

TAC - SAP for Process Industries and Natural Resources Conference Designed for the metals, paper, packaging, chemicals, building materials and mining industries

Building Materials Track:

SAP Digital Supply Chain Strategy with focus on SAP S/4HANA Production Planning and Detailed Scheduling (PP/DS)

Presented by Achim Rink / SAP Vienna June 19, 2024



# Agenda

S/4HANA PP/DS in the Big Picture of APO Succession

Selected Innovations of S/4HANA PP/DS

**Synchronized Planning Innovation** 

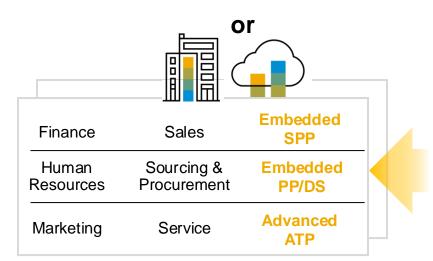
Roadmap Outlook

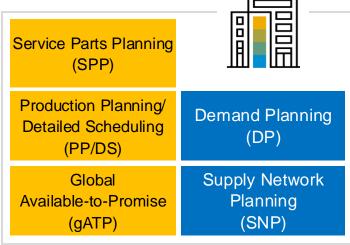
# **Big Picture**



# APO Succession with S/4HANA and IBP









#### SAP S/4HANA

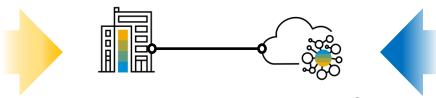
## SAP APO

### **Execution**

Closer to execution, Orchestrating the network to find the right fulfillment

## **Plant-Centric Planning**

Unified Manufacturing Processes – Plan to Produce in ONE System



- Detailed Scheduling
- Production Execution
- Order Promising
- Response & Supply
- Deployment Planning
- Allocation Planning

# **Planning**

Strategic, Tactical and Operational Planning

## **Network-Centric Planning**

Innovative & Re-architected Supply Chain Planning Processes

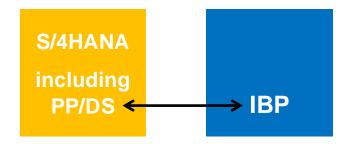
# S/4HANA PP/DS – Two Value Propositions

**APO Succession**, Synchronized Planning





ERP customers, ease the use of PP/DS





# PP/DS as tool for operational planning

- close to ERP PP and execution
- tightly integrated with IBP for E2E supply chain planning

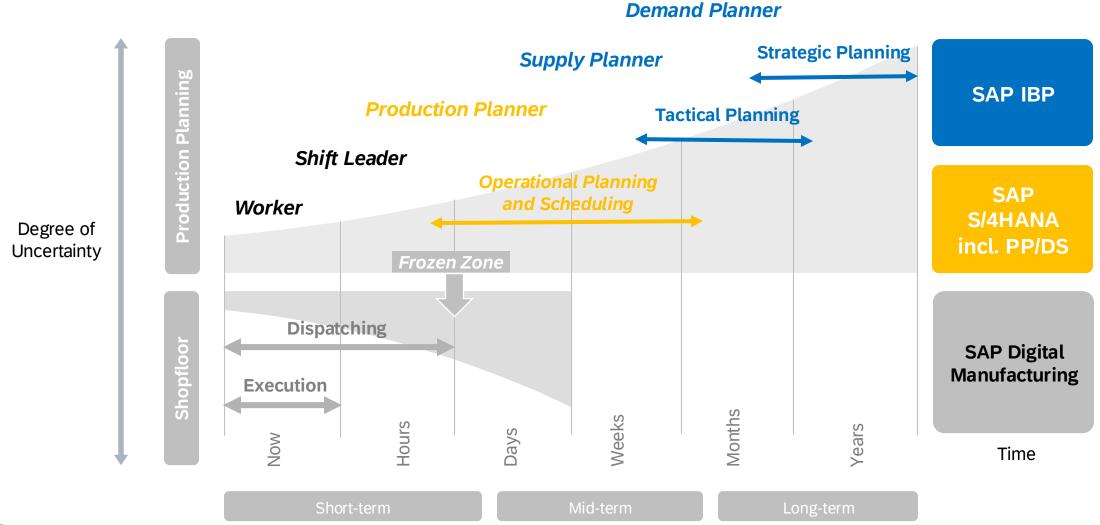
## PP/DS part of ERP, going for simplification

