

CHEAT-SHEET: SALES & OPERATIONS PLANNING PROCESS



MOTIVATION & CHALLENGES

The sales and operations planning process S&OP is the navigation tool for the challenging task of balancing supply and demand. Any business that manages resources such as human resources, machinery, capital, and inventories to meet the market demand needs such a process.

S&OP is a medium- to long-term planning process and integrates financial, sales, marketing, and operations plans. It does not replace business savvy, but it forces the top management to talk regularly about critical issues concerning the synchronization of supply and demand.

S&OP is about making decisions based on planned demand and supply and thus depends heavily on the quality of the forecasts. In situations

with highly volatile demand, the outcomes of the S&OP process can therefore be questioned. But there is no alternative to such a process for the following reasons:

- 1) S&OP avoids the silo mentality by the organization-wide alignment of strategies, objectives, and action plans.
- 2) S&OP is an early warning system for operational and financial issues.
- 3) S&OP focuses mainly on optimizing the internal supply chain, which sets the ground for further initiatives like collaborative planning with suppliers and clients.
- 4) With an ERP (Enterprise Resource Planning) in place, implementing the S&OP does not require additional investments in IT tools. All that is needed is a spreadsheet and good problem-solving tools and skills.

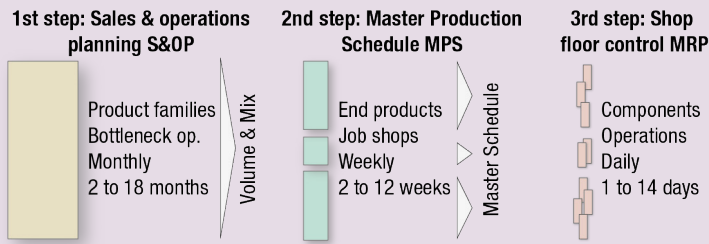
OVERALL PROCESS

Steps	Description	Essential questions
<p>Step 1: Updating data & maintaining process</p> <p>Step 2: Demand planning</p> <p>Step 3: Supply planning</p> <p>Step 4: Partnership meeting</p> <p>Step 5: Executive meeting</p> <p>Monthly</p>	<p>Maintaining the S&OP data: All S&OP data is maintained and distributed timely – S&OP displays, statistical forecasts, KPIs, meeting minutes, and action plans.</p> <p>Creating the demand forecast: The future customer demand is determined based on marketing and sales input, customer information, business strategies, and statistical forecasts.</p> <p>Creating the supply plan: The supply plan is defined that best meets the actual demand forecast. All critical issues are identified where capacity does not meet demand (significant over- or undercapacities).</p> <p>Aligning supply and demand plans: The planned demand and supply are aligned. If necessary, different scenarios are defined. All critical issues are identified where no consensus has been found.</p> <p>Approving plans and making decisions for achieving the long-term balance of supply and demand: The demand and supply proposals are analyzed, and the final S&OP plans are chosen and approved.</p>	<ul style="list-style-type: none"> • Are all S&OP documents updated in case of process changes (order fulfillment strategies, product families, etc.)? • Are all parts of the organization working with the same supply and demand data, KPIs, and product groupings? • Is the demand planning process owned by the sales/marketing department? • Are all significant gaps between planned and actual demand identified and explained? • Do you know the product life cycle of all main products – new releases, replacements, and new versions of existing products? • Do you know all the planned marketing actions to amplify/modify the demand – promotions, price adjustments, and new markets? • Is the supply planning process owned by the supply chain/operations department? • Are all significant gaps between planned and demonstrated supply identified and explained? Do you know all bottleneck operations? • Do you know all planned modifications of the supply process – new suppliers, new production technologies, and planned out- or insourcing? • Have you chosen adequate order fulfillment strategies for the different product families? • Are the demand and supply organizations actively involved in the partnership meetings? • Is the consensus on alternative supply and demand plans easy to find? • Is the top management informed of critical issues where no consensus has been found? • Is the top management, including the CEO, actively involved in the S&OP process and decision-making? • Are clear decisions taken for all critical cases where the supply and demand organizations could not reach a consensus? • Is the financial planning (budget) compared with the actual demand and supply plans?

