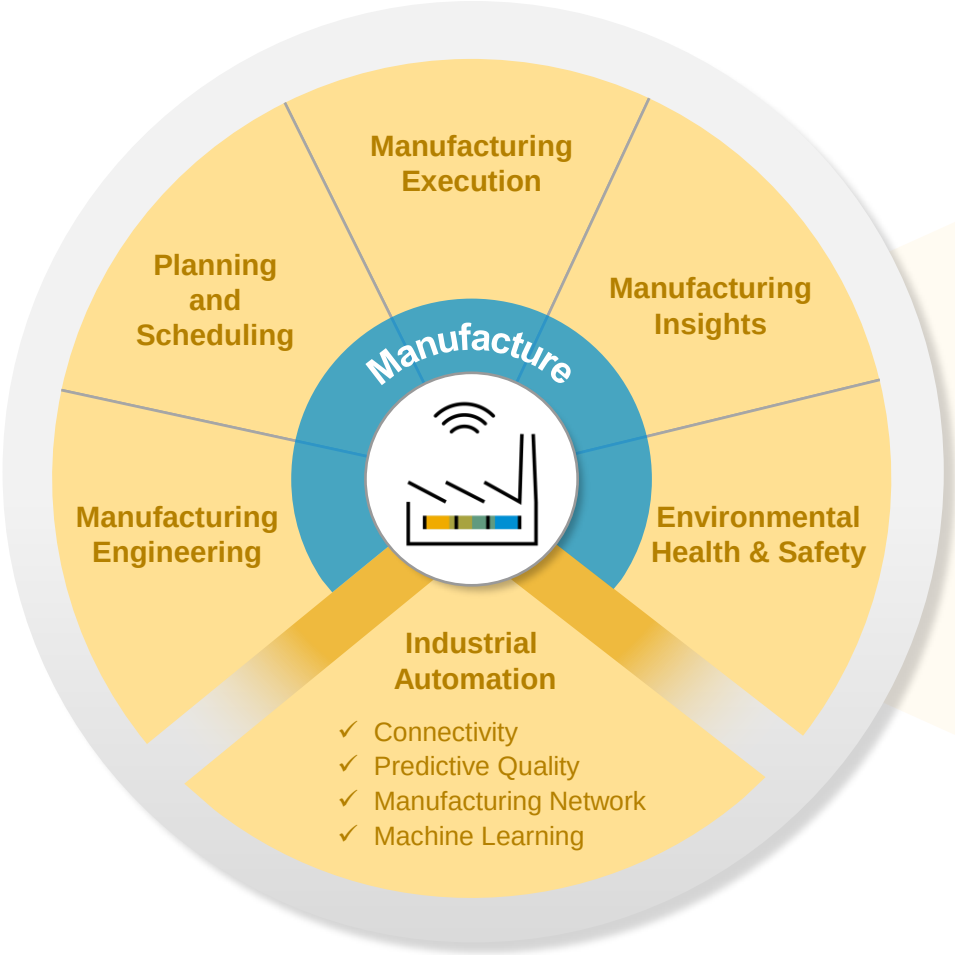
Business Networks
Connect for next-level business collaboration

Sustainable Supply Chain
Circular Economy for zero waste



SAP Digital Manufacturing Solutions

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



SAP Digital Manufacturing Cloud

- Manufacturing Insights
- Manufacturing Execution

SAP Manufacturing Suite

- SAP Manufacturing Integration and Intelligence
- SAP Manufacturing Execution
- SAP Plant Connectivity

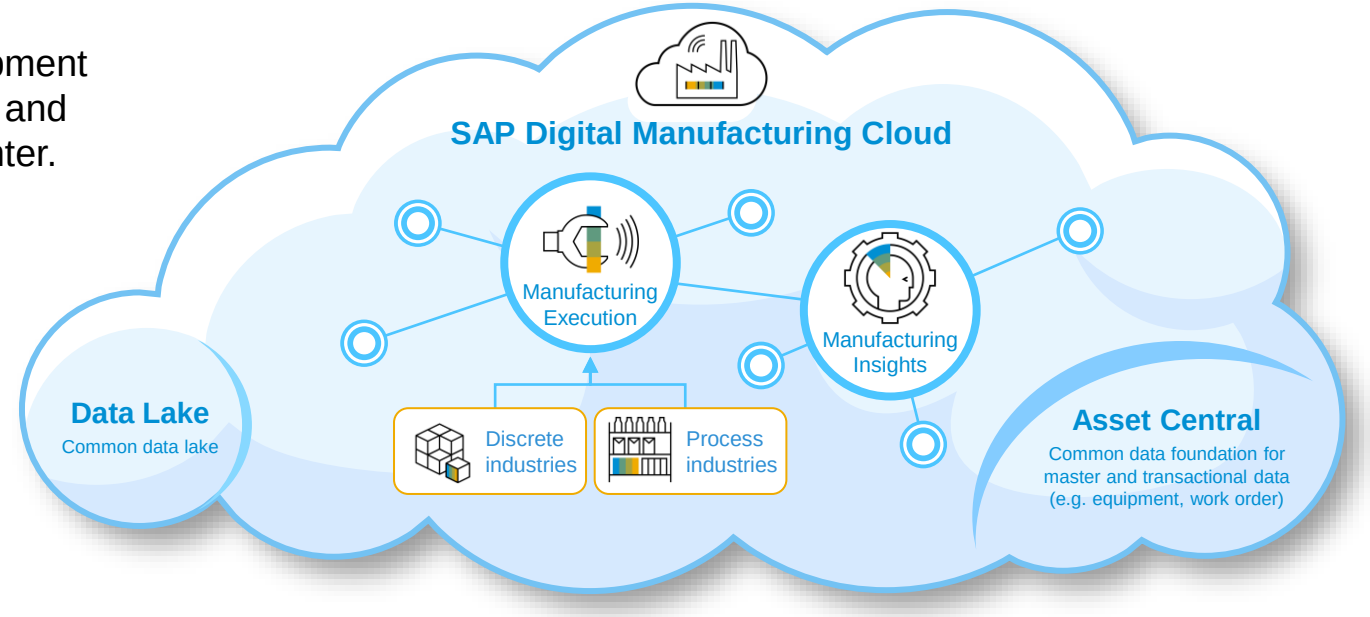
SAP S/4HANA Manufacturing

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

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 for 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

SAP Digital Manufacturing Cloud for execution

Product road map overview

V2102 – Recent innovations

Manufacturing execution

- Integration with quality management (QM) for in-process controls
- Support for AI-ML functionality enabling visual inspections in plants running SAP Manufacturing Execution
- Tooling support consisting of integration of tools from SAP S/4HANA and subsequent planning, scheduling, and execution
- Support for batch-oriented process manufacturing with production orders
- Integration with quality management for defects and nonconformance recording
- Automatic load-balancing of work centers or resources in resource orchestration

V2105 – Planned Q2/2021[1]

Manufacturing execution

- Location of defects on images of inspected products to train machine learning models to detect defects
- Visual inspection: semi-automatic mode using machine learning predictions
- Process-order execution with advanced batch management

V2108 – Planned Q3/2021[1]

Manufacturing execution

- Process lots to Group SFCs for Execution
- Integration scenarios with extended warehouse management
- Support for advanced order status management
- Integration Of Shifts for Planning and Scheduling

V2111 – Planned Q4/2021[1]

Manufacturing execution

- Modular Production Support
- Production Operator Dashboard Usability Enhancements
- Order execution with an option for weighing and dispensing materials
- Support of 'Non-conformance' scenarios for Process order execution
- Process-order execution with guided-process instructions

