Precisely Wrong Numbers & Approximately Right Ranges

Why the Demand Driven Adaptive Enterprise Model Solves a VERY BIG Problem for Supply Chains

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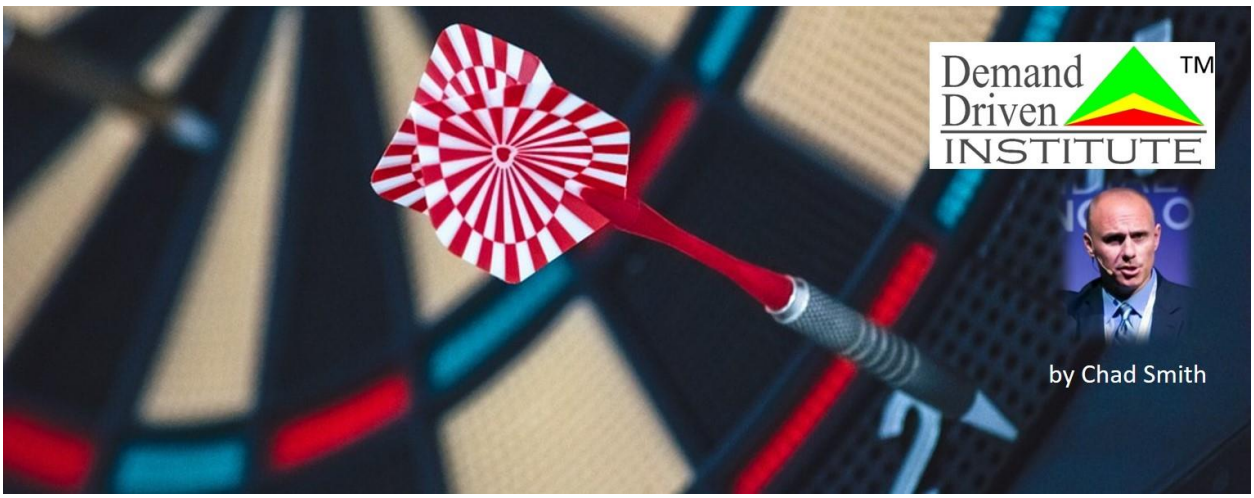
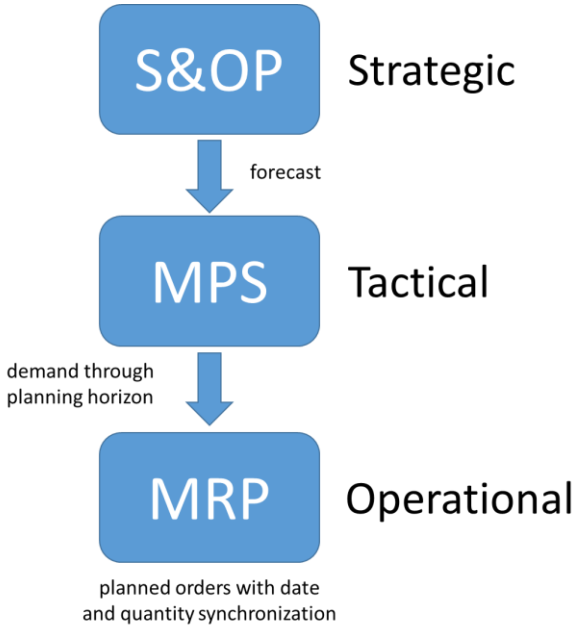


