How Jarden Branded Consumables Made Forecasting Simpler & Better Through Executive S&OP

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INTRODUCTION

The previous column ("S&OP: Simpler, Better, and Needed More than Ever," *Foresight* Issue 14, Summer 2009) laid the foundation for understanding the executive component of S&OP. Now we spotlight a case study of the demand side of the equation – forecasting – that shows how Executive S&OP facilitated significant improvements in the generation and use of sales-volume forecasts.

The case study features the Fresh Preserving Division of Jarden Branded Consumables, headquartered in Daleville, Indiana. This division manufactures and distributes jars, closures, and ancillary equipment for the home food-preserving market, through retail and mass merchandising outlets and chains. The nature of their demand is highly seasonal: they ship 87% of their annual volume in the months from March to September.

THE ORIGINAL WAY

In the second half of 2008, Jarden's Fresh Preserving Division (JFP) saw a dramatic and unexpected jump in sales. At that time, they were using a forecasting method, primarily historically based, that failed to predict the huge increase in business, which averaged 50% greater than any previous year. With such an unforeseen increase in demand, JFP did not have the immediate capacity to support the higher shipping levels required. This not only resulted in a number of cus-

tomer service issues, as you would expect, but Jarden Branded Consumables was also unable to capture potential sales during a time when most other businesses were fighting off the impacts of a broadening global recession.

The source of the problem was a forecasting process that had the following characteristics:

1. **High Level of Detail** – The forecast was managed at the individual SKU/ customer level for each month of the planning horizon, which resulted in an unmanageable number of data points (over 36,000)

2. **Heavily Based on Customer History** – The forecast was based on historical shipments by customer and then modified by the sales team based on customer specific changes (i.e. store counts, changes within the seasonal sets, etc.). This limited the process so that nothing could be predicted that was inconsistent with historical volumes, or beyond the customer's sight.

3. **Myopia** – Because the judgment part of the forecast was based almost entirely on customer-driven inputs that were dependent on an inconsistent and largely anecdotal understanding of the market drivers, these inputs represented only part of the demand picture (a particular customer within a particular channel).

Key Points

Through a mini-case-study, this column will demonstrate how Executive S&OP helped:

1. Make forecasts simpler and better- Simple things work and complex things get talked about. The ultimate sophistication is simplicity!

2. Keep the forecasters looking forward- While the process is always rooted in history, a key to successful forecasting is to tie the modeling to extrinsic/external inputs that are about the future.

3. Upgrade the forecasting process- Forecasting is a process, just like any other; it has inputs and outputs. Once established, cross-functional participation is required and provides for better decision making.

4. Promote conflict resolution- Because the process and its forecast are fact based, disagreement can happen without the participants being disagreeable.

The result was a forecast that was taking too long to develop because of the mass of detail, and then was providing poor results to boot. Revising the forecast and performing alternative demand scenarios through the supply chain was also too time consuming. The company had a *perception of precision*, thinking that maximum detail would yield an accurate forecast and lead to better planning. It simply wasn't so!

Encouraged by Phil Dolci, group president, who had experienced authentic Executive S&OP at his previous employer, JFP began an Executive S&OP implementation in the fall of 2008. By the spring of 2009, with their new approach to forecasting and planning, sales and marketing needed to forecast only total jars – *one item*. What made this all possible was the use of reasonable "simplifying data assumptions" about mix detail, allowing them to do Rough Cut Resource Planning, and inventory and financial projections, directly from the "market-facing" family. This forecast for a single item (instead of 36,000 data points) was tied to extrinsic forward-looking indicators about their market, which could see beyond their customers. This new approach is far more accurate, in what has become an even more highly volatile market place in 2009. In fact, the error at the volume level was reduced by 50% within the first 90 days of implementing this new approach.

How'd JFP develop such a simple forecasting method and still do resource planning as well as make inventory and financial projections? Stay tuned . . . in the rest of this column we will describe exactly how JFP did that with their new approach to forecasting.

SIMPLIFYING THE UNIT OF MEASUREMENT

The first hurdle to jump was to establish a unit of measure that would equalize the SKU count. This can be a simple task in some businesses when all SKU's are for a count of one. For a consumer-packaged goods company, however, equalizing the SKU count requires some thought. That's because a given SKU could be for a count of one, three, six, twelve, or more units of product. For example, if the following shipments were made, the number of units shipped could be considerably different than the number of SKU's shipped. This simple technique eliminates the distorting effect of SKU mix change on volume count over time.

SKU #	Cases Shipped	Units per Case	Units Shipped	Equalized Cases
SKU-1	50	3	150	$150/12 = 12.5$
SKU-2	100	6	600	$600/12 = 50$
SKU-3	80	12	960	$960/12 = 80$
Totals	230		1710	142.5

The result of equalizing the unit of measure switched on a huge light for the JFP people. They could now see demand and supply in equalized terms from history all the way through the planning horizon. It was such a simple change . . . but something that JFP had not done from a demand perspective.

