Meet the Expert - **Operational Supply Planning**: Overview

SAP IBP for Response and Supply

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Webinar Series on SAP IBP

Planned Sessions focusing on operational supply planning:

2/14/2019  Operational Supply Planning – Overview

5/14/2019  Operational Supply Planning - Deployment Planning –

6/27/2019  Operational Supply Planning - Integration - SDI, etc -

7/23/2019  Operational Supply Planning - Supplier Commit Scenario w/ Ariba -

9/26/2019  Operational Supply Planning - Order Based Optimizer -

10/24/2019 Operational Supply Planning - Best practices/ Tips and Tricks – Troubleshooting -
Agenda

Welcome

Overview

Focus on Supply Planning using optimizer
- Live Demo

Focus on Response Planning using priority heuristic
- Live Demo

Outlook

Q&A
Tactical and Operational Supply Planning

Fast, flexible supply planning supporting a variety of approaches, suitable for many industries, including:

Support of **tactical** supply planning (time series) in the context of S&OP
- Unconstrained heuristics or constrained optimization
- What-if analysis
- Flexible, loosely coupled integration

Support of **operational** supply planning (orders)
- Unconstrained or constrained priority heuristics and optimization
- What-if analysis
- Tight, built-in integration with SAP ERP and S/4
- Creates supply orders (planned orders, purchase req., distribution req.)
How do customers run SAP IBP for Response and Supply today?

- **Product Family/Market**
- **SKU/Location**
- **Tactical Supply Planning**
- **Operational Supply Planning**

![Diagram showing different supply planning levels](image)
Operational Supply Planning

Master & Transactional data

Profiles & Settings

Integration to execution Systems

Monitoring & Controlling of the Planning Process
- Process Step 1
- Process Step 2
- …
- Process Step n

Supply Planning Run
- Pegging & Gating Factors
- Manual Input by Planners
- Management by Exception
- Order-based priority Heuristic
- Optimization

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Operational Supply Planning

Monitoring & Controlling of the Planning Process

- Process Step 1
- Process Step 2
- ... Process Step n

Supply Planning Run

- Pegging & Gating Factors
- Manual Input by Planners
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- Optimization
- Master & Transactional data
- Profiles & Settings
- Integration to execution Systems

Integration to execution Systems
Key processes supported in Operational Supply Planning

**Supply Planning & Allocations Planning**

Create a supply plan based on prioritized forecast demands and supply chain constraints

Optionally, generate and provide allocations to ATP for online confirmations of sales orders

**Unconstrained or constrained priority heuristics and optimization**

**Response Planning**

Create order confirmations and an adopted supply plan based on prioritized demands, allocations, and supply chain constraints

**Unconstrained or constrained priority heuristics**

**Deployment Planning**

Create a deployment plan, adjust other supply proposals and order confirmations based upon prioritized demands, allocations, supply chain constraints, and deployment settings

**Constrained priority heuristics**
### IBP Planning Business Coverage

<table>
<thead>
<tr>
<th>Application Job</th>
<th>Comments</th>
<th>Supply Elements Created</th>
<th>Forecast Consumption</th>
<th>Allocations</th>
<th>Sales Order Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constraint Forecast Run</td>
<td>Useful as a baseline calculation for allocation quantities based upon forecast only. However, it might not be as useful for supply creation since it is a make-to-forecast planning approach (no forecast consumption).</td>
<td>Planned Order, Stock Transfer Req., Purchase Req.</td>
<td>Via Additional Key Figures</td>
<td>Creation</td>
<td>No</td>
</tr>
<tr>
<td>Confirmation Run</td>
<td>Uses forecast consumption to determine the higher of forecast or sales to use as demand. Since this algorithm uses consumption, the supply plan results can be different than that of the constraint forecast run. If allocation creation are not needed, the confirmation run can be the defacto supply planning application job.</td>
<td>Planned Order, Stock Transfer Req., Purchase Req.</td>
<td>Yes</td>
<td>Consumption</td>
<td>Yes</td>
</tr>
<tr>
<td>Deployment Run</td>
<td>Uses forecast consumption to determine the higher of forecast or sales to use as demand. Since this algorithm uses consumption, the results can be different than that of the constraint forecast run. However, it creates a different type (Deployed STR) of supply element.</td>
<td>Deployed Stock Transfer Req. for ATD quantities. Stock Transfer Req. for rest of horizon</td>
<td>Yes</td>
<td>Consumption</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Faster planning runs and more frequent planning cycles

