



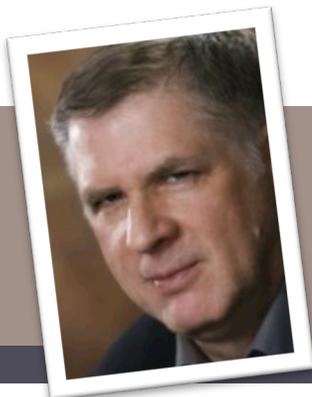
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President's Note:

I have seen great improvements from splitting normal and abnormal demand into separate demand streams and using the appropriate planning approach. This Journal topic is covered in my soon to be released S&OP book. Yes, the book is still on schedule to come out this year. Hope you enjoy the article.



Are 2 Demand Streams Better Than 1?

Do you have one set of demand numbers or one demand stream feeding your S&OP family? If you answered yes, then you are probably in the majority. However, to improve the quality of your demand planning and to get the most out of the "S" in S&OP, you usually have to split your demand plan into multiple demand streams. These demand streams may require different planning approaches and they will typically have different people responsible and accountable for them.

In this article, I am going to cover one of the common reasons to split demand into streams – separating abnormal and normal demand.

You may refer to normal demand as run rate demand, flow demand, regular demand, steady-state demand, MRO demand etc. This type of demand is typically forecasted or planned using historical data with a management adjustment.

Abnormal demand is the spikes in the demand that are driven by large orders. These spikes may be caused by large customer projects, opening of new distribution points in the outbound supply chain or large export orders. This type of demand is typically planned using an opportunity management tool or a CRM system.

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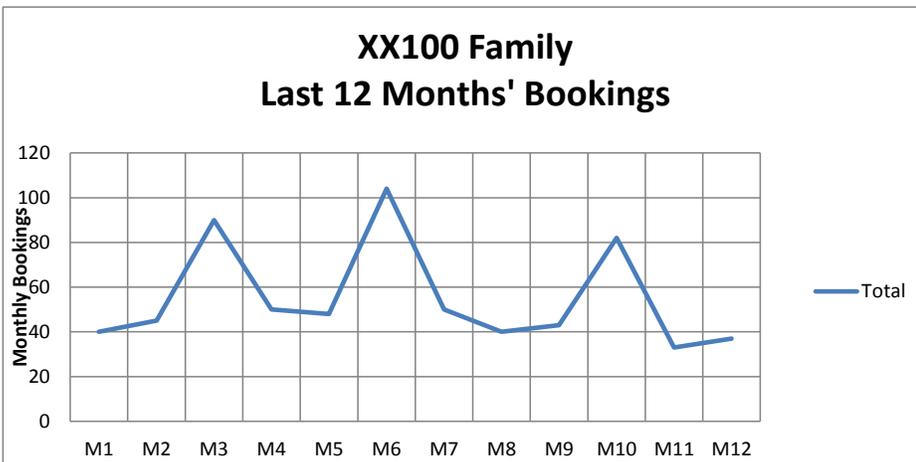
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Typical forecasting systems use historical data and then apply an algorithm to this data to project future demand. Over the years, a number of different algorithms have been developed and some forecasting tools will actually test multiple algorithms and then select the best one to project future demand.

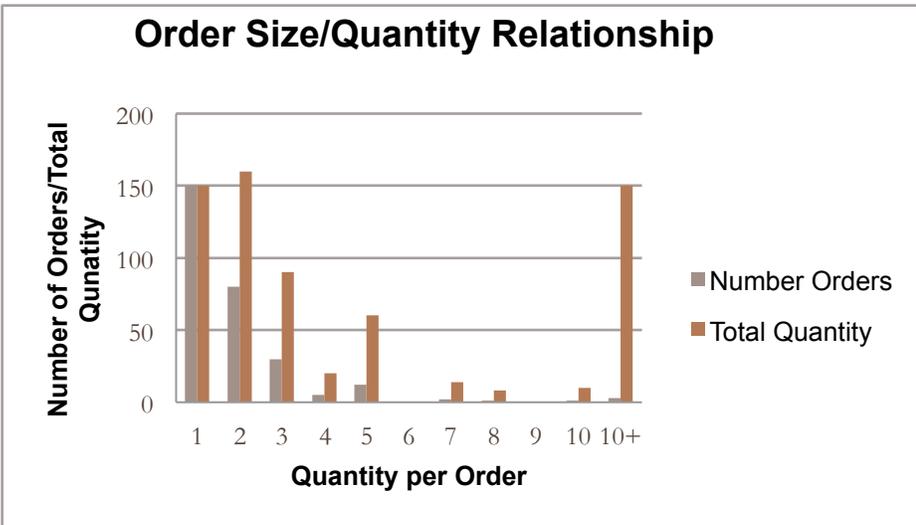
Some of the tools include filters that remove spikes or abnormal demand out of the historical data. This improves the future projections for the normal demand but it also assumes there will be no spikes in the future. These spikes need to be planned for but historical data is not very useful in this case. We need to track the opportunities and predict timing and win probability.