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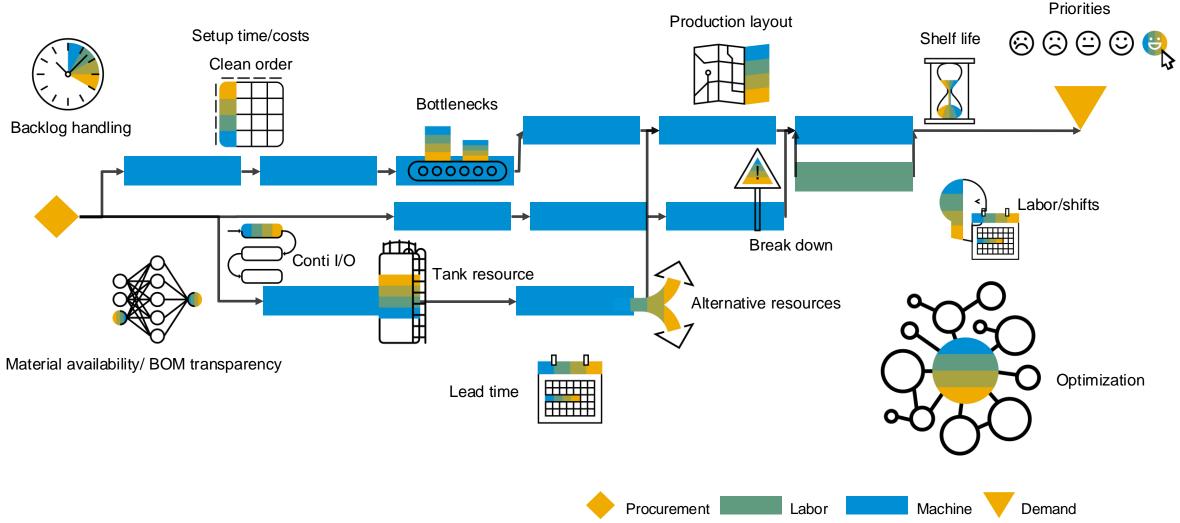
- One Master Data
- One MRP (Live) integration
- One technical system
- Simplified CIF integration

# Synchronized Planning along the Value Chain

Data seamlessly moves real time between applications with "hand offs" ownership transfer



# Real-Life Topics and Opportunities in a Production Environment



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# PP/DS for Industries – Process Manufacturing Scenarios

#### Consumer Products



- Shelf-life based / batchmanagement planning (MTS)
- Complex material flow (incl. tank constraints, resource networks)
- Rhythm wheel

#### Life Science



- **Segmentation** (product
- Complex material flow
- **Campaign planning**
- Rhythm wheel

#### Chemicals



- attributes like country of origin)

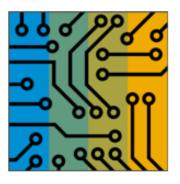
- Continuous & **Batch Production**
- **Logistics Constraints**, Planning, bulk/transport vessels
- Campaign planning

- Characteristic Based Planning, **Variant Configuration**
- Extensibility for partner / customer heuristics, optimizer developments et al (e.g. Trim-Optimization, LPP)
- Capable to Promise (SBC)

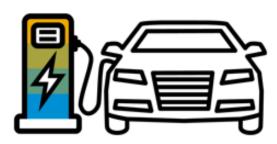
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# PP/DS for Industries – Discrete Manufacturing Scenarios

## High Tech



#### **Automotive**



## Machinery



#### A&D



- Dynamic BOM, Time-Phased BOM
- Contract Manufacturing/ Subcontracting
- By-Products/ Co-Products
- Dynamic Routing selection

- Model Mix Planning and Sequencing
- Line structure for physical layout, capacity and restrictions
- Planning of MTS- / MTO- CTOproducts
- Planning of complex projects
   & solution offerings
- Capable to Promise (SBC)

- Engineering Change
  Management with
  configurable BoM /
  Routing effectivities
- MTO/MTS/CTO planning

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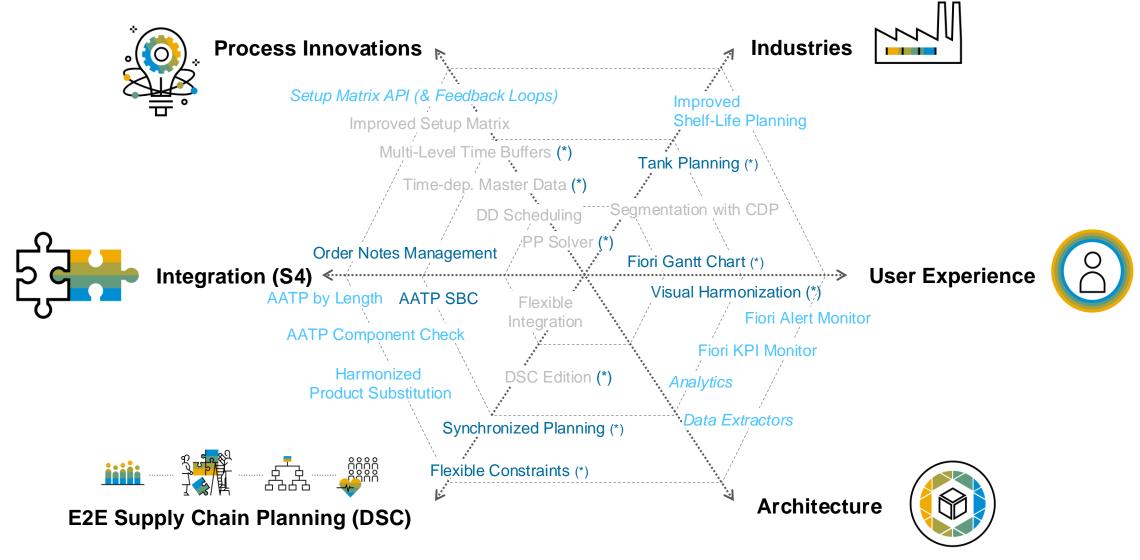
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# **Innovations**