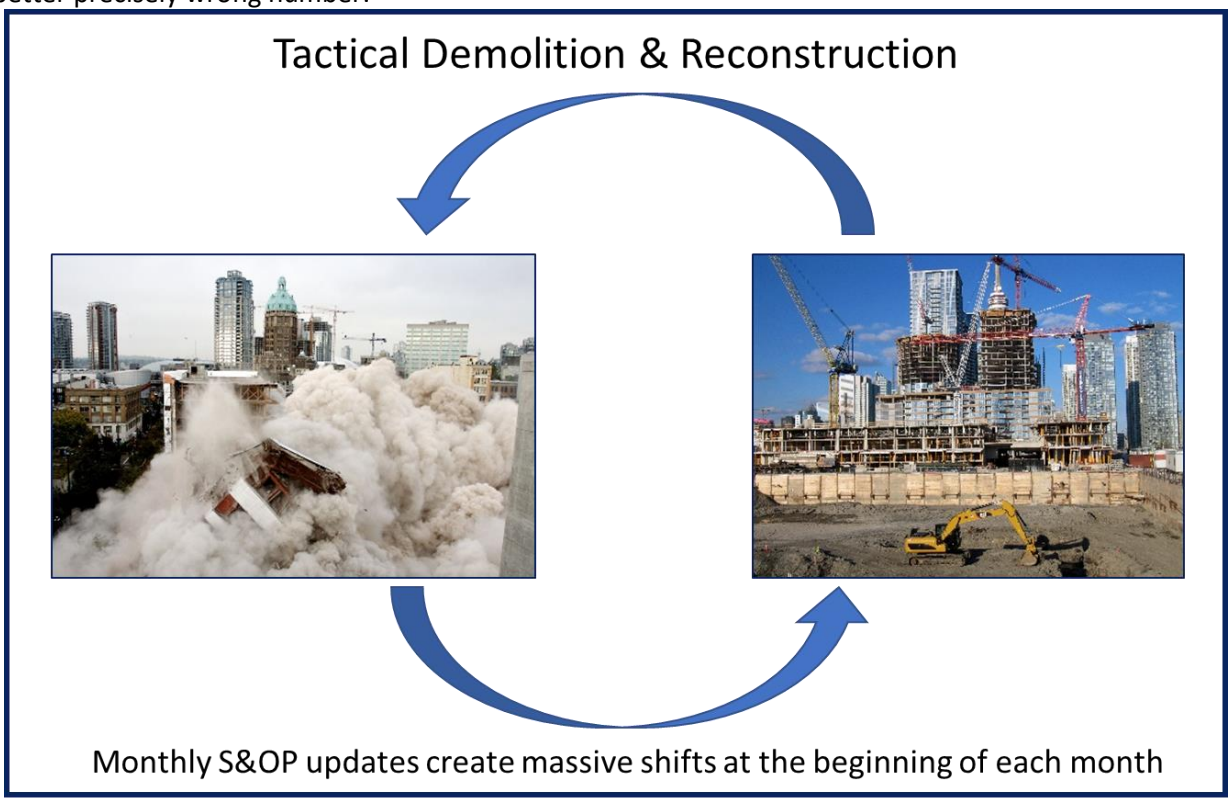
In our book [Precisely Wrong – Why Conventional Planning Fails and How to fix It (Ptak and Smith, Industrial Press, 2017)] we detailed a very big problem with what we called the conventional management schema characterized by a Sales & Operations Planning (S&OP) process feeding forecasted demand to a Master Production (MPS) Schedule that then feeds specific high-level demand requirements to Material Requirements Planning (MRP). Figure 1 shows this basic conventional schema.



Almost every S&OP expert readily acknowledges that any good S&OP process is about understanding and defining ranges of possibilities as an outcome NOT getting to a single and precisely wrong number. Yet the Master Production Schedule cannot accept ranges, it is a tactical scheduling tool that requires a single and discrete high-level demand number (not a range) as an input. So, despite a desire for and an

understanding that ranges are the key, we are handcuffed by convention when converting our projections and forecasts into operational action. We are simply forced to supply that precisely wrong number.

This single and precisely wrong number is then used to build a plan of high-level demand that is fed to MRP. MRP then directly launches supply orders with specific timing requirements against that high-level demand. All of this is done with the full knowledge that the starting number is guaranteed to be wrong and subsequently guaranteeing that all the derived lower level dependent demand numbers will also be wrong. It is nothing short of a proverbial razor-bladed boomerang. Next month, we will change the high-level numbers, blow everything up, rebuild the plan and attempt to manage and clean up the mess. This is a cycle that we have coined "tactical demolition and reconstruction." Figure 2 depicts this cycle. What is truly amazing is that convention is locked into thinking the only way to improve is to produce a better precisely wrong number.

