McKinsey & Company

Transitioning from APO to IBP

April 18th, 2024

SCM connections

SAP Gold Partner

Today's agenda

Overview: Why consider IBP?

What's new in IBP and how to set yourself up for success?

1. Demand
2. SNP and Supply
3. PPDS

Next Steps: How do you get started?

Patrick Green
SCM Connections Leader

Mike Raftery
SCM Connections Leader

Supply Chain leaders are faced with an unprecedented mix of challenges…

- Higher customer expectations – need to **maintain and improve service levels** despite supply chain pressures
- **Inflationary pressures** forcing organizations to focus on **cost and efficiency**
- **Rising interest costs** putting **pressure on inventory reduction**
- Increasingly **volatile operating environments** creating a need for **supply chain resiliency**
- **Talent scarcity and high turnover** fueling greater demand for **automation**

When done right, digital SC planning can overcome these challenges and drive tremendous impact

Business results

Tangible bottom-line impact

2-5%
Revenue increase & better customer service

5-10%
SC costs savings

2-4 p.p.
Higher EBITDA margin

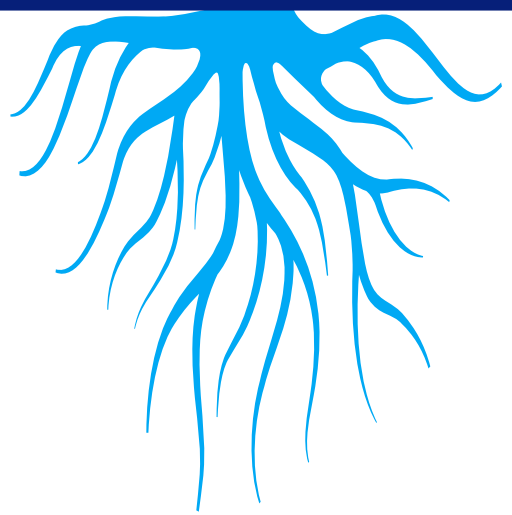
10-20%
Carbon footprint reduction

5-10%
Capex & labor productivity

10-20%
Working capital reduction

Strategic importance

Competitive and operational improvements beyond the P&L

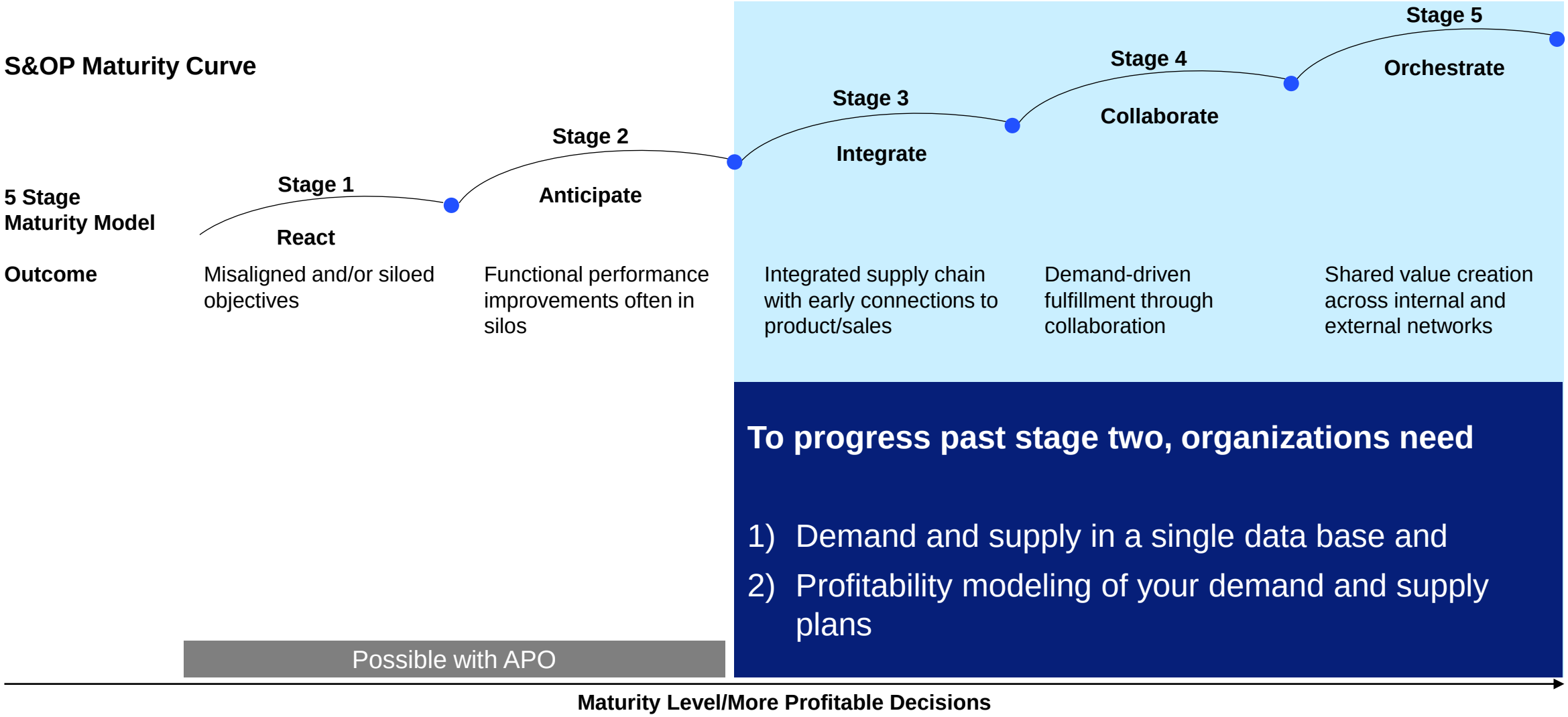


10-15%
Re-invest planning team towards value added activities

25-35%
More root-causing capability for SC continuous improvement enabled by AI

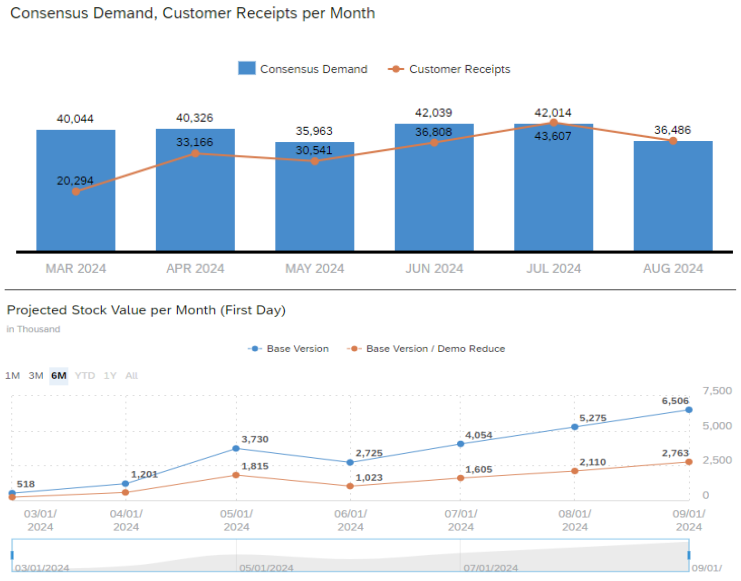
4x
Faster decision making for a resilient & agile SC

Technology enabled transformations can address supply chain challenges and advance the org along the S&OP maturity curve



SAP IBP equips organizations to more easily make data driven decisions …

IBP offers a dynamic, integrated user interface with robust prebuilt reports



SAP IBP Benefits

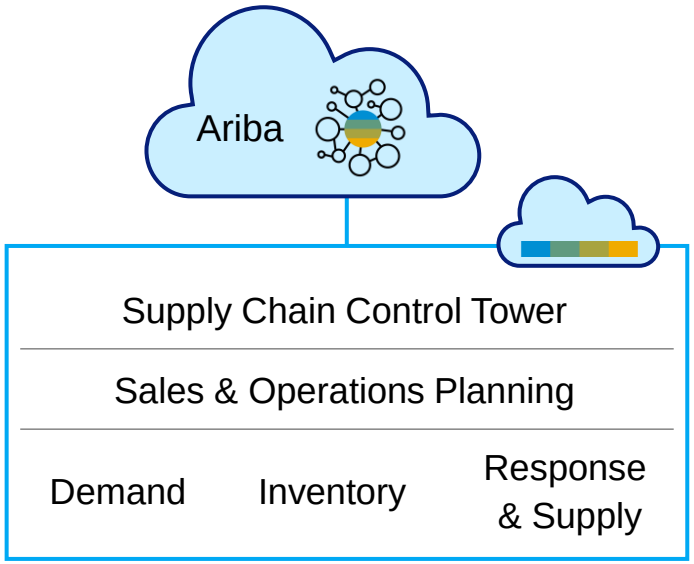
- **Real time reporting and metrics**
- **Unified planning and data**
- **Real time simulation capabilities**
- **External partner collaboration**
- **Unified user experience**
- **Fiscal and operational planning at any level**
- **Integration of demand/supply**
- **Financial data**