Example: Response Planning

Faster, and Sub-Daily Planning Runs with SAP IBP

Faster, and Sub-Daily Planning Runs with SAP IBP

Faster planning processes like Demand Sensing or Response Planning allow planning at a more granular level and enable sub-daily planning processes

 runtime

6 hours

45 min

SAP IBP

traditional APS systems

More than 8x Faster Planning Runs

14% Higher on-time delivery*

*SAP Performance Benchmarking
Supply Planning
Process Description

Supply Planning

- The process creates a feasible supply plan based on forecasts and constraints in a single step.

- In addition, the planning provides constraint forecast and product allocation quantities, which are covered by supply.

- For this, a supply chain model with a distribution network, multiple production levels, production resources, supplier constraints, and safety stock targets is considered.

- ERP integrated transactional data like purchase orders and production orders are considered as well.

- Flexible rules allow to prioritize the demand, so that the restricted supply is assigned to the most important demands.
Typical Planning Cycle for Supply and Allocation Planning

Example

- Release Supply Plan & Allocations
- Make adjustments
- Review Exceptions
- Execute mid-term Supply Planning Run
- Preparation
Supply and Allocations Planning
Order-based Optimizer – Priority heuristic

Contrary to the **Constrained Forecast Run** using priority heuristic (rules-based) the order-based optimizer is cost-based. Using the optimizer, planning will generate plans using a holistic view on the supply chain and yield in global optimal plans considering the given cost setup and constraints to consider. Optimizer will balance orders to maximize the profit and minimize the overall cost of the generated plan.

<table>
<thead>
<tr>
<th>Business Objective</th>
<th>Response heuristic</th>
<th>Optimizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>create a feasible plan by fulfilling the highest-priority demands first</td>
<td>create a feasible plan with minimum costs or maximized profit</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Example: Optimizer evaluates all valid sources of supply and tends to consume stock before producing while the response heuristics considers valid sources of supply in a strict priority sequence.
Other Features of the Planning Algorithm

- Lot Sizes (Min./Max./Rounding Values)
- Component lead time offset *(not considered by Optimizer)*
- Safety Stock (absolute quantity and Day’s Supply)
- Target Stock (absolute quantity and Day’s Supply) *(only Priority Heuristic)*
- Maximum Stock (absolute quantity and Day’s Supply) *(only Optimizer)*
- Demand Fair Share (only for Sales Orders and Forecast demands; only Priority Heuristic)
Finally when the plan is made, you like to hand over it to execution.

- Planned order (Production)
- Stock Transfer Requisitions
- Purchase Requisitions

can be sent to SAP ERP/S4 as Orders for Supply Chain Execution.

A key completion process makes sure they have same order number in IBP and SAP ERP/S4.
Release Allocation Plan
Optional step: Publish allocation constraint

Allocations can be used as input for:

- Response Planning process
- Online Order Promising in SAP S/4 or ERP as well as in SAP APO-gATP or other systems.
Supply Chain Network Structure

- Very simple multi-stage network
- Components are sourced either from Supplier 1 or through the Vendor Hub from Supplier 2
- End Product: CBO_PHONE_A
- Three customers with different classifications
Locations & Master Data
7d_simple: 7 days factory calendar, simple production
Further Capabilities in Order-based Planning

- Demand Prioritization
- Demand Fair Share
- Version Spec. Master Data
- Forecast Consumption
- Component Offset
- Planning Offset
- ASU on Excel
- PP-PI