# SAP S/4HANA PP/DS Roadmap (Link)

Growing in 6 Dimensions, incl. examples of innovation topics

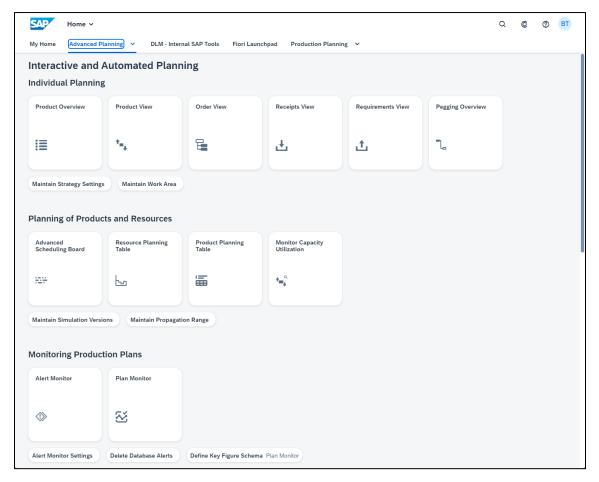


Roadmap 2024-2026

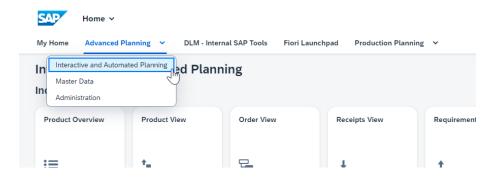
# Fiori, User Experience

# **Example: Fiori Launch Pad featuring PP/DS spaces**

## First impression



- Motivation: Provide E2E process coverage in FIORI
- Fully integrated with FIORI-native apps, incl. forward/backward navigation
- Distinction of main and supportive apps (big vs. small tiles)
- More content / spaces, structured as follows ...

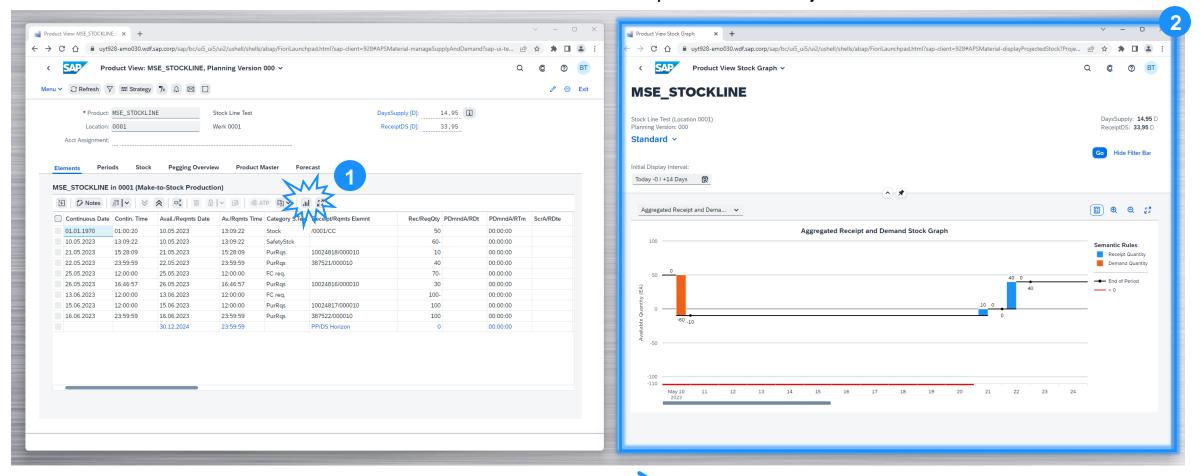


# **Product View and integrated Stock Projection**

## as Fiori Hybrid Example

**Product View** 

Graphical Stock Projection in FIORI



# **Order Notes Management**

# as Fiori Hybrid Example

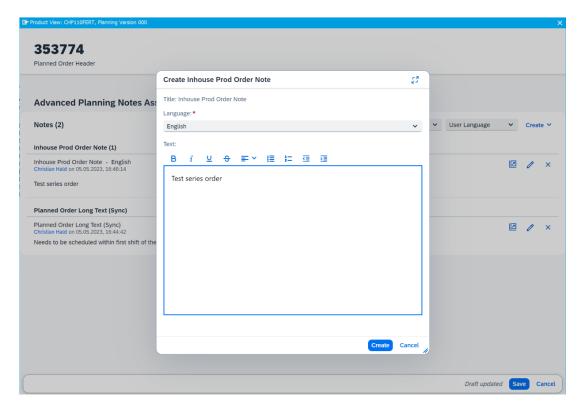
## Storage and exchange of planning relevant information

