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## S&OP: Getting to “The Story” Interpreting the numbers to help you make decisions

By Duncan McLeod

Here are two of the most frequent S&OP questions that I am asked:

1. From the S&OP team: How do we get senior management, especially our CEO, involved in the S&OP process?
2. From the CEO: What should my role be in the S&OP process?

It should be obvious that you need to answer the second question first. In this article, I will share my opinions on the CEO role and how you should approach the S&OP process.

As CEO, you need to hold your team accountable and make the tie breaking decisions. To do this, you need to understand the numbers and then get past the numbers to “The Story”. I will shed some light on understanding the numbers and getting to “The Story”. Holding people accountable and making decisions is why you get to be CEO.

“Holding people accountable and making decisions is why you get to be CEO.”

### Definitions

For the purpose of this article, I am going to assume you are using some version of the standard 5-Section S&OP sheet. You may have a slightly different format but you should be able to relate to this one (Figure 1 on Page 5). Definitions of the terms vary from organization to organization so I need to document the ones I will be using in this article.

**Bookings** are customer orders taken during the period. The bookings for a month would be the sum of all of the customer orders received, regardless of planned ship date.

**Shipments** are all of the shipments during the period. This term can get fuzzy as we look at inter-company shipments, progress billings and FOB points. For the sake of simplicity in this article I am going to assume shipments and billings are the same and that this transaction occurs when material leaves the finished goods inventory linked to the production facility.

**Backlog** are all of the open customer orders for the family. This would include past due and future orders. Bookings increase the backlog and shipments decrease it.

**Aged Backlog** are the open customer orders placed in their planned shipping period.

**Production** is the total finished product produced for a family in a period.

**Inventory** is the finished goods inventory for the family at the end of the period.

### Getting to “The Story”

Flip to Page 5 and take a look at the S&OP 5-Section sheet. There are more than 250 numbers on this family presentation. That’s a lot of numbers. How do you quickly work through all these numbers and get to “The Story”? I am going to outline my approach, not to suggest it is the only approach, but it works for me. So here it is step by step:

**1. Validate the numbers.** Having been fooled by Excel magic in the past, I do checks to make sure people are paying attention to the data. Checking won’t prove that the data is right but it will uncover some of the common problems.

**a.** Take the actual opening backlog, add the bookings and subtract the shipments. Check the result against the closing backlog. In this case, the December closing backlog was 150, the January bookings were 460 and the January shipments were 410. The resulting backlog should be 200, and it is. The numbers check but you would be amazed how often they don’t. Make sure your team understands you check them and you expect them to cross-check. (Refer to Figure 2 on Page 5)

**b.** Do the same for inventory. The opening inventory (previous month’s closing inventory), plus production, minus shipments should equal the closing inventory. In this case, the December closing or January opening inventory was 50 units, production was 410 and shipments were 410 so the ending inventory should be 50. It is, and the numbers tie out.

**2. Check last month’s performance to plan.** The grey column represents the month just closed. The previous S&OP represents the previous month’s plan for that month. The current S&OP represents the actual results. Compare the plan to the actual and see how you did. For example:

**a.** Bookings were planned at 410 and they came in at 460. This is a 50 unit variation or more than 10%. If the booking tolerance for this family is +/- 10%, then the bookings for this family are out of tolerance. I would expect answers. Looking at the past, it looks like the actual bookings have been higher than the call for the last four months. Hold that thought.

**b.** Shipments were planned at 420 units and the actual shipments were 410. Not a big miss, but 30 units in the backlog went past due and the bookings were strong. That’s another thought to hold on to.

**c.** The backlog was planned at 140 and actually came in at 200. You can probably see where the 140 was higher than target because of production constraints. In fact, the target is actually to get the backlog down to



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# S&OP: Getting to “The Story”

## Interpreting the numbers to help you make decisions

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100 units. It went the wrong way. There could be customer service and lead-time issues on the horizon. (Some people will add a row for the target backlog.)

**d.** Production was planned at 400 units and the actual was 410. Not a big variance and probably not an issue.

**e.** Inventory was planned at 60 units and came in at 50. The financial people may say this is good but the targeted inventory is 100 units. For four months in a row, the inventory has come in low. (Refer to Figure 3 on Page 5)

**3. Look at the changes to the future plan.** Compare the previous S&OP to the current S&OP from Month 1 (February in this case) out into the future.

**a.** The February bookings have been turned up from 410 to 430 and the March bookings have been turned up from 500 to 540. The demand owners are getting more bullish, probably based on the last four months history of under calling demand.

