



Sales & Operations Planning The Next Generation

by

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EXECUTIVE OVERVIEW

Sales & Operations Planning (S&OP) has emerged as a powerful decision-making tool for executives and managers. It provides them with a window into the future and has been called “top management’s handle on the business.”

Positive results that companies have realized from S&OP include both hard benefits (higher customer service, lower inventories, increased production efficiencies, etc.) and soft benefits (more effective decision-making, enhanced teamwork, better control of the business, etc.).

However, as complexity and the rate of change increase across the industrial landscape, the need has arisen for S&OP to become more powerful, more effective, and more useful to the executives and managers of manufacturing enterprises. It’s time for a new generation of S&OP.

S&OP as it is currently constituted lacks the following important capabilities:

- Rapid and comprehensive simulation
- Seamless linkage between aggregate plans and detailed plans
- Enhanced financial integration
- Support for Sarbanes-Oxley and other requirements for regulatory compliance
- Combining data from disparate data sources for decision-making

There’s good news here: software support is becoming available. We’re starting to see the onset of software capable of doing the kinds of things described above. It can’t come too soon; American industry is ready for these kinds of tools.

THINGS CHANGE – PROCESSES EVOLVE

Isn't it likely that S&OP will evolve as it matures? We think so. Here are some examples of processes that became highly successful when used in their original state – and then evolved into something even better and more powerful:

- Just-in-Time evolved into Lean Manufacturing
- Material Requirements Planning evolved into Enterprise Resource Planning
- Statistical Process Control evolved into Six Sigma/Total Quality

Sales & Operations Planning will be no exception. It will – it must – evolve into something more powerful and thus more helpful to executive and operating management, for two reasons:

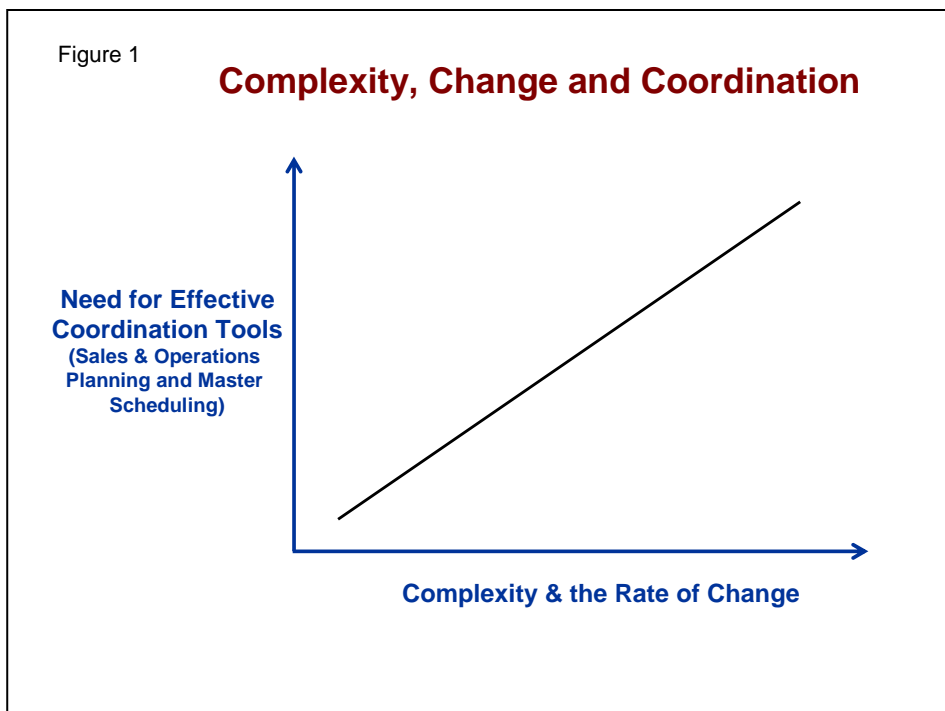
1. There is a need within industry for more robust, more complete decision support processes than currently exist. There are gaps which need to be filled.
2. S&OP has the capability to fill those gaps, containing all of the elements necessary to support this kind of enhanced decision-making. But it will need some help from the software community.

WHY IS S&OP IMPORTANT?

S&OP is not only important; it's essential. It enables virtually all manufacturing businesses to be run more effectively and more profitably.