Splitting the family demand into these two demand streams, and then using the appropriate forecasting method for each may provide the best opportunity for improving the accuracy of your demand plans.

Look at the following historical booking data for a typical S&OP family:



In this case, the average bookings were 55 per month with a standard deviation of 23 units and a coefficient of variation of 42%. If you are not big on statistics, those numbers mean that the historical demand has a lot of variation from average. Sometimes, the best way to see this is just looking at the graph.



Now, what if we dig into the historical demand and look at the distribution of order size? This graph shows a breakdown of the orders booked for items in this family, showing the total quantity booked by different order sizes.

For above graph:

Order Size	1	2	3	4	5	6	7	8	9	10	10+	Total
Number Orders	150	80	30	5	12	0	2	1	0	1	3	284
Total Quantity	150	160	90	20	60	0	14	8	0	10	150	662
% of Quantity	23%	24%	14%	3%	9%	0%	2%	1%	0%	2%	23%	100%

This data shows that a large portion of the quantity booked was on orders for five units or less. It also shows that three orders that were larger than 10 units accounted for 23% of the bookings. Let's consider those three orders as abnormal demand and revisit the historical data after eliminating these orders.

With abnormal demand removed, the new average is 43 units a month with a standard deviation of five units and a coefficient of variation of 12%.

This is a much tighter distribution and probably a good indicator of future normal demand.

It is unlikely that the three large orders that totaled 150 units could have been predicted using history. The opportunities that resulted in these orders should have been tracked as opportunities and managed by the appropriate people in Sales. In fact, they probably would have had to manage more than three opportunities, as it is unusual to win them all. The following diagram is a simple example of an opportunity management tool:

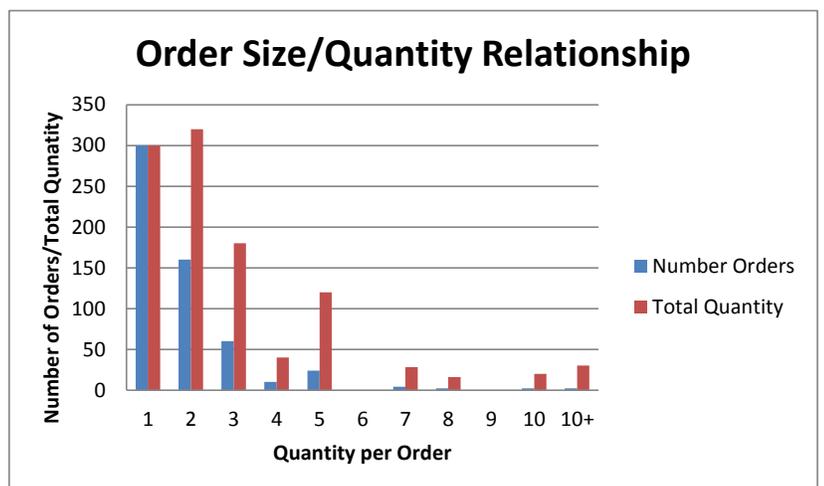
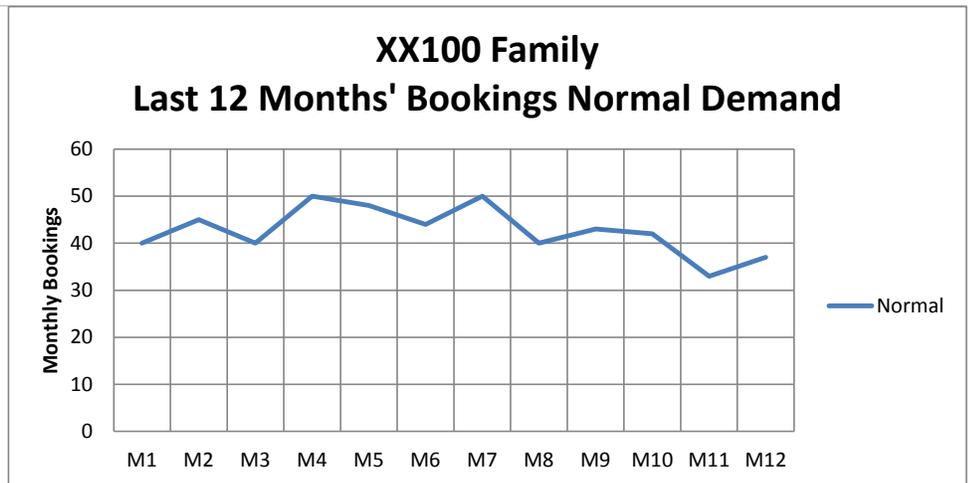
CRM Opportunity Number	Opportunity Description	Opportunity Status	Family - Demand Stream	Sales Person	Quantity	Sales Win Probability	S&OP Probability	Booking Period	Booking Year	Shipping Period	Shipping Year
A1	BTO - Cleveland	open	MX-35	Mandino	5	80%	100%	Dec	2014	Feb	2015
A2	Acme - Houston	open	MX-36	Hopkins	30	50%	0%	Jan	2015	Mar	2015
B3	BTO - NY	open	MX-37	Hopkins	8	70%	100%	Dec	2014	Mar	2016
B5	Allee - France	lost	MX-38	Richard	4	50%	0%	Nov	2014	Dec	2015
J2	Edmonton - CND	won	MX-39	Hoser	10	50%	100%	Nov	2014	Jan	2015

There is a lot more to opportunity tracking than shown on this sheet but that's a topic for another article. For demand planning, the objective is to boil this data down into a sensible demand plan. With experience, you will learn how to manage the opportunities and the probabilities and summarize the data into a booking and shipment plan.

Let's assume you accept the premise that there may be value in splitting normal and abnormal demand into two separate demand streams. So, where do you start?

Step 1: Analyze Your Historical Order Size

Go through the last year or two of bookings for the family and analyze the total quantity booked for different order sizes. If you get a graph looking like the first Order Size/Quantity Relationship one, you have abnormal demand. In this case, decide what order size represents abnormal demand and plan on having two demand streams. The graph on the right shows a family that does not have abnormal demand. In this case, you would probably not set up a separate demand stream for abnormal demand or implement an opportunity tracking process.



Step 2: Develop the Planning Process for Normal Demand

If Step 1 indicated that there was abnormal demand, the next step would be to filter this abnormal demand from the historical data. This filtered data would be the input to your history-based forecasting algorithm or tool. As part of your demand planning process you should be prepared to apply a management override to the results, as there are things the algorithm will not consider. Some of these things are market conditions like the price of oil, for example. Other examples are demand shaping events, promotions and price increases. The person accountable for this demand stream should make the call on this adjustment.

Step 3: Implement an Opportunity Tracking Process for Abnormal Demand

You only want to track abnormal demand in this process. These would be opportunities greater than the threshold you set in Step 1. If you track smaller opportunities, you will be double planning some of the demand, as these small opportunities are covered in the normal demand stream. If the threshold is too small, you will have a lot of opportunities to track.

Step 4: Assign Responsibility and Accountability for Each of the Demand Streams

Remember from your RACI training, the responsible person does the work and the accountable person signs off on it. The responsibility of preparing the data usually belongs with a demand planner but the accountability belongs with Sales. This is where the rubber meets the road for the “S” in S&OP. Obviously, you will need to measure results by demand stream in order to manage the responsibilities and accountabilities.

If you suspect that abnormal demand is impacting your demand planning process I encourage you to go through this exercise for one of your S&OP families. As always, feel free to contact me if you have any questions or want to discuss any of the points in this article at dmcleod@dbmsys.com.