**b.** The February shipments have been held constant and the March shipments have been reduced by 10 units. The shipments start to catch up to the bookings from April onward.

**c.** The backlog continues to grow into April and then comes down but never to the target of 100.

**d.** Production has been turned up slightly in February, (usually not a good idea to change Month 1 as it is probably locked in. In this case the change of 5 units is eraser dust). It has been turned up for most of the rest of the year as well.

**e.** Inventory has been adjusted to come back close to plan in April.

**4. Look for “The Story”.** In this case it is pretty straight forward.

**a.** We have been booking over plan for the last four months and we have been slow to react to the sales increase.

**b.** As a result, the backlog has increased and the finished goods inventory has fallen below target.

**c.** We are probably experiencing service issues in this family.

**d.** The production response to the demand change is lagging behind sales due to current output constraints and the responsiveness of the supply chain.

**e.** In total we are 100 and 50 units behind. The backlog has increased by 100 units over target and the finished goods inventory is 50 units below target for a total of 150 units. This is roughly one to two weeks at current output rates.

**5. Ask the hard questions.**

**a.** To Sales: Are we still under calling the bookings? We have under called the plan for four months in a row. Is the plan going forward pessimistic? If so, what is the upside that we may be faced with?

**b.** To Production: What would we have to do to bring the backlog back down to 100 units by April? This would mean adding 130 units to production assuming we hold the same booking plan. If the booking plan is increased again next month, when could we respond to the change? What are the constraints and what are the options?

**6. Make the decisions.** The S&OP data is only a portion of what goes into making decisions but it does at least give some hard facts. Here is what this CEO is faced with:

Do I increase output to bleed off backlog and put myself in a better position for demand increases? If I do, and the demand falls off, I will end up with inventory and I will need to turn off capacity. If I don't and the demand increases I will get further behind and risk serious service issues.

### Making Decisions

The numbers can't make the decision but they are a big help. In this case, production should be throttled up to at least rebalance the inventory and backlog. Based on the history of under calling sales, I would be inclined to error on the high side of production and be prepared to adjust it down next month.

Each family will have a different story every month. However, if you follow these steps to interpreting the data and getting to “The Story” and then combine “The Story” with your intuition, you will make better decisions.

“The S&OP data is only a portion of what goes into making decisions but it does at least give some hard facts.”



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# Are You Ready for the Recovery? Using S&OP to take advantage of the economic environment

By Doug Dedman



I'm an economist. Well, at least I studied to be one. There are some interesting challenges in the study of economics. First, it's about predicting future behavior. We use models to explain the past, but we are really trying to develop one that allows us to look ahead. Secondly, economic predictions are made in an extremely complex environment. The "Economic Crisis" of the past two years is a prime example. Events in one part of the world have far-reaching impact in other parts of the world. Finally, the act of making economic predictions can influence the results themselves. A poor economic prediction affects consumer confidence, which can lead to less spending and increase our aversion to risk.

The truth is that economists, like the rest of us, don't really know what is going to happen in the future. According to the predictions, we are either at the beginning of the upturn, on a temporary upturn awaiting a second drop, not at the bottom yet, or we are well into the recovery. Take your pick.

Despite the uncertainty, there is one thing that all economists agree on: the economy will improve. The cyclical nature of economics shows that every downturn is followed by an upturn. While we may all want to know when the upturn will happen, the real question is: Are you ready for it?

## S&OP = Preparation

We can't control the timing of economic change, but we can make sure we are prepared for it.

I believe a good S&OP process is fundamental to being prepared for uncertainty because it's forward looking. It's about coming up with a single "story" (if you're not sure what I mean by that you should read Duncan's article) for our future demand and supply plans.

In the process, you come to agreements on the risks and tradeoffs that are inherent in the future plans. We don't know what exactly is happening, but we rely on the key players in S&OP: Sales, Operations, Supply Chain, Engineering, and Finance to develop a single set of plans that we can execute. Almost as important, it allows us to measure our performance against those plans and make adjustments as we go into the next month.

## Positioning for Success

Over the past 18 months, many organizations have become internally focused. They've had to reduce resources, shut down or mothball production lines and plants, reduce inventory and re-negotiate contracts with suppliers. In survival mode, we "batten down the

hatches". Now is a good time to take a look around, evaluate where you are and make sure you're prepared for the future. Here are four areas that I believe you should focus on to make sure you're positioned to take advantage of the upturn.