Demand Prioritization

Demand Fair Share

Version Spec. Master Data

Forecast Consumption

Component Offset

Planning Offset

ASU on Excel

PP-PI

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Integration – Order Based Planning

Master Data:
- Material
- Location
- Resource
- BOM
- Capacity Consumption
- Transportation Lane
- Supplier

Transactional Data:
- Sales Order
- Purchase Requ/Order,
- Planned/Prod Order,
- Stock Transfer Requ/Order
- Stock
Template planning area SAP7

- SAP7 is designed to support order based planning. Focus is on visibility of aggregated orders planned by order-based planning runs and as data entry for input key figures, e.g. forecast, time dependent safety stock or constraints (e.g. supplier, capacity).

- The storage profile used for SAP7 consists of days and weeks only. Monthly buckets are not used.

- SAP7 is designed to work as a sample or starting point for order-based planning implementation projects:
  - SAP7 was designed to be as realistic as possible (to the best of our knowledge)
  - Customers may use a copy of SAP7 and make changes to it as needed

<table>
<thead>
<tr>
<th>Master Data Type</th>
<th>Used for modelling of</th>
</tr>
</thead>
<tbody>
<tr>
<td>S7PRODUCT</td>
<td>Material-related attributes</td>
</tr>
<tr>
<td>S7LOCATION</td>
<td>Location-related attributes</td>
</tr>
<tr>
<td>S7LOCATIONPRODUCT</td>
<td>Attributes specific to location/material combination</td>
</tr>
<tr>
<td>S7LANEPRODUCT</td>
<td>Attributes specific to transportation lane/material</td>
</tr>
<tr>
<td>S7RESORCETYPE</td>
<td>Resource-related attributes</td>
</tr>
<tr>
<td>STRESOURCESPRODUCT</td>
<td>Attributes specific to resource/material</td>
</tr>
<tr>
<td>S7CUSTOMER</td>
<td>Customer-related attributes</td>
</tr>
<tr>
<td>S7SUPPLIER</td>
<td>Supplier-related attributes</td>
</tr>
<tr>
<td>S7SUPPLIERPRODUCT</td>
<td>Attributes specific to supplier/material</td>
</tr>
<tr>
<td>S7LOCFR</td>
<td>Location-From related attributes</td>
</tr>
<tr>
<td>S7LOCCTO</td>
<td>Location-To related attributes</td>
</tr>
<tr>
<td>S7PDS</td>
<td>Production Data Structure</td>
</tr>
<tr>
<td>S7PDSCOMP</td>
<td>PDS Component</td>
</tr>
<tr>
<td>S7PDSRES</td>
<td>PDS Resource</td>
</tr>
<tr>
<td>S7PDSACT</td>
<td>PDS Activity (= IBP1808)</td>
</tr>
</tbody>
</table>

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Order Store and Time-Series Store Blending

Operational Order Store

On-the-fly aggregation

Order-Based Planning Engine

Time-Series Store

Operational Master Data

Editable Key-Figures:
- Unconstrained Forecast
- Allocation
- Capacity Availability
- Safety Stock
- Supplier Constraint
- Adjustment Key figures
Response Planning
Process Description

Response Planning

- The process does sales order rescheduling and supply planning in a single step. The planning provides a short to mid-term supply plan based on prioritized and categorized demand such as sales orders, forecasts and safety stock targets. In addition sales orders are rescheduled and confirmed according to the planned supply.

- For this a supply chain model with a distribution network, multiple production levels, production resources and supplier constraints is considered. Product Allocations and Rules for Demand Prioritization allow assigning restricted supply on fine granular level to the most important demands.