## Scope

- Capturing of object specific free text information in PP/DS
- Structuring of notes by usage of multiple note types
- Exchange of planning relevant information with shop floor by integration with PP long texts

#### **Benefit**

- Improve information flow within and across planning departments
- Hand-over of planning information to shop floor
- Improve process flow

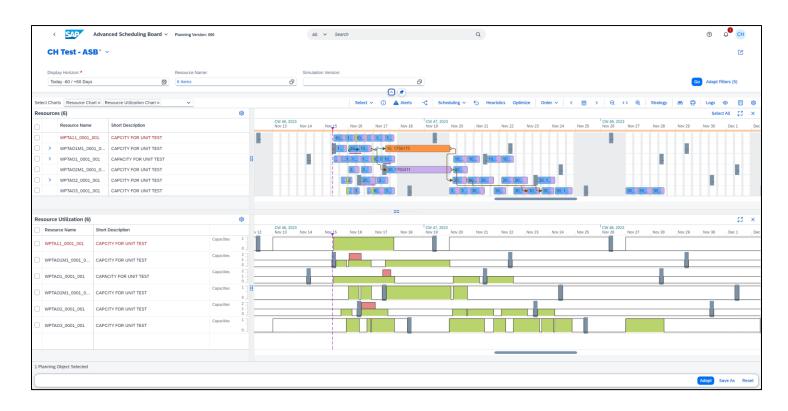


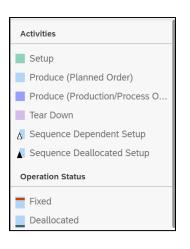
Creation and administration of order notes in PP/DS

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# Fiori, User Experience

# **Example: Advanced Scheduling Board**



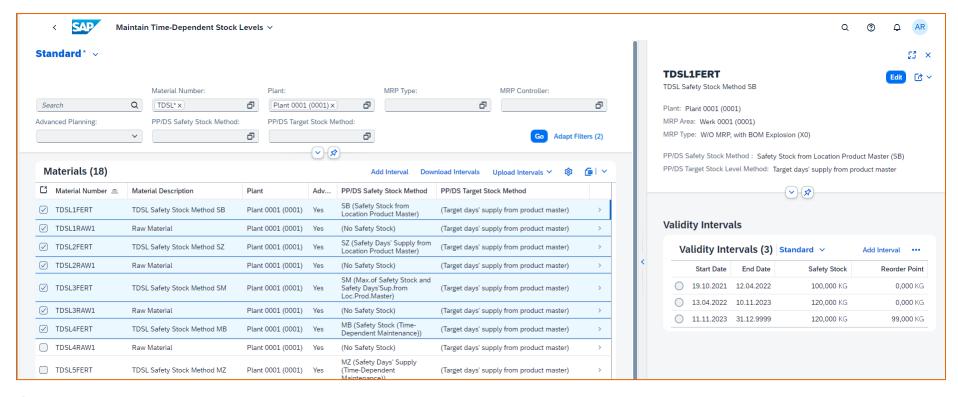


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- Visualization of production plan and constraints on multiple charts
- Interactive planning using heuristics, drag & drop, order creation/change
- Seamless integration within PPDS using cross app navigation
- Exception-based planning using PP/DS Alerting

# **Process Innovation, Fiori, User Experience**

## **Example: Time-Dependent Stock Levels**



### Scope

- Enable safety stock planning and target stock planning (via safety stock and target stock methods)
- Usability improvements in Product View and Product Planning Table
- Support integration scenarios with IBP for Inventory (via S/4HANA PP)

#### **Benefits**

• Support use cases like seasonality or trends

**Example: Production Planning Optimization (PPO)** 

## The Production Planning Optimization ...

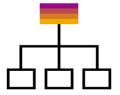
- supports multi-level and time-bucket-based supply planning
- considers constraints such as production capacity, lead time, material flow and maximum delay allowed in fulfilling a demand
- weighs different costs and penalties (e.g. for production, stock transfer, external procurement, storage) against each other
- to arrive at an **optimized supply plan** (in the form of planned orders and purchase requisitions) to ensure the availability of materials for a defined part of your manufacturing or supply chain network



What to produce



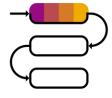
From where to source



What level to stock (by Product, Location)