GENERAL CONCEPTS

Hierarchical planning (choice of level of detail)

According to the hierarchical planning concept, the S&OP process corresponds to the first planning step. At this level, only product families (groupings) and bottleneck capacities are considered for the medium- to long-term planning (2 to 18 months). The S&OP process defines the input (volume and mix) for the second planning step, the Master Production Scheduling MPS.



Hierarchical planning: Hierarchical planning is based on a heuristic principle that divides the complex planning process into more manageable consecutive planning steps with increasing levels of detail.

Criteria for product groupings: The product groupings should share the following characteristics: Product type, supply process (bottleneck operation), order fulfillment strategy, and sales channel.

Volume and mix: The S&OP Process defines the demand and supply volumes and the product mix. Usually, the demand planning is started at the product grouping level since forecast accuracy is generally higher for aggregated demand (pooling variability). But if a few key products dominate the demand, the demand planning should be started at a more detailed level.

Order fulfillment strategies

Order fulfillment strategies do not alter the S&OP process but modify the data shown in the S&OP displays. They define how much labor and material is invested in the product before receiving the customer order.

The good choice of these strategies is often an essential condition for minimizing the inventory levels. The chosen strategies can vary by product family or by product within a product family. All strategies have in common that inventory is built at a certain level (generally at the order penetration point) based on anticipated customer demand.

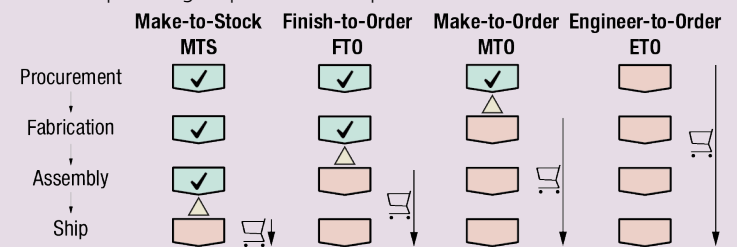
Example: Make-to-Stock for key products (high sales, inventory of end products), Finish-to-Order for other products (medium to low sales, inventory of subassemblies and components).

Make-to-Stock MTS: When an order arrives, the products are picked from inventory and shipped to the customer. Estimating adequate end product inventory levels based on anticipated customer demand is the critical issue of this strategy.

Finish-to-Order FTO (or Assemble-to-Order ATO): This strategy is the perfect choice if a wide variety of products are built (assembled) based on standard components and subassemblies (late customization). The FTO strategy is a blend of the MTS (for components and subassemblies) and the MTO strategy (for end products).

Make-to-Order MTO: Production is started only when customer orders are present, and inventory is built ahead only for raw materials or standard components. Critical issues of this strategy are the customer order backlog and the production lead times.

Engineer-to-Order ETO: This strategy is used for products that are developed and built based on customer specifications. Like MTO, inventory is built only for raw materials and standard components. In the case of this strategy, the planning of engineering capacities is often more critical than the planning of production capacities.



Supply chain coordination and bullwhip effect

Demand variability tends to be amplified as it moves down the supply chain, and demand becomes quickly unpredictable and erratic for second and third-tier suppliers.

The root causes of this bullwhip effect are not aligned business strategies of the supply chain actors. Different forecasts, lot sizes, safety stock levels, uncoordinated promotions and discounts, and lack of communication distort the "real" customer demand.

Collaborative planning: Collaboration with supply chain partners becomes even more critical in demand planning if your business is at the outer end of the overall supply chain. Statistical forecasts should only be used to indicate trends since they might reproduce demand patterns that do not exist in the final marketplace.

