



SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF MANAGEMENT STUDIES

COURSE NAME : 19BA204 OPERATION MANAGEMENT

I YEAR / II SEMESTER

UNIT 2 - Forecasting



Capacity

Capacity is defined as the ability to achieve, store or produce.

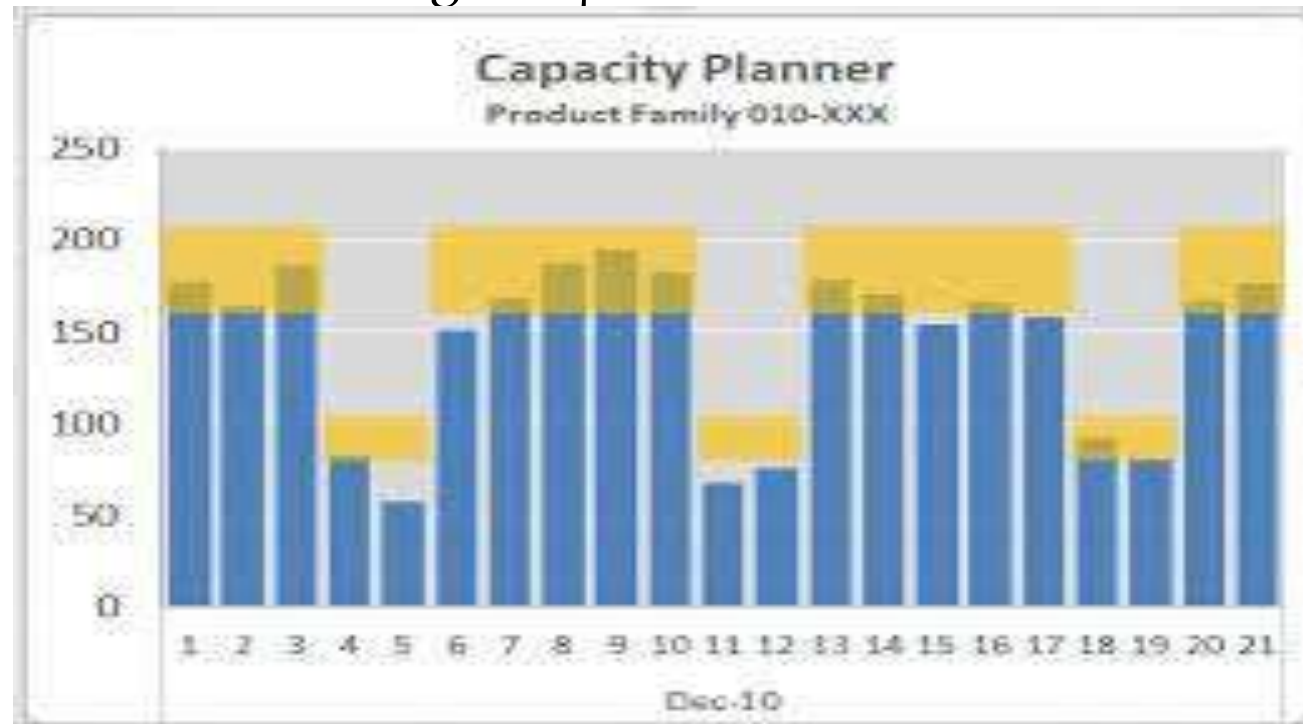
Capacity Planning

For an organization, capacity would be the ability of a given system to produce output within the specific time period. In operations, management capacity is referred as an amount of the input resources available to produce relative output over period of time.



Capacity Planning

Capacity planning is essential to be determining optimum utilization of resource and plays an important role decision-making process, for example, extension of existing operations, modification to product lines, starting new products, etc.





Strategic Capacity Planning

A technique used to identify and measure overall capacity of production is referred to as strategic capacity planning. Strategic capacity planning is utilized for capital intensive resource like plant, machinery, labor, etc.

Strategic capacity planning is essential as it helps the organization in meeting the future requirements of the organization. Planning ensures that operating cost are maintained at a minimum possible level without affecting the quality. It ensures the organization remain competitive and can achieve the long-term growth plan.



Capacity Planning Classification

Long Term Capacity: Long range capacity of an organization is dependent on various other capacities like design capacity, production capacity, sustainable capacity and effective capacity. Design capacity is the maximum output possible as indicated by equipment manufacturer under ideal working condition.