Moving from APO to IBP enables both network-centric and plant-centric planning

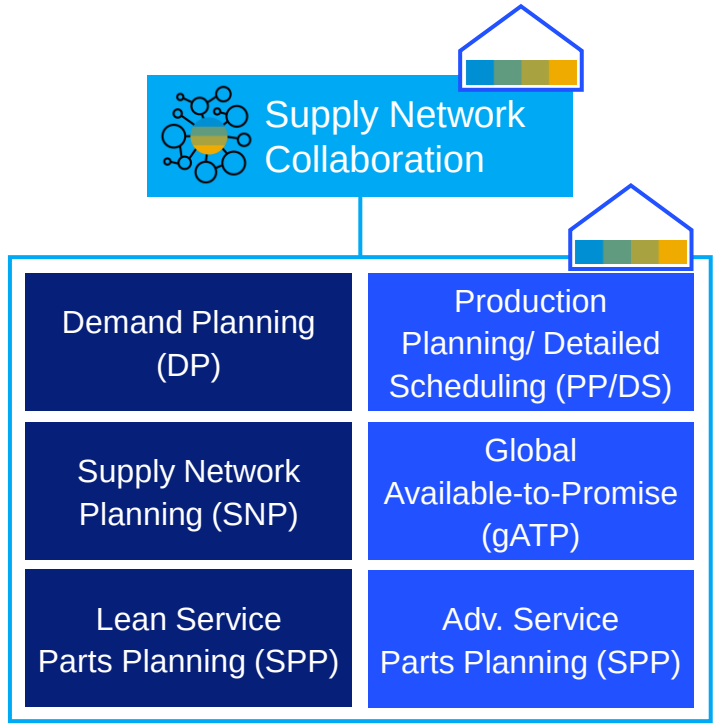
= Cloud = On Premise

Network-Centric Planning

Innovative & Re-architected
Supply Chain Planning Processes



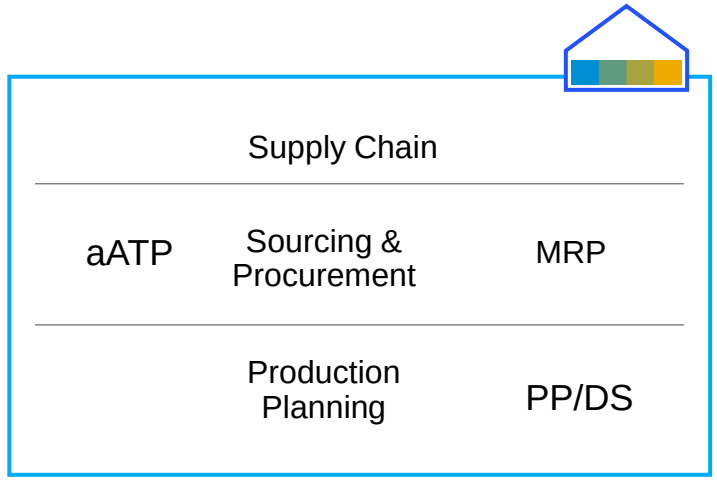
SAP Integrated Business Planning (IBP)



SAP Advanced Planning & Optimization (APO)

Plant-Centric Planning

Unified Manufacturing Processes Plan to Produce in ONE System



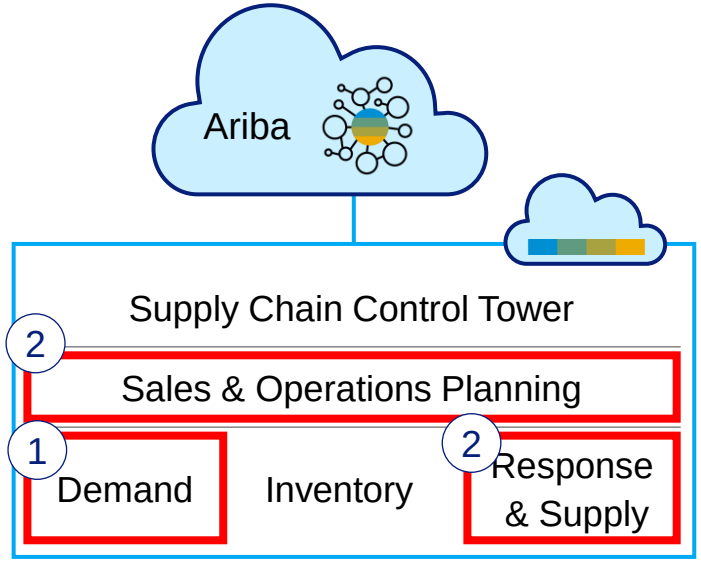
SAP S/4HANA

Today's webinar will focus on difference between IBP and APO in three key areas

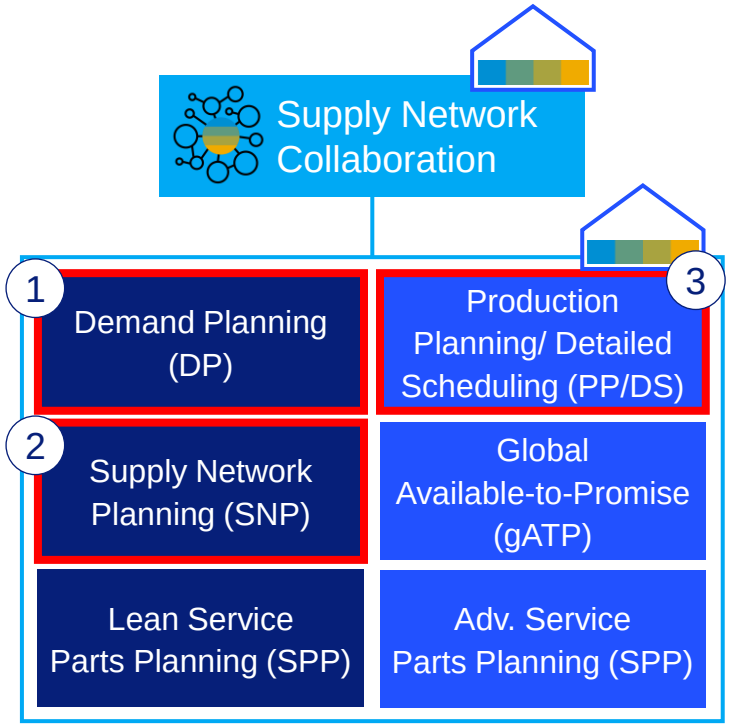
= Cloud = On Premise

Network-Centric Planning

Innovative & Re-architected
Supply Chain Planning Processes



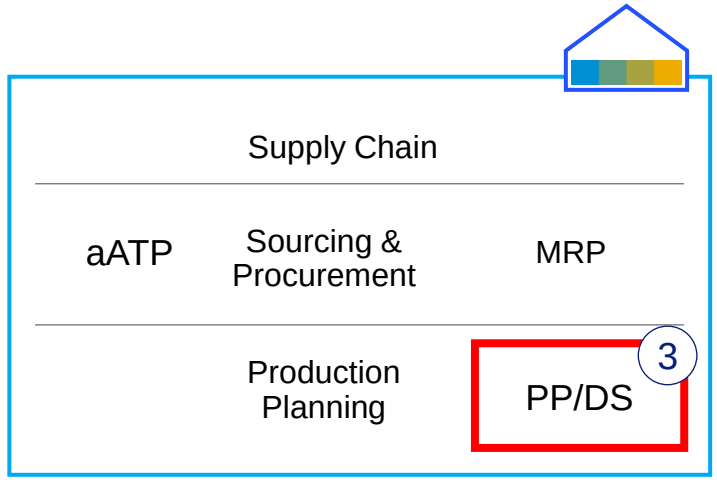
SAP Integrated Business Planning (IBP)



SAP Advanced Planning & Optimization (APO)

Plant-Centric Planning

Unified Manufacturing Processes Plan to Produce in ONE System



SAP S/4HANA

APO and IBP comparing key structural elements

APO

- Multiple planning areas
- CVC driven planning levels
- Separate from supply planning
- Aggregation logic is fixed
- Difficult to compare multiple signals
- Revenue uses averages
- External reporting for analytics support
- Static statistical forecasting methods
- Fixed Planning Books/Data Views

IBP

- Unified planning area with supply
- Flexible planning levels
- Integrated with supply planning for scenarios
- Dynamic aggregation levels
- Side by side comparison of multiple demand inputs
- Actual pricing for revenue
- Embedded analytics and improved UI
- AL/ML and driver-based planning
- Dynamic Planning and User Views

Today’s agenda

Overview: Why consider IBP?

What’s new in IBP and how to set yourself up for success?

1. Demand
2. SNP and Supply
3. PPDS

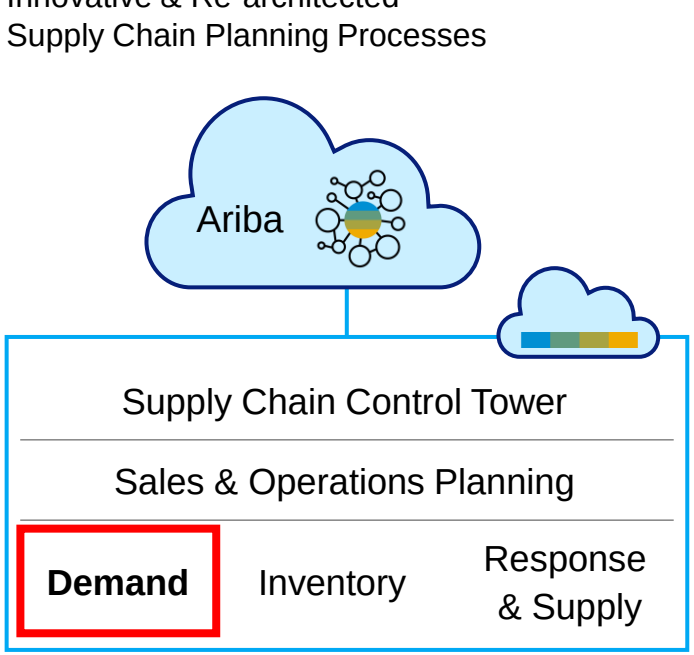
Next Steps: How do you get started?

