

3.4.4: Determinants of Effective Capacity

Determinants of Effective Capacity

- **Facilities:** The size and provision for expansion are key in the design of facilities. Other facility factors include locational factors, such as transportation costs, distance to market, labor supply, and energy sources. The layout of the work area can determine how smoothly work can be performed.
- **Product and Service Factors:** The more uniform the output, the more opportunities there are for standardization of methods and materials. This leads to greater capacity.
- **Process Factors:** Quantity capability is an important determinant of capacity, but so is output quality. If the quality does not meet standards, then output rate decreases because of need of inspection and rework activities. Process improvements that increase quality and productivity can result in increased capacity. Another process factor to consider is the time it takes to change over equipment settings for different products or services.
- **Human Factors:** the tasks that are needed in certain jobs, the array of activities involved, and the training, skill, and experience required to perform a job all affect the potential and actual output. Employee motivation, absenteeism, and labour turnover all affect the output rate as well.
- **Policy Factors:** Management policy can affect capacity by allowing or disallowing capacity options such as overtime or second or third shifts
- **Operational Factors:** Scheduling problems may occur when an organization has differences in equipment capabilities among different pieces of equipment or differences in job requirements. Other areas of impact on effective capacity include inventory stocking decisions, late deliveries, purchasing requirements, acceptability of purchased materials and parts, and quality inspection and control procedures.
- **Supply Chain Factors:** Questions include: What impact will the changes have on suppliers, warehousing, transportation, and distributors? If capacity will be increased, will these elements of the supply chain be able to handle the increase? If capacity is to be decreased, what impact will the loss of business have on these elements of the supply chain?
- **External Factors:** Minimum quality and performance standards can restrict management's options for increasing and using capacity

Summary of examples of capacity factors.

Facility Factors

- e.g. expansion potential, strategic location

Product & Service Factors

- e.g. uniformity within the product manufactured or service executed

Process Factors

- e.g. reducing inspections, efficient equipment adjustments

Human Factors

- e.g. high employee motivation, low absenteeism, low labour turnover

Policy Factors

- e.g. opportunity for overtime and/or additional shifts

Operational Factors

- e.g. well-stocked inventory, minimal scheduling delays

Supply Chain Factors

- e.g. adaptable distributors

External Factors

- e.g. minimal interference with quality and performance standards

Inadequate planning can be a major limitation in determining the effective capacity.

The most important parts of effective capacity are process and human factors. Process factors must be efficient and must operate smoothly. If not, the rate of output will dramatically decrease. They must be motivated and have a low absenteeism and labour turnover. In resolving constraint issues, all possible alternative solutions must be evaluated.

Steps in the Capacity Planning Process:

1. Estimate future capacity requirements
2. Evaluate existing capacity and facilities and identify gaps
3. Identify alternatives for meeting requirements
4. Conduct financial analyses of each alternative
5. Assess key qualitative issues for each alternative
6. Select the alternative to pursue that will be best in the long term
7. Implement the selected alternative
8. Monitor results

The above content is an adaptation of Saylor Academy's BUS300 course.^[1]

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