Turbocharge your sales and operations planning process

BY REGINALDO MONTAGUE

EXECUTIVE SUMMARY
Balancing supply and demand while maximizing profits are age-old business imperatives. The sales and operations planning process offers a framework that can integrate plans from sales, marketing, development, manufacturing, sourcing and financial areas, allowing your overall enterprise to meet its goals. Consider S&OP a plan of reconciliation between various departments that often operate in silos.
One of the most pressing business challenges is how to balance supply against demand while maximizing profits. This can be understood by considering what is the true demand? How much of the demand do we expect or have the ability to serve? What is the optimal orchestration of our resources, and how should we assemble them to meet the demand we expect to serve?

These questions are not merely the purview of operations and supply chain professionals, but rather core to the strategic questions organizations must address that, if answered incorrectly, can lead to business failure. Sales and operations planning (S&OP) provides an effective framework to address these questions. The following challenges indicate that your organization needs to institute or improve its S&OP process, according to Operations Strategy by Peter W. Stonebraker and G. Keong Leong.

- Marketing complains that the correct quantities of the right products are not being produced in time and pushes to increase inventories to limit lost sales.
- Finance is concerned about the high inventory levels and pushes for inventory reduction.
- Procurement (or purchasing) is required to reschedule vendor shipments to accommodate changing production schedules.
- Manufacturing experiences frequent changeovers, driving production inefficiencies, excessive machine setups and increased operating cost.
- Items frequently are rushed or expedited.
- You are considering trade-offs between quality and meeting the delivery dates.
- Extra work is required to make month-end production and sales commitments.
- High overtime contributes to high labor costs.

S&OP is not an arcane tactical tool deployed by the operations department, but a strategic tool that can enhance business operations by integrating departments that operate in silos. Also known as sales, inventory and operations planning, integrated business planning and integrated business management, it provides a forum for business decision-making, execution and accountability. Despite the benefits that can flow from an effective S&OP process, organizations often fall short. This article presents leading practices to improve the S&OP process, ultimately leading to an improved supply chain.

A plan of reconciliation
S&OP helps organizations develop tactical plans that help management strategically direct its businesses to achieve competitive advantage by integrating customer-focused marketing plans for new and existing products with supply chain management.

The process brings together all business plans (sales, marketing, development, manufacturing, sourcing and financial) into one integrated set of plans. It should happen at least once a month and reconcile all supply, demand and new product plans at both the detail and aggregate levels and tie to the business plan. The result is the definitive statement of the company’s plans for the near to intermediate term, covering a horizon sufficient to plan for the resources and to support the annual business planning process. The sales and operating process links the enterprise’s strategic plans with its execution and reviews performance measures for continuous improvement.

The output of the process is a plan that typically covers at an aggregate (product family) level a period of eight to 18 months with monthly periods exploring later years in half-year periods. The actual time horizon depends, in part, on the time required to add additional capacity. Industries like aerospace and petroleum tend to have longer lead-times to add capacity and require longer planning time horizons, up to five to 10 years for the petroleum industry and seven years for the pharmaceutical industry. The time frame also accounts for research and regulatory approvals, according to “Demand Management: A Cross-Industry Analysis of Supply-Demand Planning,” a 2006 MIT master’s thesis by Peng Kuan Tan. S&OP specifications also are influenced by the percentage of capital or assets to the entire organizations’ cost, essentially a measure of capital intensity. For example, aerospace, petroleum and automobile have high capital intensity, while retail and consumer packaged goods companies tend to have relatively lower capital intensity.

High capital intensive companies would focus on high capacity utilization and high asset utilization, Tan reported. Figure 1 indicates how capital intensity impacts supply and demand characteristics. The efficacy of a business strategy is truly tested only at the point of execution.

Like the balanced scorecard, S&OP bridges business strategy with business performance and accountability. However, S&OP focuses on operations. Although the precise methodology can vary from company to company, the following five steps are widely recognized in S&OP, illustrated by Figure 2 and detailed in Sales & Operations Planning, The Executive’s Guide by Thomas F. Wallace and Robert A. Stahl.

1. Data gathering: Planning team obtains historical sales data to develop the baseline forecast and production and inventory data from the prior month. This step is typically characterized by the use of statistical smoothing methods through automated forecasting systems to develop baseline forecasts for the bulk of existing items, according to Daniel Antonio Uriarte’s 2010 MIT master’s degree thesis, “Developing a Framework for Dependable Demand Forecasts in the Consumer Packaged Goods Industry.”