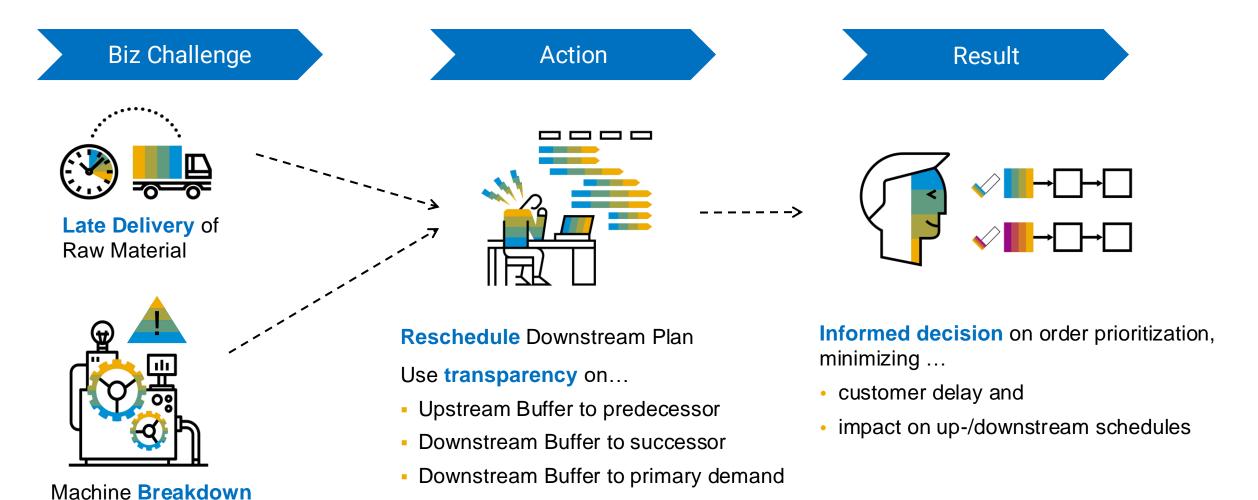


Pre-build to Store or Just-in-Time production

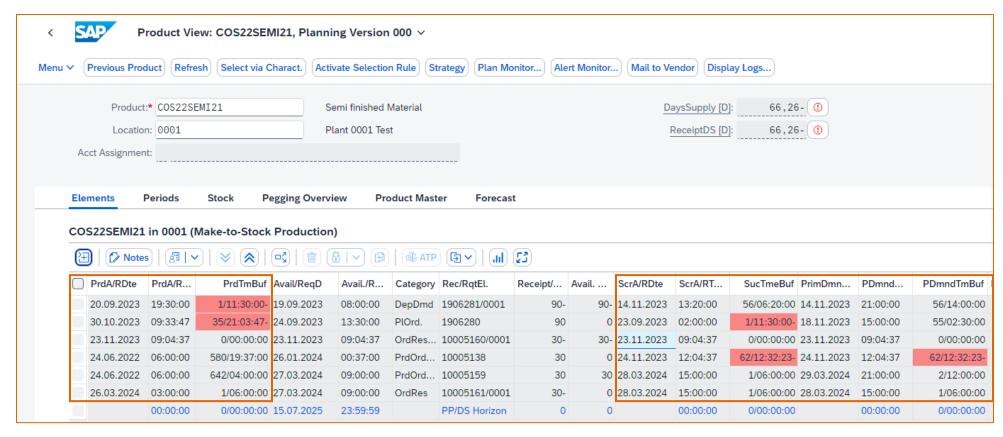


In which sequence to produce

Example: Multi-Level Time Buffers (MLTB) to support informed decisions on order prioritization



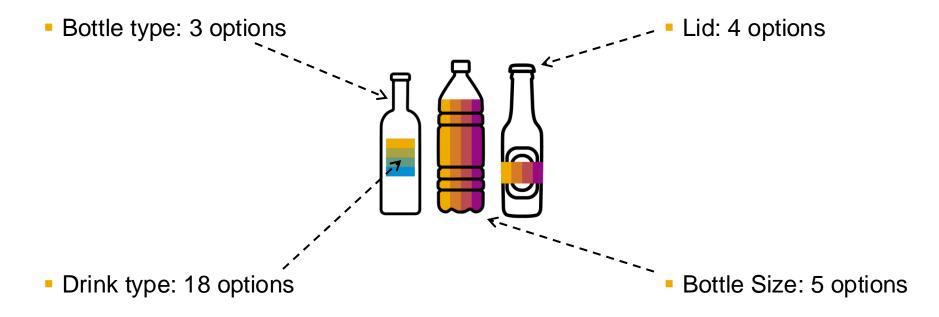
Example: Multi-Level Time Buffers (MLTB) to support informed decisions on order prioritization