PROCESS STEPS

The monthly S&OP process is structured around the culminating event of the Executive meeting, where all important decisions are taken. This meeting, usually held at the beginning of the month, discusses all information prepared in the previous process steps.

These steps are performed in a logical order, but if necessary, Demand planning is performed as often as needed. The demand forecast must always reflect the latest market trends!

S&OP process owner: The CEO is usually the global process owner since virtually all parts of the organization are affected by the decisions taken.

Accuracy vs. agility trade-off: An essential objective of the S&OP process is to improve the precision of the demand and supply plans. On the other hand, constantly precise forecasts don't exist, and too ambitious targets for forecast errors can be counterproductive. Therefore, the focus must be on the fast detection (early warning system) of critical gaps between the plans and the actual results and on the resulting learning process for reducing the most significant and frequent imbalances.

Strive for simplicity of the S&OP process: Changing market conditions are the rule, and an increasingly complex S&OP process can become too difficult to be maintained. Furthermore, the S&OP process must be understandable for non-specialists if it has to be used by the whole organization.

Step 1: Updating data & maintaining process

All data used by the S&OP process must be updated timely, and process documents must be adjusted in case product groupings or order fulfillment strategies are modified.

Process owner: It is recommended that a centralized organization maintains the S&OP process. In practice, this role is often fulfilled by the Master Production Scheduler.

Updated and maintained S&OP data: S&OP displays, KPIs, product groupings, definitions of bottleneck processes, and assumptions about order fulfillment strategies, meeting minutes, and action plans.

Forecasts: Checking statistical forecasts with the demand organization for inconsistencies and adjusting model parameters if necessary.

Step 2: Demand planning

The demand organization generates the medium- to long-term demand forecast (2 to 18 months) and explains significant changes or gaps between the planned and the actual demand. If necessary, it redefines inventory targets or sales and marketing strategies.

This process must be monitored by a continuous measure of the forecasting precision (sales vs. forecasts) to avoid the same systematic forecasting errors over an extended period.

Marketing input: Promotion and pricing plans, competitor analysis, new product launches, and market assumptions (opportunities and risks).

Sales input: Sales plans, buying plans/schedules from customers, and territory plans.

Business plan input: Sales and margin targets.

Step 3: Supply planning

The supply organization generates the medium- to long-term supply plans (2 to 18 months) that best meet the demand forecast and explains significant changes or gaps between the planned and the actual supply. It identifies substantial supply and demand imbalances and defines potential solutions.

This process must be monitored by a continuous measure of the supply planning precision (demonstrated vs. planned) to avoid the same systematic planning errors over an extended period.

Operations input: Performance of internal capacities, identification of (potential) bottlenecks, the definition of order fulfillment strategies, and planned capacity updates.

Sourcing/procurement input: Supplier performance, identification of (potential) bottlenecks, and planned new suppliers.

Inventory levels: Inadequate inventory levels must be identified since they are the best indicators for imbalances between supply and demand.

Step 4: Partnership meeting

The Partnership meeting is generally the most critical process step since the demand and supply organizations must agree on plans that assure the alignment between supply and demand. These supply and demand plans will be proposed to the Executive meeting for approval, with additional information on issues with more than one potential solution and where no compromise between supply and demand could be found.

Examples: Hire additional workforce to reduce backlog faster; postpone product release because of insufficient production capacities.

Step 5: Executive meeting

The Executive meeting reviews the supply chain performance, chooses the long-term supply and demand plans, and decides on corrective actions for reducing critical gaps between planned and actual results (sales, margins, capacities, and efficiencies). S&OP displays and KPIs are used as the principal performance review tools.

This meeting is usually held at the end or the beginning of every month, with the participation of the complete top management.

Reviewed KPIs: Inventory and service levels, process efficiencies (output and quality), and financial results.