Note the phrase “virtually all.” That implies that there are some businesses that don't need it, and let's see what kind of companies they are. Figure 1 on the next page depicts the relationship between companies' operating environments and the need for effective tools for the coordination and planning of demand and supply. It says that as complexity and the rate of change increase, the need for S&OP and its companion tool, Master Scheduling, increases right along with them.

If a company's environment – products, processes, customer base, supplier base, and so forth – is extremely simple and, second, if things hardly ever change, then they probably don't need this stuff. Seen many companies like that lately?



There are opposing forces at work on many companies today.

- First, thanks to Lean Manufacturing, many companies have been able to dramatically simplify their operating environment. This can eliminate the need for some of the more complex parts of the traditional ERP tool kit: shop floor dispatching and detailed capacity requirements planning are two that come to mind. They're no longer needed in the new, simplified environment. Thus the planning tools can become simpler.
- Pressing in the opposite direction, towards more complexity, is Supply Chain Management. Trying to manage an extended supply chain – in both directions – is a more complex task than looking primarily within the plant and the immediate suppliers.
- Also raising the complexity factor are global sourcing of components and the extensive use of outsourced manufacturing. It's substantially more challenging to deal with suppliers of finished products and components located half a world away than with those located next door, or in the next town or the next state.

We'll come back to this complexity/change/coordination relationship later, but first let's take a closer look at just what S&OP is all about.

S&OP 101

S&OP is a set of decision-making processes that 1) balances demand and supply, 2) links a company's day-to-day operations with its strategic and business plans and 3) integrates operational planning with financial planning.

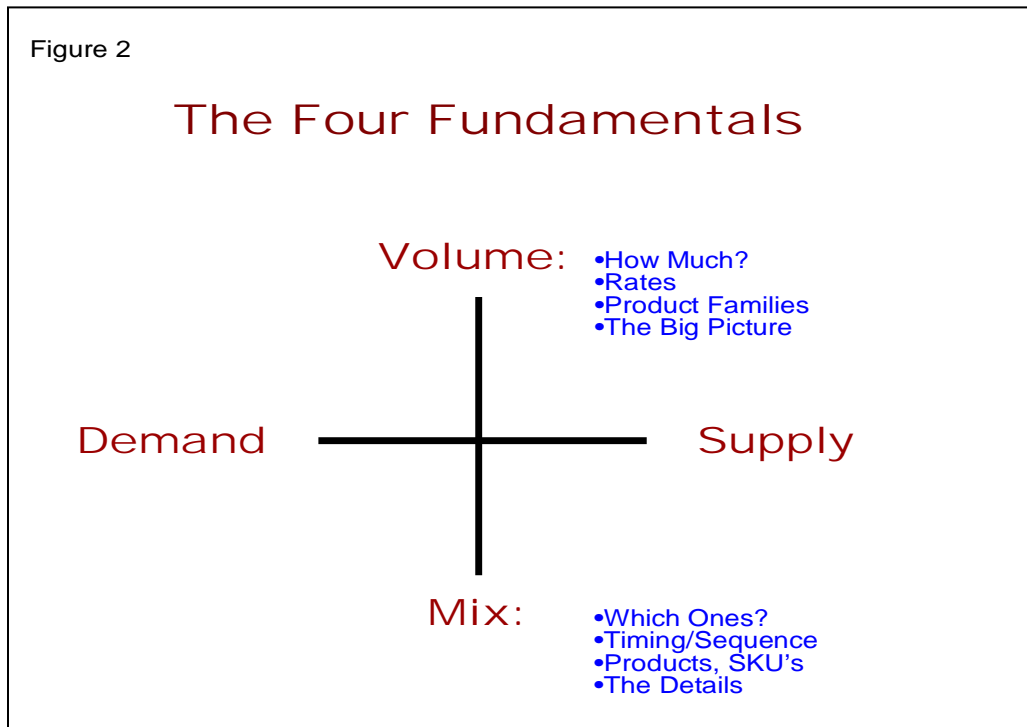
Balancing Demand and Supply

In order to fully understand the first, we need to look at what we call the *four fundamentals*. They come in two pairs:

demand & supply

volume & mix.

To run a business well, *demand* and *supply* must be in balance at both the *volume* and the *mix* level, as indicated in Figure 2.