Demand Planning

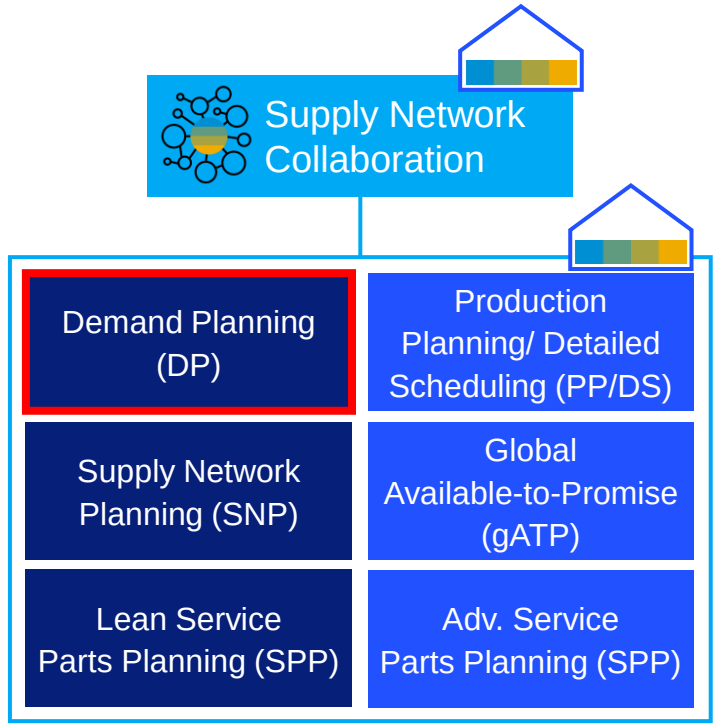
= Cloud = On Premise

Network-Centric Planning

Innovative & Re-architected
Supply Chain Planning Processes



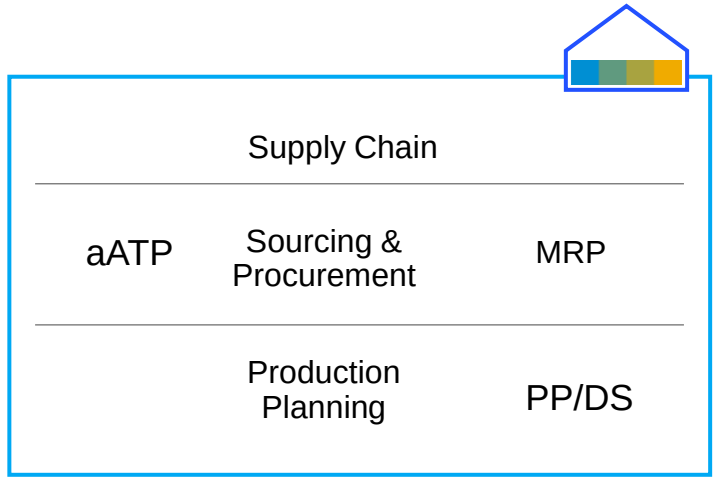
SAP Integrated Business Planning (IBP)



SAP Advanced Planning & Optimization (APO)

Plant-Centric Planning

Unified Manufacturing Processes Plan to
Produce in ONE System



SAP S/4HANA

What is new in IBP for Demand?

In comparison to APO DP

Deep dive to follow

Demand Sensing

Create short-term forecast to drive better fulfillment and inventory reduction

Statistical Models

Additional forecasting algorithms, including ARIMA and Machine Learning techniques

Time Series Analysis

Determine data patterns as part of a more robust best-fit methodology

Segmentation

Robust segmentation tools based on volume and variability

Forecast Accuracy

Flexible forecast accuracy calculations and support for Forecast Value Add analysis.

Driver Based Planning

Model and evaluate impact of events that will affect your demand plans

Improved Usability and User Acceptance

Excel user interface for planning. Web-based Fiori apps for setup of forecast models, segmentation and forecast error calculations

Simulation Capabilities

Easier scenario creation and evaluation

Embedded Analytics

User generated dashboards and ad-hoc analytics for any key figure or KPI

Exception Management

Robust alerting with user subscription model to reduce alert overload*

Process Management

Manage the demand planning process and timing*

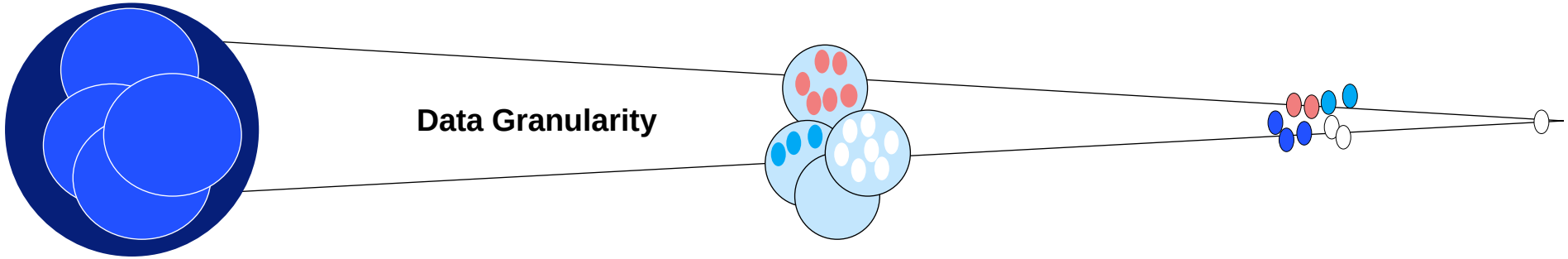
Demand Sensing bridges the gap between planning and execution

New with IBP

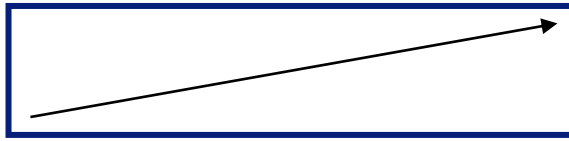
Long Term (years)	**Medium Term** (months)	**Short Term** (weeks)	**Execution** (days)
Annual budgeting	Sales and Operations Planning	Demand sensing	Deployment
Annual strategic planning	Demand planning		Kitting/packaging
Network design	Inventory planning		Order fulfillment
	Production planning		Logistics execution

Forecasts Used

Annual Budget | **Statistical → Consensus** | **Orders**



Advanced statistical models improve forecast accuracy

Product	Common Demand Patterns	Demand Proprieties
		Constant
		Seasonal
		Sporadic
		Trend

Algorithms Used	Forecast Accuracy
Adaptive Response Rate Single Exponential Smoothing	**78%**
Automated Exponential Smoothing	80%
Auto-ARIMA/SARIMA	**78%**
Brown Exponential Smoothing	**75%**
Croston Method	
Double Exponential Smoothing	**70%**
Multiple Linear Regression	
Simple Average	**70%**
Simple Moving Average	**65%**
Single Exponential Smoothing	85%
Triple Exponential Smoothing	
Weighted Average	**75%**
Weighted Moving Average	**75%**

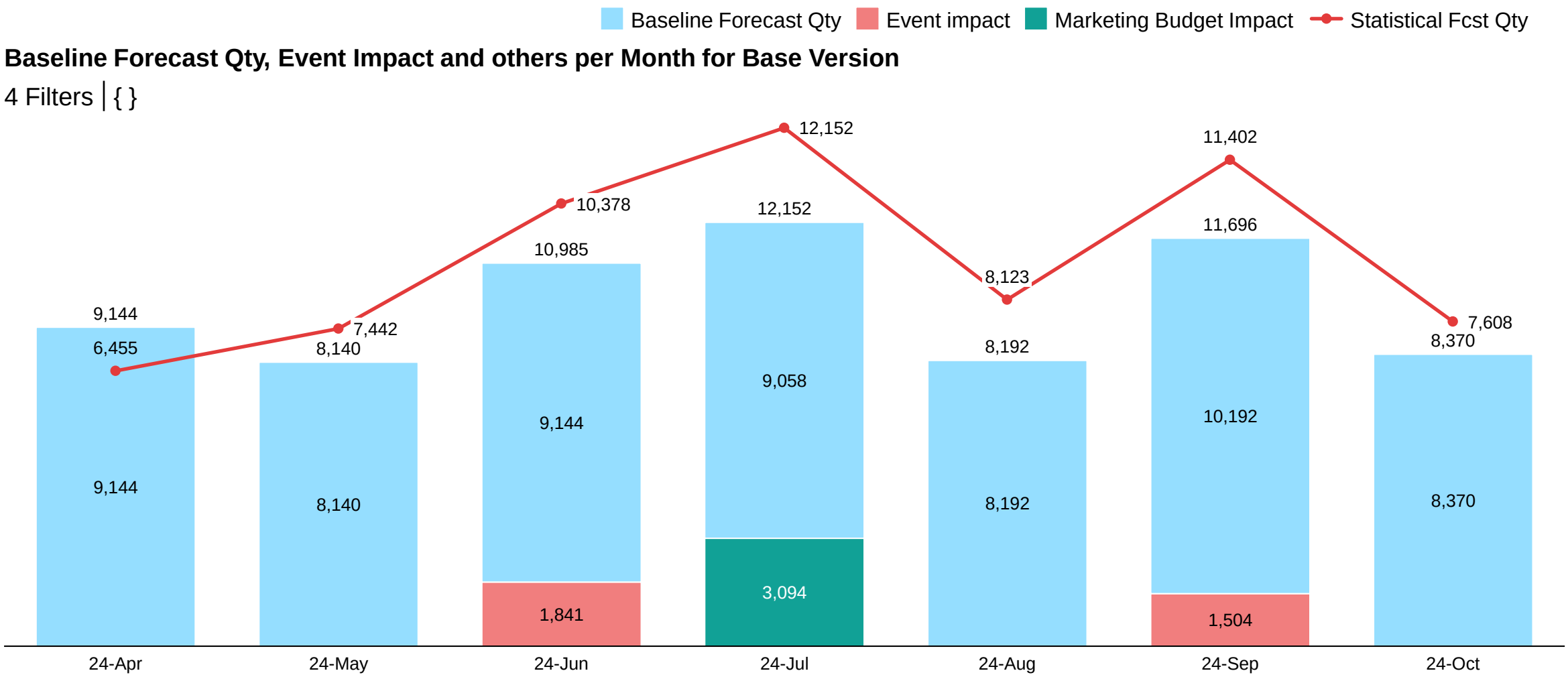
Time Series Analysis identifies which demand pattern fits for which product