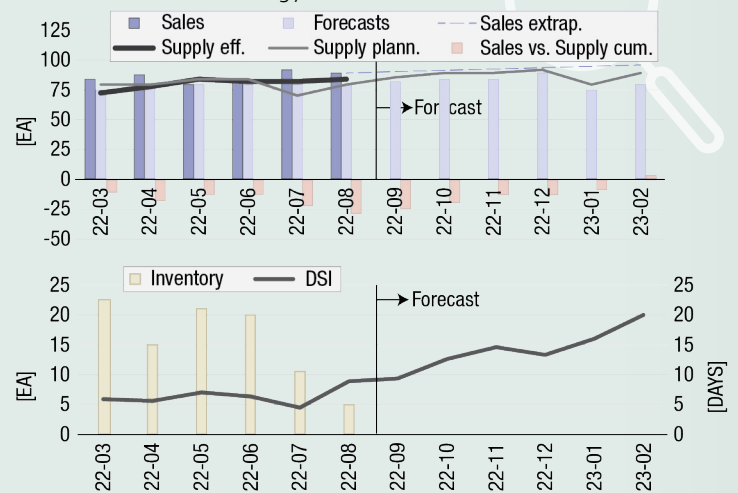
S&OP displays (steps 1 to 5)

S&OP displays are the primary communication tool and are analyzed and updated in all process steps. They summarize all critical information per product grouping, usually for a time horizon of plus and minus 12 months. In practice, these displays can be enriched with additional information explaining the root causes of critical issues.

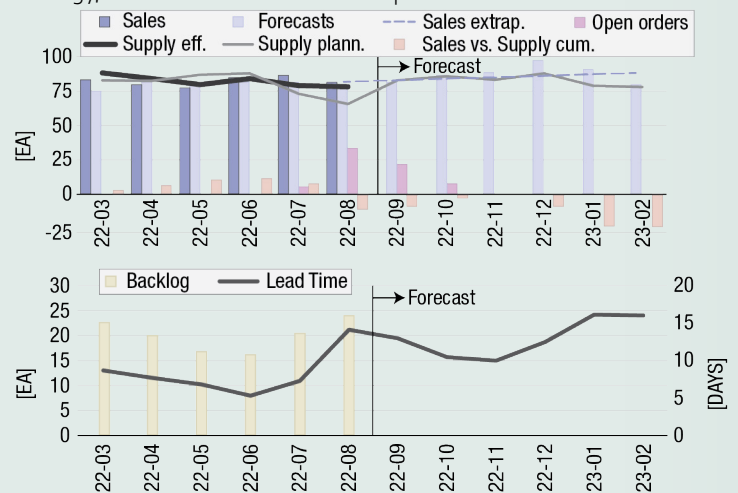
Examples: Month 22-03, insufficient supply due to a quality issue; month 22-12, high demand forecast due to planned product launch.

The following displays show examples typically defined for the different order fulfillment strategies.

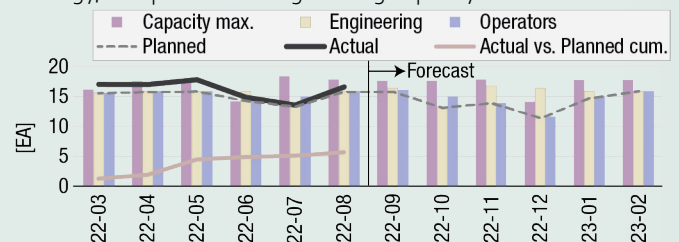
MTS, Supply vs. Demand, and Inventory vs. DSI (Days Sales of Inventory): The evolution of the end product inventory is the crucial issue in the case of the MTS strategy.



