Capacity Planning: The new strategic tool to manage supply and demand.

Understanding capacity of a two workstation system has been an operation researcher’s delight. Actual capacity can be masked by so many variables such as inventory levels, labor issues, equipment downtime, quality levels to name a few. In addition, scheduling strategies and techniques as well as product mix can play a large role in determining the true capacity of manufacturing plant. And trying to understand a supply chain’s capacity can really be daunting task.

However one does realize that the foundation that is required to react to dynamic changes in supply and demand is based on understanding your supply chain’s capacities. Understanding and then building the infrastructure that provides the needed flexibility and speed requires an in-depth understanding of how capacity impacts your business. This is an area most OEM's have still not developed it as a disciplined subject to pursue.

The impact of capacity management is felt throughout the organization, within every element of the supply chain. Supplier capacity can bring production to a standstill. Production capacity is equally important; if the capacity is not great enough to meet peak demand periods and inventory building is not properly planned, customer demand will go unfilled. Distribution capacity, both storage and throughput, ensures delivery of the right product at the right time. Transportation connects all elements of the supply chain; as such, its capacity issues are key influencing service levels and on-time delivery performance. Change has become the rule, not the exception. The need for capacity management is measured not in years or quarters but rather in weeks and months. With these current levels of change, dynamic measurement and planning tools have become a necessity.

External as well as internal dynamics create the need for constant monitoring and adjustment of capacity levels and policies. From price pressures to raw material availability, organizations must be flexible enough to react quickly to these changes. However, without proper planning, these opportunities can become large challenges and liabilities if synergies are not exploited.

Capacity: How to understand it

Historically, capacity analysis has been focused on planning and assessing the utilization of various machines and machine-paced processes within an organization. Capacity utilization measures serve as a leading indicator at a macro-economic level, signaling the health of the economy. When capacity utilization numbers drop, recession becomes a concern. When they reach all-time highs, inflation worries are raised. Given that these metrics play a key role in setting macroeconomic policy, one would assume that they must be fairly well defined and understood. But are they?

As every manager knows, capacity is a difficult concept to quantify. Whether it’s a workstation’s ability to process jobs or a manufacturing plant’s capability for a year, the answer is frequently “it depends.” Because of the dynamic nature of capacity and the interrelationships among different supply chain elements, capacity is forever changing. Product-mix changes, process or equipment engineering improvements, labor availability and new data management systems are only a few reasons capacity can suddenly change. The most available and, therefore, most popular measure of capacity is the past—but the past is not necessarily a good indication of the future.
Any methodology to understand capacity must address from identifying bottlenecks, to backup suppliers, to available alternate routings, to contingency planning, the true cost and impact of decisions etc. All elements of the system must be studied at once, so that sub-optimization can be avoided. Alternatives can be objectively evaluated to determine their true impact on a variety of performance measures, including throughput capacity, inventory levels, and cycle times, before expensive and disruptive changes are made.

CGN through its extensive work in the field of supply chain capacity assessment has developed robust methodology to not only assess the capacity gaps but also to deliver solutions to overcome those.

Capacity’s pervasive influence and the pace of change make the need for accurate knowledge and flexibility a necessity. The ability to quickly react, while making educated and informed decisions, will directly impact the health and success of your organization. It will enable you to rise above your competition, to compete based on your supply chain and the service and flexibility you can provide.

Case Studies

White Goods Manufacturer

Market demand is always volatile for white goods manufacturers. With new designs and products being introduced every fortnight, fluctuations in demand are very high, forecasting becomes very difficult.

With myriad SKU’s and short product life cycles, if demand is not closely monitored and capacity adjusted, there will be either too less inventory or excess of it. White goods manufacturers must be able to quickly make capacity management adjustments.

The company has several manufacturing facilities around the world; all capable of assembling majority of the SKU’s. To reduce cost, the most obvious choice is assembling products where the cost of labour is the lowest. However, in assessing this decision, cost of labor must be appraised along with increased logistics costs (national and international), as well as input material and assembly availability. As this decision is magnified by all potential locations and subassemblies, the problem grows into a complicated issue with many possible alternatives.

Questions like in-house assembly or third party assembly must also be made. But this cannot be based on cost alone; quality, marketing, product availability also need to be considered. Decisions and options are endless—analytical tools help evaluate and quantify these decisions.

A tactical tool for network design was used. This tool evaluated which locations were appropriate, which suppliers should be used, which operations should be kept in house and which outsourced, which international facilities made sense to minimize international trade costs, what modes could be leveraged to ensure service but minimize inventory costs, and how distribution operations should be designed. The impact of time and capacity on the supply chain during peak demand was also evaluated. The company was able to achieve optimal solution for sourcing & distribution of products to meet customer demand.
FMCG Company

FMCG as a sector faces extreme seasonality in supply and demand, so much so that fulfilling this demand becomes a difficulty. In the FMCG sector, customer loyalty is very low as the cost of switching is negligible, company’s needs to ask to prioritize which demand to fulfill and which to let go. Therefore, capacity management at own location and at suppliers becomes a strategic problem.

With customer’s ready to experiment with new brands, more and more companies are fighting for customer loyalty from the same customer group. Constantly meeting and exceeding customer expectations was the key to success. For the FMCG company, demand for a particular product was growing exponentially. However, the availability of the raw material for the product was seasonal in nature, therefore forecast on availability was not accurate and finding new sources was also a difficult task.

To cater to demand, options included either building inventory or building capacity – in-house or outsourced. Though in-house capacity yielded reliability but it was an expensive alternative. Outsourcing provided flexibility but also pushed prices up. Building inventory incurred additional storage costs and required more space. All three options had to be simultaneously evaluated to determine the lowest cost solution.

A planning tool has used to determine, an optimal way to meet demand, depending on demand, production efficiency and distribution capabilities.

Production line efficiency and capacity, raw material availability, logistics cost, the cost of carrying inventory and cost of distribution were evaluated to carry out a comprehensive analysis. All costs, constraints and capacities were modeled, eliminating sub-optimization. Through all this, the company was able to achieve a profitable way of meeting customer orders and managing all capacities within the business.

Conclusion

Imbalanced capacity can be hazardous for your company. Too much capacity results in low return on assets; while too little can result in lost sales. Speed of response and flexibility in doing business are dictating how successful a company can become today. Strategic network tools allow companies to keep their supply chain’s responsive and supple while keeping costs in check and turning out profitable solutions.