Sales and Operations Planning (S&OP)

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Luennoitsija

• Research Fellow, Aalto-yliopisto
• Senior Lecturer (assoc. level), Chalmers teknillinen yliopisto, Göteborg 2016-
• Tutkimusalueet
  – Toimitusketjun ohjaus, suunnittelu, tiedonvaihto, data-analytiikka
  – Hankintojen johtaminen, toimittajasuhteet, toimittajainnovaatio
• Opetusta ja opinnäytetöiden ohjausta
• Opetusta ja ohjausta Metropoliassa, Aalto EEssä, HYssa
• Kesko Oy 1988-99, kehityspääällikkö teolliset tuotteet
What this lecture is based on

• Research
  – Case studies in 4 companies in Sweden, Norway, Denmark and Finland – state of S&OP
  – Case studies (8 cases) on how S&OP needs to be aligned to the planning environment
  – Systematic literature review on S&OP, 99 articles included
  – Case study about S&OP implementation, Finland, ongoing
  – PhD thesis on supply chain planning

• Course book, consultant reports

Ivert, Dukovska-Popovska, Kaipia, Fredriksson, Dreyer, Johansson, Chabada, Damgaard, Tuomikangas (2015) Sales and operations planning: responding to the needs of industrial food producers, Production Planning & Control, 26:4, 280-295
The need for S&OP

- When visiting a small metal equipment company near Helsinki, the person responsible for purchasing told:
  - “It is challenging and painful to make purchase order decisions, because I don’t have the needed information. I try my best to find out what’s going on in production, sales, marketing and inventory, but the guys seldom give me answers about what they are planning to do in the near future, not to mention a year ahead. I can only dream about exact figures.”

=> The company did not have a S&OP process in place
Background

- Companies are facing increased pressure to be able to match supply with demand effectively
  - Increased price competition.
  - Demand changes grow the need for increased flexibility, shorter lead times, customized products and delivery processes.
  - Through outsourcing, supply chains have become complex networks of organizations, with a high number of relationships and stakeholders keeping various positions and roles.
  - Increased pressure for cost-efficiency and flexibility.
Plan vs forecast

• Forecast
  – Is an estimate
  – To form a forecast, information from multiple sources needs to be collected
  – For demand forecast a company collects data from market, from own company, competitors, historical sales
  – Measured as forecast accuracy

• Plan
  – Is based on decisions
  – Uses forecasts, capacity data, constraints, financing
  – Plan tells what a company is going to purchase/produce/deliver
  – Is realistic and will be implemented
  – Can and needs to be controlled
Purpose of S&OP

• Creates a plan - one set of numbers
• Proactive communication and decision making process
• Creates common understanding throughout the company about what the company is going to produce, deliver, or purchase in the coming periods of time
• Key business process applied to balance demand and supply
• Forum for executive debate
• Decisions made in S&OP impact costs, flexibility or leadtimes
S&OP originates from related concepts

• S&OP type of processes have been practiced since the 1950’s, referred to as
  – aggregated production planning
  – manufacturing resource planning (Olhager et al., 1999)
  – demand-supply planning, demand-supply balancing,
  – Supply chain planning
  – integrated business planning (Bower, 2012).

• Currently high managerial interest towards S&OP
• Process appears easy to understand, but it suffers from implementation challenges, not to mention achieving the expected benefits (Grimson and Pyke, 2007; Lapide, 2004).
S&OP is an important integration and coordination mechanism

- Addresses volume and product mix and company's key resources - combines demand and supply
- Is tactical planning process: links strategic planning to operations planning
- Unites plans into one integrated set of numbers
- Enhances constructive engagement and alignment across functions - coordinates the operations, marketing, and finance functions - despite functional incentives and orientations
- Interorganizational relations are mostly considered through collaborative supply chain planning concepts
Planning levels