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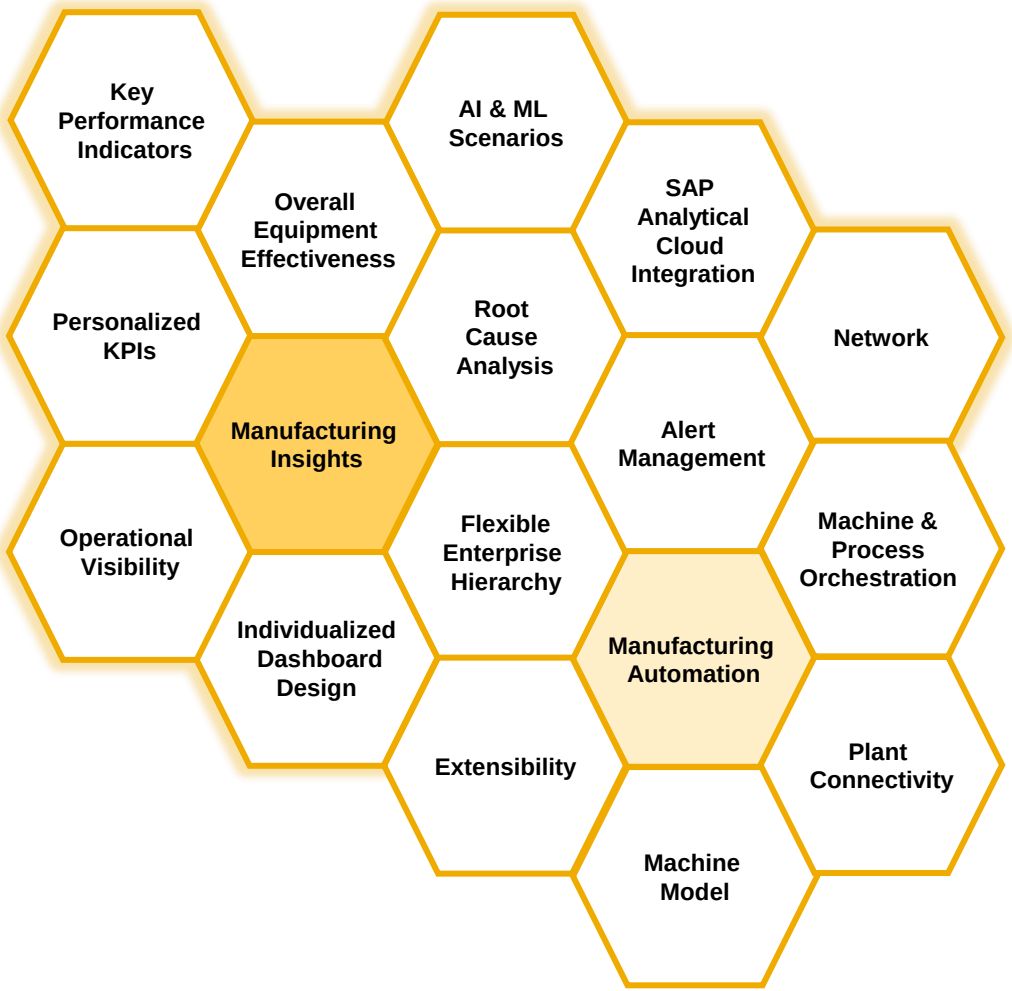
Remark: The content is updated on Feb 2020. Please go to SAP Road Map Explorer for latest version.

SAP Digital Manufacturing Cloud for 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



SAP Digital Manufacturing Cloud for insights

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V2105 – Planned Q2/2021[1]

Manufacturing insights

- Simplified transfer of on-premise data to the cloud
- Intuitive onboarding of the machine model: Web server

V2108 – Planned Q3/2021[1]

Manufacturing insights

- Higher Efficiency using OEE for process orders
- Measurement of the difference between planned and actual production
- Functional ability to monitor the resource status and gain transparency of the production performance
- Operational reporting framework to generate reports on execution data from digital manufacturing cloud execution
- Feed the dashboard with measurements ingested into the digital manufacturing cloud with high frequency
- Intuitive onboarding of machine model: equipment
- Define an MQTT-based data ingestion stream for digital manufacturing cloud (DMC)
- Smoother definition of complex data types and their consumption in automation sequences

V2111 – Planned Q4/2021[1]

Manufacturing insights

- Ability to include custom data for calculating KPIs
- Ability to raise notifications to expedite corrective actions in response to alerts
- Flexible toolbox for an automatic creation of any kind of alert
- Show and configure the full network of systems on and around the shop floor in a graphical view

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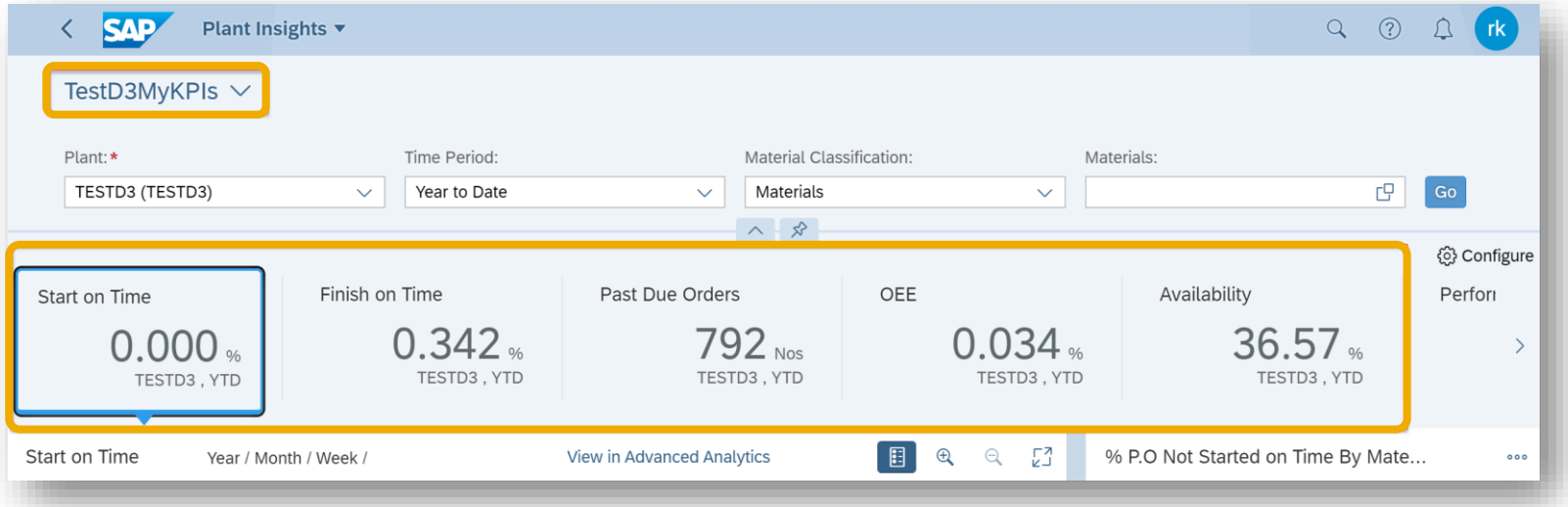
User defined KPI visualization in Global Insights and Plant Insights

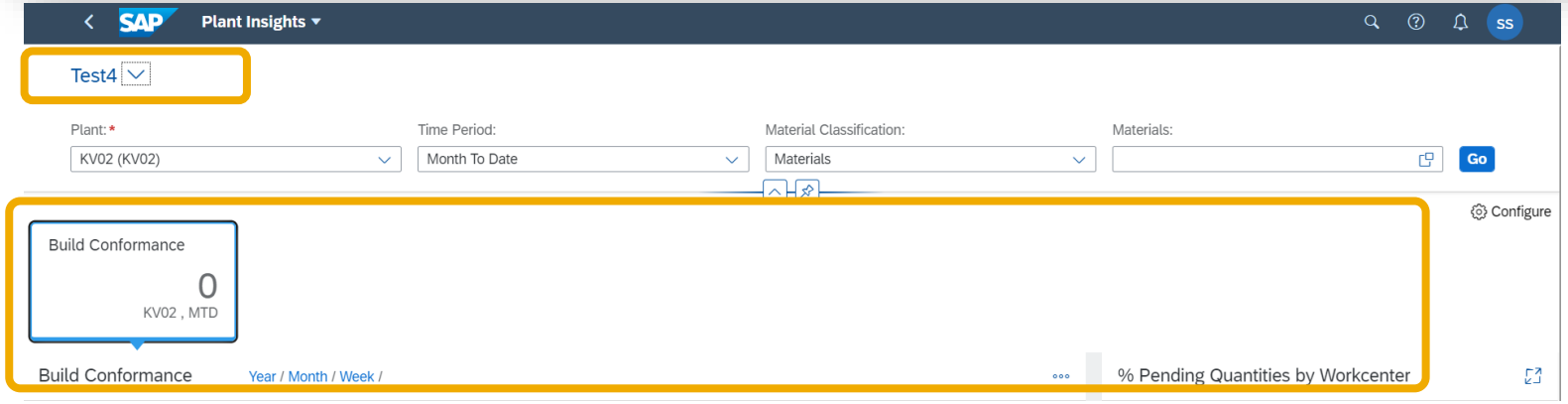
Feature Details

- In the Global Insights and Plant Insights application user can configure and save the KPIs to be viewed in the carousal and also the filter criteria based on his/her choice.