Only algorithms which fit the identified demand pattern are considered by system

Best Fit selects the algorithm with the best accuracy based on Model Fit Error

Driver based forecasting allows users to model and evaluate impact of events that will affect your demand plans

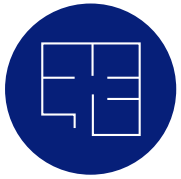
Understand the main drivers of your business through variable impact analysis



Best Practices: APO DP to IBP Demand Migration

Process Alignment

Demand Planning Alignment with the S&OP Process



Demand Inputs from Functional Areas

Define the Consensus Demand calculation

Adjustments and inputs

Roles and Responsibilities

Consensus Forecasting Process

Define the Consensus Demand calculation

Adjustments and inputs

Roles and Responsibilities

Plan to reassess forecasting models

Models are similar but have enhanced functions in IBP

Additional models not available in APO – ARIMA, Gradient Boosting

Utilize time series analysis in IBP

Determine statistical forecasting levels for highest accuracy

Metric Definitions

Define Forecast Error Calculation

Forecast Accuracy

Forecast Bias

Forecast Value Add

Today's agenda

Overview: Why consider IBP?

What's new in IBP and how to set yourself up for success?

1. Demand
2. SNP and Supply
3. PPDS

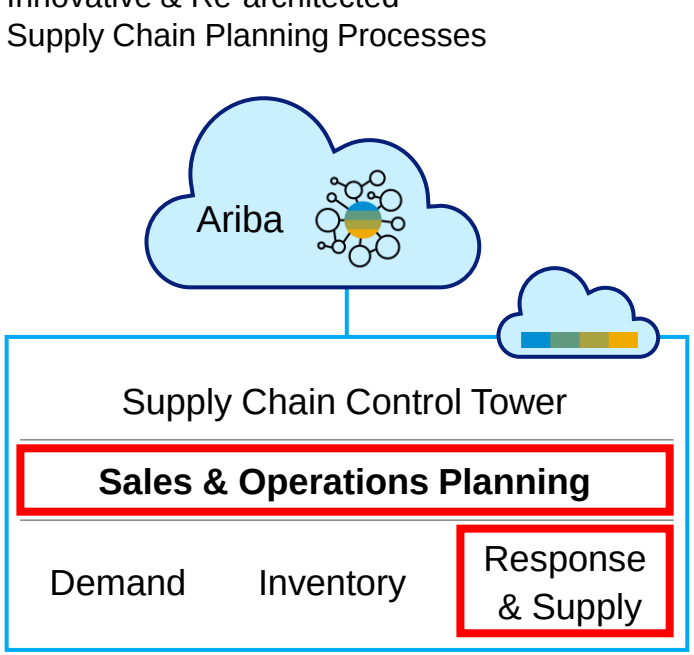
Next Steps: How do you get started?

Supply Planning

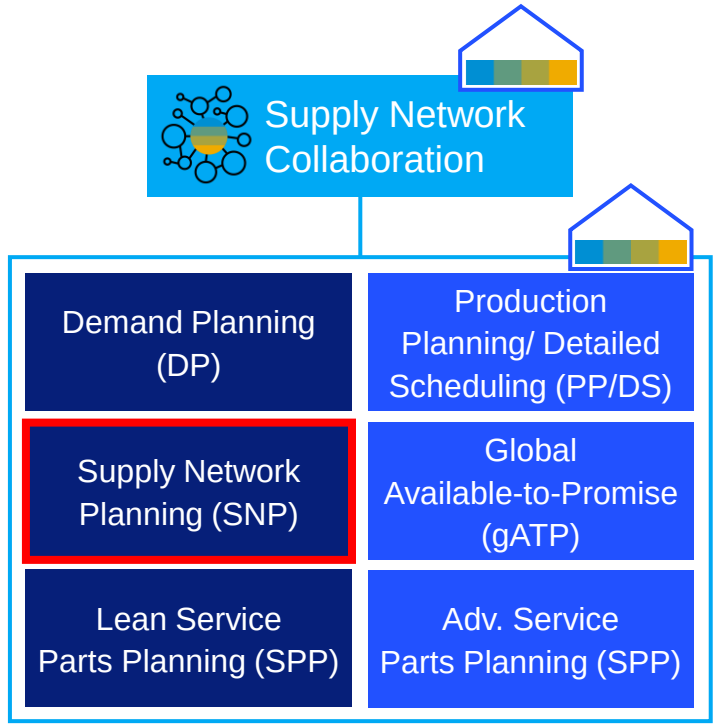
= Cloud = On Premise

Network-Centric Planning

Innovative & Re-architected
Supply Chain Planning Processes



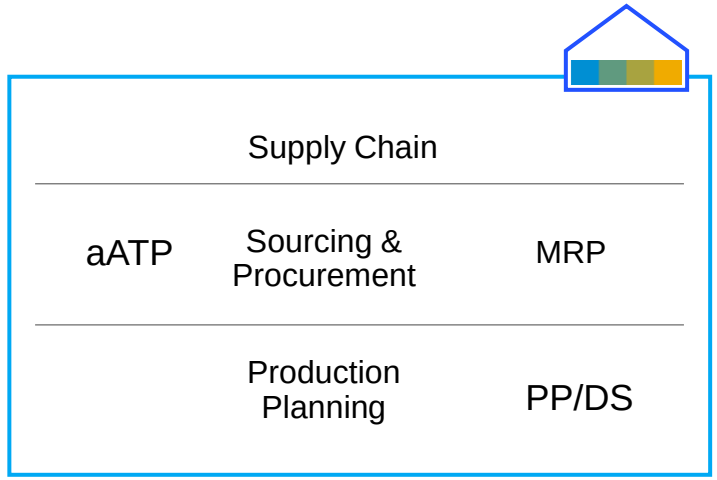
SAP Integrated Business Planning (IBP)



SAP Advanced Planning & Optimization (APO)

Plant-Centric Planning

Unified Manufacturing Processes Plan to
Produce in ONE System



SAP S/4HANA

What is new in IBP for SNP and Supply?

Improved Usability and User Acceptance

Excel user interface for planning (focus: bucket view). Web-based Fiori apps for setup of profiles and viewing order data (order view)

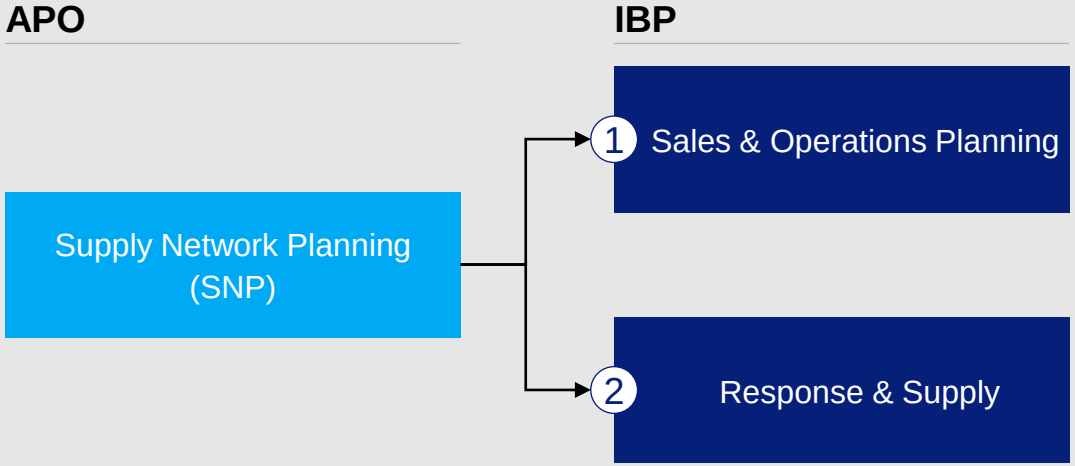
Embedded Analytics

User generated dashboards and ad-hoc analytics for any key figure or KPI

Simulation Capabilities

Fast scenario creation, sharing and evaluation

New System Architecture



Functionality that used to be in APO's Supply Network Planning module is now split into two IBP modules for more robust functionality

1. The Sales & Operations Planning for order series analysis
2. The Response and Supply module for time series data and analysis

IBP provides operational & financial projections side by side for improved usability

Key Figure	21-Jun	21-Jul	21-Aug	21-Sep	21-Oc
Production Cost Spend	$112,477	$663,110	$1,018,571	$985,714	$1,018,571
Production Overhead Spend	$ 3,803	$ 20,706	$ 30,765	$ 28,776	$ 31,378
Production Raw Material Spend	$ 14,342	$ 76,908	$ 113,945	$106,576	$ 116,213
Transportation Cost Spend	$ 9,058	$ 33,505	$ 5,978	$ 632	$ 515

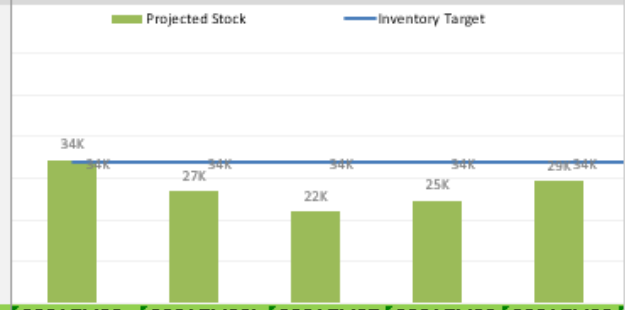
Key Figure	Q3 2021	Q4 2021	Q1 2022	
Total Production Value	$26,937,848	$25,260,136	$24,559,870	$
Average Projected Stock Value	$ 7,220,505	$ 1,616,627	$ 68,048	
Constrained Demand Rev.	$49,595,027	$23,147,450	$18,506,924	$
Gross Profit	$10,138,333	$ (4,665,020)	$ (5,659,077)	$
Total Receipts Value	$40,482,862	$26,132,934	$24,559,870	$

