Is Your S&OP Supply Plan Synchronized with the Master Schedule?

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If you follow our newsletter and have read our writing on the 5-Section Sheet, you will know that it is at the core of our S&OP implementation. It helps leave us with a simple equation. If we can arrive at our booking and shipment volumes, we can then analyze the backlog and inventory to produce an S&OP Supply Plan.

Think of the S&OP Supply Plan as a gift to the Master Scheduler. It's a clear and concise statement of planned volume for a family. It is essentially saying, "Here is the Supply Plan, we all agree, now go build it!". It can't get any better than that.

The alternative is having information coming in from several sources. This can bring a level of uncertainty, and with the Master Scheduler juggling the inputs, problems can arise if it's not done right. While the S&OP Supply Plan states the volume, it does not determine the mix. The mix question is left to be worked out in the details of the Master Schedule.

The S&OP Supply Plan shown in the 5 Section Sheet is a clear statement of the mission. The Master Scheduler can see the objective clearly, and they can set up the build plan to match the volume. This doesn't mean that the Operation will hit the desired output, but the volume is synchronized to the S&OP Supply Plan, and any variance to the plan will translate into meaningful feedback. For further review on the 5-Section Sheet click here.

5-Section Sheet

Family Name: Product X
Site Name: New York
S&OP Month: May
S&OP Fiscal Year: 2019
Current Configuration: Default

	Apr (M0)	May (M1)	Jun (M2)	Jul (M3)	Aug (M4)
Total Supply Plan					
Receiving Days	20	20	24	19	20
Capability		208	250	198	208
Apr 2019 S&OP Plan	0	0	0	0	0
May 2019 Current Plan	**100**	**100**	**150**	**175**	**200**
Supply Per Day	0	5	6	9	10

The gift - is having the volume decided. The goal is for the Master Schedule to drive the MRP system to the same set of numbers as the S&OP plan. In this way, one plan runs the business, a single source, and it's a plan that all the stakeholders have bought into. The Master Schedule then takes the S&OP Supply Plan at the family level and breaks it down to the specific SKU's that will be built (the mix) to hit the planned volume.

The Master Schedule is often referred to as the build plan for independent demand items. It's a blend of planned orders, work orders (schedules), purchase orders, and firm-planned orders for these independent demand items. The Master Schedule drives the MRP system and subsequently the Supply Chain. Again, the key is that the S&OP Supply Plan sets the flow rate, and the Master Schedule must run to this rate.

Matching flow rates is crucial because if they don't match, then the S&OP exercise is futile. In my years of experience, it is all too common to find that the Master Schedule bears no resemblance to the S&OP plan, and as a result, it undermines the S&OP objective. The underlying goal of DBM is to solve this problem.

Do you know if your S&OP Supply Plan is synchronized with the Master Schedule in your system?

The S&OP plan is presented in a monthly bucket, and so the first step is to establish a flow rate by day, and then convert it into weeks for the Master Schedule. If the two sets of numbers do not match, then synchronization is not present, and it must be fixed first before you can do any other Master Scheduling work.

How do you check if the two are synchronized?

Each S&OP period has a start and end date based on the S&OP calendar. In this example, we are using a 4-4-5 period structure, so the Master Schedule weeks match perfectly with the S&OP periods. If your operation uses a calendar period for S&OP, there is a bit more effort to deal with the overlap of Master Schedule weeks into multiple S&OP periods, but the same synchronization logic applies. The following diagram shows each Master Schedule week, alongside the S&OP periods for May and June.

MS Week	Sun	Mon	Tue	Wed	Thurs	Fri	Sat	S&OP Period
18	28	29	30	1	2	3	4	
19	5	6	7	8	9	10	11	May
20	12	13	14	15	16	17	18	
21	19	20	21	22	23	24	25	
22	26	27	28	29	30	31	1	
23	2	3	4	5	6	7	8	
24	9	10	11	12	13	14	15	June
25	16	17	18	19	20	21	22	
26	23	24	25	26	27	28	29	
27	30	1	2	3	4	5	6	