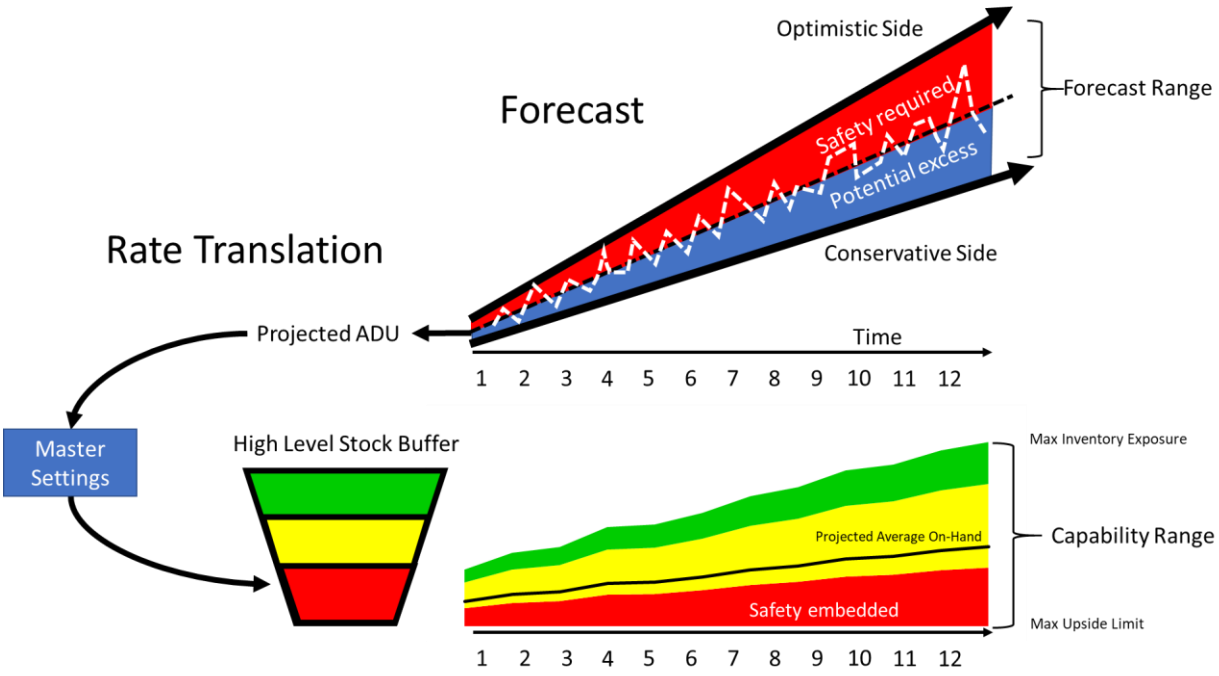


With the understanding that ranges can be right but single forecasted numbers are always wrong maybe we should rethink what we do with these numbers? Perhaps there is a way to make a precisely wrong number automatically translate to a range of approximately right capability without all the mess and constant misalignment?

This is the elegance of the Demand Driven Adaptive Enterprise (DDAE) model. To better understand this elegance, we first must understand the operational component of the DDAE model, something called the Demand Driven Operating Model (DDOM). The DDOM utilizes strategic decoupling point buffers to absorb and mitigate variability in both demand and supply. The size of any buffer, by definition, has a range of capability to absorb variability. The key is whether our precisely wrong number fall within that range.

How are the sizes of buffers (and their corresponding ranges of capability) determined? The DDAE model does not utilize a Master Production Schedule that translates single wrong numbers into wrong commitments. Instead it uses "Master Settings" to configure and reconfigure the Demand Driven Operating Model into capability ranges. The Master Settings include buffer profile definitions and part properties that include a rate of demand called average daily usage (ADU). ADU can absolutely be forecasted (and should be as part of the Adaptive S&OP process). When the forecasted ADU (a single number) is used to size the buffer, it combines with the specific buffer profile attributes to automatically translate to a range of operational capability!

Figure 3 shows the conversion of a forecast out in time (with optimistic and conservative ranges) translated to ADU for future time periods. Will the ADU be correct? No, it is still a single and precisely wrong number (just like any forecasted number). Through the master settings, however, it populates a buffer level that has a definable range of capability including a high and low limit. The high-side limit shows us what our maximum inventory exposure is if demand is much lower than expected. Our lower limit defines how much demand can surge within a replenishment period before the buffer collapses. It is important to note at this point that no supply order generation is directly tied to the ADU!