SCM connections

0018100001; 0037100001; 0037100002; 0061100001; 0062100001; 0062100003

SUP01 Supply Optimization

Last Refresh: 2021-Jun-29 15:23:10

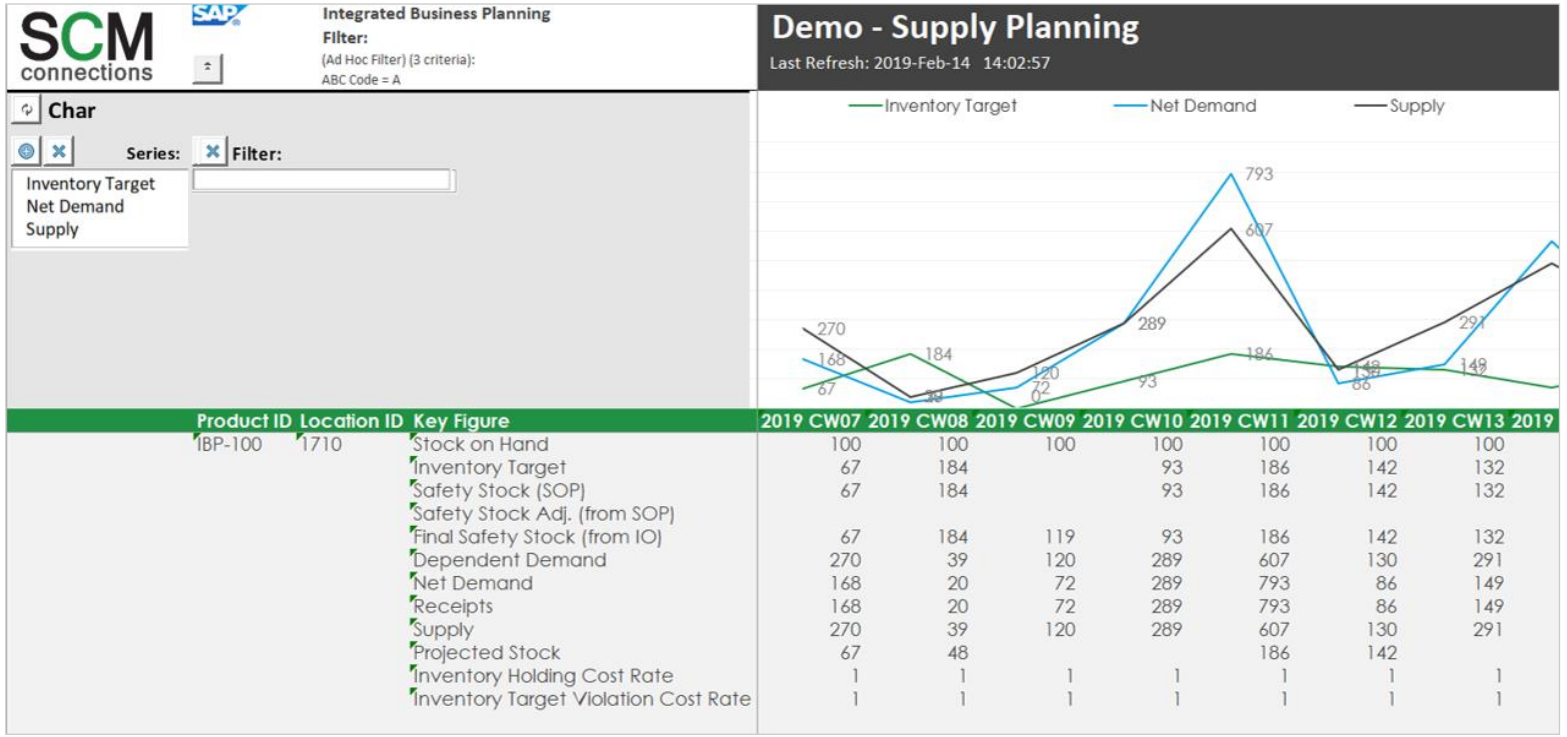


Location	Key Figure	2021 TW26a	2021 TW26b	2021 TW27	2021 TW28	2021 TW29
DC Boston	Inventory Target	6,750	6,750	6,750	6,750	6,750
	Projected Stock	6,425	6,045	4,327	3,785	8,475
	Average Projected Stock Value	$ 2,491,086	$ 2,753,888	$ 2,025,017	$ 1,824,933	$ 3,339,827
DC Detroit	Inventory Target	6,750	6,750	6,750	6,750	6,750
	Projected Stock	5,975	4,960	4,540	4,370	6,049
	Average Projected Stock Value	$ 2,440,139	$ 2,466,730	$ 2,318,940	$ 2,505,022	$ 2,659,708
DC Seattle	Inventory Target	6,750	6,750	6,750	6,750	6,750
	Projected Stock	6,229	5,619	5,517	4,682	5,208
	Average Projected Stock Value	$ 2,503,129	$ 2,745,179	$ 2,586,681	$ 2,251,146	$ 1,948,218
Plant Chicago (Co Man)	Inventory Target	4,500	4,500	4,500	4,500	4,500

New IBP functionality:

1) Inventory, production, shipping and revenue all calculated in the same planning area
2) Project spend, profit, revenue and cost levels based on constrained plan against time effective pricing inputs

Robust simulation capabilities allow for proactive planning for potential business disruptions

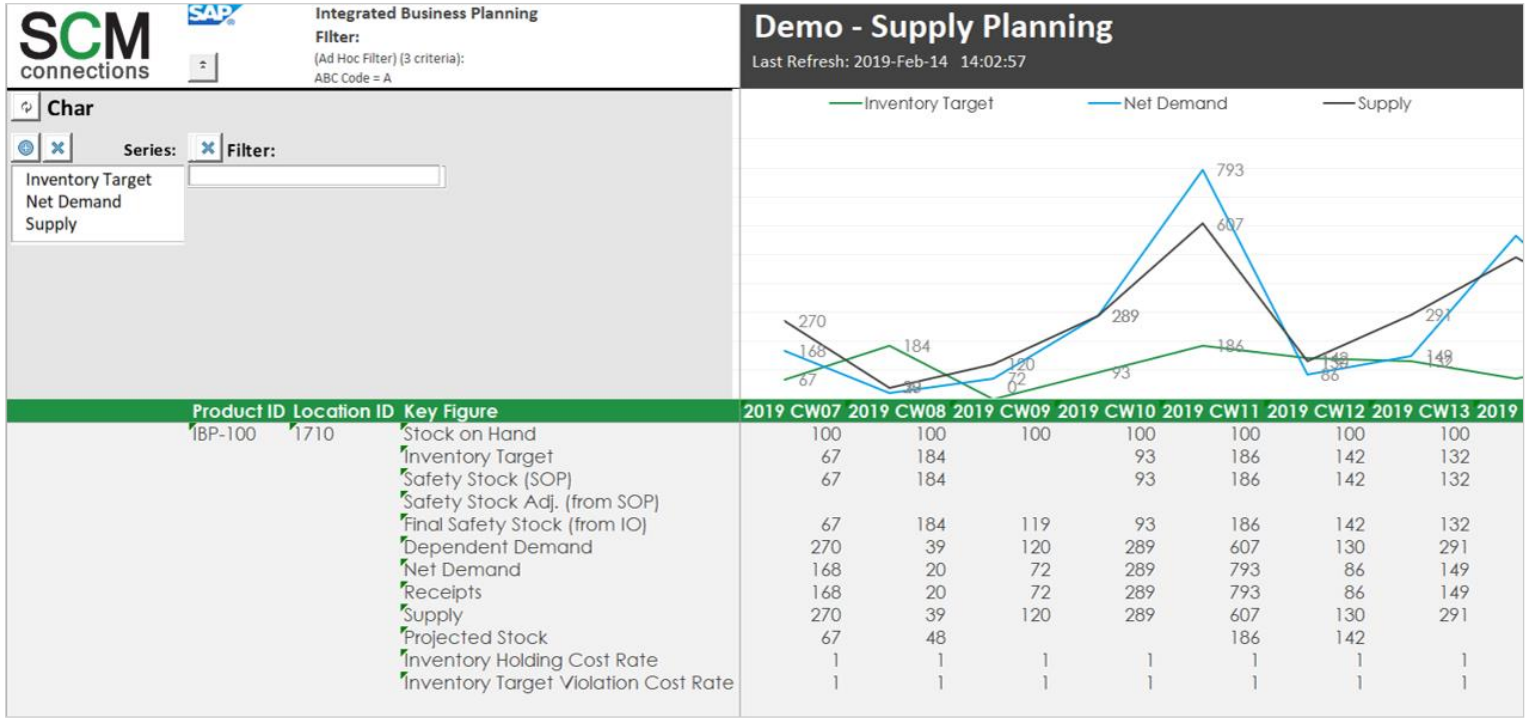


Product ID	Location ID	Key Figure	2019 CW07	2019 CW08	2019 CW09	2019 CW10	2019 CW11	2019 CW12	2019 CW13	2019
IBP-100	1710	Stock on Hand	100	100	100	100	100	100	100	
		Inventory Target	67	184		93	186	142	132	
		Safety Stock (SOP)	67	184		93	186	142	132	
		Safety Stock Adj. (from SOP)								
		Final Safety Stock (from IO)	67	184	119	93	186	142	132	
		Dependent Demand	270	39	120	289	607	130	291	
		Net Demand	168	20	72	289	793	86	149	
		Receipts	168	20	72	289	793	86	149	
		Supply	270	39	120	289	607	130	291	
		Projected Stock	67	48			186	142		
		Inventory Holding Cost Rate	1	1	1	1	1	1	1	
		Inventory Target Violation Cost Rate	1	1	1	1	1	1	1	