As JFP found out, this equalized unit of measure is important for several reasons:

1. It allows volume family forecasts (without detail) to be consistent with family history, regardless of SKU mix and count per SKU.
2   It allows for accurate regression analysis using demand history in determining key trends and patterns in correlation to extrinsic data – very important to the new approach.
3. It allows volume family forecasts to be more accurately converted to
    a. Resource requirements (hours, run rates, cubic feet of space, etc.) and
    b. Inventory and revenue projections.

More specifically, the discussion at JFP led them to a unit of measure called "equalized cases." An equalized case is the equivalent of twelve jars: For example an SKU containing six jars would convert to 0.5 equalized cases, and an SKU containing twelve jars would convert to 1.0 equalized case. In the table above, the number of equalized cases is shown in the final column.

With this convention, all data for demand, supply, inventory, and backlog are now expressed in this unit of measure – both for history and for forecasts. Because history is tracked by SKU, that history had to be converted and stored in an "equalized case" unit of measure – a data-processing activity. Once that was done, they could turn their attention to establishing proper market-facing families in order to see trends and patterns.

MARKET-FACING FAMILIES

Grouping products into families is not a new subject for most companies. It may have been done before in a company for financial reasons and/or manufacturing flow (lean, value stream) reasons. In implementing Executive S&OP, it's a mistake to use what had been previously established without considering forecastability. First and foremost, the family definitions used by Executive S&OP must allow sales and marketing to forecast with reasoned and reasonable results. This means that the family groupings must be made to correlate with market leading indicators, extrinsic to the company, its customers, and the biases they may hold. We call these "market-facing families."

The challenge for the JFP organization was to take their significant, largely anecdotal understanding of their market drivers and turn that understanding into quantifiable inputs to their 24-month rolling family forecast. These quantifiable correlations would need to be monitored and refined over time.

Among those market drivers considered were:

- Geography
- Unemployment Levels
- Gross Domestic Product (GDP)
- Weather
- Consumer Confidence Index (CCI)
- Distribution Channels
- Major Customers
- Promotion
- Crop (corn, tomatoes, etc.)
- Brand Trends and Patterns
- Among others

While this task seemed fairly straightforward, the JFP people found it to be counter-intuitive. They were hampered by their not-so-unusual need for detail and its

resulting *perception of precision.* They had been working with more than 36,000 data points for the planning horizon; this new approach involved one item for each of the 24 months of rolling horizon. Even so, as time passed, it became obvious that although very different, the new approach would be unarguably better.

Led by the division's General Manager, Chris Scherzinger, JFP overcame this obstacle and decided that the following four leading indicators would be a good place to start:

- Consumer Confidence Index (CCI)
- Weather
- Distribution
- Promotion Plans

The decision to use these four indicators was backed by statistical analysis of the relationship between equalized case units and prospective indicators. The result of tying in all four factors in a 4-way regression analysis was an overall correlation (R-square) of nearly 80%, enabling JFP to tie its volume family forecasts to the leading indicators.

The next challenge was to determine to which market-facing families of products these leading indicators would be applied. Initially, the thinking was to group by jar and closure size – quart, pint, 4-oz, wide mouthed (W/M), regular mouthed (Reg.) – by region and by brand. In other words, forecast as follows for each region and brand, by month:

Market Regions

Size	#1	#2	#3	#4
W/M Qt.				
Reg. Qt.				
W/M Pt.				
Reg. Pt.				
W/M 4-Oz.				
Reg. 4-Oz.				

This would have given them 24 sub-families by region (6 sizes for 4 regions) for each brand over a 24-month rolling horizon. Workable, but still more complicated than it eventually became. Through additional data analysis, some very important simplifying characteristics were identified:

- Regional weather variability was offsetting – if one was bad, another was good.

- The mix of jar size (qts., pts., 4-oz.) was highly predictable.

- The mix of mouth size (wide mouthed/regular mouthed) was also highly predictable.

- The seasonal spread of volume over the 12-month year was closely tied to known variability factors.

What the process gained by employing these assumptions is extreme simplification – forecast only total jars and calculate the balance of the mix information necessary for supplier, operations, and financial planning based on reasonable and documented assumptions. This breakthrough saved a boatload of time and got the sales and marketing people seeing the forest and not just the trees – always a risk when dealing with the potential bias of the customer's point of view only.

SIMPLIFYING DATA ASSUMPTIONS

How does one develop and monitor these important simplifying assumptions?