- Multi-Level Time Buffers displayed in Product View as additional columns
- The MLTB key figures are calculated in real-time for all orders within the MLTB horizon.
- Pre-requisite is assignment of the MLTB profile in the user settings

**Example: Set-up Matrix Profile** 

Number of set-up transitions grows exponentially with problem size Example for a bottling process



## Even small use cases lead to huge numbers of potential set-up transitions:

• Number of possible set-up groups: 3 \* 4 \* 18 \* 5 = 1080

→ actually needed: 34

• Number of **possible transitions**: 1080 \* 1080 = **1.166.400** 

→ actually needed: 1156

# **Synchronized Planning**



# **Synchronized Planning for Production**

Tight integration of IBP Response & Supply and S/4HANA Manufacturing Production & Scheduling

- Create transparent plans and provide end-to-end visibility across systems
- Synchronize your business processes, plans and data from planning to execution

### **SAP IBP**

Utilize global network capacity to fulfill prioritized demands in the most profitable way



## SAP S/4HANA PP/DS

Optimize the production plan as part of the global plan and create feasible production schedules - ready for execution

## Process is enabled by:

- Key Figure Integration for tactical supply planning by sharing constraints between SAP IBP and PP/DS in SAP S/4 HANA
- Order Integration for operational supply planning in real-time between SAP IBP and PP/DS in SAP S/4 HANA

# Synchronized Planning for Production Two Standard Patterns for IBP-PP/DS Integration

## **NEW**

Pattern #1: Use ORDER-BY-ORDER integration ...

... if IBP is used also for Operational Planning

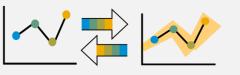
- Real-time synchronization of supply plans between SAP IBP and S/4HANA PP/DS on order level
- Tight integration for E2E processes across SAP IBP, SAP ERP, and S/4HANA PP/DS for active version
- Flexible definition of process ownership between operational supply planning and detailed planning and scheduling

Public



... if IBP is used mainly for Tactical Supply Planning

- Synchronization of supply plans by sharing IBP key figures as constraints for S/4HANA PP/DS
- Loosely coupled direct integration between IBP and S/4HANA PP/DS
- Constraints considered in selected algorithm(s) in S/4HANA PP/DS



... with one common UI across SAP IBP and SAP S/4HANA PP/DS (incl. DSC-Edition)

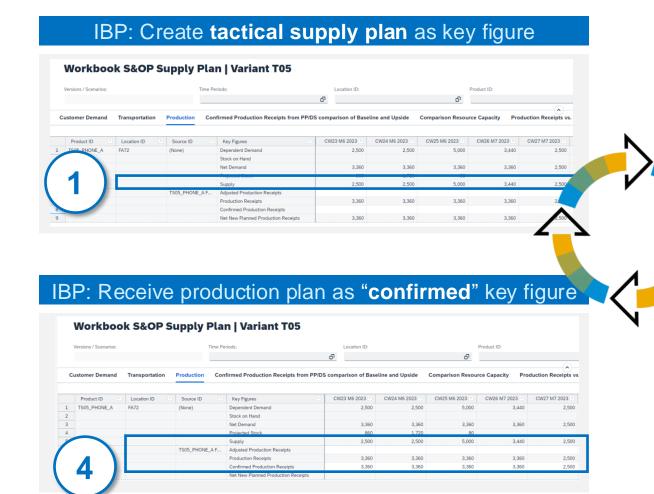


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# **Synchronized Planning for Production**

# Supply Planning decisions as constraints for operational Production Planning



## PP/DS: Receive supply key figure as **constraints**

exible Constraints												
Constraint Scope	Constraint Scope Description	Planning Versi	Product	Locati	Source of S	upply	Start Date	Start Time(in UT	End Date	End Time(in UTC	Target Supp	UoM
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	04.06.2023	23:00:00	11.06.2023	22:59:59	3.360	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	11.06.2023	23:00:00	18.06.2023	22:59:59	3.360	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	18.06.2023	23:00:00	25.06.2023	22:59:59	3.360	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	25.06.2023	23:00:00	02.07.2023	22:59:59	3.360	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	02.07.2023	23:00:00	09.07.2023	22:59:59	2.500	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	09.07.2023	23:00:00	16.07.2023	22:59:59	2.500	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	16.07.2023	23:00:00	23.07.2023	22:59:59	2.500	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	23.07.2023	23:00:00	30.07.2023	22:59:59	2.500	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	30.07.2023	23:00:00	06.08	2:59	2.500	EA
LOCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	06.08.2023	23:00:00	13		2.500	EA
OCPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	13.08.2023	23:00:00	2	7	2.500	EA
CPRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	20.08.2023	23:00:00	2		2.500	EA
PRODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	27.08.2023	23:00:00	03	و	2.500	EA
RODSOS V	Location Product Source of Supply	000	TS05_PHONE_A	FA72	TS05_PHONE_A	FA720001	03.09.2023	23:00:00	10.09.	<b>⊌</b> :59	2.500	EA
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## PP/DS: Create operational production plan