Benefit

- Ease of access to KPI's and filter criteria that are specific to plants.





SAP Digital Manufacturing Cloud for insights: Manufacturing Automation

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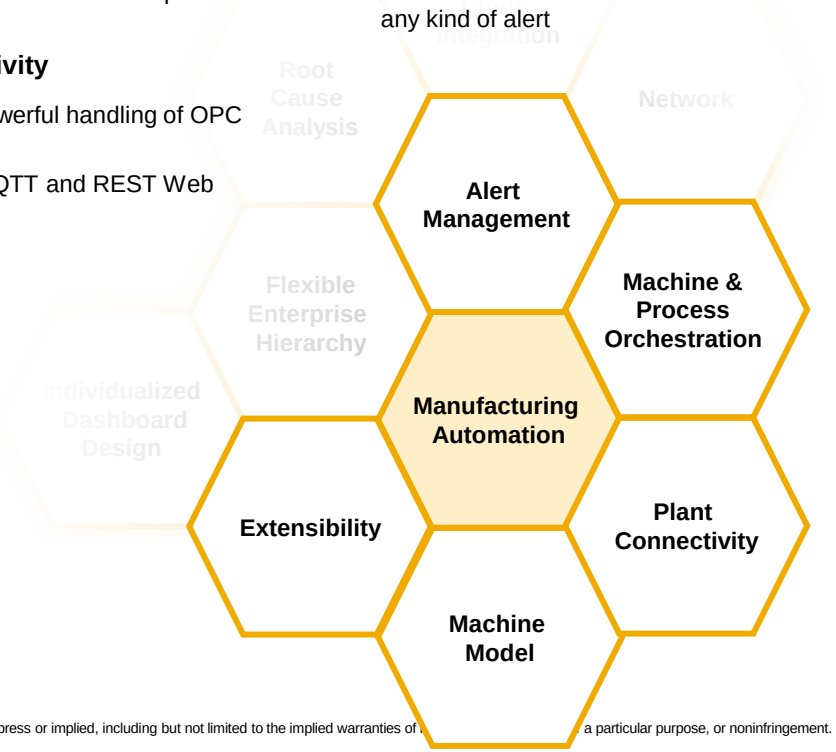

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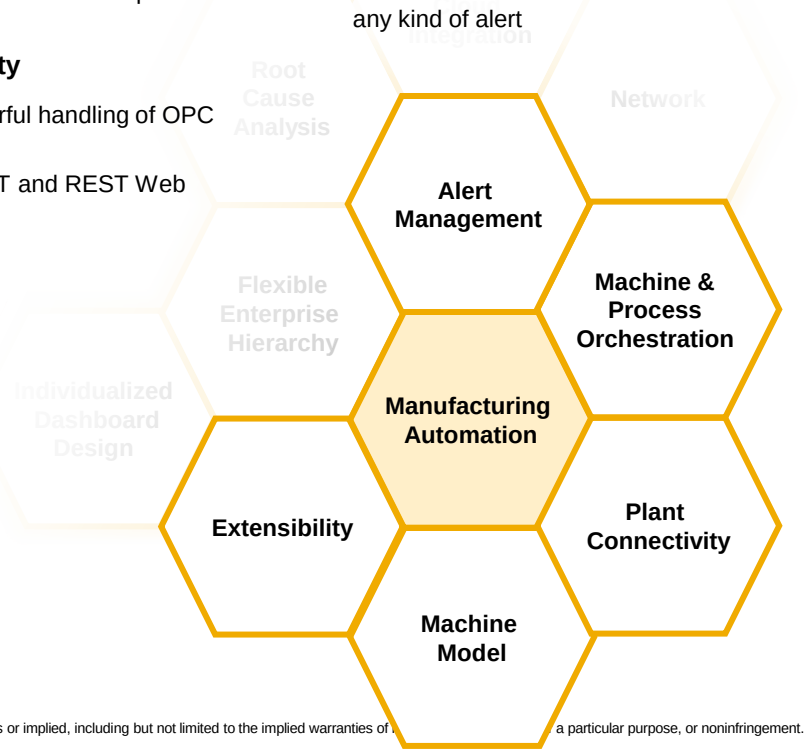

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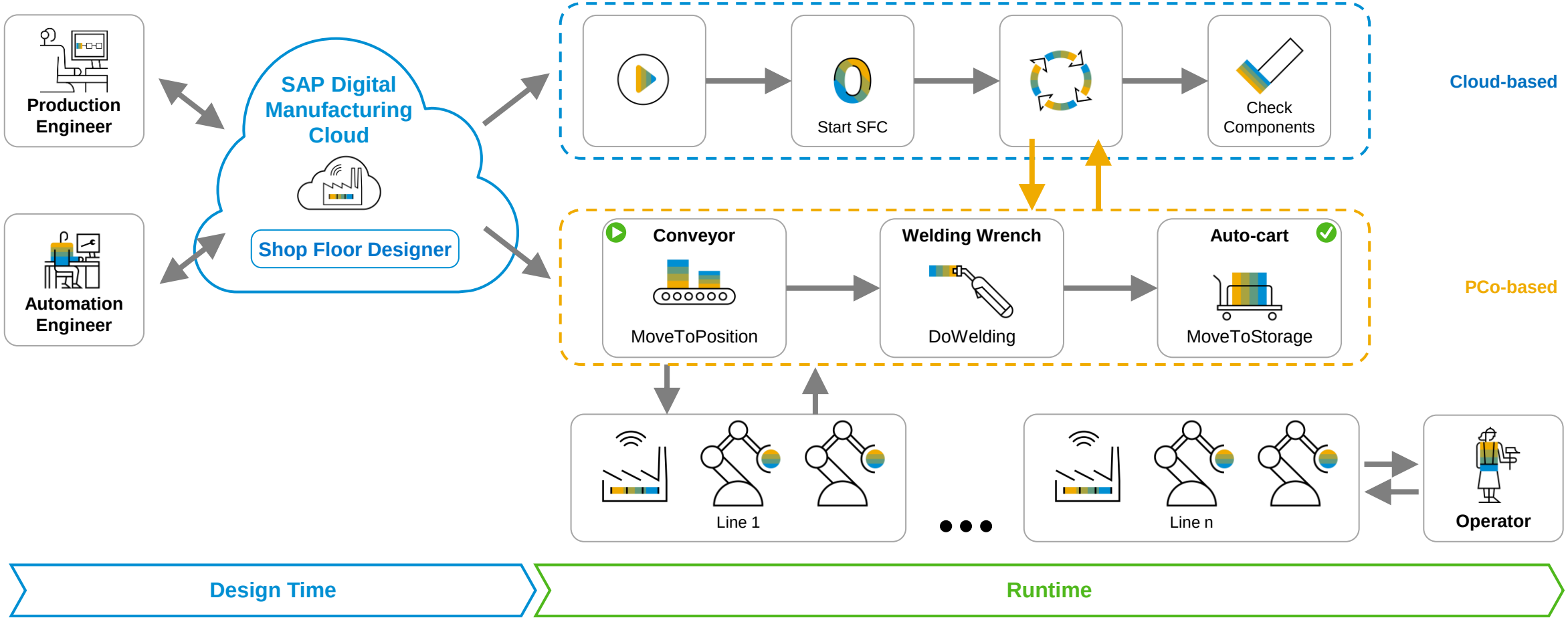
SAP Digital Manufacturing Cloud