Time series analysis functionality:

- **Constrained supply run provides feasible plan**
- **Ability to maximize profit or maximize delivery**
- **Set penalty costs according to your business model**
- **Effectively balance supply and demand with optimal plan**
- **Plan for production, distribution, and procurement**

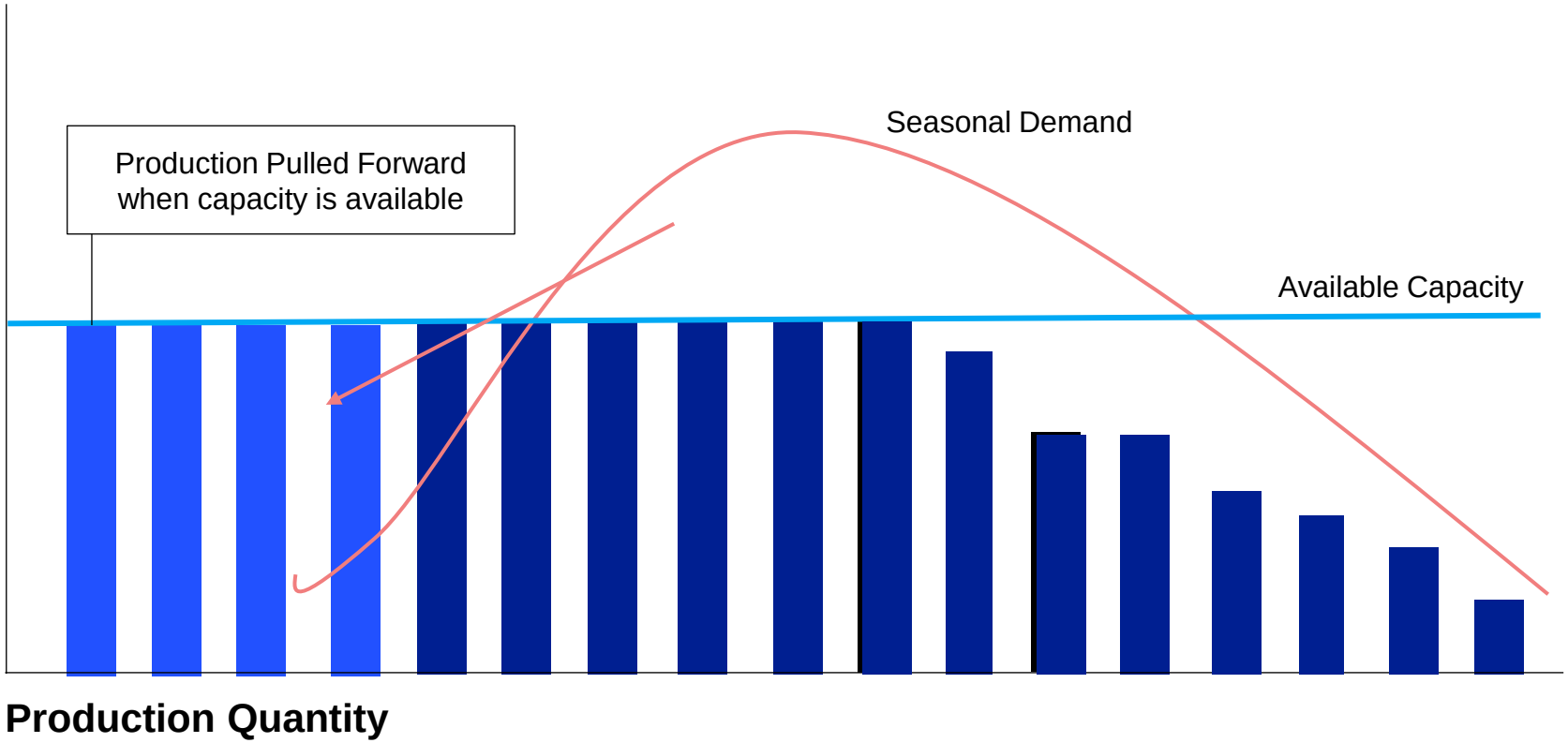
Robust simulation capabilities allow for proactive planning for potential business disruptions



Time series analysis functionality:

- Constrained supply run provides feasible plan
- Ability to maximize profit or maximize delivery
- Set penalty costs according to your business model
- Effectively balance supply and demand with optimal plan
- Plan for production, distribution, and procurement

Capacity Management in IBP will manage prebuild of inventory automatically balancing production against seasonal demand



Finite planning in IBP manages constraints and demand automatically

Provides an optimal balance of resource utilization, overtime and inventory build

Constraints can be raw materials, manufacturing capacity or shipping capacity

Best Practice: APO IBP Supply Migration Supply Planning

	Time Series Planning	Order Series
1 Remember that **process mapping** is critical (i.e., this is NOT lift and shift)	Bucketed capacity planning (improved) S&OP activities (new) Annual Budgeting (improved) Network planning Inventory Projections	Executional planning Detailed Capacity Evaluation Order based decisions Limited inventory allocations (new)
2 Carefully consider your **integrations**	Integration with S4, but executed as needed Real time is not generally a requirement for the tactical planning tasks Can incorporate data feeds from any source system (even non-SAP)!!! Costing and financial data modeling requires cost-based data integration	Bi-directional data integration Near real time for execution level order planning Updated for timely decision making and synchronized planning activities
3 Keep in mind **data integrity** for multiple tasks	Capacity planning resources can be at any level or unit Labor, storage, transportation can be approximated Can model future “what if” products	Real time integration with ERP requires synchronized data feeds Bi-directional planning limits data in IBP alone Focus on cleansed data to remove noise

Today's agenda

Overview: Why consider IBP?

What's new in IBP and how to set yourself up for success?

1. Demand
2. SNP and Supply
3. PPDS

Next Steps: How do you get started?

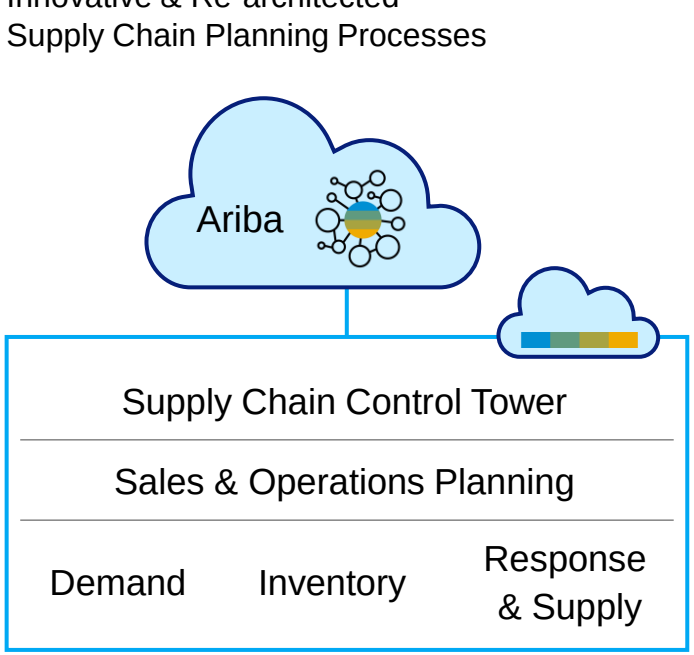
APO Transformation Strategy

Product Direction

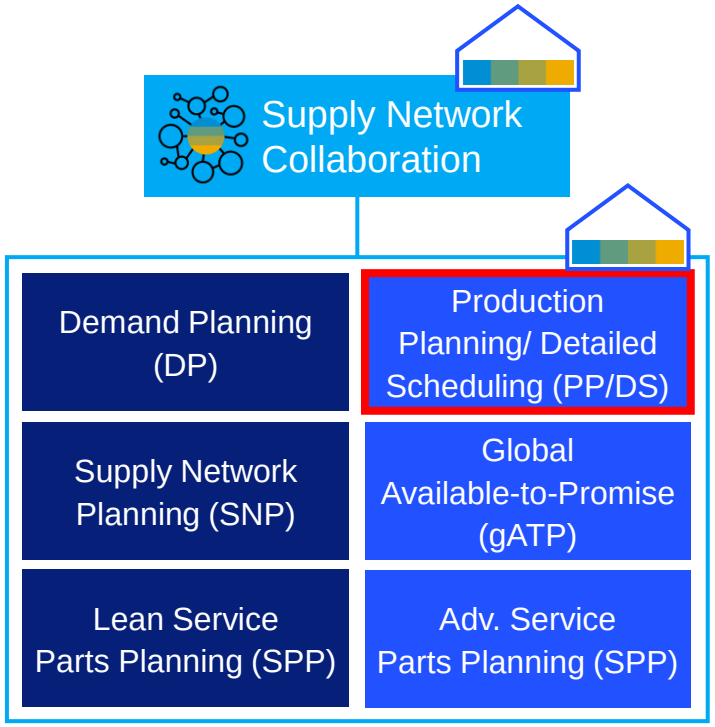
= Cloud = On Premise

Network-Centric Planning

Innovative & Re-architected
Supply Chain Planning Processes



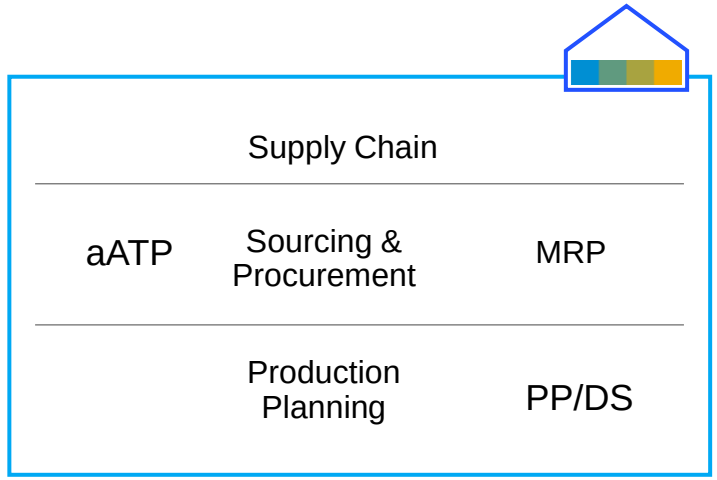
SAP Integrated Business Planning (IBP)