Product view: Periodic		Due	W 21 (26.05)	W 22 (29.05)	W 23 (05.06)	W 24 (12.06)	W 25 (19.06)
TS05_PHONE_A / Phone A / FA72 / FA72 Liverp							
_Make-to-Stock Production							
Available Quantity	EA						
Days' Supply	D	4,480	4,480	2	2	2	2
FC req. / 20 / PLANNING WITH FINAL ASSEM	EA						
PReqRel / DC72 / Conf.	EA			3.440-			
PReqReI(X) / DC72 / Conf.	EA			10.000-			
PIOrd. / TS05_PHONE_A FA720001 / WTS	EA				3.360	3.360	3.360
Target Supply Constraint	EA						
Target Supply Constraint / TS05_PHONE_A	EA				3.360	3.360	3.360

# Outlook



# Planned Innovation Highlight – PP/DS

#### Renewed PP/DS Product Overview based on Fiori UX

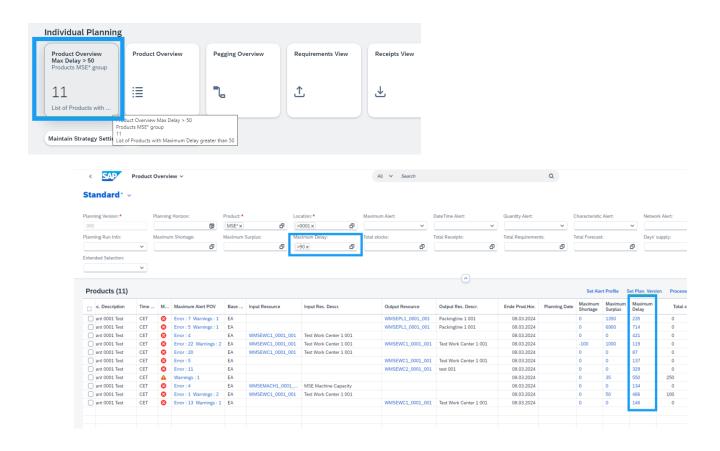
New product overview list in SAP Fiori user experience to review the current planning situation and identify planning issues.

#### Scope

- Support of Fiori variant and tile management incl. live KPIs, allowing use-case-/customer-specific tiles
- List and review of product-based planning situation
- Identify issues using aggregated alert overview
- Insight-to-action: Drill down into the details of selected products, navigating into visually harmonized screens such as the Product View screen

#### **Key Benefits**

- Support of PP/DS-related, end-to-end processes out of SAP Fiori launchpad
- Flexibility to support customer-specific insight-to-action



# Planned Innovation Highlight – PP/DS

#### Renewed PP/DS KPI Monitor

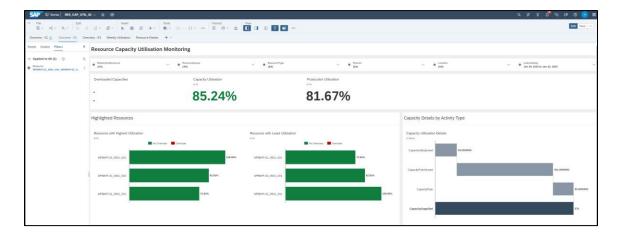
New PPDS reporting based on SAP Analytics Cloud to evaluate production plans using defined KPIs and graphical representation with modern UI technology

#### Scope

- Calculation and graphical visualization of KPIs
- Flexible combination of KPIs in one or multiple dashboards
- New data extraction based on Live Cache CDS view technology
- Pre-defined SAC content

### **Key Benefits**

- Providing improved capabilities on KPI calculation and visualization
- Enabling of modern and flexible analytics
- Extensible through underlying CDS view & SAC architecture





Planned Innovation Highlight – PP/DS

## Tank Planning: Improved consideration of Storage Tanks with continuous Production Lines

## Scope

Improvements relate to master data set-up, which includes storage resources via Product Storage Definition only:

- Improved interactive scheduling
- Support of resource networks
- Improved Fill level calculation
- Support of shrink/stretch functionality
- Ability to 'interrupt' leading production activity
- Support of splitting storage activities

#### **Benefit**

Improved utilization of storage tanks



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Planned Innovation Highlight – PP/DS

## **Support for Resource Networks in Tank Planning and Production Planning Optimization (PPO)**

## Scope

- The ability to consider resource networks in interactive splitting of filling and draining activities
- Improved consideration of resource networks for business scenarios with continuous production lines
- Improved support of resource networks in interactive simplified tank switch
- Support order internal resource networks in production planning optimization (PPO)

## **Key Benefits**

- Improve consideration of the physical factory layout
- Improve adherence to the production schedule