2. Demand planning: Sales and marketing teams meet with the demand planner to revise the baseline forecast for expected demand changes resulting from promotions, new product introductions and product obsolescence. The result of this step...
is a consensus-based unconstrained demand forecast, Uriarte wrote.

3. Supply planning: Supply chain, sales and marketing review the unconstrained demand forecast with operations (typically manufacturing, sourcing, logistics, inventory management and other functions), providing an indication of what can be produced in comparison to the demand. The goal is to determine the capacity available to meet the unconstrained demand plan. The output of this meeting is a constrained demand plan and a preliminary consensus supply plan, often referred to as a rough-cut capacity plan, according to Uriarte.

4. S&OP pre-meeting: This stage addresses imbalances between the supply and demand plan. However, executives responsible for profits, losses and business targets need to participate to endorse the demand plan, supply plan, resolve imbalances, address exceptions and evaluate the likelihood that the business goals of aligning with the budget or the annual plan will be met, Uriarte wrote.

5. S&OP executive meeting: Executives finalize the plan, resolve escalated and unresolved items from the prior meetings and confirm the supply chain and financial plan.

Implementing S&OP can have the feel and organizational impact of an ERP implementation. To succeed, include the following steps.

The first step is to educate top management to provide an in-depth view of what’s required to make S&OP operational, effective and successful, ensuring senior management commitment. The second step is to select the S&OP participants.

This is a two-tier decision involving which functions and which individuals

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**PUSHING AND PULLING**


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**Push/pull vs. capital intensity**

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<th>Capital intensity</th>
<th>Focus on demand planning</th>
<th>Focus on supply planning</th>
<th>Requires longer planning horizon</th>
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- **Push**
  - Demand planning (DP): Demand sensing & shaping
  - Supply planning (SP) focused on collaborating with suppliers through point of sales (POS) data sharing in order to get high service level from its suppliers. Typical industries: Retail, apparel

- **Pull**
  - DP: Shaping demand to short-term capacity. Have longer range forecasts to decide on long-term capacity
  - SP: Focus on asset utilization; also concerned with suppliers so that they can get their supplies in time for producing the end items
  - Typical industries: Aerospace and make-to-order or assemble to order computer manufacturing

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**Focus on supplier collaboration**

- Focus on customer collaboration and supplier collaboration

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**Focus on demand planning**

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**Focus on supply planning**

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**Requires longer planning horizon**

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**The goal is to determine the capacity available to meet the unconstrained demand plan.**
should be part of the effort. During this step, Uriarte recommends selecting the demand planning, supply planning and key S&OP leadership. Tan recommends that the typical S&OP team include an S&OP lead, a sales team, a manufacturing representative, a finance representative, a marketing and business analysis team, a product marketing team and shared roles. Figure 3, posted at www.iise.org/IM/janfeb2017/montague, provides details about their responsibilities.

The third step is to schedule the meetings and plan the S&OP steps. Meetings should be planned for a year, and participants should be trained, informed and coached in their responsibilities.

The fourth step requires that a system be identified to do the “heavy lifting” of forecasting and planning. Forecasting can be achieved initially through the use of spreadsheets. However, a system with more comprehensive capabilities eventually might be required.

Gartner, a research firm, recommends that when selecting S&OP technology, the system should include management and quality integration into operational planning, new product introduction and management, multilevel and multidimensional hierarchies, assumption tracking and management, workflow and process management, constrained-based planning, performance management, financial planning and budget integration, and what-if scenario management and simulation capabilities.

The fifth step is to develop S&OP performance measures to improve and guide the process. Measures should include key supply chain metrics such as inventory, on-time delivery, fill rate, forecast accuracy and schedule achievement. Additionally, a scorecard grading the effectiveness of the S&OP meetings should be reported as well as the status of projects instituted as a result of S&OP or connected to S&OP.

The final step is to engage in the meeting. Develop formal agendas and presentations. The initial S&OP meetings can be challenging for the uninitiated. Even at the most disciplined organizations, it can take a few rounds to get it right. The meetings are for discussions and decision-making. The analysis, research and recommendations should be developed in advance of the meetings.

Gartner has introduced a five-stage S&OP model that can gauge the maturity of your S&OP effort. This evaluation can help organizations determine where they fit on a continuum.

Organizations in stage one, the react stage, are led or dominated by sales. The emphasis is on developing a feasible operational plan to meet sales orders and revenue requirements. However, the organization has to achieve this despite misaligned incentives. The metrics tend to be specific to business units. Systems typically would be disparate, transactional-oriented systems with limited support.

In stage two, or anticipate, companies emphasize matching demand and supply volumes by optimum forecasting and supply response to demand. Functional metrics emerge. There is a push for systems integration. Systems solutions tend to be in silos.