Production capacity is the maximum output possible from equipment under normal working condition or day. Sustainable capacity is the maximum production level achievable in realistic work condition and considering normal machine breakdown, maintenance, etc. Effective capacity is the optimum production level under pre-defined job and work-schedules, normal machine breakdown, maintenance, etc.

Medium Term Capacity: The strategic capacity planning undertaken by organization for 2 to 3 years of a time frame is referred to as medium term capacity planning.

Short Term Capacity: The strategic planning undertaken by organization for a daily weekly or quarterly time frame is referred to as short term capacity planning.



Goal of Capacity Planning

- The ultimate goal of capacity planning is to meet the current and future level of the requirement at a minimal wastage. The three types of capacity planning based on goal are
- lead capacity planning,
 - lag strategy planning and
 - match strategy planning.

Lead Strategy:

Adding capacity in anticipation of a very high demand of product. Mostly used to lure consumers and keep them away from competitors. Excess inventory could get produced but the production cycle management balances out this cost. Looking at the table below, we can understand that Week 1 Capacity has been increased by 50 units anticipating the demand of the same amount in Week 4.

Full Capacity	Weeks	Lead Strategy		
		Planned Demand	Anticipated Additional Demand	Final Output
170	WK1	100	0	150
170	WK2	100	0	
170	WK3	100	50	
170	WK4	100	0	



Lag Strategy:

A reactive strategy, this is used to add capacity only when the actual demand is observed and not based on anticipation. More of a conservative strategy in nature, it decreases the risk of wastage however at the same time it may result in stock outs and invite sales loss and low service levels (example: late delivery of goods).

Most importantly, it must be known that this strategy is applied when an additional capacity is required after the organization is already running on full capacity or beyond. In the following example, we can observe that there is a need add 5 units in Week 1 over and above the full capacity which was not anticipated. Hence, there was a need to add these 5 units beyond the full capacity of 170 units.

Full Capacity	Weeks	Lag Strategy		Final Output
		Planned Demand	Additional Demand	
170	WK1	170	5	175
170	WK2	100	0	
170	WK3	100	0	
170	WK4	100	0	

Match Strategy:

Adding capacity in small amounts with respect to the anticipated demand signals and current market potential of the product. Typically moderate in nature and used by many organizations. Our example exactly talks about this strategy. It clearly shows how the anticipated demand of 100 units in Week 3 has been matched by adding capacities in smaller units in the preceding weeks and being under full capacity limits.

Full Capacity	Weeks	Match Strategy			Match Capacity	Final Output
		Planned Demand	Anticipated	Additional Demand		
170	WK1	100		0	35	135
170	WK2	100		0	40	140
170	WK3	100		100	25	125
170	WK4	100		0		



Factors Affecting Capacity Planning

Effective capacity planning is dependent upon factors like

- ✓ production facility (layout, design, and location),
- ✓ product line or matrix,
- ✓ production technology,
- ✓ human capital (job design, compensation),
- ✓ operational structure (scheduling, quality assurance) and
- ✓ external structure (policy, safety regulations)



Evaluate Capacity Alternatives

- ✓ There are a number of tools that we can use to evaluate our capacity alternatives.
- ✓ Recall that these tools are only decision-support aids.
- ✓ Ultimately, managers have to use many different inputs, as well as their judgment, in making the final decision.
- ✓ One of the most popular of these tools is the decision tree.



Develop Capacity Alternatives

Once a company has identified its capacity requirements for the future, the next step is to develop alternative ways to modify its capacity. One alternative is to do nothing and reevaluate the situation in the future. With this alternative, the company would not be able to meet any demands that exceed current capacity levels. Choosing this alternative and the time to reevaluate the company's needs is a strategic decision. The other alternatives require deciding whether to purchase one large facility now or add capacity incrementally, as discussed earlier in the chapter.