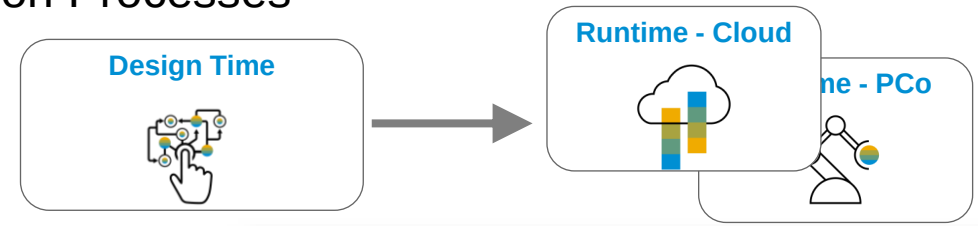
Machine and Process Orchestration – Shop Floor Designer

Design the optimal manufacturing process flow integrating MES system with machine orchestration and easily deploy it throughout the different SAP runtimes (on the cloud and different SAP Plant Connectivity instances)



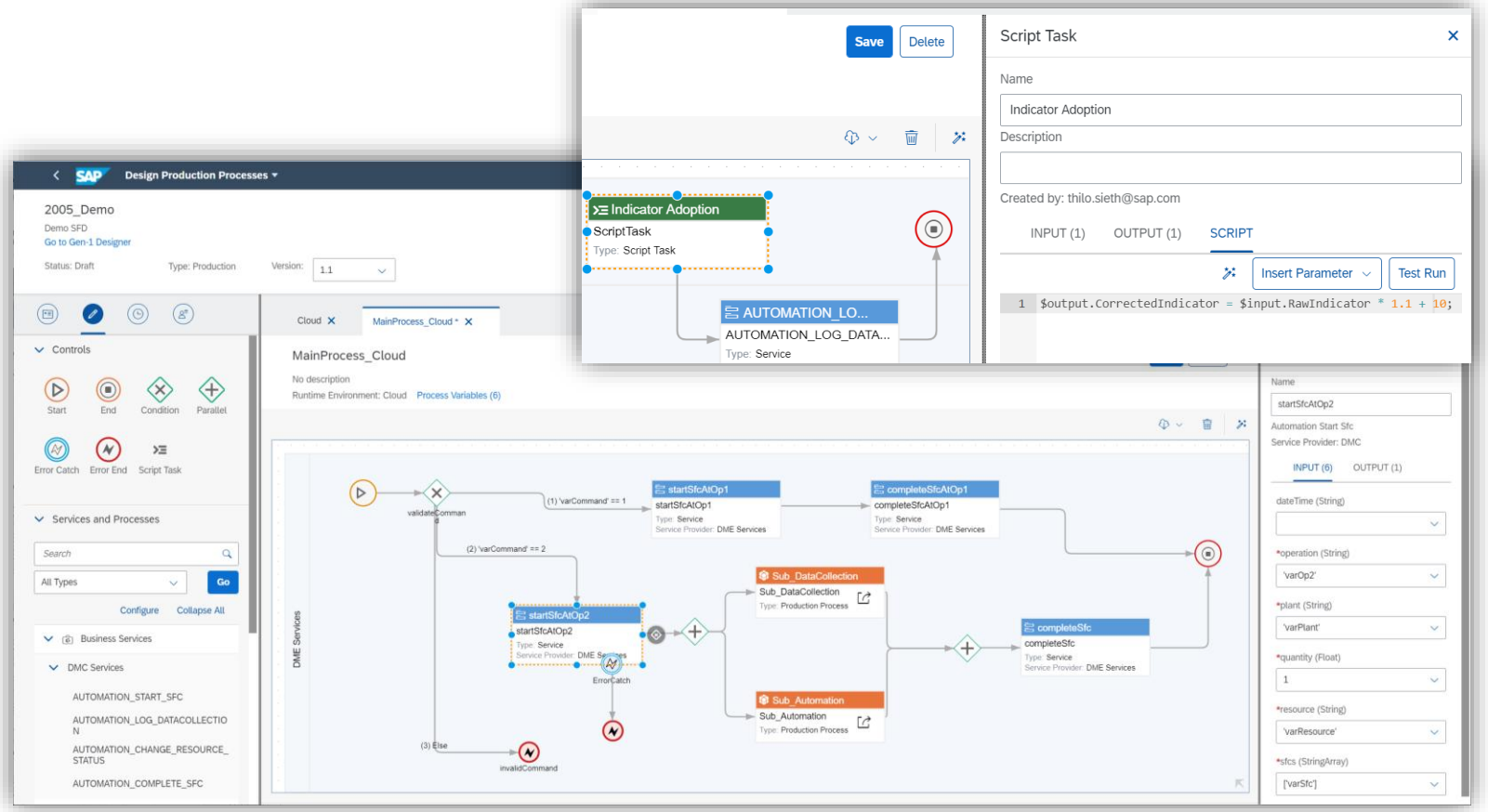
SAP Digital Manufacturing Cloud

Machine and Process Orchestration – Design Production Processes



Extended set of process control elements:

- Start and end process
  Configure process input and output parameters
- Condition element
  Branches the execution of the processes based on a condition becoming true; there is any number of conditions allowed
- Parallel element
  Unconditional branching of the process execution; the branches are executed in parallel
- Error Catch and Error End
  If a singular process step (a singular service execution) terminates with an error, the process execution runs into an exception handling branch and may itself terminate with an error
- Script task
  Implement a Java Script routine for any small customer-based functionalities

