

Capacity planning in Production and Operation Management

Capacity planning is to be carried out keeping in mind future growth and expansion plans, market trends, sales forecasting, etc. It is a simple task to plan the capacity in case of stable demand. But in practice the demand will be seldom stable. The fluctuation of demand creates problems regarding the procurement of resources to meet the customer demand. Capacity decisions are strategic in nature. Capacity is the rate of productive capability of a facility. Capacity is usually expressed as volume of output per period of time.

Production managers are more concerned about the capacity for the following reasons:

Sufficient capacity is required to meet the customers demand in time.

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Capacity affects the cost efficiency of operations.

Capacity affects the scheduling system.

Capacity creation requires an investment.

Capacity planning is the first step when an organization decides to produce more or new products.

Capacity Measurement in Operations Management

Measurement of Capacity Planning

The capacity of the manufacturing unit can be expressed in number of units of output per period. In some situations measuring capacity is more complicated when they manufacture multiple products. In such situations, the capacity is expressed as man-hours or machine hours. The relationship between capacity and output.

Design capacity:

Designed capacity of a facility is the planned or engineered rate of output of goods or services under normal or full scale operating conditions. For example, the designed capacity of the cement plant is 100 TPD (Tonnes per day). Capacity of the sugar factory is 150 tonnes of sugarcane crushing per day.

System capacity:

System capacity is the maximum output of the specific product or product mix the system of workers and machines is capable of producing as an integrated whole.

System capacity is less than design capacity or at the most equal, because of the limitation of product mix, quality specification, breakdowns. The actual is even less because of many factors affecting the output such as actual demand, downtime due to machine/equipment failure, unauthorized absenteeism.

Capacity and output relationship

Measurement of Capacity Planning

The system capacity is less than design capacity because of long range uncontrollable factors. The actual output is still reduced because of short-term effects such as, breakdown of equipment, inefficiency of labor. The system efficiency is expressed as ratio of actual measured output to the system capacity.

System Efficiency (SE)=

Actual output

System capacity

Licensed capacity:

Capacity licensed by the various regulatory agencies or government authorities. This is the limitation on the output exercised by the government.

Installed capacity:

The capacity provided at the time of installation of the plant is called installed capacity.