Capacity Alternatives:

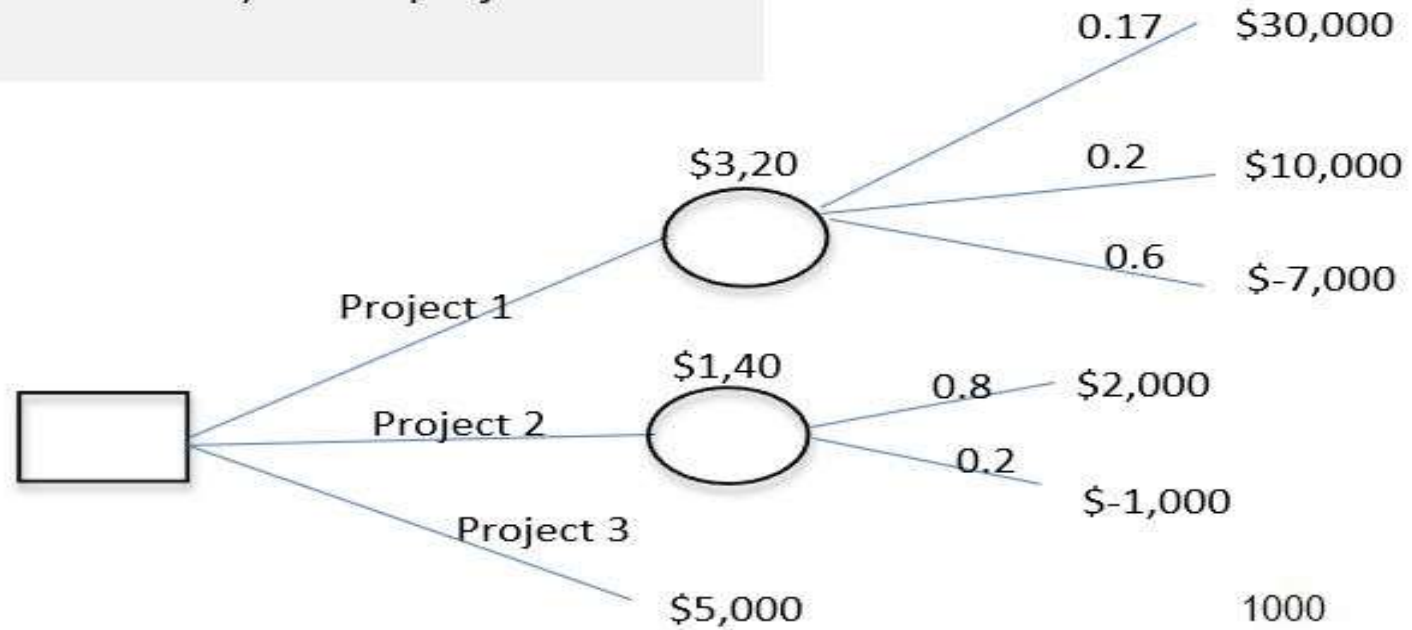
1. Do nothing
2. Expand large now
3. Expand small now, with option to add later



Decision Tree Method

Background:

There are 3 investment projects faced by the ABC company. Given the decision tree, which project should ABC undertake?



Decision Tree Method

Decision Trees



Figure 6.4 – A Decision Tree for Capacity Expansion



What Is Sales and Operations Planning (S&OP)?

Sales and operations planning is an aspect of supply chain planning whose goal is the creation of a unified, consensus-based business plan. It draws input from an organization's key functional areas, including sales, marketing, manufacturing, distribution, and finance. Cross-functional collaboration results in plans that all stakeholders understand and are committed to supporting.

On the spectrum of supply chain planning activities, S&OP is typically a more advanced discipline. Many smaller organizations or startups may require only inventory planning. They may add capabilities such as demand planning and supply planning as they grow.

S&OP Benefits

Some of the benefits of effective sales and operations planning process include:

- Increased customer service levels
- Improved profitability
- Higher product revenues
- Lower inventories and obsolescence
- Reduced lead times
- Quicker responsiveness
- Top-down management control
- Predictable operating performance for shareholders





S&OP Benefits

- Reduce inventory -- Reduce inventory carrying costs and improved cash flow
- Reduce time to market for new products -- Increase revenue by staying ahead of the competition
- Increase capacity and throughput -- Reduce operating costs and increased productivity
- Higher product quality -- Reduce cost of goods sold
- Reduce lead times -- Reduce expediting costs and inventory while increasing sales
- Better customer service -- Increase sales and customer satisfaction



General S&OP Steps

Data Gathering/Management: Collect information on past sales, analyze trends, and report forecasts. Run Pareto analysis to assign forecast parameters (i.e., item vs. group). Manage new items and discontinue old items.

Demand Planning: Validate forecasts, understand sources of demand, account for variability, and revise customer service policies; layer on promotion plans, one time events, and new product and customer launches.