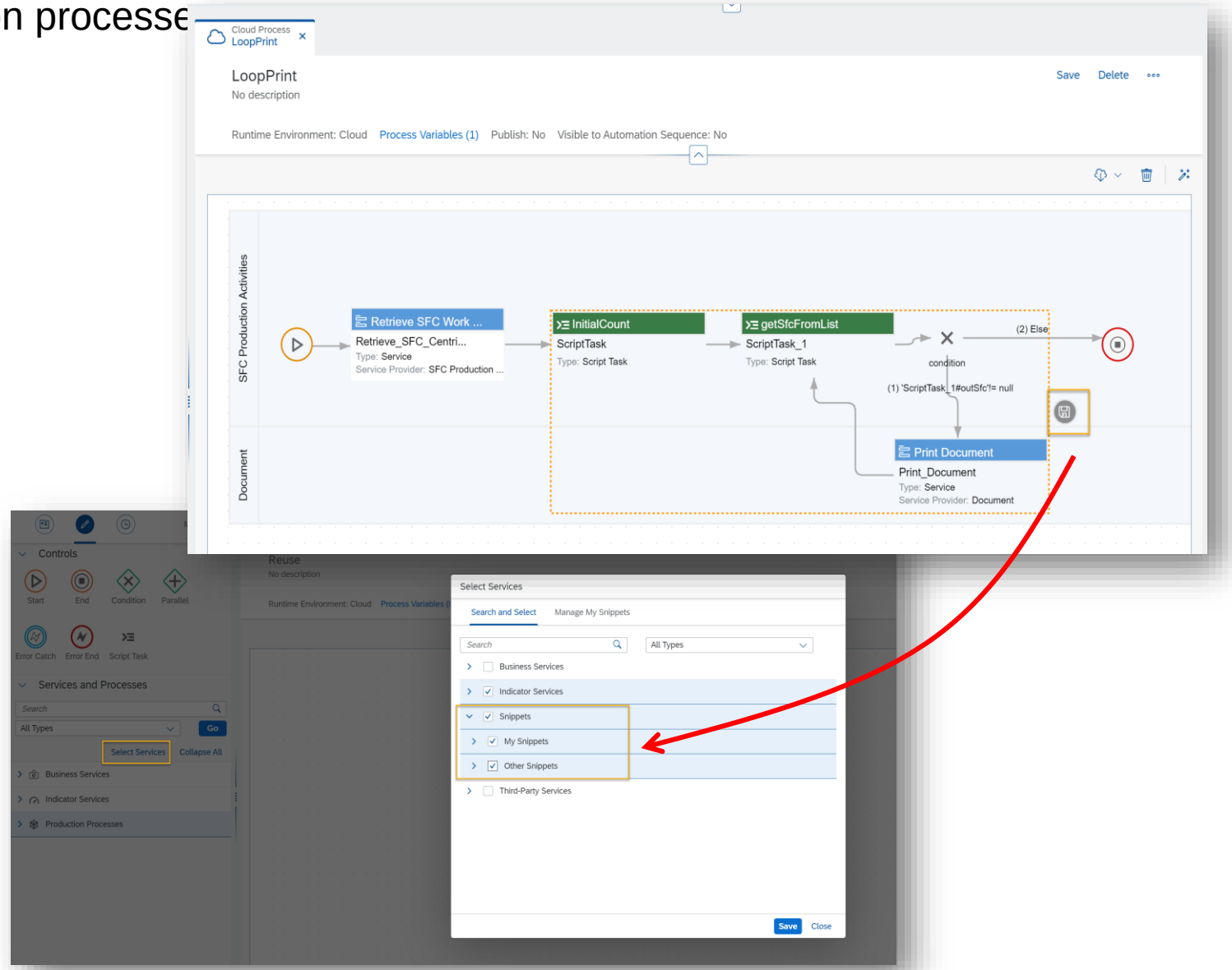


SAP Digital Manufacturing Cloud

Snippets: Reusability across production processes

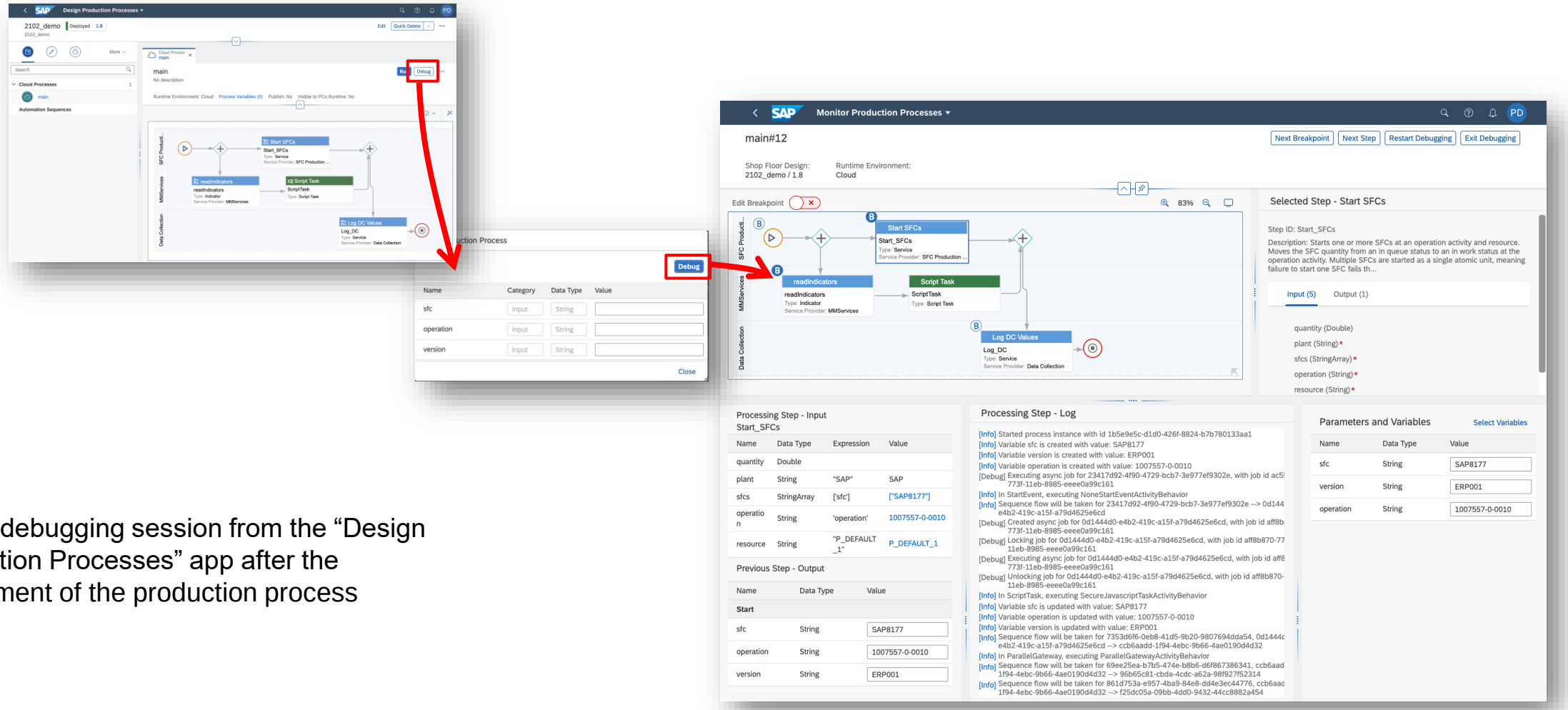
Reuse parts of a production process across designs by creating snippets

- Copy the selected services and control components to a central place
- Derive the attributes across designs
- View snippets created by all users
- Capability of managing snippets



SAP Digital Manufacturing Cloud

Machine and Process Orchestration – Production Process Debugger

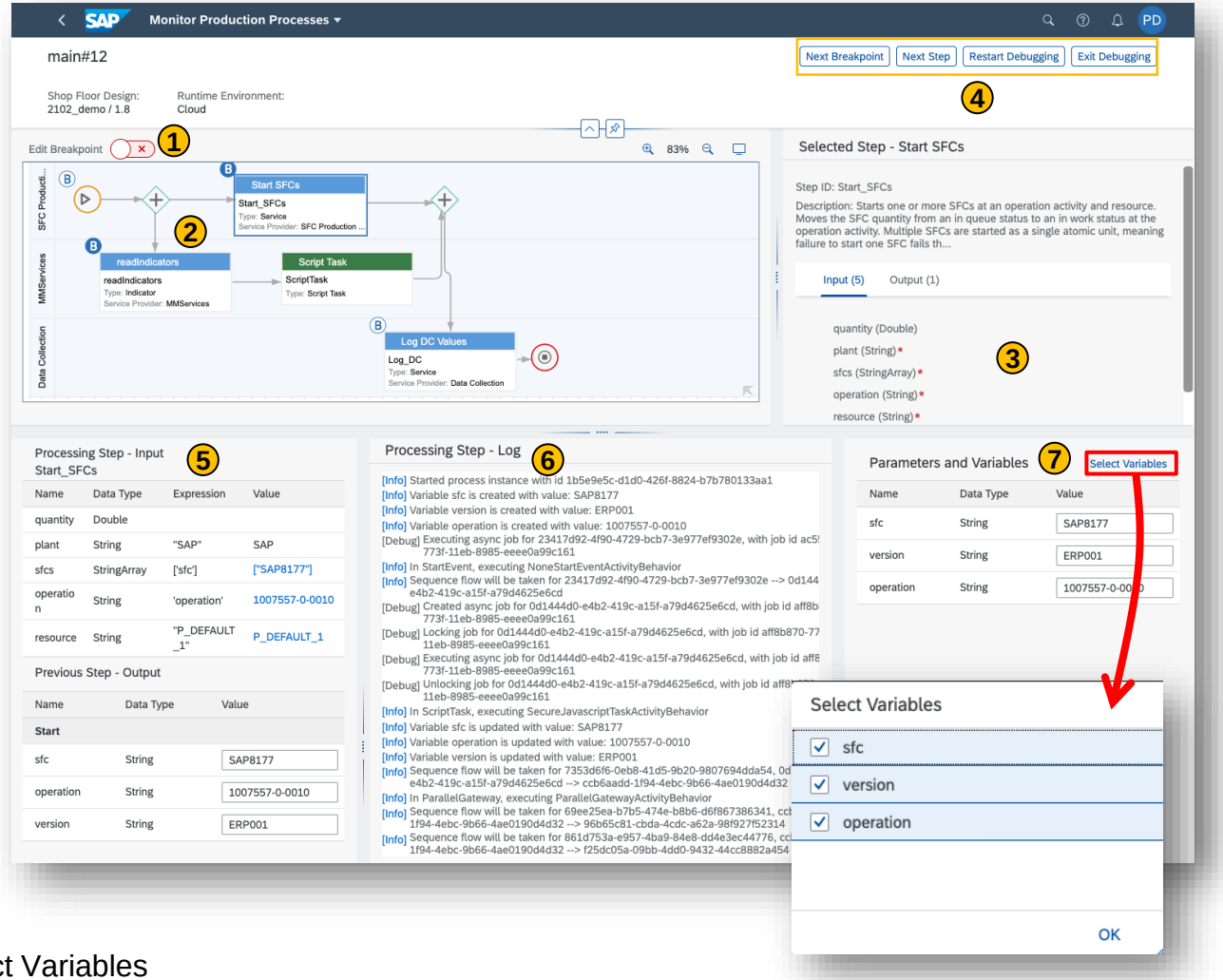


Start a debugging session from the “Design Production Processes” app after the deployment of the production process