<table>
<thead>
<tr>
<th>Planning cycle</th>
<th>Planning level/Planning output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>Business plan</td>
</tr>
<tr>
<td></td>
<td>Company, BU, sales, profits, ROI</td>
</tr>
<tr>
<td>Monthly</td>
<td>S&amp;OP</td>
</tr>
<tr>
<td></td>
<td>Product group, product, functional balanced plans</td>
</tr>
<tr>
<td>Weekly</td>
<td>Master scheduling</td>
</tr>
<tr>
<td></td>
<td>Product moduls &amp; options</td>
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<tr>
<td>Daily</td>
<td>Material and service planning</td>
</tr>
<tr>
<td></td>
<td>Components, workload</td>
</tr>
</tbody>
</table>
# S&OP frames operational planning

<table>
<thead>
<tr>
<th>Planning process</th>
<th>Aim</th>
<th>Input</th>
<th>Output</th>
<th>Planning object</th>
<th>Horizon</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales and operation planning</strong></td>
<td>Achieve a good balance between demand and supply and coordinate goals and plans in different units</td>
<td>Business mission/strategy/goal, Demand (forecast), Supply (estimation of available capacity and inventory levels)</td>
<td>deliver plan, sales plan, production plan, distribution plan</td>
<td>product group/product</td>
<td>1-2 years</td>
<td>Quarterly/ monthly</td>
</tr>
<tr>
<td><strong>Master production schedule</strong></td>
<td>Achieve a good balance between demand and supply and give info to sales function about what can be promised to customer</td>
<td>S&amp;OP (delivery and production plan), Demand (forecast/customer order), Supply (available capacity and inventories/order backlog)</td>
<td>delivery plan, master production schedule</td>
<td>product</td>
<td>0.5-1 year</td>
<td>Monthly/weekly</td>
</tr>
<tr>
<td><strong>Order planning</strong></td>
<td>For every product and other item establish quantities and point in time for all the orders created with the aim of initiating material flows and satisfying existing requirements</td>
<td>MPS (master production schedule), Demand (forecast/customer order), Supply (available capacity and stock on hand)</td>
<td>Manufacturing orders, purchasing orders</td>
<td>item</td>
<td>1-6 months</td>
<td>Weekly/daily</td>
</tr>
<tr>
<td><strong>Execution and control</strong></td>
<td>Realize order to the shop floor including material available check and sequencing in which order the operations should be carried out in the available manufacturing resources</td>
<td>Order planning (manufacturing order), Supply (current workload and available stock on hand), Basic data (work center, set up time, run time, number of machines etc.)</td>
<td>Dispatch list</td>
<td>operations</td>
<td>1-4 weeks</td>
<td>Daily</td>
</tr>
</tbody>
</table>
S&OP Process

- Formal
- Agreed-upon timing for each task and meeting
- Shared objectives
- Is performed regularly, usually monthly
- Incorporates functional plans
- Reconciles supply, demand and new product plans
## How the process runs

<table>
<thead>
<tr>
<th>Step</th>
<th>Title</th>
<th>What happens</th>
<th>Outcome</th>
<th>Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demand planning</td>
<td>Demand forecast, recent ordering patterns, orders in the pipeline, promotions, market indicators, new products and families and comparisons to prior months or years, field intelligence Demand meeting</td>
<td>Unconstrained demand forecast</td>
<td>1-7</td>
</tr>
</tbody>
</table>
| 2    | Supply planning              | -review the plan, compare it to demonstrated capacity, and perform a rough-cut capacity analysis  
- Supply meetings, may take place in each plant                                                                                                     | Supply plan                                                                                       | 11-15|
| 3    | Partnership meeting (pre-S&OP)| Functional meeting finance, marketing, materials, operations, product management, and sales leaders  
Working session  
- review and approval of the forecast  
- evaluation of performance measures  
- analysis of the financial impact and the gap between it and the company’s annual operating plan  
- identification of action that can be taken to balance demand and supply  
- resolution of constraints and escalations.                                                                                           | Partnership plan (one set of numbers) Commitment by the organization.                                                                                | 16   |
| 4    | Executive meeting            | The president or CEO, participants from the partnership meeting, human resources.  
Execution review presents data and escalations to create understanding on the situation. Reacting to any misalignments with the annual operating plan, escalation resolution, and preparation for seasonality and market shifts. | To approve one set of numbers—to ensure that finance, operations, and sales are in concert                                                             | 18   |
| 5    | Finalise S&OP                | S&OP team finalises S&OP figures, links to implementation and operational planning.                                                                                                                            |                                                                                                   | 18-19|
Escalations