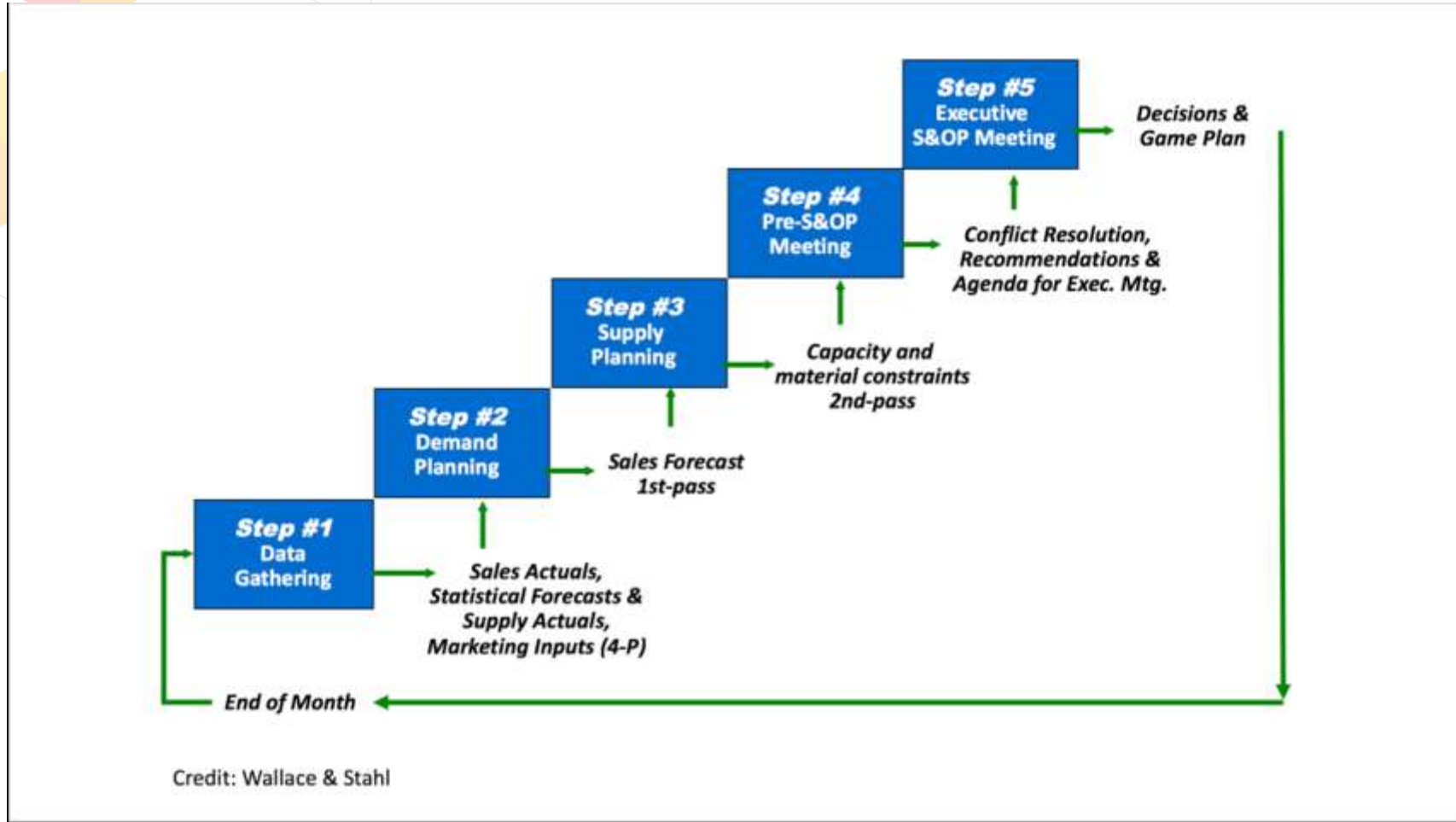
Supply Planning: Assess the ability to meet demand by reviewing available capacity, inventory, and scheduling required operations. Set inventory targets and plan supply by level loading and/or demand chase.

Plan Reconciliation (Pre S&OP): Match supply and demand plans with financial considerations.

Finalize and Release the S&OP: Finalize the plan and release it to implementation.



General S&OP Steps





Thank You