SAP Digital Manufacturing Cloud

Machine and Process Orchestration – Production Process Debugger

1. Switch on the Edit Breakpoint toggle and click on the step on which you want to add a breakpoint
2. When debug a parallel execution, you can choose which branch you want to execute by clicking the step with icon Ⓑ, and then click “Next Breakpoint” or “Next Step”
3. The step view shows the selected step's name, description, step ID, input and output parameter information
4. Process Execution Control
   - **Next Breakpoint:** Let the debugging process stop at the next breakpoint. The previous steps are executed.
   - **Next Step:** Let the debugging process stop at the next step. The previous step is executed.
   - **Restart Debugging:** Terminate the current debugging process and start another one.
   - **Exit Debugging:** End the debugging session and go back to the normal design time of shop floor designer.
5. The parameter view shows the current processing step name, input parameter name, type, expression and value and additionally the same of the previous step name. You can edit the previous step output parameter value to update the next step’s values.
6. The log view shows real-time log information with debug log level.
7. The “Parameter and Variable” pane lists selected process variables, output parameters of previous steps, input parameters of the process instance. You can edit the value of each parameter



You can configure which variable or parameter to display by choosing Select Variables

SAP Digital Manufacturing Cloud for Insights

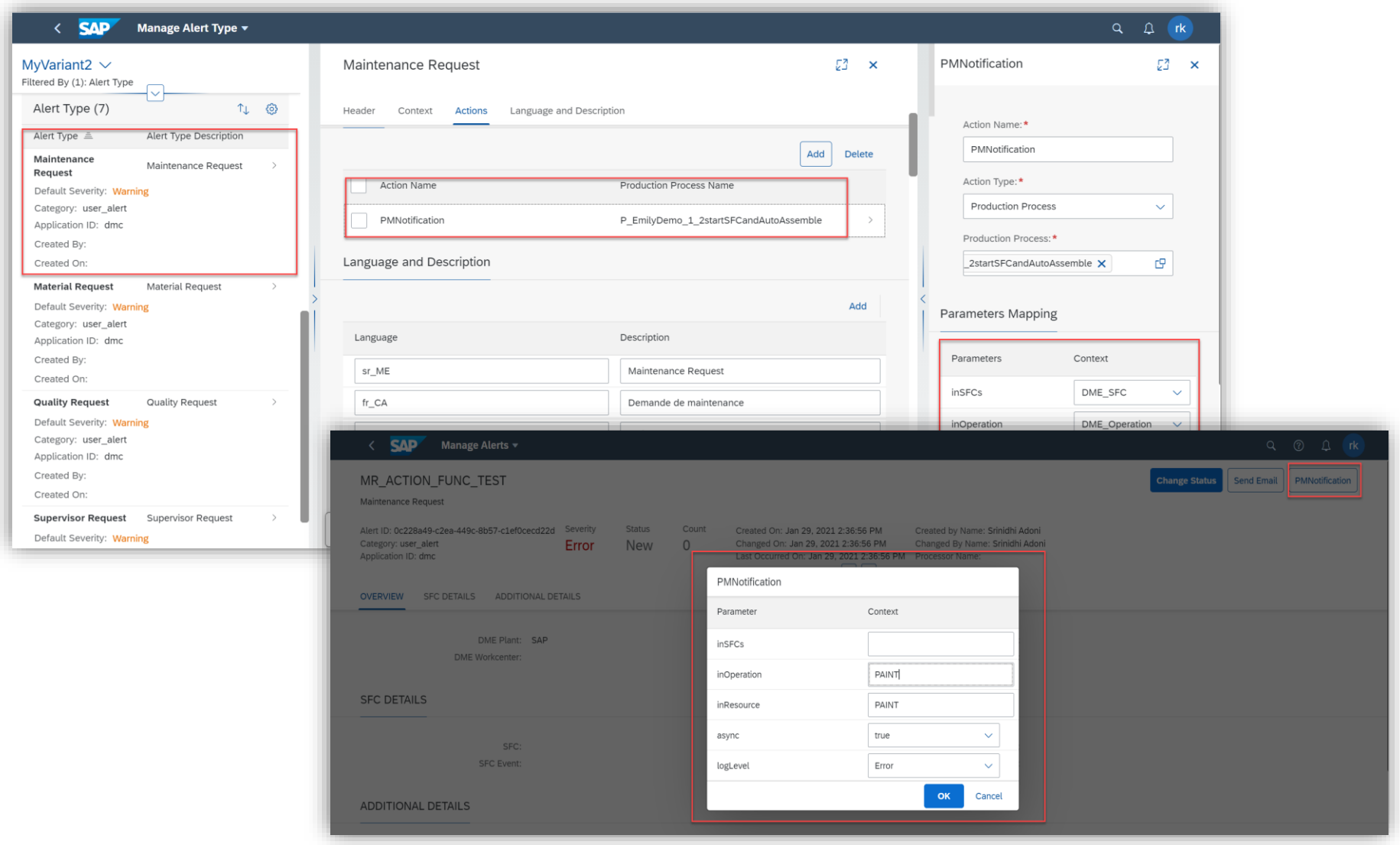
Manage alert types and configure the start of a production process from the Alert Inbox

Feature Details

- New Manage Alert Type app to modify pre-delivered alert types
- Associate action to Alert type, that is link a production process i.e. to trigger a PM notification.
- Map the production process parameters with the context available for the alert type.
- Raise the action from the alert detail page.

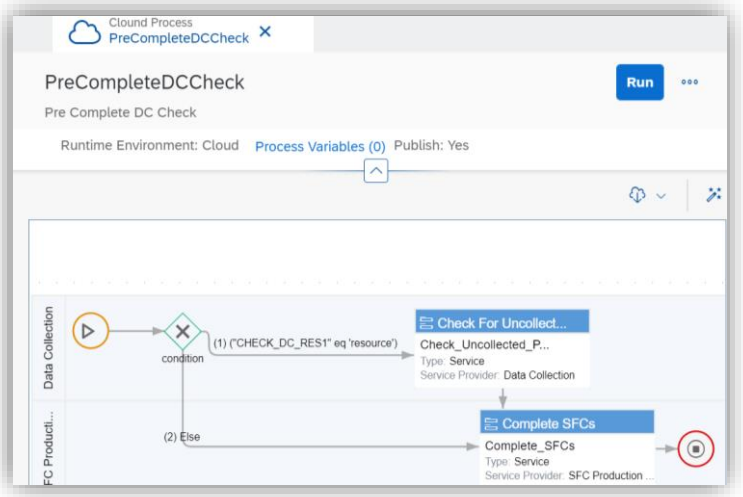
Benefit

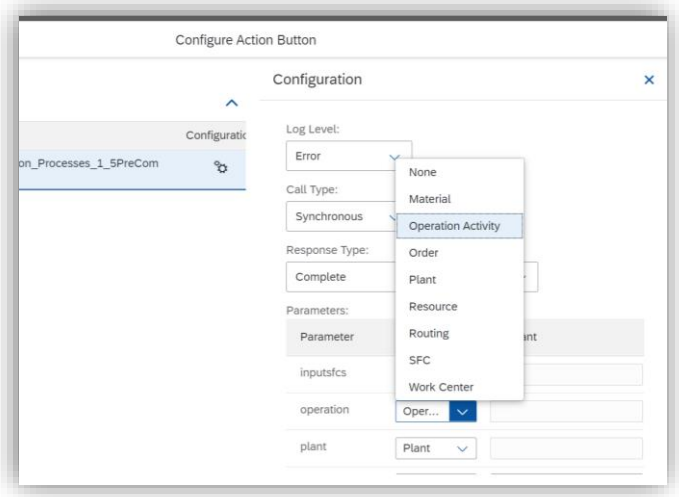
- Insight to action flow for manufacturing events happening on the shop floor.