Here's an important distinction:

- Sales & Operations Planning is a tool to balance demand and supply at the *volume* level. It deals with rates of sales and production, aggregate inventories and backlogs. It is typically

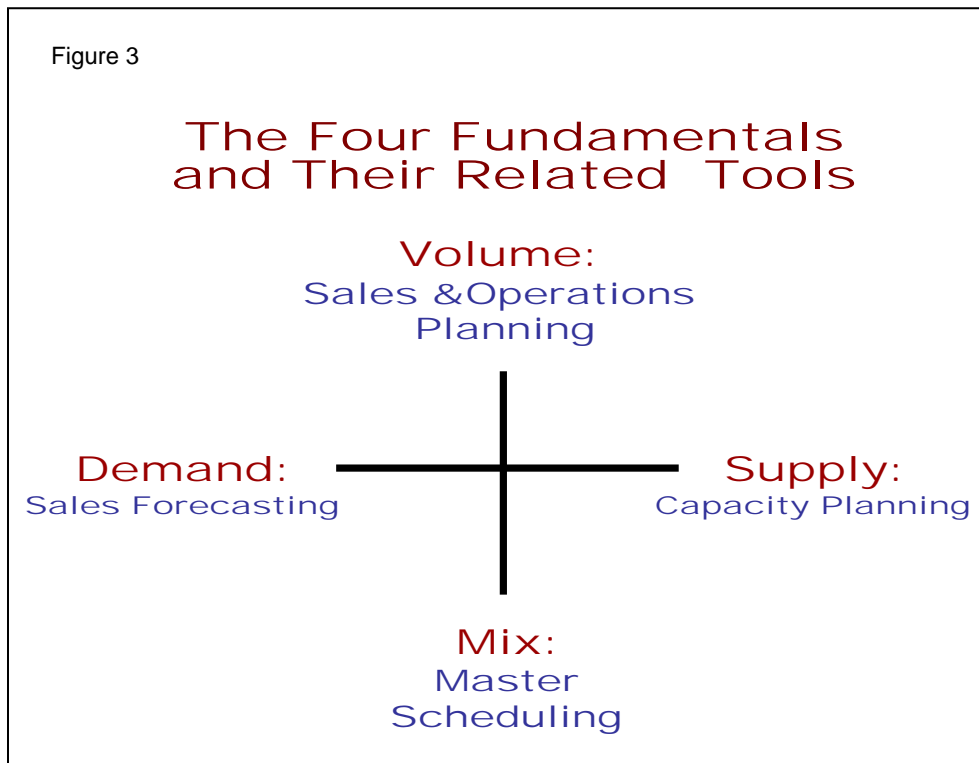
expressed in product families or other aggregate groupings; it answers the question “how much”; it gives the big picture.

- Master Scheduling’s task is to balance demand and supply at the *mix* level. It’s concerned with which individual products to run first, second, third and which customer orders will ship when. It answers the question “which ones”; it’s the details.

These words, and the drawing in Figure 3 below, are saying that S&OP and Master Scheduling are *not* the same things. They’re different tools for different purposes. Trying to use Master Scheduling processes to do S&OP – or vice versa – is comparable to trying to drive nails with a saw . . . or cut wood with a hammer.

Linkage – Volume and Mix

However, even though S&OP and Master Scheduling are different things, they must be in agreement. The sum of the demand and supply detail in the Master Schedule must tie back to aggregate demand and supply data in the Sales & Operations Plan.



When they don’t agree, there’s a *disconnect*. The plans that Executive Management has authorized in the S&OP process are disconnected from the plans contained in the Master Schedule, which

drive what happens day-to-day and week-to-week on the shipping dock, the plant floor, the receiving dock, and the customer order department.

So, an integral part of an effective S&OP process is to have S&OP and the Master Schedule – two different things – in a high state of agreement with each other. Joined at the hip, so to speak.

Linkage – Units and Dollars

Another important mission for S&OP is to tie together the company’s operational plans with its financial plans. There must be *coherence* between the two.

The financial plans represent, for most companies, critically important commitments to deliver X amount of revenue and profit dollars for the quarter and the fiscal year. These commitments are made to some very important people: the corporate office, the board of directors, to Wall Street, and ultimately to owners of the business: the stockholders.

The operational plans focus on things like procurement, production, sales, inventories, customer backlogs, and the like. When these operational plans are not aligned with the business and financial plans, there is another disconnect. This one is between what the company has promised to its core constituencies and how it’s operating the business. Not a good thing.