SAP Advanced Planning & Optimization (APO)

Plant-Centric Planning

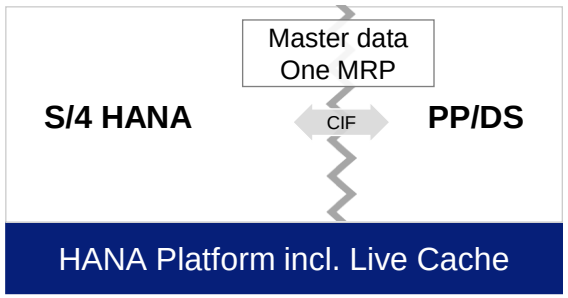
Unified Manufacturing Processes Plan to
Produce in ONE System



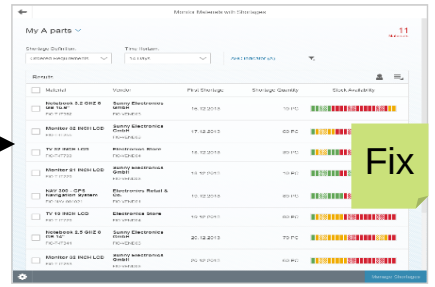
SAP S/4HANA

S/4HANA Manufacturing for Planning and Scheduling with embedded PP/DS improves master data harmonization

Key Capabilities

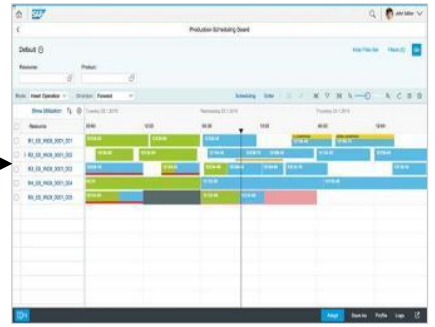


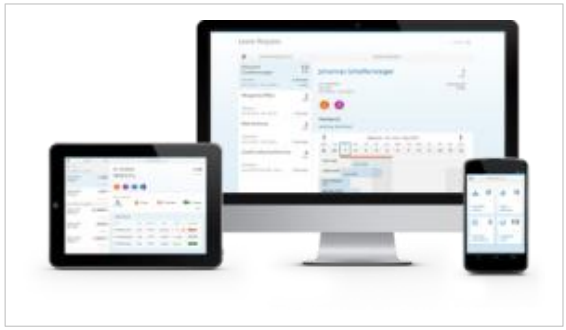
Production Planning Detailed Scheduling



Production Planner

Analyze the detailed material flow and time continuous capacity in real-time with PP/DS@S/4HANA





Advanced Production Planning and Scheduling (APS-) functionality is now integrated into the ERP

Features available since 1610:

- UI Harmonization / CIF Simplification
- Master Data Harmonization
- One MRP / Analytics
  Available since 2020:
- PP-Solver
  for a multi-level finite planning approach with mathematical optimization (MILP)
- IBP-Process Integration
  for synchronized planning across the network and within production sites

Further Roadmap Definition based on CEI e.g.:

- DD-Scheduling (DDOM)
- Tank Planning, etc…

ePPDS Production Planning Features

Integrated Manufacturing Process Flow

Multi-level production planning (i.e., Production Planning Optimizer)

Use existing or own developed heuristics

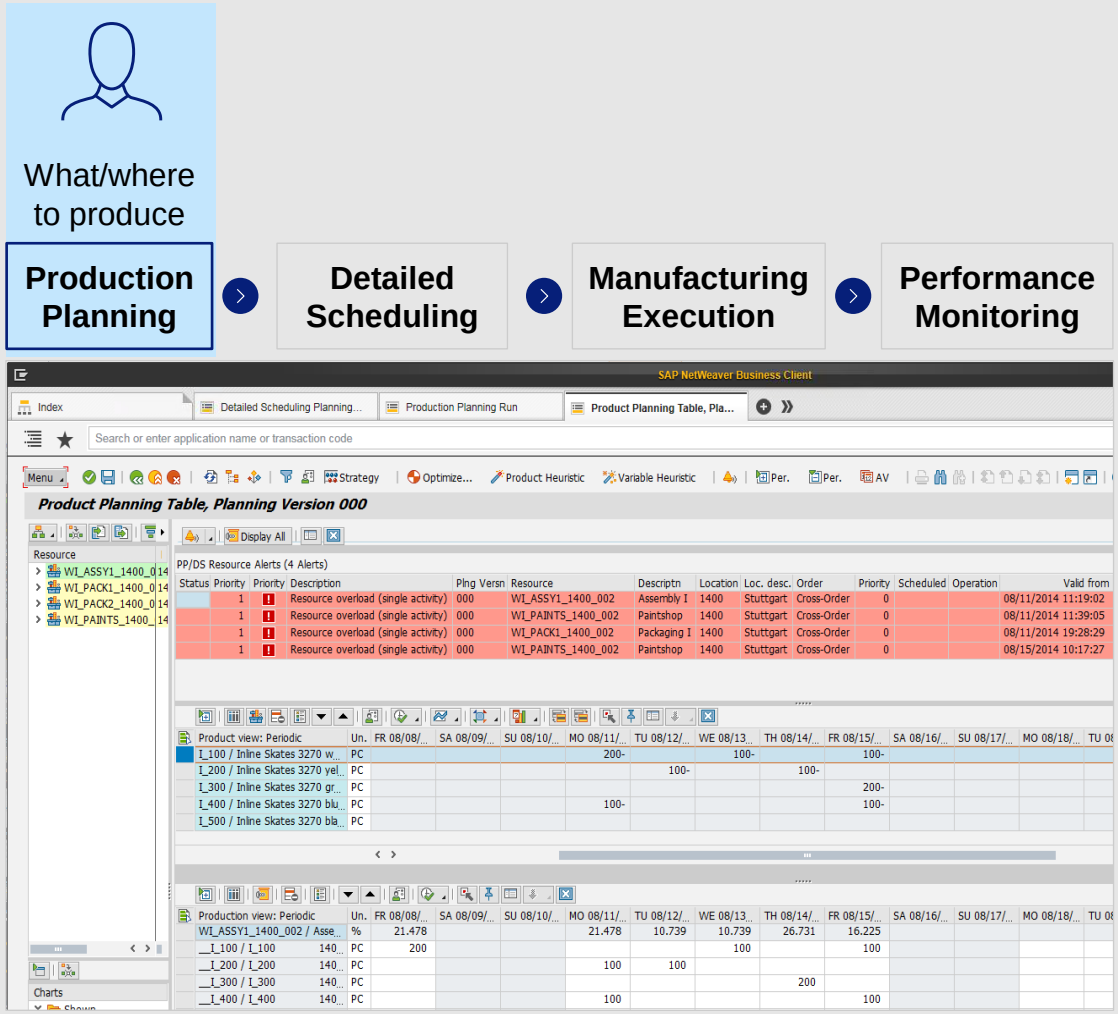
Lot quantity calculations and sourcing supported