Fast, priority-based Response Management

React to short term changes in demand or supply with adjustments
Typical Planning Cycle for Response Planning

Example

- Release Supply Plan & Order confirmations
- Make adjustments
- Execute Response Planning Run
- Review Exceptions, make What-if Simulations

Management by Exception
Understanding Priority Rules and Segments

1) Segmentation

- Demand_Type=Blue
- Demand_Type=Green
- Demand_Type=Orange

2) Sort within Segments

- By Request Date
- By Demand Class
- By Order Entry Date

3) Sort Segments

FC+SO Segments Sorting Rule
Review Demand, Supply and Master data Settings

Preparation step

Sales Orders, Forecast, Safety stock targets (static or time-dependent)

Adjusted Distribution Receipts, Adjusted Production Receipts

Supplier constraints

Allocation constraints

Stock on hand, Purchase Orders, Stock Transfer Orders, Production Orders, (fixed and unfixed) Purchase Requisitions, (fixed and unfixed) Stock Transfer Requisitions, Deployment Stock Transfer Requisitions, (fixed and unfixed) Planned Orders

Multi level production and distribution network

Demand Prioritization rules allow segmentation flexible attributes like type of demand. Furthermore fair share and priority based segments can be combined.
Demo

SAP IBP for Response and Supply in action
The Priority Heuristic will plan individual demand elements, one by one.

Planning algorithm plans multi-level. Constraints like Allocations, Production Capacity, Supplier Constraint, Material availability and lead time are considered.

Planning algorithm selects highest priority Source of Supply first. In case of shortage or lateness secondary sources are used.

Optionally you can create Sales Orders confirmations that are transferred back to ERP.

Planning Runs cannot change fixed supply elements like Purchase or Production Orders because ECC is the master of these orders.

How does the priority heuristic work? 1/2

Execute Confirmation Run
Other Features of the Planning Algorithm

- Lot Sizes (Min./Max./Rounding Values)
- Component lead time offset
- Freeze Horizons for Distribution/Procurement and Production
- Safety Stock (absolute quantity and Day’s Supply)
- Target Stock (absolute quantity and Day’s Supply)
- Demand Fair Share (only for Sales Orders and Forecast demands)
Release Supply Plan & Confirmation
Optional step: publish Sales Order Confirmation

Finally when the plan is made, you like to hand over it to execution.

- Planned order (Production)
- Stock Transfer Requisitions
- Purchase Requisitions

can be sent to SAP ERP/S4 as Orders for Supply Chain Execution.

Furthermore SO confirmation can be send to SAP ERP/S4

A key completion process makes sure they have same order number in IBP and SAP ERP/S4
SAP IBP Response & Supply – Response Planning

Key take away

- Today – Response Planning is
  - Using an order based planning model
  - Tightly integrated with SAP ECC or S/4 HANA on Premise (Built-in batch integration)
  - Priority Heuristic planning model
  - Well adopted by customer, often focused on supply planning

- Features and Planning Algorithms are evolving (important improvements on the roadmap)

- Key differentiators compared to APO (today)
  - Simulation, what-if, scenario/version management capabilities
  - Pegging and Gating factor analysis
  - Sales Order confirmation
How to implement?
Best practices RDS
SAP Best Practices for SAP Integrated Business Planning

Have a jump start in SAP IBP with SAP Best Practices
Leverage SAP Best Practices for SAP Integrated Business Planning to get an entry scope of the Supply Chain Control Tower and the planning processes of sales and operations planning, response and supply planning, demand planning, demand sensing, and inventory optimization.

Solution highlights
- Detailed configuration documentation for setting up predefined SAP Best Practices processes
- Predefined planning views in Microsoft Excel
- Predefined charts and dashboards to analyze trends and exceptions
- Predefined process management to track progress and integration into social collaboration
- Predefined case management in the Supply Chain Control Tower
- Based on an integrated planning area that allows to operate an end-to-end process across all IBP applications

Key benefits
- Reduce sales and operations planning cost
- Improve demand forecast accuracy and react more quickly to changes in demand
- Increase sales forecast accuracy
- Reduce inventory carrying cost and increase inventory turnover / reduce days in inventory
- Improve on-time delivery performance
- Increase revenue and reduce revenue loss due to stock-outs
- Increase user productivity by using Microsoft Excel for interactive planning and by integrating with SAP Jam for collaboration
SAP Best Practices for SAP Integrated Business Planning IBP1811
Scope item overview