A stage three corporation is in the integrate phase, which focuses on enabling the shift to an external focus by capitalizing on information flows. There is increased integrated or cross-functional supply chain decision-making. Technologies to support end-to-end supply chain processes are in place.

In stage four, collaborate, more of the company’s business functions are involved, and they are focused on the logistical and financial impact of decisions. Integration happens across the extended value chain. The head of supply chain participates in corporate strategy development, and technology connects to trading partners.

Stage five is orchestrate. Demand-sensing and demand-shaping optimize supply chain decision-making with business strategy. The head of supply chain shapes corporate strategy. Aligned, value-based metrics are in place.
across the suppliers and customers. Networkwide solutions are in place to support value creation, risk management and scenario analysis and manage trade-offs though innovative technologies.

Benefits and failures
Organizations that go beyond the mechanics and truly use S&OP experience improved customer service with lower finished goods inventories, increased stability in the supply rates, more effective new product introductions and shorter lead-times, Wallace and Stahl reported. They maximized profits, maximized sales, optimized cash flow and working capital, minimized supply chain cost and maximized distribution center and warehouse utilization. By synchronizing the operating strategies, organizations can execute their strategic objectives.

Organizations have experienced substantial benefits as a result of implementing S&OP. Writing for *APICS Magazine* in 2011, Tom Wallace reported a number of benefits in several organizations: on-time delivery improvements ranged from 10 percent to 40 percent, inventory was reduced by 12 percent to as much as 70 percent, manufacturing downtime reductions ranged from 20 percent to 50 percent, plant efficiency improvements ranged from 2 percent to 33 percent and transportation cost declines ranged from 5 percent to 30 percent.

Kimberly Clark, Caterpillar, L’Oreal and Colgate Palmolive have been named in “The Gartner Supply Chain Top 25” for their use of S&OP, which has resulted in reduced cycle time and inventory, improved cash-to-cash cycle, improved supplier collaboration and improved return on assets. Additionally, Wallace and Stahl noted that S&OP users experience better teamwork, better decision-making and improved financial planning.

Despite its many benefits and the fact that it has been around for more than three decades, organizations have not been as successful as they should be at implementing S&OP.

“Only one out of two companies believes that their processes are effective,” Lora Cecere wrote in a 2015 analyst report for Supply Chain Insights LLC. In a 2010 APQC survey, 89 percent of respondents said S&OP does not work well in their organizations, and in another survey 75 percent indicated that their S&OP process had significant opportunity to improve. In fact, only 10 percent of organizations regard their process as excellent or world class, according to a 2013 CSCO Insights report.

Organizations fail at S&OP for several reasons, such as lack of capacity planning (manufacturing, sourcing and logistics), lack of inventory planning (including budget and locations) or lack of integration of financial plans and budgets. Organizations often experience more mundane reasons for failure, such as cancellation of meetings or lack of senior leadership support, sponsorship or presence.

**How to improve S&OP**

Companies that want to implement S&OP should make sure they address strategic, organizational, process and technology areas.

Organizationally, ensure a high level of executive support and involvement. There is a positive correlation between senior executive engagement and a successful S&OP process. Unfortunately, only about a quarter of survey respondents have a senior executive as the champion or lead in their S&OP process, according to CSCO Insights.

For example, take the example of a company that had agreed to engage in S&OP. However, its leadership had limited commitment, instead focusing on other initiatives. Consequently, meetings were not timely and often cancelled, and decisions frequently were not executed because key decision-makers did not participate in meetings. As a result, the implementation effort suffered.

Establishing a clear governance structure to manage the process is necessary. There should be clear understanding of roles and responsibilities with respect to sales, marketing, product development and management, customer requirements, demand planning, supply planning and materials management. The organization should bridge silos within its enterprise and require representation from each of these.

Lack of well-defined roles and responsibilities combined with traditional silos can translate into an ineffective S&OP process where each group maximizes its own benefit and focuses on its own goals rather than balancing demand and supply to maximize profits.

To be sure, the proper infrastructure of business processes should be built. This would include documented processes that define how S&OP should work, including how to do the forecasting and demand planning, how to conduct the supply planning, how to manage each of the meetings (including required attendance and sample agenda), how to manage risks and, when necessary, rules to escalate issues and engage in root cause corrective action.

However, one important aspect is to ensure the information is managed effectively. Forecasts and plans should be aggregated, disaggregated and translated into terms understandable to sales, marketing, finance and operations participants. This should include unit and dollar forecasts, as well as brand, budgetary units and sales region forecasts.