The purpose of forecasting is to properly anticipate the future so that you can prepare for it or adjust to it while you still have time. As we've noted, the families that are used to forecast must be market-facing families. Resources requirements and financial projections cannot always be directly derived from those market-facing family projections because of mix variety. When this is the case, simplifying data assumptions are used regarding the mix of individual products within a market-facing family, based on actual sales history.

For example, a simplifying data assumption derived from an examination of sales history might be that in a typical month the sales mix for market Family A is:

50% in SKU A-1 (average selling price of $100) = $50
40% in SKU A-2 (average selling price of $150) = $60
10% of SKU A-3 (average selling price of $180) =$18

      Weighted average selling price   =$128

Therefore, if the forecast for Family A six months from now is for 10,000 units, that converts to a projected sales revenue of $1,280,000 (10,000 times $128 each). Even though the data assumption has variability, this is a far more accurate way to project revenue than from the mass of detail by SKU by customer, and so on, that had brought JFP such poor results.

What if the sales mix changes or has variability? Couldn't one get badly fooled by using simplifying assumptions that are out of date? Absolutely – which raises the need for routinely validating these numbers and changing them as the mix changes. Traditional Six Sigma control charts are used for that purpose.

Control Chart for Size A
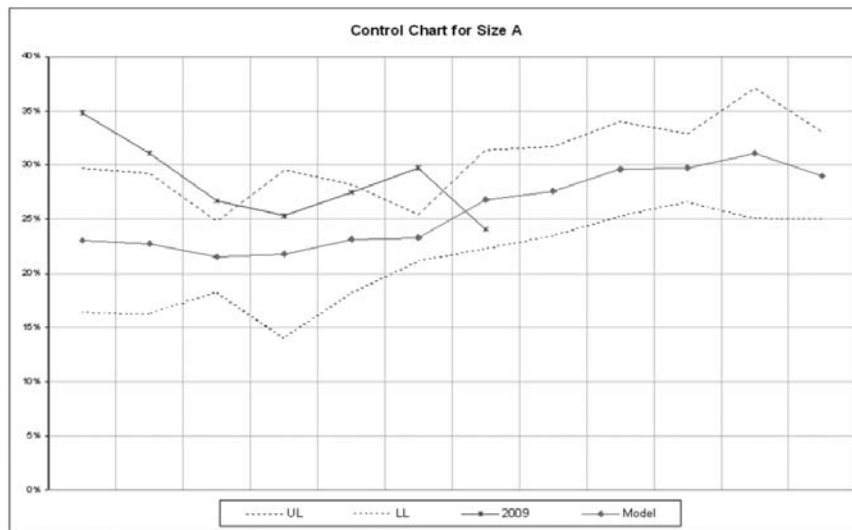
JFP's ability to use such a simple demand model (total jars) and still provide for the critical capacity and material planning required incorporating many simplifying assumptions. Among them are:

Simplifying Data Conversion Assumptions
Mix of Jar size – Qt, Pt, 4 Oz.
Mix of Mouth size – W/M, Reg.
Volume of glass per jar – lbs.
Volume of tin plate per closure – lbs.
Mix of Mouth size for individual lids
Average unit selling price
And more

Let's take a closer look at how JFP determines, uses, and maintains their simplifying data assumptions; our example is the conversion from a "total-jar" forecast to how many will be a particular mouth size (Mouth Size A). This is essential information for the supply team to calculate rough-cut capacity requirements on their manufacturing line from the market-facing family.

The control chart displayed has the following three data sets:

- A 12-month line representing the model, derived from five years of history.
- A dotted line representing the upper and lower control limits (UCL/LCL), showing the range of statistical variability with a 96% confidence level.
- 2009 YTD actual percentage for orders shipped.

This data helps to determine a conversion ratio to calculate the total volume for a particular size from the total jar forecast. This volume, in part, establishes a viable production plan that meets two criteria:

1. It's within their capacity constraints for production of mouth Size A jars.
2. It meets their financial inventory constraints of cash-flow and working capital budgets.

The control chart indicates that the YTD actuals have been out of the control limits. In the past, under the old system, this would have been all but invisible, bur-

Size A Capacity
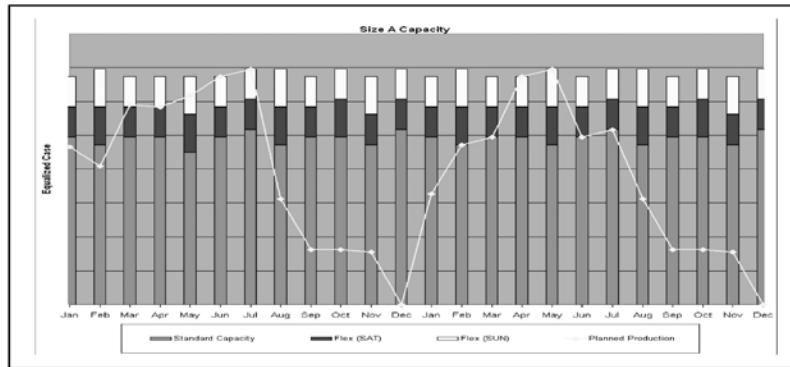
ied under 36,000 points of data – again, not seeing the forest for the trees. With this new simplified approach, JFP can now see what's happening with regard to mouth-size mix, as well as model different scenarios to measure their consequences on resources and plan accordingly.