Integrated Business Planning for sales and operations
❖ IBP for sales and operations – demand review
❖ IBP for sales and operations – supply review – heuristic
❖ IBP for sales and operations – reconciliation review
❖ IBP for sales and operations – management business review
❖ IBP for sales and operations – forecast error calculation and analysis

Integrated Business Planning for demand
❖ IBP for demand – demand planning
❖ IBP for demand – demand sensing
❖ IBP for demand – forecast error calculation and analysis
❖ IBP for demand – time-series analysis

Integrated Business Planning for inventory
❖ IBP for inventory

Integrated Business Planning for response and supply
❖ IBP for response and supply – supply review – optimizer
❖ IBP for response and supply – supply and allocations planning
❖ IBP for response and supply – response planning
❖ IBP for response and supply – deployment planning
❖ IBP – order-based planning inbound integration with SAP S/4HANA
❖ IBP – order-based planning outbound integration with SAP S/4HANA

Supply Chain Control Tower and Business Network Collaboration
❖ Supply Chain Control Tower
❖ IBP – Business Network Collaboration – supplier commit with SAP Ariba

Cross-application scope items
❖ IBP – ABC-XYZ Segmentation
Outlook
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SAP Integrated Business Planning for response and supply
Product road map overview – Key themes and capabilities

V1902 – Recent innovations

Order-based planning
- Integration
  - Enable a separate integration source for each order-based planning area
  - Deployment STR visible in SAP S/4HANA
- Usability and traceability enhancements
  - Additional location material attributes
  - Additional demand fulfillment key figures
- Target and Safety days of supply

Tactical supply planning
- Enhancements to the time-series-based supply planning
  - Combined static and dynamic periods of supply in lot-sizing procedures
  - Enable forecast consumption for non-supply-planning areas

V1905 – Planned Q2/2019

Order-based planning
- Flexible optimizer cost maintenance with new profile
- Maximum lateness of demands
- Advanced forecast consumption
- Assembly scrap
- Consider goods receipt processing time
- Capacity base quantity

Tactical supply planning
- Enhancements to the time-series-based supply planning
  - Support transportation resources
  - Alternative components (component substitution) with priority for optimizer
  - Support subnetworks for shelf-life heuristic

V1908 – Planned Q3/2019

Order-based planning
- Optimization
  - Goods receipt processing time
  - Cost maintenance on demand attributes
- Priority heuristic improvements
  - Reduction of Projected Stock
  - Default prioritization of manual adjustments
- Maximum lateness of demands on demand attributes

Tactical supply planning
- Enhancements to the time-series-based supply planning
  - Aggregate Constraints using conversion factors
  - Assembly scrap (for heuristic)

V1911 – Planned Q4/2019

Order-based planning
- Integration
  - Multiple integration sources for one common planning area
- Quota Arrangements
- Flexible planning periodicity
- Transport/Receiving/Shipping Calendar
- Priority heuristic improvements
  - Alternating usage of sources of supply

Tactical supply planning
- Enhancements to the time-series-based supply planning
  - Flexible mapping for attributes and key figures
  - Alternate components with component coefficients for optimizer
  - Holiday or blackout time-period support on sources of supply
- Simplified optimizer cost maintenance
- Assembly scrap (for optimizer)

Additional roadmap detail is available on request

Release 1902

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1. This is the current state of planning and may be changed by SAP at any time without notice.
SAP IBP Response & Supply – operational Supply Planning

Key take away

- Today - operational supply planning is
  - Using an order based planning model
  - Tightly integrated with SAP ECC or S/4 HANA on Premise (Built-in batch integration)
  - Priority Heuristic or Optimization planning model
  - Well adopted by customer, often focused on supply planning

- Features and Planning Algorithms are evolving (important improvements on the roadmap)
  - Simulation, what-if, scenario/version management capabilities
  - Pegging and Gating factor analysis
  - Predefined process to derive Allocations + order confirmations
Thank you.

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