Synchronous Solutions

The continuous pursuit of excellence

Capacity Planning in 2021

"A tsunami is coming." That is a quote from one of my clients referring to the expected increase in customer demand in the coming months. I think he is right. The pandemic is winding down and the pent-up demand that has grown over the past eighteen months will surely translate into dramatically increased sales.

> "Having more work than you can do is a nice problem to have…but it is still a problem!"

The challenge in the coming months will be how to handle all this high demand on your available capacity. Therefore, careful *capacity planning* is vitally important to your business success. Of course, *capacity planning,* means considering all the various scenarios on what could happen in the coming months.

There are three types of capacity that should be in your planning routine:

- Productive Capacity
  - The minimum required to get the job done.
- Protective Capacity
  - Capacity to absorb variability.
  - The minimum plus some extra to accommodate the inevitable attacks by Murphy.
- Excess Capacity

- Wasteful. More capacity than needed.

Productive Capacity
The minimum capacity needed at each process step is called Productive Capacity. It is fairly easy to calculate by comparing the demonstrated productivity at each process step to the needed square feet per day. However, as we all know, "Murphy Lives" meaning that you must have some additional capacity over the minimum to accommodate the inevitable issues that will occur every day.

- Staffing issues. Absenteeism, turnover, vacations, training, etc.
- Equipment issues. Machine downtime, tooling availability, etc.
- Material issues. Poor quality, erratic delivery from vendors, etc.
- Weather issues.
- Coronavirus issues.
- Etc., etc., etc.

It is a fact that if you only plan for the minimum capacity, you will always struggle to meet the market demand. That approach can result in excessive overtime, potential quality problems, employee burnout and extreme chaos throughout the business process.

Protective Capacity
Therefore, given the reality of Murphy, it is important to establish and maintain "Protective Capacity" throughout the operations system. Protective Capacity is essential for a smooth and predictable process flow. Maintaining Protective Capacity at all times allows you to:

- Achieve and maintain short cycle times.
- Absorb the daily attacks by Murphy without affecting the *Install* schedule.
- Finitely schedule the Control Point (Install) with assurance that the schedule can be met.
- Bring stability and calmness into the business system.
- Confidently sell because there is knowledge that manufacturing can meet the demand.

Note that Protective Capacity is not an additional cost issue. In fact, it will save you money and, more importantly, it will allow you to create more $T value with less need for overtime, stress and chaos in busy times.

Planning for Growth
The Protective Capacity Planning (PCP) Report is the tool to use in planning for profitable growth. This tool will tell you when to take certain actions to keep three important business metrics in alignment: The projected market demand, the needed manufacturing capacity to meet that demand and your resulting financial goals. This report will show you the current status of each. It will allow you to do a "what if" analysis to check the effects of any demand projection and any operational action. It is

the "long-term planning tool" for your business. It is the essence of planning using the Synchronous Flow business system.

The example below is a portion of the PCP indicating the sales projections by product and market segment. Only the white cells require data entry and should be updated monthly to assure current information is posted.

Protective Capacity Planner

Sales Forecast	Sales $ / Sq. Ft.	$T Ratio %	May	June	July
Builder Nat Stone 47%	$50	65%	96,000	99,000	110,000
Builder Quartz 35%	$64	67%	88,000	105,000	125,000
Builder Ultra Compact 10%	$88	66%	16,000	18,000	22,000
Total - Builder >>			232,098	246,612	272,652
Retail Nat Stone 35%	$68	71%	186,000	195,000	205,000
Retail Quartz 40%	$88	70%	209,000	223,000	239,000
Retail Ultra Compact 10%	$98	69%	24,000	25,500	29,000
Total Retail >>>			435,214	458,646	482,632
Total Sales Projection	$T Ratio	66%	**925,707**	**957,653**	**1,007,679**
			May	June	July
Work Days>>>	Working days per month		21	22	21
$T per day			May	June	July
Total Projected Install Demand as $T/day:			**$29,500**	**$30,000**	**$33,100**

The system then calculates the daily Throughput ($T) required to be scheduled in order to meet the demand. We use $T rather than square feet or any other dimensional metric because it is more reflective of the actual labor content and it is directly related to the company financial goals.