The following chart represents the production plan that supports the forecasted demand compared to available capacity. The bars represent the capacity for a five, six-, and seven-day operation. The line indicates the production plan in support of the forecast. As you can see, they must operate at peak capacity during the busy season, far less so at other times of the year.

Similarly, this can be done for outside suppliers. The demand for glass, for example, based on the average glass per jar, can be derived from the same production plan. This is shown in the next chart as a line, easily compared with the bars representing the current arrangements with their glass supplier(s).

BENEFITS

Let's take a look at some of the specific benefits that are the result of this new approach to forecasting:

- It does not disregard the expertise/experience of either the sales or marketing people; rather, it focuses and channels their experience in meaningful ways.
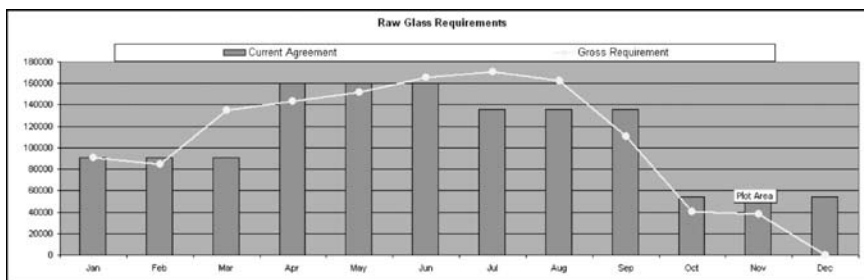
- It allows conversion of important, extrinsic market drivers into quantifiable forecasting inputs that can be monitored and refined, giving marketing a real seat at the demand table.

- Unlike before, the sales and marketing people have full confidence that the supply and finance people are working with one agreed-upon demand number, and that demand number is known to everyone.

- It allows and supports easy and rapid scenario analysis that deals with the risks and consequences of various alternatives. Scenario work that used to take 30+ hours can now be done in a matter of minutes; this enables leadership to be proactive, not just reactive to painful problems thrust upon their plates.

The effective implementation of Executive S&OP at JFP has created a foundation for their ongoing success. Leadership conversation has become much more strategic where before it had been tactical – the company is taking charge of its own destiny, rather than being a victim of circumstance. For another example, they are now testing various inventory-build scenarios against their working-capital (cash-flow) budgets and risks, making sure that their actions match the financial expectations of their corporation. Phil Dolci says, "Before we were utilizing Executive S&OP, we were in constant reactive mode. Now we make informed deci-

Raw Glass Requirements

sions that allow us to proactively manage our business with much better service despite lower inventory levels."

Keep in mind that the simplification on the demand (forecasting) side of the business is made possible because we have developed a way to validly express the impact of market-facing family projections into valid resource and financial terms. The sales and marketing forecast is now driving actions on the supply (inside and outside) and financial ends of the business, running alternative scenarios, and anticipating problems before they happen. While the hard benefits are clearly present and on the increase, the soft benefits of moving the energy of employees into alignment are what make things really click. Chris Sherzinger, JFP's General Manager, has said, "We had a significant win right out of the gate, just by getting all the cross-functional

team members in a room hashing out the details on a regular basis, with fact-based analyses and a focus on real quantifiable business drivers. The further progress since then has been gravy."

The success of this effort at Jarden's Fresh Preserving Division has generated a level of enthusiasm that is causing Executive S&OP to be implemented in all other divisions of the Branded Consumable group of businesses.

STAY TUNED

Next issue, we will go into more detail concerning how this works on the supply and financial side of the business, as we look at a company from the oil patch industry that makes seamless pipe for drilling operations. They are profitably operating a steel-mill operation right here in North America – Youngstown, Ohio – and are serving a world-wide market. See you then.

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Bio. Bob Stahl has spent 30 plus years as a practitioner and consultant to manufacturing companies, developing leading-edge processes for their manufacturing, logistics, and supply chain practices. He is a teacher, writer, and S&OP coach and has co-authored six books, including *Sales & Operations Planning: The How To Handbook, 3rd Edition*, and *Sales & Operations Planning: The Executive's Guide*. Three of his books are used for professional certification.

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