S&OP and the Financial Plan

Contribution, Fixed Cost and Profit

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In this, the second article in the "**S&OP and the Financial Plan**" Series, I will review the relationship between Revenue, Variable Costs, Fixed Costs and Contribution and show how combining the S&OP plan with this data gives us the tools to synchronize our financial projections with the S&OP plan. This is not a "Supply Chain" article and I would appreciate you sharing it with your financial associates and have them forward their feedback to me on LinkedIn.

The difference between revenue and profit is cost, but what costs? The key points I want to cover in this article regarding costs and S&OP include:

- **Unit Costs (standard cost, average cost or any other fully loaded cost applied to a specific SKU) are misleading.**
- **Costs should be classified as Variable and Fixed Costs, where Variable costs can be directly linked to the SKU, but fixed costs cannot.**
- **Volume can vary within a range (the Relevant Range) for a given level of fixed cost**
- **All Fixed costs are variable. The question is when.**
- **With S&OP we can address the timing required to change fixed costs and address the impact of volume. Without this it is very difficult to understand the impact of Fixed Costs on profit.**

In this article I hope to show you that linking Cost to S&OP is an excellent way to project future profit. But before we can understand how to link costs to S&OP, we need to dig a bit deeper into what makes up cost and what needs to be considered as we look at costs and their impact on profitability.

Traditionally, in the manufacturing environment, cost was looked at as the sum of the: Material, Labour and Overhead costs associated with producing the product. The material cost was based on the cost of procuring the materials, the labour cost was calculated based on standard production times and labour rates and the overhead costs were applied to the product based on a cost driver, typically direct labour as it was arithmetically the easiest. The relationship between the Overhead Costs (primarily fixed) and the driver is sensitive to volume and is usually set once per year based on a budgeted volume.

The result of this exercise was a "Unit Cost" (often referred to as the standard or average cost). Differences between earned costs and actual expenditures were charged to variance accounts and operations typically had to explain unfavorable variances. These variances were not predictable and had a significant "Surprise" impact on Profit. Sound familiar?

This costing approach provided misleading information, sub-optimal metrics and resulted in some poor decisions. In my early days in manufacturing I became an expert at manipulating the cost system to make my numbers look good. While I may have looked good,

this wasn't in the best interest of the business – but you get the performance that you measure for, don't you? I am not going to cover the issues with unit cost in this article, but they are well addressed by Debra Smith and Chad Smith in their book "Demand Driven Performance – Using Smart Metrics"

Standard or Unit Cost is not linked to volume. The name "Unit Cost" implies this is the cost of a unit and clearly suggests that volume is not a factor. However, if you dig deeper in the product costing system you are likely to find that a large portion of the "Unit Cost" is really based on an allocation of Fixed Costs.

Before we go any further, we need to understand some terms: Variable Cost, Fixed Cost, Relevant Range and Contribution Margin.

A **variable cost** is directly related to rises and falls in volume. Volume is the only cost driver for variable costs. The variable cost per unit does not change with the volume of units produced. The cost of material is a classic example of a variable cost. We can track variable cost at the Family/Site level in S&OP. Labour on the other hand is probably not variable, but that's a topic for a future article.

A **fixed cost** is a cost that remains constant regardless of changes in volume. If you produce twice as many units, the fixed cost per unit is cut in half. The fixed cost per unit is a function of the total fixed cost and the volume of units produced. Property taxes on a building would be an example of a fixed cost. Fixed costs are typically not directly linked to specific SKUs, but more commonly driven at the "Site Level". The same facility could make many different product families using the same fixed cost elements. Allocating these fixed costs to specific SKUs just doesn't make sense.

Contribution Margin is the difference between revenue and variable cost. This is different than Gross Margin, which is the difference between revenue and unit cost, where the unit cost includes variable cost and allocated fixed costs. Because it is valid to calculate revenue and variable cost at the unit level, it is also valid to calculate contribution margin at the unit level. Gross margin at the unit level is misleading as it does not account for volume fluctuation and the use of erroneous cost drivers.