# Appendix



## Planned Innovation

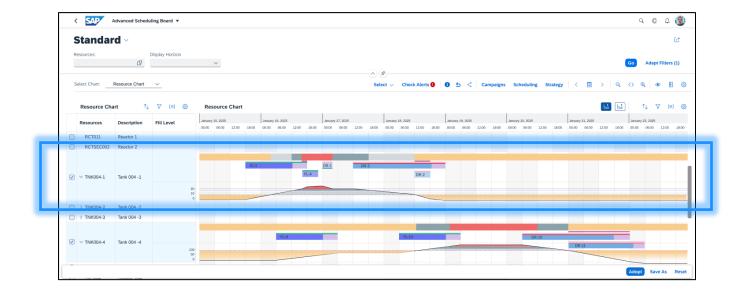
## Advanced Scheduling Board: Detailed Fill-Level Information on Storage Tanks in the Resource Chart

### Scope

- Combined visualization of projected fill level curve of storage tank resources and respective filling and draining activities
- Enable drill-down on projected fill level situation via fill level detailed list
- Facilitate tank split out of Advanced Scheduling Board to allow to drain from / fill into multiple tanks in one order

### **Key Benefits**

- Understand impact of filling and draining on fill level directly
- Improved support of tank planning processes within Advanced Scheduling Board



## Planned Innovation

## Configuration and Extensibility of Advanced Scheduling Board

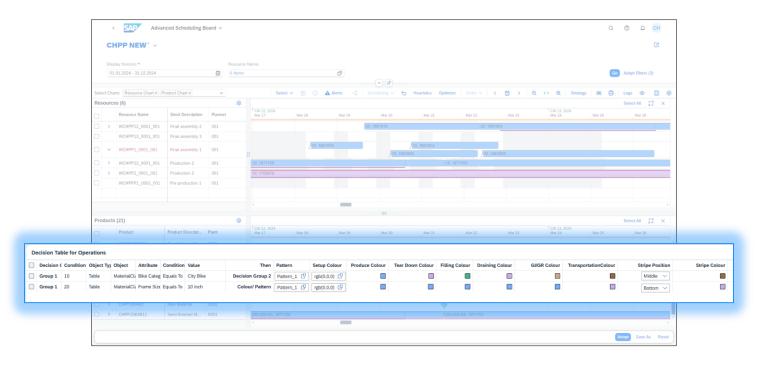
Provide options to configure and enhance Advanced Scheduling Board in a more flexible way

## Scope

- Individual coloring of graphical shapes with chart area of Gantt Chart based on business content
- Configuration of text information on shapes and tool tips
- Enable usage of customer-specific field enhancements within side-panel and table area

### **Key Benefits**

- Improved modelling options of individual business scenarios
- More flexibility and transparency in visualization of current production planning situations



### Planned Innovation





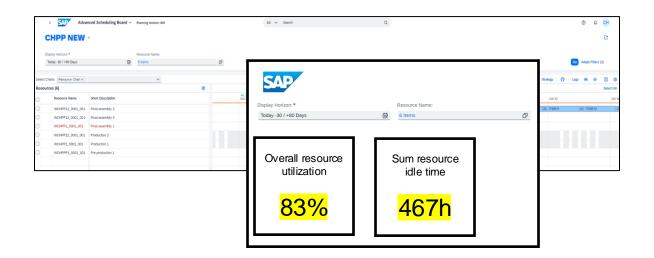
# Integration of the new PP/DS KPI Monitor into the Advanced Scheduling Board

## Scope

- Visualize KPIs defined by new Production Planning and Detailed Scheduling KPI Monitor based on Fiori UX within Advanced Scheduling Board
- Navigate to new Production Planning and Detailed Scheduling KPI Monitor based on Fiori UX out of Advanced Scheduling Board

## **Key Benefits**

- Improved capabilities to evaluate production plans within Advanced Scheduling Board
- Compare alternative plans and understand differences such as resource overloads or order delays



## Planned Innovation

#### Renewed PPDS Alert Monitor based on the SAP Fiori UX

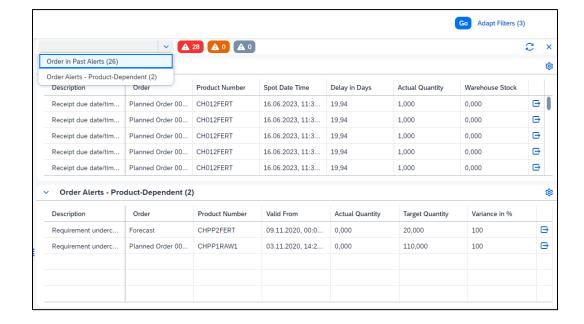


## Scope

- Ability to evaluate PP/DS alerts through the SAP Fiori launchpad
- Starting point for navigation into issue resolution

## **Key Benefits**

- Modernized user experience
- Support for the exception-based planning process, insight-to-action



# Thank you.

Contact information:

SAP