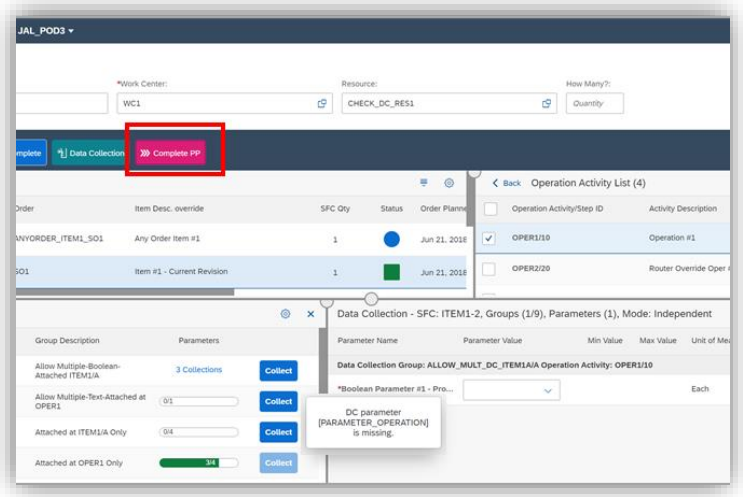


SAP Digital Manufacturing Cloud for Insights

Configure the Start a production Process from POD







Construct a Production Process

- Use *Design Production Process* app
- Input parameters defined to give API context from the POD

Configure a button in POD

- Use *POD Designer* app
- Configure the Production Process call with this button
- Match Parameters with Variables that give values from the POD for the context defined for the process OR input a constant value for the parameter

Operator gets button offered in POD

- When operator clicks the button, the POD calls the production process in the process engine
- Give the defined parameters to the process engine
- Display applicable message

SAP Digital Manufacturing Cloud for insights: Manufacturing Automation

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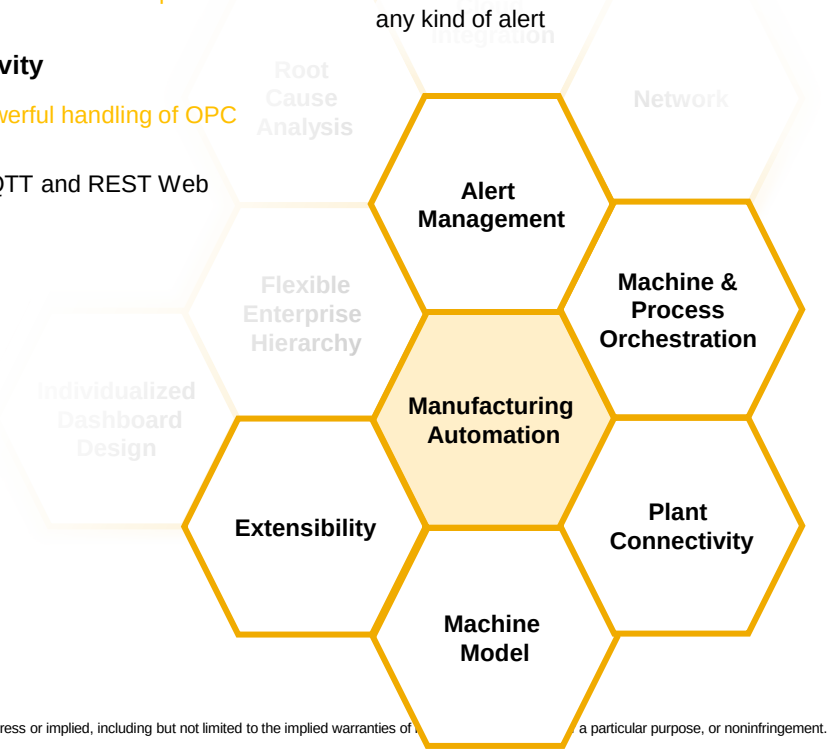

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Complex (structured) Data Types in Manufacturing Automation

Objectives

- Provide default mappings to speed up and simplify configuration
- Easy mapping of structured data types between sources and destinations
- Support of customer specific OPC UA data types
- End-to-End consistent data type handling (MM)

Customer Benefit

- Easy and quick configuration of structured data types by MM
- Customers can define data type libraries corresponding to their business objects
- Tight integration into OPC UA and DMC on both ends
- Support of SFD to enhance and simplify machine data handling
- Reuse of structured data types minimizes configuration effort (e.g. Webservice definitions)

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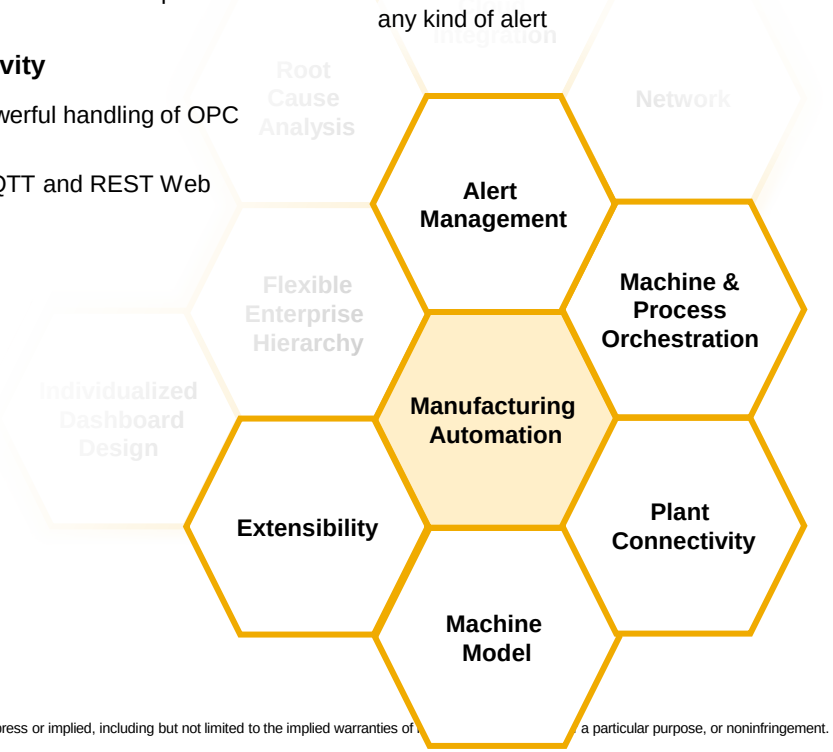

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- Smoother definition of complex data types and their consumption in automation sequences