Various Manufacturing Models supported

- Make to Stock
- Make to Order
- etc.…

Order Pegging

Integration with the Alert Monitor



ePPDS Detailed Scheduling Features

Integrated Manufacturing Process Flow

Scheduling Optimizer

Optimal Sequencing

Flexible & Graphical Activity Scheduling

Backlog Resolution Planning

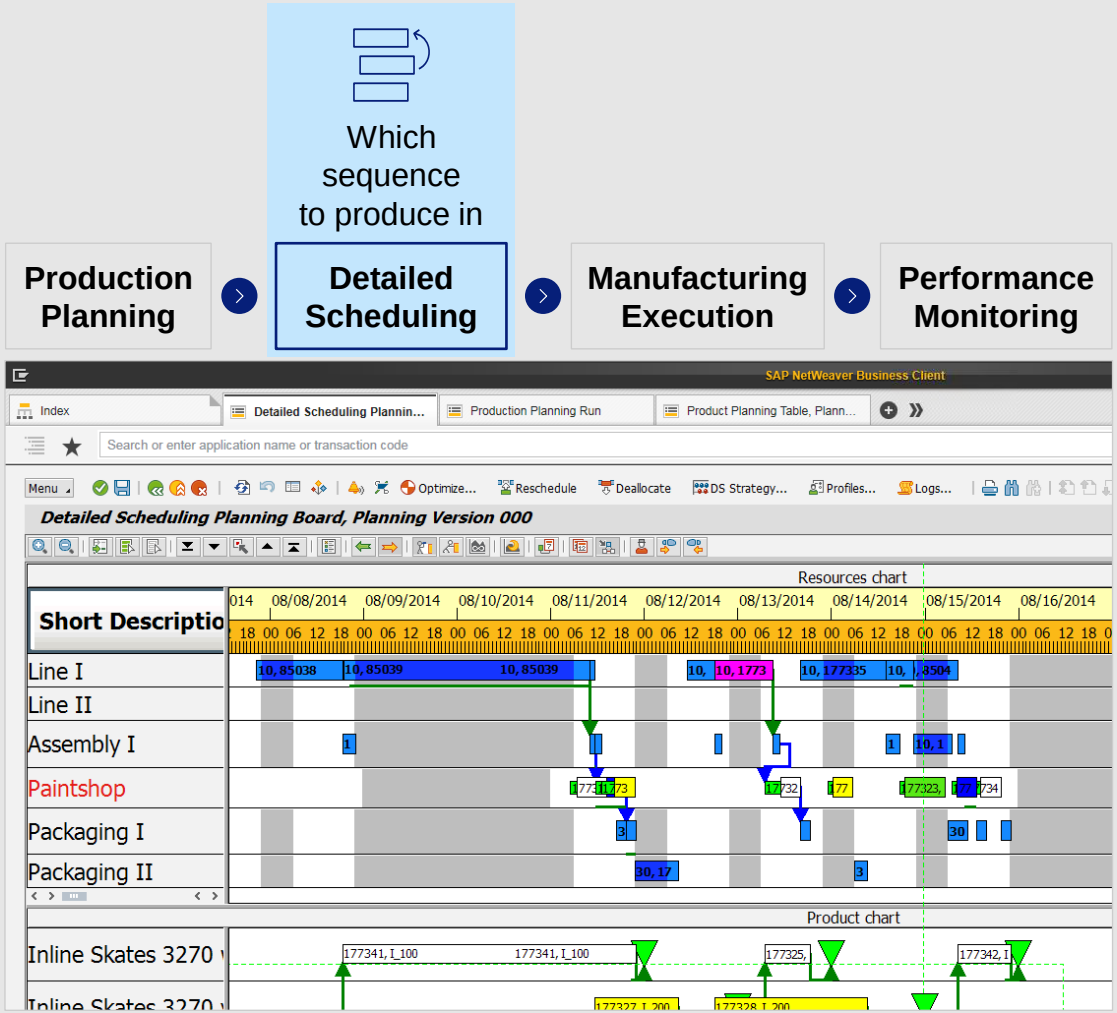
What-if Analysis & Simulation

Forward & Backward Scheduling

Configurable Exception Alert Monitor

Plan Monitor

Production Order Release

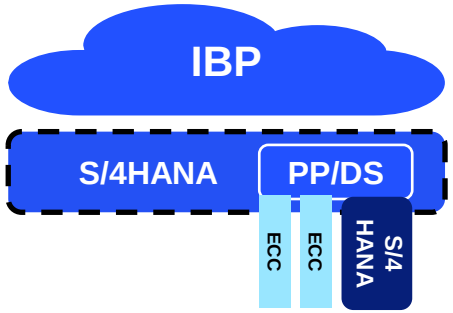


APO Succession supported by the S/4HANA DSC Edition for PP/DS

One S/4HANA code line with common innovations

S/4HANA "**DSC Edition**[1] for PP/DS"

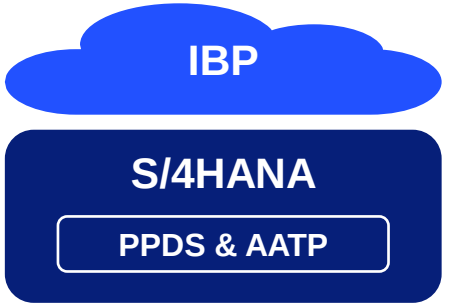
- Real time SCM platform
- & **selective** simplification
- Emphasis on integrated Supply Chain Planning



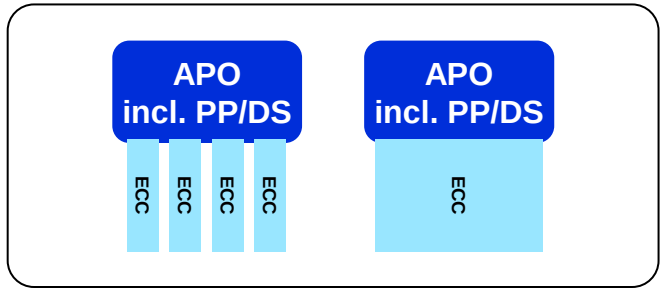
OR

S/4HANA including **Embedded** PP/DS

- Real time SCM platform
- & maximize simplification / harmonization
- Emphasis on integrated Manufacturing



Classical Legacy Architecture



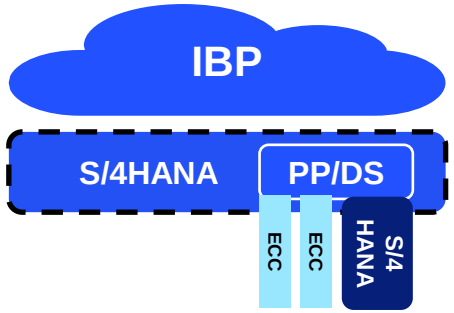
1. Not yet one-Voice branded

APO Succession supported by the S/4HANA DSC Edition for PP/DS

One S/4HANA code line with common innovations

S/4HANA "**DSC Edition**[1] for PP/DS"

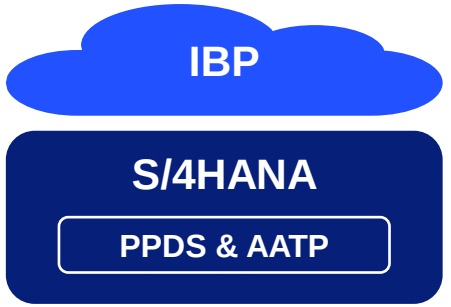
- Real time SCM platform
- & **selective** simplification
- Emphasis on integrated Supply Chain Planning

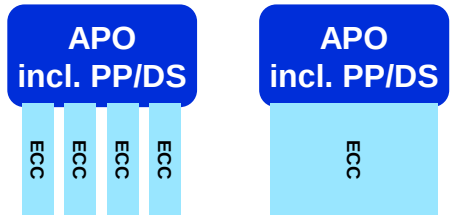


OR

S/4HANA including **Embedded** PP/DS

- Real time SCM platform
- & maximize simplification / harmonization
- Emphasis on integrated Manufacturing





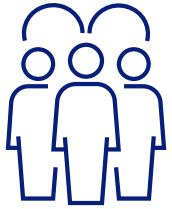
Classical Legacy Architecture

1. Not yet one-Voice branded

APO to ePPDS migration system architecture decisions

System critical to determine early in the migration process

In which systems will key planning functions occur?



Distribution Network Planning

S4 MRP

S4 ePPDS

IBP Response and Supply

Rough Cut Capacity Mapping

S4 PP

S4 ePPDS

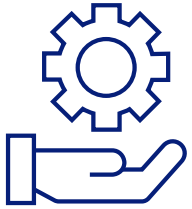
IBP Response and Supply

MRP and Procurement

S4 MRP Live

S4 ePPDS

IBP Response and Supply



Specific PPDS Functions not Supported in ePPDS

There is a need to review current restrictions in ePPDS to ensure core functions are supported

PPDS to ePPDS Migration Mapping PPDS best practices

1. Assess APO PPDS design elements and map to ePPDS
2. Assess APO PPDS data enhancements and map to ePPDS
3. Review APO PPDS enhancements and assess the need in ePPDS
4. Implement a CIF strategy as part of the project
    1. Master Data
    2. Transactional Data
    3. Reconciliation
5. Look for opportunities to improve processes and streamline functionality
    1. Alert Monitor
    2. PPDS Planning Board functionality

Today's agenda

Overview: Why consider IBP?

What's new in IBP and how to set yourself up for success?

1. Demand
2. SNP and Supply
3. PPDS

Next Steps: How do you get started?

McKinsey/SCM connections has partnered with organization across industries to conduct end to end SAP-IBP enabled transformations

End-to-end tech-enablement transformation recipe adjacent

Program dimension	Oil & gas ($159B, global)	Frozen foods ($7B, US/CAN)	Home Hardware ($2B, US/CAN)
Client situation	Client sought unified demand planning solution across two divisions with cohesive integration to multiple systems and data lake	Client faced imminent sunsetting of SAP APO and substandard S&OP and inventory planning processes	Client sought to consolidate its fragmented planning system landscape across three global regions while undergoing an S/4HANA-led implementation
Work performed	**SAP IBP modules implemented:** S&OP, demand Enabled functionality to analyze and forecast marketer-servicer accounts, intercompany accounts, and MRP consumption data Integrated and synthesized data from multiple SAP systems	**SAP IBP modules implemented:** S&OP, demand, supply, inventory Retired APO solution Enabled inventory policy-setting processes and modeling of aggregate optimization constraints	**SAP IBP modules implemented:** S&OP, demand, supply Created two-phased roadmap for implementation • Enabled standardized demand planning (statistical forecast and commercial inputs) solution • Enabled standardized supply network planning (heuristics and optimizer) solution, including what-if scenario analysis Enabled financial reporting and created customized analytics layer
Resourcing	4-6 remote resources for 24+ months	4 on-site resources for 18 months	4 remote resources for 13 months
Impact[1]	Decreased system downtime Improved forecast accuracy	Reduced inventory levels by 18% Reduced response time on what-if analyses to 1 day	Replaced three legacy platforms

1. Measured 30 days post-go-live

Come See Us!

Upcoming Events

Gartner

Gartner SC Symposium
Orlando May 6-8

SAP Sapphire
Orlando June 3-5

Please keep in touch as you continue on your digital supply chain planning journey

Keep learning about technology solutions

Define your organization's requirements

Explore options to determine the best fit

Create a comprehensive business transformation plan enabled by technology

Please reach out if you'd like to discuss how IBP could benefit your organization

Patrick Green
patrick_g_green
@mckinsey.com

Mike Raftery
mike_raftery@mckinsey.com