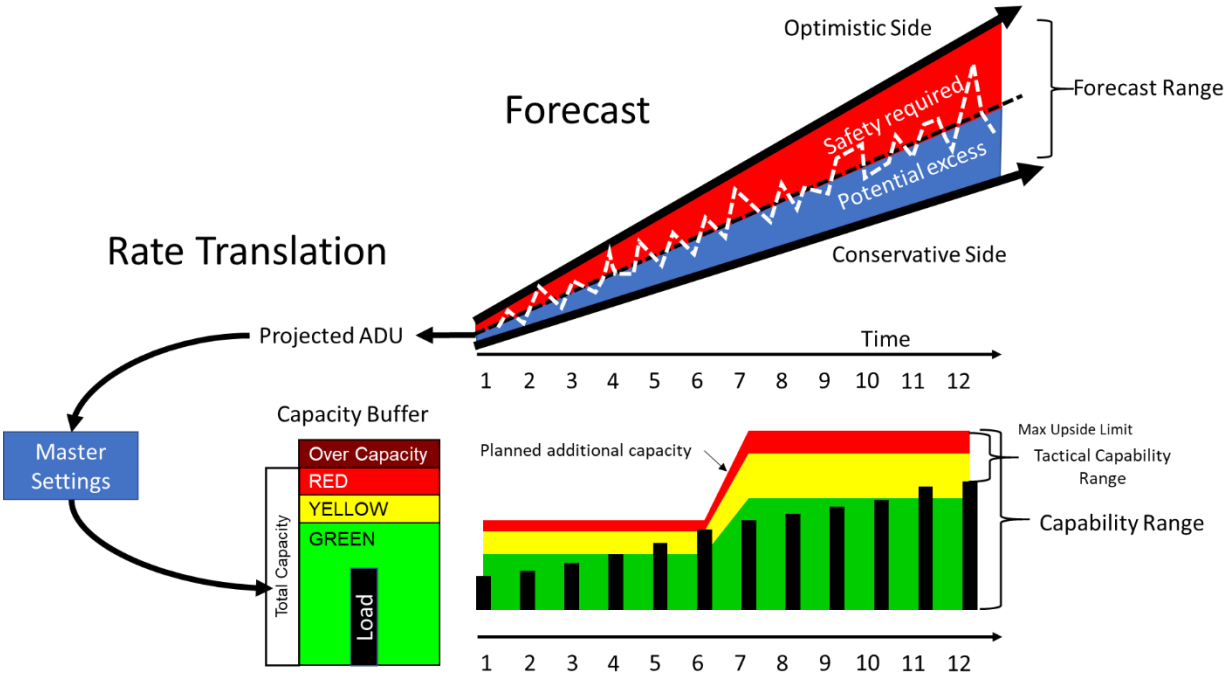


Now the question is whether that range of capability is enough to absorb the potential error embedded in the single wrong number. With well-defined and managed buffer profiles the answer is typically a resounding, "Yes!" If the answer is, "No", then the buffer can be migrated to a new buffer profile to produce the appropriate range of needed capability. Configuring and re-configuring these buffers is the job of Demand Driven S&OP – the tactical component of the DDAE Model.

ADU projection also works with another type of buffer in the DDOM – capacity buffers. A capacity buffer is the amount of excess capacity a resource or group of resources has in any given environment. Some have more and some have less excess capacity relative to mix and volume. Capacity and stock buffers are very much related. Stock buffers are "storage tanks" of capacity that can cushion the environment against temporary capacity shortages relative to demand at all levels of the product structure.