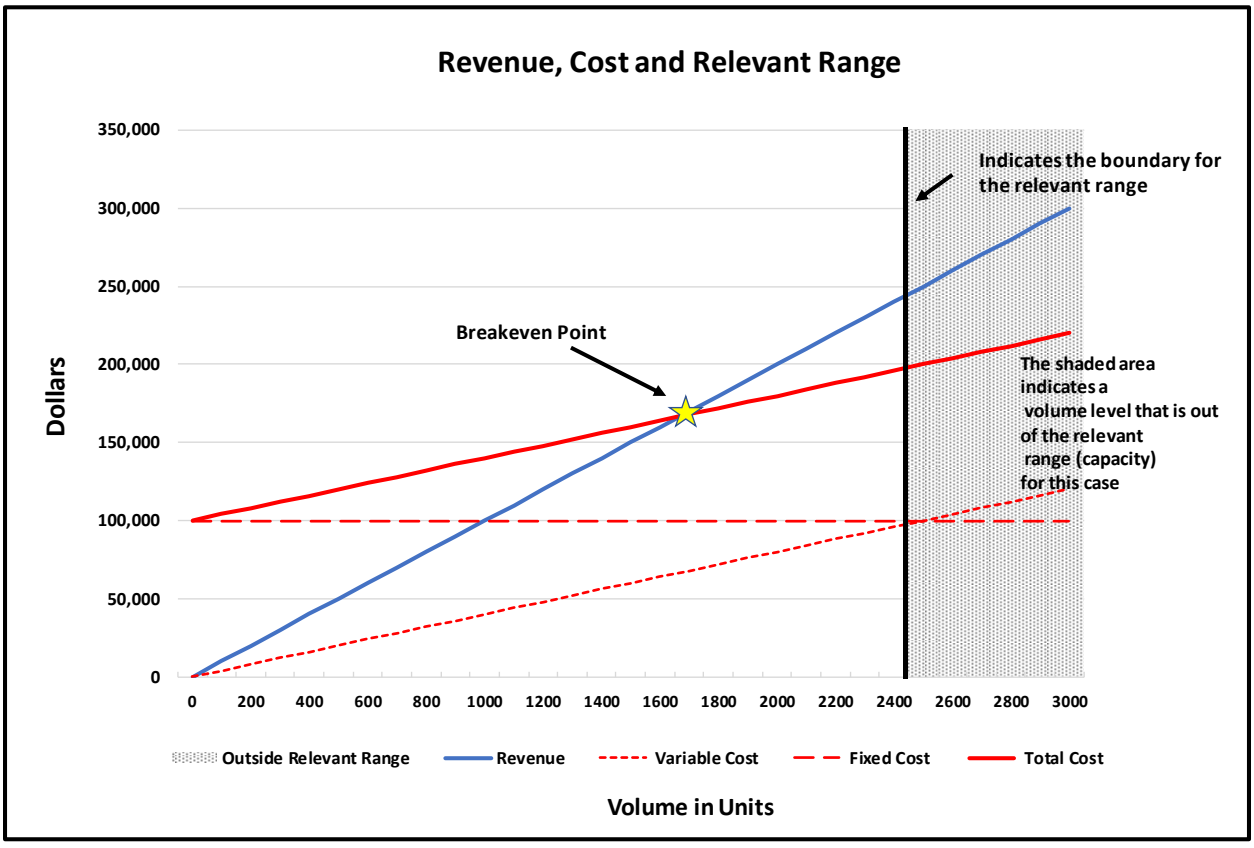
Relevant Range, this next definition is taken directly from Debra and Chad's book.

> *"The **Relevant Range** is the range of activity within which the assumptions about variable and fixed costs are valid. It is also associated with time. The timeframe of the relevant range of volume is determined by the time it will take to step into or out of a fixed cost."*

Looking at the following diagram the following points apply:

1. **The revenue and the variable costs increase linearly with volume.** The difference between the revenue line and the variable line is the total contribution to fixed cost and profit.
2. **The fixed cost line is constant.**
3. **The total cost line has the same slope as the variable cost line but starts at the fixed cost line.**
4. **The Break-even is the point where the Revenue Line crosses the total cost line.** You don't start making profit until you cross the break-even point.

5. **The Relevant Range line represents the maximum output that can be achieved based on the current capability.** Beyond this this point the Fixed Cost and volume assumptions are longer valid and the model does not apply.



For many of you this pre-amble was just a rehash of the costing fundamentals you already understand. However, it was necessary to review this before explaining how S&OP brings in the missing elements needed to project profit.

The problem with models like the one shown above is that they are static. By linking this model to S&OP we can see, by month for future months the impact of volume, fixed cost changes and capability changes, which gives us the ability to project contribution and profit by future month and update the model in the monthly S&OP cycle.

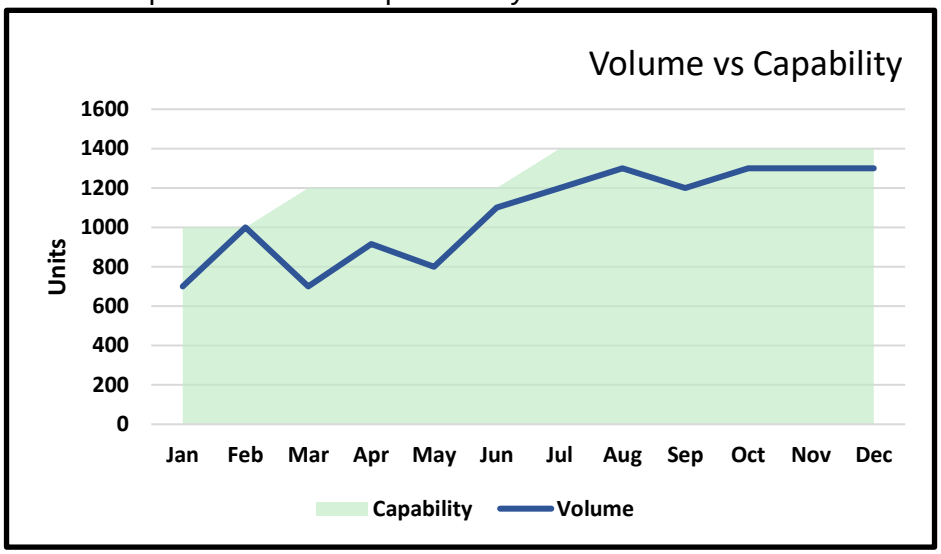
S&OP provides the missing data required:

- **Future volume levels.** The S&OP volumes can be directly converted to Revenue and Variable cost at the family level. With this data we can recalculate the contribution margin by family every S&OP cycle.
- **The Relevant Range**. The Supply Plan capability defined for future months sets the maximum output for the family. Think of this as the Relevant Range by family by month. The volume can not exceed the capability or top of the relevant range.
- **Timing for future fixed cost changes**. The capability for future periods can be changed during the S&OP cycle if there are plans to increase or decrease the capability. These

planned increases or decreases in capability will be directly linked to changes in the total fixed cost for the future periods and must be planned well in advance of the period. S&OP is the forum for changing future capabilities.

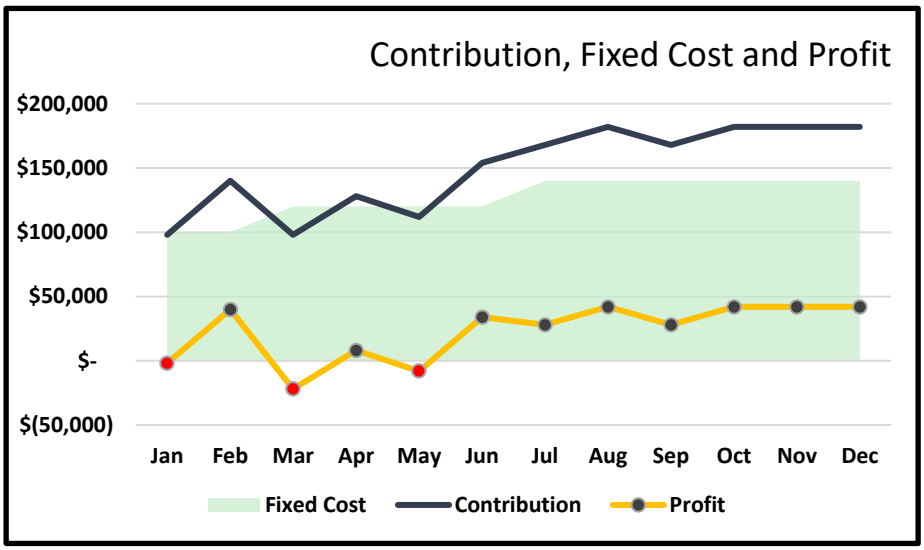
With S&OP we can take the static cost model, apply it to the plan by month and get a realistic projection of contribution and profit. The following two graphs show the relationship between the S&OP plan and the Contribution Fixed Cost and Profit Plan.

S&OP units with volume and capability and the resulting Contribution, Fixed Cost and Profit. This S&OP model has a monthly presentation of the fixed cost model, thus providing insight into the impact of the S&OP plan on future profits. This is a powerful view showing the real impact of the S&OP plan on the future profitability of the site.



The graph to the left, shows the available Capability of the site (the shaded area) compared to the S&OP volume plan moving forward (blue line). The Capability had a direct relationship to the Relevant Range for Fixed Costs. The Volume Plan will directly relate to Revenue, Variable Cost and Contribution. Notice that the plan is to increase Capability in future months. This increase will come at a cost and that cost will be an increase in Fixed Costs.

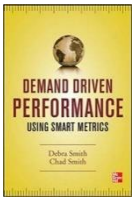
At right, the graph shows the fixed cost, contribution, and subsequent profit resulting from the S&OP plan.



Hopefully you can see where I am going with the financial linkages to S&OP. If you do this right, S&OP will become the driver for financial planning within your organization. The model is simplistic and in future articles I intend to flush it out. Some of the issues we need to explore include:

- **What costs are Variable and what costs are Fixed?** Be prepared for some surprises here.
- **How do we find the Variable and Fixed costs in the ERP system?** What view of lower level costs should be used to determine the correct variable and fixed costs at the end item level?
- **How do we determine future capability and fixed cost changes?**
- **What should the presentation look like?** Hint here – it does not look like a 5-Section Sheet!
- **What costs should be inventoried and what costs should be expensed.**

Lots to cover but we are on our way to building a strong financial model. As I mentioned at the beginning of the article, I would really appreciate feedback from your financial associates. Chances are that I will barbeque a few sacred cows in this series and I look forward to some controversy along the way.



To read further, or to gain a better understanding of the material referenced from Deborah and Chad Smith's "Demand Driven Performance- Using Smart Metrics", follow the link in the image to purchase the book on Amazon.

For more information on Duncan's S&OP philosophy, strategies, and implementation, read his book, "Sales and Operations Planning - How to Run a Process Everyone Understands". Head to Amazon.ca or Amazon.com by clicking the image to pick up a copy.