**1. Re-evaluate your suppliers.** Over the past several months, your suppliers have been in the same situation as you have. They've reduced capacity and inventory levels. They've had to look for new customers to offset the reduced sales volumes from their current customers. If you assume that your suppliers have the same capability of responding to your demand as they did only six months ago, you may be very mistaken. The best way to evaluate your suppliers is to communicate with them.

If possible, you should evaluate the financial health of your suppliers. Losing a critical supplier due to bankruptcy can shut down your entire organization. Pay close attention to profitability and cash flow.

Present supplier risks as part of your S&OP meeting. Any forward looking plans that have significant changes in volume levels should include some level of analysis on supplier capability. Having the internal capability to deliver a plan, without suppliers that can meet your volume levels will not work.

Now is not the time to keep your critical suppliers at arm's length. Where it makes sense, share the plans developed in your S&OP meeting with your suppliers. The more information you can share with them about what you think is going to happen, the better off you will be. Communication is a two-way street. If you provide information to them, they will reciprocate.

**2. Understand what it will take to increase or reactivate mothballed capacity.** During the downturn, many companies have shutdown production lines or entire plants. Depending on how long they have been shut down, restarting will require extra maintenance, re-hiring, and re-priming of the supply chain. Having a good understanding of how long it will take to make this happen is important. This information then should be shared across the organization to ensure that everyone understands what the constraints are to increasing supply.

Use this information to develop short and long term plans. In the following example below, it will take three months to get the mothballed capacity back and running. If the decision is made in May to increase capacity, adding back the full 500 units of production will not happen until August. An alternate plan, using overtime, decreases the gap between the forecast and production



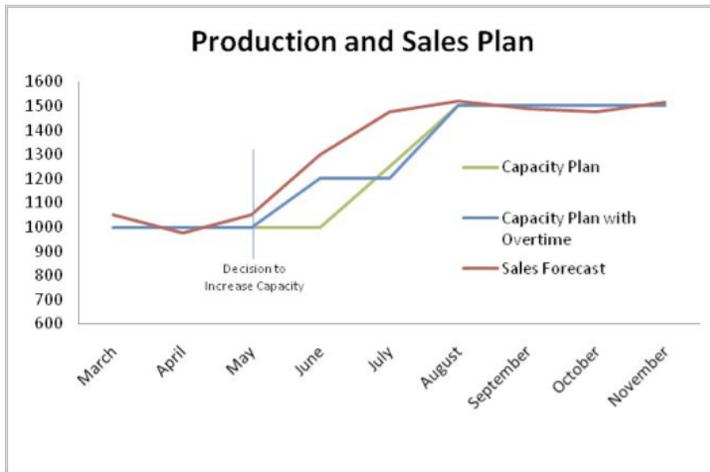
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# Are You Ready for the Recovery?

## Using S&OP to take advantage of the economic environment

Continued...

capability. Understanding the time constraints, capabilities and costs will all be factors in deciding what action to take.



Communicate the constraints and costs of reactivating capacity as part of your S&OP family presentation. Use S&OP to monitor performance against your future plans, in order to evaluate both demand expectations and supply capability.

**3. Identify and monitor the leading indicators for demand changes.** These indicators may be extrinsic, intrinsic or both. Extrinsic indicators are more valuable if they are tied closely to your industry. For example, housing starts will be more applicable for someone selling air conditioning units or closet storage units.

Don't ignore hard sources of data that may be available. If you distribute your data through retailers such as Home Depot or Lowes, point of sale (POS) data may show information earlier than looking at the forecast provided directly from the retailer. Another example of this would be inventory levels in the outgoing supply chain. If inventory levels of distributors are declining, this may be a sign that future demand levels will increase to refill the pipeline.

Monitor your booking and backlog levels as early internal indicators of demand shifts. This should happen as part of your S&OP process. An increase in bookings and/or backlog is an indicator that business is picking up. Comparing the overall backlog level to a target level for each S&OP family will help you monitor the health of that business. In some cases you may even be able to monitor future quote levels. The level of quoting activity is often a leading indicator of bookings.

**4. Identify forecasting biases.** It's true that all forecasts have a certain degree of inaccuracy. They are, after all, predictions of events that have not yet happened. There are two parts to the inaccuracy: bias and variability. Variability refers to the normal uncertainty or fluctuation in the forecast. Bias refers to the tendency for the sales forecast to be either understated or overstated. You first need to address the reasons for bias and then plan for the variability.

