



CAPACITY UTILIZATION and PROFITABILITY

Capacity Utilization – CAPUTIL

CAPUTIL measures the degree of utilization from human resources to profitability. The following examples show various methods for analyzing input/output ratios, offer insight into current productivity, efficiency, and assisting in drawing conclusions on how to detect unprofitable capacity utilization, plan changes, and implement improvements.

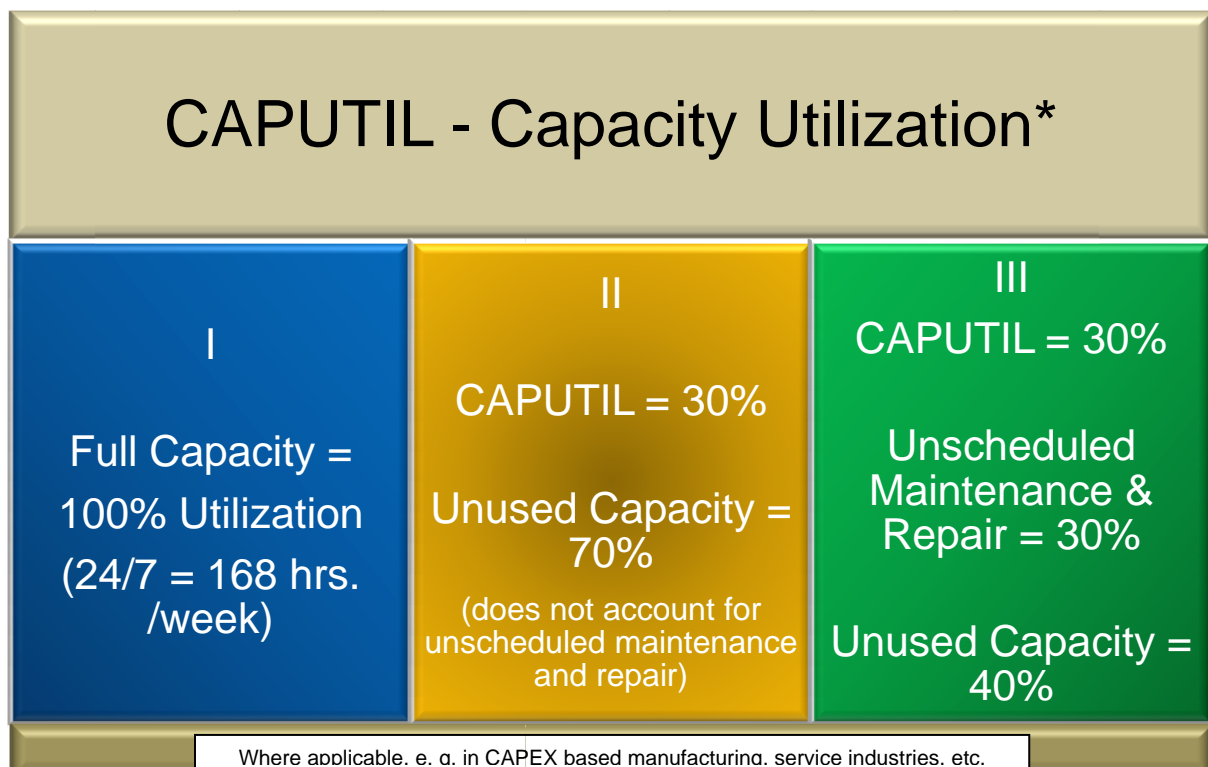
Human Resources (HR)

HR in Service Areas ➤ **Productivity Ratio = productive hours per day / daily attendance**

HR in Production Fields ➤ **Productivity Ratio = working hours per day / number of parts produced** (or Sales \$, € produced, manufacturing costs incurred, etc.)

Capital Expenditures (CAPEX) – Plant and Equipment

The following examples refer to production oriented organizations and various service industries



I – Full Capacity is an ideal situation which depends on net cycle time, loading and unloading, set-up, trial runs, etc. that have to be accounted for in a job order. Statistics have to show standardized metrics to be comparable. Parameters must not be changed for comparison purposes.

II – Unused Capacity is a result of underutilized equipment (less than 100% CAPUTIL) and becomes a critical cost factor when earnings from production or services do not cover depreciation and other related costs (personnel, energy, etc.) per piece of equipment.

III – Unscheduled Maintenance & Repair (UM&R). Monitoring downtime for unscheduled maintenance and repair is of importance especially if obsolete pieces of major production machinery are in use and – besides scheduled maintenance – extraordinary equipment breakdowns occur beyond already factored-in downtime.

Example: A piece of equipment shows - over a monitoring period of 3 years - the following weighted average annual numbers:

Total available hours p. a.: $365 \text{ days} \times 24 \text{ hours} = 8,760 \text{ hrs / year}$

Less scheduled maintenance and repair (SM&R): 1 month = 730 hrs

Full capacity = 8,030 hrs = 100% available capacity for production

Actual capacity utilizations = 2,409 hrs = 30%

UM&R = 2,409 hrs = 30%

Unused Capacity = 3,212 hrs = 40%

Remark: In a CAPUTIL II – scenario, the degree of underutilization would amount to 70% and wrong conclusions, e. g. in production planning, could be drawn.

PROFITABILITY

Profitability assessments are usually based on accrued controlling data. Ratios are derived from controlling Profit & Loss (P&L) and Balance Sheet (B/S) statements. Today, medium sized and large enterprises compute Return on Capital Employed (ROCE) – besides many other profitability ratios - and compare this value with the Weighted Average Cost of Capital (WACC).

Rule of thumb:

Profitable companies: $ROCE > WACC$ [%]

Loss makers: $ROCE < WACC$ [%]

Economic Value Added (EVA)* and Market Value Added (MVA)*

Express managerial effectiveness, in funds (\$; €; others), in a given year:

$$EVA = (ROCE - WACC) * CE$$

A positive number denotes **added value**

$$EVA = (ROCE - WACC) * CE$$

A negative number denotes **value destroyed**

Public companies usually measure MVA as well:

$$MVA = \text{Market value of equity} - \text{Invested capital}$$

Profitability assessments give leaders insights into the overall performance of a business unit. This is a great starting point; however, it does not reveal the entire story about productivity, efficiency, and profitability of major pieces of equipment. In addition to the above profitability evaluation, CAPUTIL offers a proper tool for analyzing the degree of utilization. Furthermore, CAPUTIL can be used as a triggering point for detailed (Discounted Cash Flow – DCF) analyses on “Make or Buy”, replacement, divestiture, and other decisions.

*The concepts of EVA and MVA were developed by Joel Stern and Bennett Stewart, co-founders of the consulting firm Stern Stewart & Company