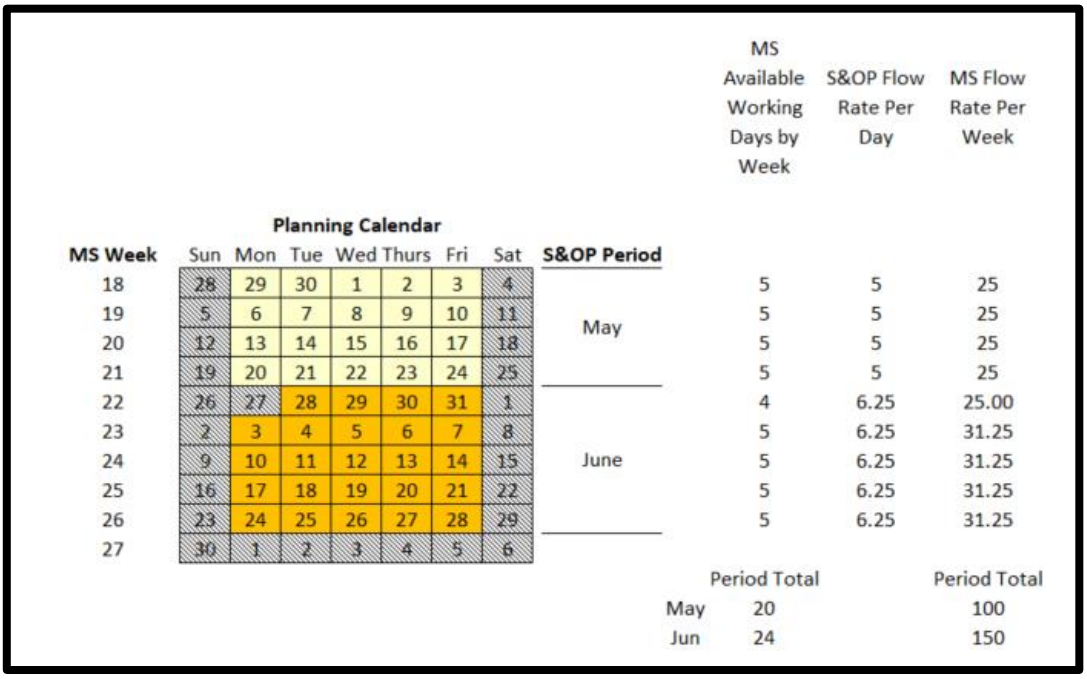
Start by identifying the working days for each week in the S&OP period. The total number for the S&OP period will match the sum of the weekly total for each Master Schedule week in the period. The objective is to match on the number of working days for both the S&OP and the Master Schedule.

1. **The next step is to calculate the S&OP Flow Rate Per Day**. This must be based on the available working days in the period.

	May	June
S&OP Supply Plan	100	150
S&OP Working Days	20	24
S&OP Flow Rate Per Day	5	6.25

Note: May 27 is Memorial Day, so it is not an available working day.

2. **Then multiply the Flow Rate Per Day against the number of Master Schedule days per week**. This needs to be done for each week of the S&OP period to arrive at the Master Schedule Flow Rate Per Week. Hitting a steady flow rate per day and week at the Master Schedule item level will smooth out the supply chain.



Planning Calendar

MS Week	Sun	Mon	Tue	Wed	Thurs	Fri	Sat	S&OP Period	MS Available Working Days by Week	S&OP Flow Rate Per Day	MS Flow Rate Per Week
18	28	29	30	1	2	3	4		5	5	25
19	5	6	7	8	9	10	11	May	5	5	25
20	12	13	14	15	16	17	18		5	5	25
21	19	20	21	22	23	24	25		5	5	25
22	26	27	28	29	30	31	1		4	6.25	25.00
23	2	3	4	5	6	7	8		5	6.25	31.25
24	9	10	11	12	13	14	15	June	5	6.25	31.25
25	16	17	18	19	20	21	22		5	6.25	31.25
26	23	24	25	26	27	28	29		5	6.25	31.25
27	30	1	2	3	4	5	6				

	Period Total	Period Total
May	20	100
Jun	24	150

3. **Compare the calculated Master Schedule Flow Rate Per Week against the *actual* Master Schedule in the ERP system**. To do this, it will be necessary to extract the various order types from MRP (typically the planned order file) for end-items in the family (by S&OP family code). Then sort by due date and sum up the quantity for each MS week.
    - **1st week will include the past due**. If past due is an issue, it may show a large overload in the first period, producing a front-end loaded Master Schedule. This is an issue that will need to be fixed.
    - **Consider weeks to be 7 days**. This will capture any orders that are scheduled on weekends.

- Each week has a start and end date to establish an extract.
- Ensure that the 1st and last MS week are split to correct S&OP period.
- Statutory holidays are normally not included in available days.

The Master Schedule must align to the S&OP Flow Rate. If the ERP system schedule matches weekly Master Schedule Rate for each week of the period, then you are in sync. If it does not, then you need to fix the Master Schedule to bring it into sync. Stay tuned, I will cover some techniques to do this in future articles.

Notes, not detailed in this article:

- *The items (SKU's) that form the family in S&OP must be the same items that formulate the Master Schedule and means to group these items in the ERP system for data extract requires a field or flag identified as a S&OP Family Code. Additionally, if you are using Planning BOM's then the Planning BOM Item is one of the items in the family.*
- *Some SKU's within a family may require greater capacity and will run to a different flow rate per week, but the calculation performed in this way will average out.*
- *This article is based on syncing S&OP in an MRP environment, but for other planning logic such as TPS or DDMRP, we would sync the S&OP to the Average Daily Usage (ADU).*