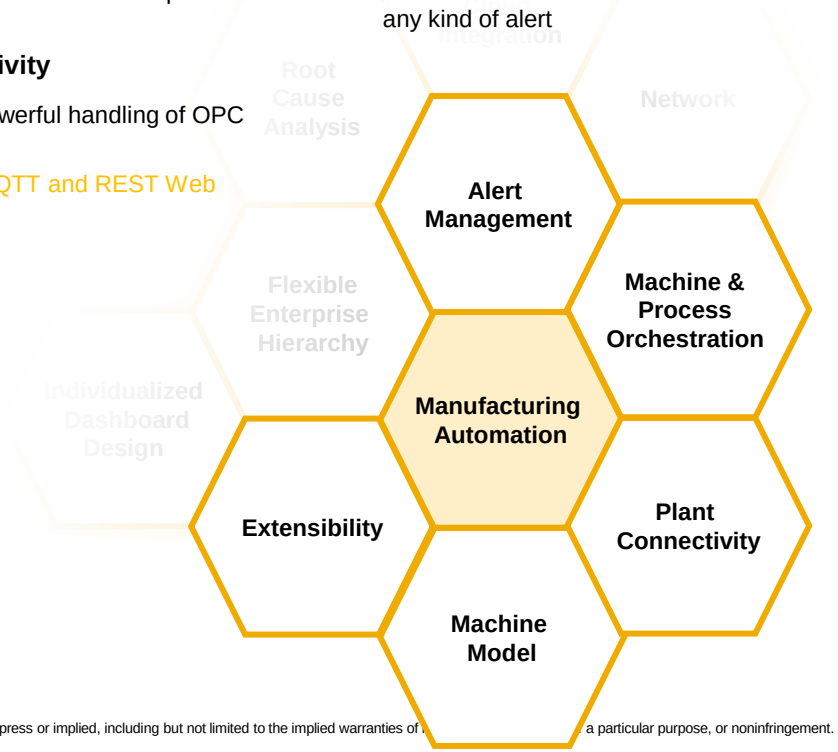
SAP Plant Connectivity

- Easier and more powerful handling of OPC Data Types
- Improvements to MQTT and REST Web service support

V2111 – Planned Q4/2021[1]

Manufacturing automation

- Show and configure the full network of systems on and around the shop floor in a graphical view
- Ability to raise notifications to expedite corrective actions in response to alerts
- Flexible toolbox for an automatic creation of any kind of alert



Remark:
The content is updated on Feb 2021. Please go to SAP Road Map Explorer for latest version.

1. This is the current state of planning and may be changed by SAP at any time without notice.

SAP Digital Manufacturing Cloud for insights: Manufacturing Automation

Product road map overview

V2102 – Recent innovations

Manufacturing automation

- Create production process snippets
- Extended monitoring and intuitive debugging in executing the production process
- Start a production process from the “Alert” inbox
- POD interaction to call production processes
- Definition of complex data types and their consumption in cloud-based production processes

V2105 – Planned Q2/2021[1]

Manufacturing automation

- Intuitive onboarding of the machine model: Web server

V2108 – Planned Q3/2021[1]

Manufacturing automation

- Intuitive onboarding of machine model: equipment
- Define an MQTT-based data ingestion stream for digital manufacturing cloud (DMC)
- Smoother definition of complex data types and their consumption in automation sequences

SAP Plant Connectivity

- Easier and more powerful handling of OPC Data Types
- Improvements to MQTT and REST Web service support

V2111 – Planned Q4/2021[1]

Manufacturing automation

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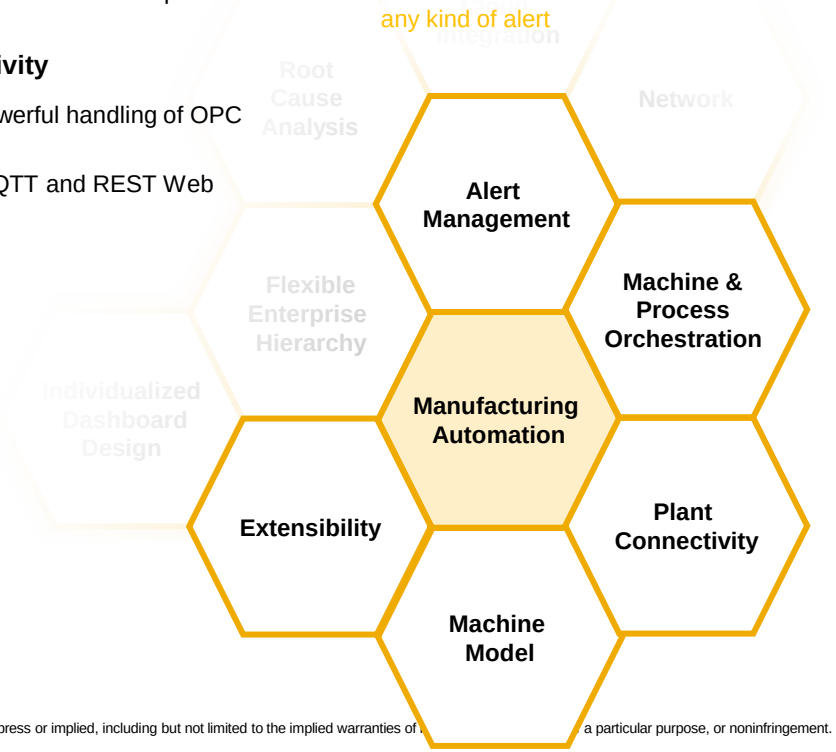

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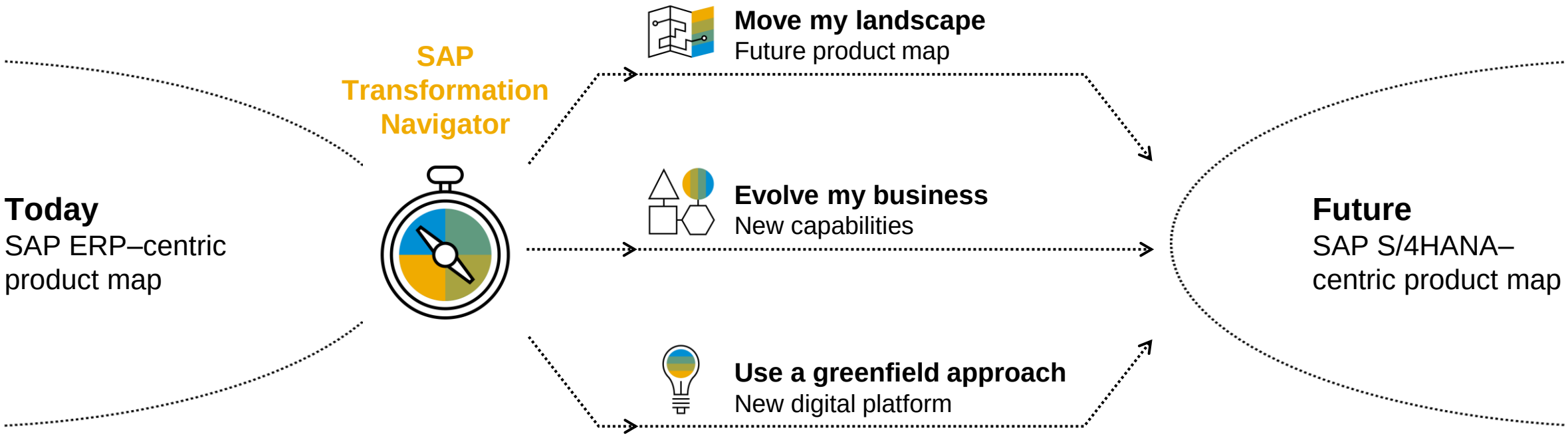
SAP Transformation Navigator

Supporting your digital transformation



SAP Transformation Navigator provides you with clear guidance to chart the Intelligent Enterprise:

- Based on your currently used products, this free self-service produces an individualized report highlighting business value, detailing integration to SAP S/4HANA and other cloud products, and explaining transformation services and license information.
- With the new time-slider feature, you can even identify the best point in time to engage in your journey to becoming an intelligent enterprise.
- Discover the tool and your transformation path at https://support.sap.com/stn.

Related road maps``

The product road map for digital manufacturing from SAP includes SAP Manufacturing Execution, SAP Manufacturing Integration and Intelligence, SAP Plant Connectivity, SAP Digital Manufacturing Cloud, and SAP S/4HANA Manufacturing for production engineering and operations, which build the foundation for Industry 4.0 in the cloud and on premise.

Product road maps for digital manufacturing available on SAP Road Map Explorer roadmaps.sap.com/:

- SAP S/4HANA Manufacturing for production engineering and operations
- SAP Manufacturing Suite

Learn more

SAP customers and partners

- SAP Road Maps
- SAP Community
- IT Planning Resources
- Innovation Discovery
- SAP Transformation Navigator
- SAP User Groups
- SAP Help Portal
- Manufacturing Community at SAP

Thank you.

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