In a positive economic environment, forecasts are typically understated. Conversely, when business is on the decline the tendency is to over-forecast. Why? The full reasons behind this are probably worth another article, but simply put, on the upturn, Sales feels it's better to under promise and over deliver, and on the downturn they are reluctant to present a real picture of what is going to happen.

The measurements and closed loop nature of S&OP will help you determine and address any forecast bias in your organization. As part of the process you should:

- a. Separate the bookings and shipments forecasts.

You can then assign responsibility of the bookings forecast to Sales. Shipments are the shared responsibility of Production and Sales.

- b. Assign accountability for the forecast.

c. Measure forecast accuracy. Compare the actual demand for a period with the forecasted demand. Establish tolerance levels for accuracy. If the forecast is out of tolerance you should address it in the next step.

d. Determine reasons for inaccuracy. Look at how the forecast is generated. Is it a specific region that is causing the problem? Is the historical information overstating the forecast?

e. Address the reasons for inaccuracy. Don't expect perfection. Remember an unbiased forecast is one where the variance is just as likely to be overstated as it is to be understated.

When a bias exists for a period of time, we start to second guess the forecast. Operations will base their operating plans on the discounted forecast, and when Sales sees an upturn in business, it is not believed. This may jeopardize the speed in which we respond to changes in demand. The bottom line is that it ends up costing us in expedites or lost sales as we scramble to catch up. Address the bias now to position your organization to respond proactively.

The future is uncertain. It always will be. The best way to face this is to be prepared. You can accomplish this by looking at your internal and external constraints (capacity, suppliers) and developing a good understanding across the organization of what these are. Use your S&OP process to improve your forecast and build trust across your organization. You can't control the future, but you can be ready for it.



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**Figure 1**

S&OP 5-Section Sheet

	CYE	YTD	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
<b>Section 1 - Bookings Plan</b>																		
Budget	5,790	400	400	400	400	400	400	500	400	400	500	440	440	550	440	440	440	440
Last S&OP	5,810	410	390	410	400	410	410	500	400	400	500	440	440	550	440	440	440	440
Current S&OP	5,970	460	440	440	450	460	430	540	420	430	500	440	440	550	440	440	440	440
<b>Section 2 - Shipment Plan</b>																		
Budget	5,790	400	400	400	400	400	400	500	400	400	500	440	440	550	440	440	440	440
Last S&OP	5,820	420	420	420	450	420	420	530	400	400	500	440	400	550	440	440	440	440
Current S&OP	5,990	410	430	410	450	410	420	520	420	440	540	470	460	550	440	440	440	440
Current Backlog Spread						30	150	20										
<b>Section 3 - Backlog Plan</b>																		
Last S&OP			100	110	100	140	130	100	100	100	100	100	140	140	140	140	140	140
Current S&OP			120	150	150	200	210	230	230	220	180	150	130	130	130	130	130	130
<b>Section 4 - Production Plan</b>																		
Budget	5,790	400	400	400	400	400	400	500	400	400	500	440	440	550	440	440	440	440
Last S&OP	5,850	400	400	420	430	400	420	520	410	410	520	450	410	550	440	440	440	440
Current S&OP	6,045	410	400	440	420	410	425	540	440	440	550	460	470	560	430	440	440	440
<b>Section 5 - Inventory Plan</b>																		
Budget	100		100	100	100	100	100	100	100	100	110	110	110	110	110	110	110	110
Last S&OP			100	100	80	60	60	50	60	70	90	100	110	110	110	110	110	110
Current S&OP			50	80	50	50	55	75	95	95	105	95	105	115	105	105	105	105

**Figure 2**

	Dec	Jan
<b>Section 1 - Bookings Plan</b>		
Last S&OP	400	410
Current S&OP	450	460
<b>Section 2 - Shipment Plan</b>		
Last S&OP	450	420
Current S&OP	450	410
<b>Section 3 - Backlog Plan</b>		
Last S&OP	100	140
Current S&OP	150	200

**Figure 3**

	Jan
<b>Section 1 - Bookings Plan</b>	
Budget	400
Last S&OP	410
Current S&OP	460
<b>Section 2 - Shipment Plan</b>	
Budget	400
Last S&OP	420
Current S&OP	410
<b>Section 3 - Backlog Plan</b>	
Last S&OP	140
Current S&OP	200
<b>Section 4 - Production Plan</b>	
Budget	400
Last S&OP	400
Current S&OP	410
<b>Section 5 - Inventory Plan</b>	
Budget	100
Last S&OP	60
Current S&OP	50