S&OP’s job, as we said, is to tie the operational marching orders together with the financial commitments – to establish alignment and coherence between them.

BENEFITS

The benefits that companies have realized from S&OP are substantial. We divide them into two categories: hard benefits – ones that can be readily quantified – and soft benefits, which are more subjective and less quantifiable but nonetheless highly important.

First, the **hard benefits**. Most companies will benefit in most, perhaps all, of the following areas:

- **Higher Customer Service** – the ability to ship on time and complete at a higher rate than before S&OP. Frequently this is accompanied by . . .
- **Lower Finished Goods Inventories** – doing a better job of shipping to customers with lower, not higher, inventories.
- **Shorter Customer Lead Times** – through an enhanced ability to manage the customer order backlog and keep it at a low level.

- **More Stable Production Rates** – due to the ability to see future shifts in customer demand sooner and thus make smaller adjustments to production rates, which leads to . . .
- **Higher Productivity** – by avoiding extreme swings in production volumes with their attendant layoffs and rehiring.

Soft benefits include:

- **Enhanced Teamwork** – at both the executive and operating management levels, resulting from the more holistic view of the business provided by S&OP. One company president said that S&OP enabled his staff – the vice presidents and directors – to “view the business through my glasses.”
- **Better Decisions** – with less effort and time. S&OP provides a highly effective structure via which to make decisions on demand and supply issues, and to obtain buy-in on them. One group vice president said that S&OP resulted in “an amazingly efficient use of my time.”
- **Greater Accountability and Control** – due to the backward and forward visibility provided. A chief executive officer said to one of us: “Tom, when I think back to a year ago, before we had S&OP, I wonder how we were able to run the business without it.”

Sales & Operations Planning is truly “top management’s handle on the business.”

UNFULFILLED POTENTIAL

Back in 1999, one of your authors made a prediction, writing these words:

“Imagine that you’ve successfully implemented Sales & Operations Planning (S&OP) in your company. Your top management team is meeting once a month to authorize sales and operations plans that will harmonize demand and supply and to integrate those plans with the financials. In an Executive S&OP meeting, one of the attendees X the president or perhaps the CFO X raises a question: *‘If we can pull up the new product launch by six weeks, we’re sure we can beat the competition to the market. Can we do it? If so, what other products might be affected? Would we have enough raw material and capacity to do that?’*

“You’re projecting the S&OP display for this product family onto a large screen from your PC, which contains the ERP data base for the entire company. You ask for a brief time-out while you run the simulation . . . Within no more than a few minutes, you have answers: Plan A is feasible but will negatively affect product 123 because of raw material availability problems; Plan B is feasible but

will impact products 234 and 345 slightly; and Plan C will have the least total cost but will cause serious stockouts across much of the product line, because of capacity constraints in Fabrication. Armed with these facts, the Executive S&OP Team is well equipped to make the right decision. They'll most likely select Plan B: it's feasible; it has only slight negative impact; and it accelerates the new product launch.

“The phrase ‘top management war room’ comes to mind. I’m looking forward to the day when this type of capability is widespread: Sales & Operations Planning linked with . . . simulation software running at the speed of light X supporting major demand/supply decisions with facts, not guesses X in a top management setting. That is where I’d like to see S&OP by the year 2010.”

Well, it hasn't happened yet – at least not on a widespread basis. We've been disappointed by the lack of progress in this area, but we're beginning to sense that the times may be a changin'. Companies may be close to having this kind of capability . . . and making highly effective use of it; the vision just may be reality by the year 2010. More on this later.

GAPS IN TODAY'S TOOLS

There are gaps in the current array of tools for S&OP. Here's what's needed to get to the next generation:

- The **simulation** capability, as we've just described, needs major enhancements to support complex businesses operating in a global environment. The complexity, change and coordination diagram shown in Figure 1 indicated that as businesses are faced with increased complexity and subject to more and more rapid change, then they need more robust coordination tools to manage and plan effectively.

The software tools to do what-if simulations on the fly – “supporting major demand/supply decisions with facts, not guesses in a top management setting” – are not yet widely available. That needs to change.

- More effective ways to establish **linkage and alignment** between volume (S&OP) and mix (Master Schedule) are needed. S&OP and the Master Schedule need to be joined at the hip, as we said. They need to be kept in constant alignment via an ongoing, dynamic process – not merely once per month.