Decisions to be escalated from demand planning or supply planning to pre-S&OP or Executive meeting

- If there are any major issues in demand or supply planning, escalate them to the partnership meeting
- Examples: remarkable signs of market changes, new product introductions with uncertain demand, changes in the environment, competitor actions
Participation

- All business functions engaged — finance, human resources, marketing, materials, operations, product management, and sales.

- The process is usually facilitated by the S&OP manager and S&OP team.

- S&OP is not just a bunch of extra work, but an integral part of employees responsibilities.

- Management participation: the process should be seen as an avenue to effectively running the business and determining what levers should be pulled in order to better meet customer expectations.
S&OP risks and traps

- Poor forecast accuracy
- Reactive process
- One dominant player – i.e. S&OP manager makes decisions without consensus decisions
- Not all functions involved
- No senior management involved
- No KPIs – planning without checking quality
- Resource-consuming process without improving performance
S&OP success factors

1) Ongoing routine S&OP meetings
2) Structured meeting agendas
3) An unbiased baseline forecast to start the process
4) A planning horizon as long as the longest supply-demand lead time
5) Pre-work to support meeting inputs
6) Cross-functional participation
7) Clearly defined functional roles at the meetings
8) Participants empowered to make decisions
9) An unbiased, responsible organization to run a disciplined process
10) Internal collaborative process leading to consensus and accountability (by leveraging a forecast/planning hierarchy)

Lapide, 2014
S&OP opportunities – advanced S&OP

- Integrated business planning
- Target-oriented planning
- Identifies gaps in reaching the targets - where and when reactions are needed
  - Additional marketing efforts
  - Sales personnel activities
  - Production – additional shifts
  - Purchasing
The S&OP environment
# How to select S&OP design

Kjellsdotter et al. 2015

<table>
<thead>
<tr>
<th><strong>PE variables</strong></th>
<th><strong>S&amp;OP set up</strong></th>
<th><strong>S&amp;OP process</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product related</td>
<td>Planning frequency</td>
<td>Input</td>
</tr>
<tr>
<td></td>
<td>Shelf life</td>
<td>Activities</td>
</tr>
<tr>
<td>Demand related</td>
<td>Planning horizon</td>
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<tr>
<td></td>
<td>Demand uncertainty</td>
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<td></td>
<td>Service level</td>
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<tr>
<td>Supply related</td>
<td>Planning object</td>
<td></td>
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<tr>
<td></td>
<td>Product launches</td>
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<td></td>
<td>Supply uncertainty</td>
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<td></td>
<td>Production network complexity</td>
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S&OP design in food industry

Planning environment

• Rate of change in product portfolio
• Product introductions
• Perishability
• Demand uncertainty
• Service level
• Supply uncertainty
• Production network complexity
• Seasonality
• Supply leadtimes

S&OP design

Planning horizon
• Mid-term
• 3 to 24 months
• over the next season

Planning frequency
• Monthly/four weeks
• Four times a year

Planning object
• Product
• Product group
S&OP culture and leadership

• An organizational mindset and practices that facilitate and advance formal planning
  – aligned objectives
  – rewarding and incentives
  – top management ownership
  – Collaborative manner of working
  – Empowerment – encouraging employees to participate actively in S&OP
S&OP coordination framework

- Strategic alignment
- S&OP process
- S&OP tools and data
- S&OP organization
- S&OP culture and leadership
- Performance management

Tuomikangas and Kaipia, 2014
Summary - learnings

- Need for S&OP in companies
- Role between strategic and operative planning
- Integration and coordination role
- S&OP process
- S&OP organization