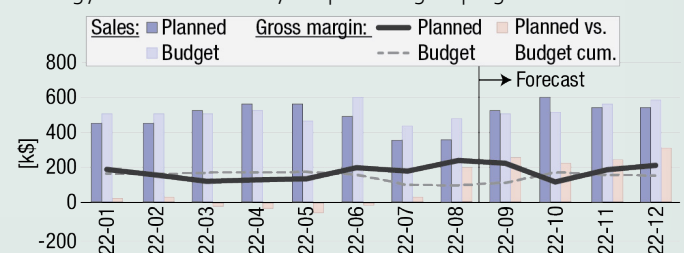
MTO or FTO, Supply vs. Demand, and Backlog vs. Lead Time: The evolution of the backlog (or the service level) and the Lead Time are the crucial issues in the case of the MTO strategy. In the case of the FTO strategy, the evolution of critical components can be added.



ETO, Rough-cut capacity analysis: The ETO strategy is similar to the MTO strategy, except that the engineering capacity is often its crucial issue.



Finance view: The S&OP process provides the perfect link to financial planning since it allows comparing the budget with planned and actual sales and supply. It is generally independent of the order fulfillment strategy used for the analyzed product grouping.



AUDIT

The following audit helps to verify the actual level of achievement of the S&OP process.

	People	Process	Tools
Level 4 Robust	<p>The management requires all supply and demand decisions to be integrated into the S&OP process.</p> <p>S&OP stimulates a learning process that helps minimize imbalances between supply and demand.</p> <p>Training programs are available and promoted to train people using the S&OP concepts and tools.</p>	<p>It is easy for non-specialists to understand the S&OP process, all standards are available, and assumptions are clearly explained.</p> <p>The S&OP process is easy to maintain to reflect the current processes and market conditions.</p>	<p>It's easy to identify critical demand and supply information with the help of S&OP displays, protocols, and action plans.</p> <p>Product groupings and classifications are fully integrated into the information system (ERP).</p>
Level 3 Essential	<p>All top management is engaged in the process. It approves supply and demand plans and authorizes changes involving high costs or other consequences.</p> <p>The demand and supply organizations share the same vision of current and future bottlenecks and market risks.</p>	<p>A centralized organization maintains the S&OP process.</p> <p>Financial, supply, and demand planning use the same product groupings.</p> <p>S&OP meetings are scheduled for the next 12 months.</p> <p>The S&OP process is standardized: Process owners, process steps, documents, and meeting outcomes.</p>	<p>Standards for S&OP documents and data are defined and applied: S&OP displays, protocols, and action plans.</p> <p>KPIs are available for inventory and service levels, process efficiencies (output and quality), financial results, and forecast precision (supply and demand).</p>
Level 2 Minimal	<p>The supply and demand organizations are involved in the supply and demand alignment process.</p>	<p>Meetings are organized regularly to align supply and demand for the main products.</p> <p>The supply and demand alignment process is defined for all main products.</p>	<p>S&OP displays are defined for comparing supply with demand (supply vs. demand) for all critical processes.</p> <p>Inventory and service levels are available for all main product families.</p>
Level 1 Insufficient	<p>Top management is not involved in the process of aligning supply and demand.</p> <p>Silo culture is predominant, and most decisions about supply and demand are taken without coordination with the other parts of the organization.</p>	<p>No formal S&OP process is defined.</p> <p>The forecasts are based on statistical models without significant input from sales and marketing.</p> <p>Planning meetings are focused on short-term problems, shortages, and decisions about short-term deliveries.</p>	<p>No tools are available for helping to identify imbalances between supply and demand.</p>

TO GO FURTHER...

- Dougherty John and Christopher Gray. **Sales & Operations Planning – Best practices**, Partners for Excellence: Perfect for understanding how the S&OP Process works in different manufacturing environments.
- Sheldon Donald. **World Class Sales & Operations Planning – A guide to successful implementation and robust execution**, J. Ross Publishing: A classic book focused on implementing the S&OP Process.
- Thomé Antonio, Luiz Scavarda, Nicole Fernandez, and Annibal Scavarda. **Sales and operations planning: A research synthesis**, Int. J. of Production Economics: A helpful summary of existing S&OP research efforts.