This calls for a capability to update the volume plan as mix changes during the month, and to know the overall impact of those changes on materials, capacities, and other customer orders. It also implies the need to be able to simulate at both levels: mix as well as volume. Frequently, it's necessary to simulate at the mix level to ensure that a given

alternative is truly *do-able*, and then to reflect that in the volume picture quickly. Today's capabilities here are close to non-existent, and that gap needs to be filled.

- A more robust ability to support **financial projections**, down to and including the bottom line, is needed to realize S&OP's full potential as the integrator of operating plans and financial plans. With this, S&OP can truly contain the business and financial plan as well as the operating plan, coming from a common set of numbers. Further, as the plan is simulated in operational terms – pieces, pounds, hours, cases, kilos, and so forth – the simulation can be translated into dollar terms to test its financial impact.

Here also, as operational plans are changed during the month and the quarter, the financial plan needs to be updated to reflect the new operational reality. This then can make visible any substantial “drift” away from the original plan, enabling corrective action to be taken. Today's capabilities in this area of financial integration are limited, and that shortcoming needs to be rectified.

As the financial integration piece becomes more robust, then S&OP will begin to serve as an important source for the **generation of quarterly earnings estimates**. Estimates can be made with a good deal more confidence if their base data is the operating plan – sales, production, inventories, and so forth – being used to run the business day-to-day and week-to-week.

This benefit will apply not only to close-in estimates for the current quarter – sometimes called the *red zone* – but also to the making of guidance calls for the following quarters. The current lack of support for this activity should be corrected.

- As a business moves through time, its people make a large number of decisions about demand and supply: to buy this material and not that one, to produce these products but not those; to ship the Jones order instead of the one for Smith, and so forth.

Sometimes the impact of those decisions is relatively minor; sometimes major. Often these decisions are made by a person with a five-figure income . . . and they have a seven-figure impact.

What's needed is the ability to **create archives** of these kinds of decisions – at a detailed, mix level as well as for aggregate volumes – **to support compliance with regulations such as the Sarbanes-Oxley Act** and also to serve as a source for internal review, evaluation, and analysis. Stated another way, as the rate of change increases, there is a greater need for a “system of record” for the resultant S&OP decisions and plan changes.

- Our last point is based on several characteristics of business today:

1. They're data intensive. Most businesses of any size have large data bases supporting their activities.
2. Mergers and consolidations are frequent, often resulting in a corporation with multiple systems: one division is on, say, Oracle; another on SAP; another on QAD.
3. With global manufacturing and outsourcing, much of the needed data lives outside the four walls of the organization.

What's needed is the capability to easily **combine data from disparate data sources**, thereby providing a unified view for analysis and decision-making at the S&OP level. This is yet another gap that needs to be filled.

CONCLUSION

Sales & Operations Planning has served admirably over the past quarter century in accomplishing its missions. It's been adopted by a large and growing number of manufacturing companies around the world.

However, the tools and processes within S&OP are much the same today as they were twenty years ago: extracting data from operational systems, converting some of it into financial terms, and displaying it via spreadsheet software. Now it's time for S&OP to move up to the next level.

Here's why: the increasing complexity and rate of change which create increased pressures on manufacturing enterprises. Businesses need more powerful tools to cope with extended supply chains, global sourcing of both components and products, and customer demands for increasing variety and speed.

There's good news here: software support is becoming available. We're starting to see the onset of software capable of doing the things described in the prior section:

Rapid and comprehensive simulation

Seamless linkage between aggregate plans and detailed plans

Enhanced financial integration

Support for Sarbanes-Oxley and other regulatory compliance requirements

Combining data from disparate sources for decision-making

In conclusion: American industry needs these kinds of tools, and it's ready for them.

ABOUT THE AUTHORS

Tom Wallace has over 30 years of experience in the supply chain and manufacturing fields. He's authored ten books, including *Sales & Operations Planning: The How-To Handbook, 2nd Ed.*, and with Bob Stahl *Sales Forecasting: A New Approach, and Master Scheduling in the 21st Century*. Tom is a Distinguished Fellow at Ohio State's Center for Excellence in Manufacturing Management. He is currently co-writing two new books: *Building To Customer Demand* and *Sales & Operations Planning: Best Practices*, both due for release in 2005.

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