Throughput ($T)

- $T is the measure of ***value added*** by the company
- Sales **price** of the job minus actual **costs** (variable expenses)
  - Variable expenses = all materials & outsourcing
    Basically, your investment to start the job
- **Example:**

$	**10,000**	**Sales price of a typical job**	
- $	3,500	Variable Expenses (Materials)	35%
=	**$6,500**	**$T Throughput**	**65%**

From $T comes all labor, all overhead and business profit.

The sales dollars per square feet is used to convert dimensional capacity estimates to Throughput dollars ($T), which is then compared to the daily $T demand. Using the

current equipment and staffing in the company, the system automatically calculates the needed hours per week at each resource step to meet the posted market demand. As in the example below, the system shows black font when the calculation is at 40 hours or less, red font when the indication is that some overtime will be required and red fill when the overtime required is excessive (over 48 hours per week).

Capacity in Hours Per Week

Including Protective Capacty

Protective Capacity Multiplier		15%			
Installation		5%			
HARD SURFACE	Projected Sq. Ft. Capacity	Projected $T Capacity	May	June	July
Project Management	820	28,538	41.3	42.0	46.4
Scheduling	800	27,842	38.9	39.1	47.6
Template	820	28,538	41.3	42.0	46.4
Program	825	28,712	39.0	39.1	46.1
Receiving/SlabSimth	825	28,712	41.1	41.8	46.1
Cut - 1 Saw Jet	705	25,391	42.2	42.6	47.9
CNC Routing - 2 CNC	645	23,230	46.1	46.5	52.4
Polish	863	31,063	34.5	42.2	39.2
Mitered Edge 0.02	20	720	29.8	30.0	33.8
Install	800	27,842	41.1	43.1	47.6

The *Protective Capacity Multiplier* is used to allow for the needed additional capacity at each resource step to accommodate the inevitable interruptions due to statistical fluctuations (aka attacks by Murphy).

Financial Goals. Given the demand picture and the desired return on those sales, the Protective Capacity Planning tool will calculate the expected net profit and the maximum operating expense (all labor and all overhead) that can be experienced in order to make that profit amount at the given level of sales. In effect, this becomes the expense budget for each of the coming months. The financial officer of the company can divide that maximum operating expense into a fixed and variable budget. Usually, the variable budget boils down to labor and supplies and can form the expenditure targets for operations management. Controlling labor (including overtime) and supplies to this level while meeting the market demand will help to assure that the company's financial goals can be met.

Taking this to the next logical step, the system evolves to a monthly *Dynamic Budget* (aka Expense Control Planner) which uses the current sales revenue projections to automatically post to a line-item financial status of the business system. The conclusion of this analysis indicates the prevailing *Status to the Controllable Expense (CE) Limit.* This leads to a clear indication of the actions that are needed to maximize financial profits.

Dynamic Budget

Expense Control Planner

When the constraint is in the market, focus on expense control.

Enter data in the white cells. All other postings come directly from the PCP.

	% of LIMIT	December	January
Sales Demand from Business Planner		$914,069	$917,993
MAXIMUM Operating Expense		$537,924	$494,079
Uncontrollable, Fixed Expenses		$117,079	$131,244
Controllable Expense LIMIT		**$420,845**	**$362,835**
Plan for use of Controllable Expenses			
OT Expense		15,595	17,600
Total Labor	50%	210,537	237,600
Shop Supplies	6%	26,594	25,000
Advertising	1%	5,217	1,042
Vehicle Allowance		2,758	2,758
401K Employer Match	1%	4,058	3,300
Employee Expenses Other	9%	37,229	28,430
Fuel/Delivery Surcharge	0%	125	162
Interest	1%	6,020	6,238
Professional Fees	1%	5,000	5,000
Rent Expense	4%	14,875	14,875
Repair & Maintenance Expense	1%	5,912	7,000
Supplies	0%	1,897	5,000
Use Tax	4%	17,000	6,000
Vehicle Expense	3%	13,000	14,000
Total Controllable Expenses		**$359,173**	**$370,021**
		$476,252	**$501,265**
Status to CE LIMIT		**$61,672**	**-$7,186**

Kept up to date and used effectively, the Protective Capacity Planner can become a very important element of your routine business management. It will trigger actions to generate sales when the demand is low and it will trigger actions to prepare the needed capacity when demand is high. It is the tool to coordinate market demand, manufacturing capacity and your financial goals.

For more information on how to effectively plan for the needed capacity, contact:

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