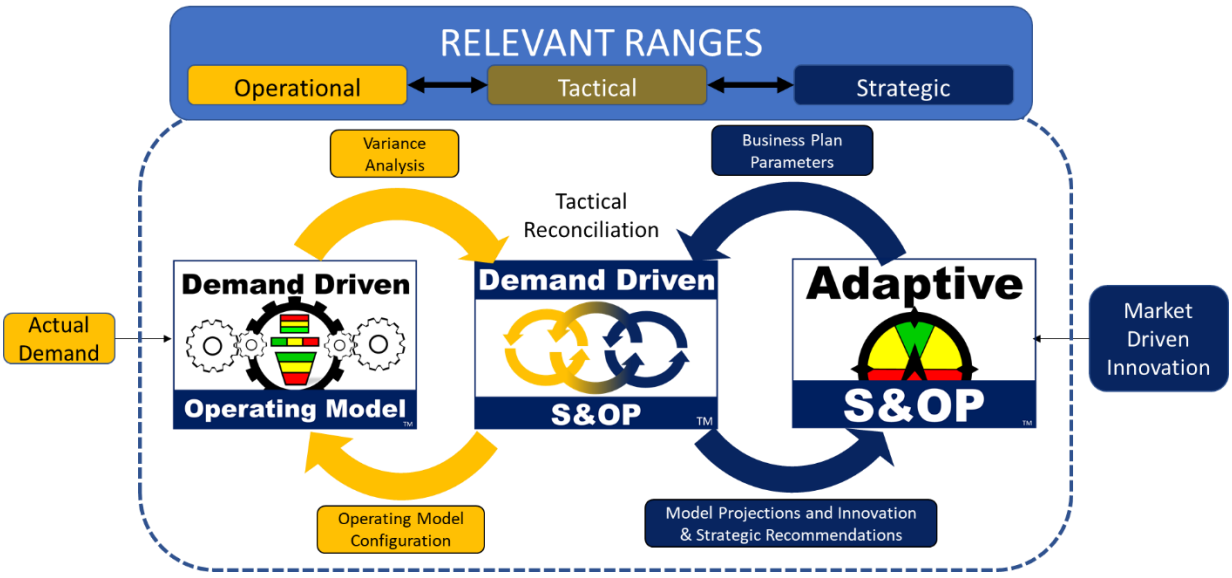
But what about longer-range capacity visibility and limitations? A key component of any good S&OP process is to understand those longer-range capacity implications. This is particularly important in the DDAE Model since prolonged capacity shortages will collapse stock buffers and their respective capability ranges.

Figure 4 shows the conversion of the forecast into a projected ADU and the impact of that ADU in the future on the capacity buffers in the DDOM. The black bars represent the total load against the resource(s). As the black bar climbs out of the green zone capacity begins to become constrained. The cumulative green, yellow and red values define the capability range of the resource(s) with a maximum sustainable limit of high load. The remaining capacity between the load and the maximum capacity is the tactical capability range. This range allows for shorter-term decisions and opportunities for additional volume and cash contribution. Demand Driven S&OP dictates the use of that capacity in the tactical relevant range.

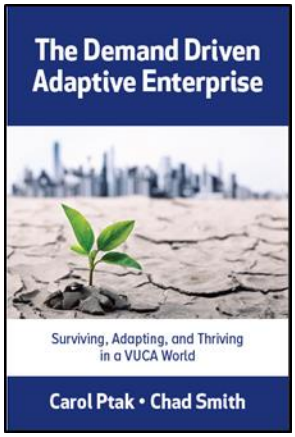


Here we can see that there is a planned capacity addition that will allow for more capacity buffer in the future as capacity is projected to be very constrained by period 6. This additional level of capacity might also allow some related stock buffers to be reduced because the plant will be more responsive to the buffers after the capacity upgrade.

Figure 5 shows the DDAE Model and its three components; one for the strategic relevant range (Adpative S&OP), one for the tactical relevant range (Demand Driven S&OP) and one for the operational relevant range (The DDOM).



The whole DDAE Model is driven around a basic philosophy: to be approximately right, not precisely wrong. The DDAE model still uses specific numbers representing predictions, but those numbers then automatically translate to ranges of capability in the DDOM. Those specific ranges can be changed either by changing the input number or by changing things like stock, time and capacity buffer profiles. It is Demand Driven S&OP's job to manage the DDOM to those ranges through Master Settings. The specific numbers will be wrong and will vary within a range, but the ranges will be approximately right and will self-correct or adjust to get even more right!



If you want to learn more about the Demand Driven Adaptive Enterprise model visit us at www.demanddriveninstitute.com or pick up a copy of The Demand Drive Adaptive Enterprise – Surviving, Adapting and Thriving in a VUCA World.