It is vital that supply, demand and inventory plans be connected to financial plans. Without this component, your organization’s workforce will deem S&OP as a program of the day that remains disconnected from the day-to-day financial and operational management of the firm.

Another important component of a well-functioning S&OP is having a “one number plan” — the sales, marketing, finance and operations should not have different numbers. Demand forecast should be distilled into a consensus forecast used for financial estimates and planning activities. The consensus sales forecast should be used to develop the
annual budget or annual operating plan. If this is not conducted, the S&OP process and associated meetings devolve into Oxford style debates on the merits of one set of figures over another instead of a coherent discussion about what the figures mean as they relate to demand and supply.

Think about what happens when companies install new equipment into a manufacturing setting. Employees must connect the new equipment to the pre-existing infrastructure. That infrastructure might require piping, mechanical and electronic systems to be connected to ensure the equipment operates.

The same is true of S&OP. S&OP requires other business processes to operate effectively. A low level of performance might have been acceptable prior to S&OP. However, business processes such as product life cycle management (including new production introduction and product development), business planning, trade promotions management and other connected business processes need to be aligned with S&OP to operate effectively.

To illustrate, a food company embarked on a typical S&OP implementation. Once the implementation was functional, attention was devoted to the company’s new product introduction process. The company recognized its new product introduction process lacked effective stage-gate decision processes. Products were introduced without adequate vetting for profitability.

The organization was operating with direction from two leaders, and the enterprise also faced scale-up challenges with the manufacturing process. Things that worked well in labs required reformation when placed into full manufacturing, which drove delays.

The implication for the S&OP process was that it was difficult to predict when new products would come to market, and sales and profitability forecasts often were wrong. The process was improved by addressing the flawed organizational structure and changing some of its business processes.

When S&OP functions within the organization, there is a tremendous opportunity to collaborate with supply chain partners.

According to APQC, inventory carrying costs as a percentage of average annual inventory value was 8 percent for companies that rated collaboration as “high,” while corporations that rated collaboration as “low” experienced 16 percent carrying costs. Collaborating companies also had a lower return on assets, 11 percent, in contrast to the high collaborating firms, 15.0 percent.

Companies should engage in collaborative planning, forecasting and replenishment. According to APICS, it is “a collaboration process whereby supply chain trading partners can jointly plan key supply chain activities from production and delivery of raw materials to production and delivery of final production to end customers. Collaboration encompasses business planning, sales forecasting and all operations required to replenish raw materials and finished goods.”

One of the most legendary collaborations is the one between Procter & Gamble and Wal-Mart, where Wal-Mart provides P&G point of sales data on its daily sales. This collaboration, in place since the 1990s, enables P&G to plan and more effectively supply Wal-Mart, Gartner reported. This suggests that strengthening ties between supply chain partners can help each side flourish.

Organization and business processes are critical to a well-functioning S&OP process. However, one cannot ignore technology. Initially, spreadsheet use is likely to be the first technology step until your organization becomes comfortable with S&OP. In fact, spreadsheets are so popular that a survey found that 45.8 percent of respondents use spreadsheets for their S&OP process.

However, because spreadsheets can’t always provide the capabilities needed in a complex and dynamic supply chain, organizations should examine systems that can better manage the data, provide forecasts, conduct planning and have the characteristics previously identified by Gartner. S&OP technology solutions should effectively connect with pre-existing ERP systems. Systems available include add-ons to existing ERP systems as well as those available from third-party vendors. With increasing computing power and the reduced unit cost of computing, system capabilities are certain to grow to include “big data” analytics as well as artificial intelligence.

The idea of having “one number” becomes increasingly important because it facilitates cross-functional alignment and sharing of key metrics and information such as forecasts, supply plans, orders from suppliers, production capacities, financial goals and other vital information.

Metrics that should be considered include growth, market share, cost, inventory levels (turns, days of inventory, raw, WIP, finished goods, etc.), customer service, return on investment (i.e., return on invested capital) and fill rate.

The availability of good quality data and metrics allows your organization to benchmark by comparing key metrics against industry standards. For example, Gartner indicates that Colgate Palmolive’s inventory turnover for 2015 was five. A consumer packaged goods enterprise examining its own operations might benchmark itself against Colgate Palmolive and other organizations to determine if it is operating as effectively as it can.

Other metrics can be used depending on ease of availability. This makes accountability and more effective decision-making possible.

Face the challenge
Implementing S&OP in an organization can be a challenging endeavor. Despite all the things that can go wrong, it is well worth the effort to achieve improved customer service, improved profitability and optimized inventory. It effectively connects the strategy to the execution and allows for the ongoing management of the most important business objectives.