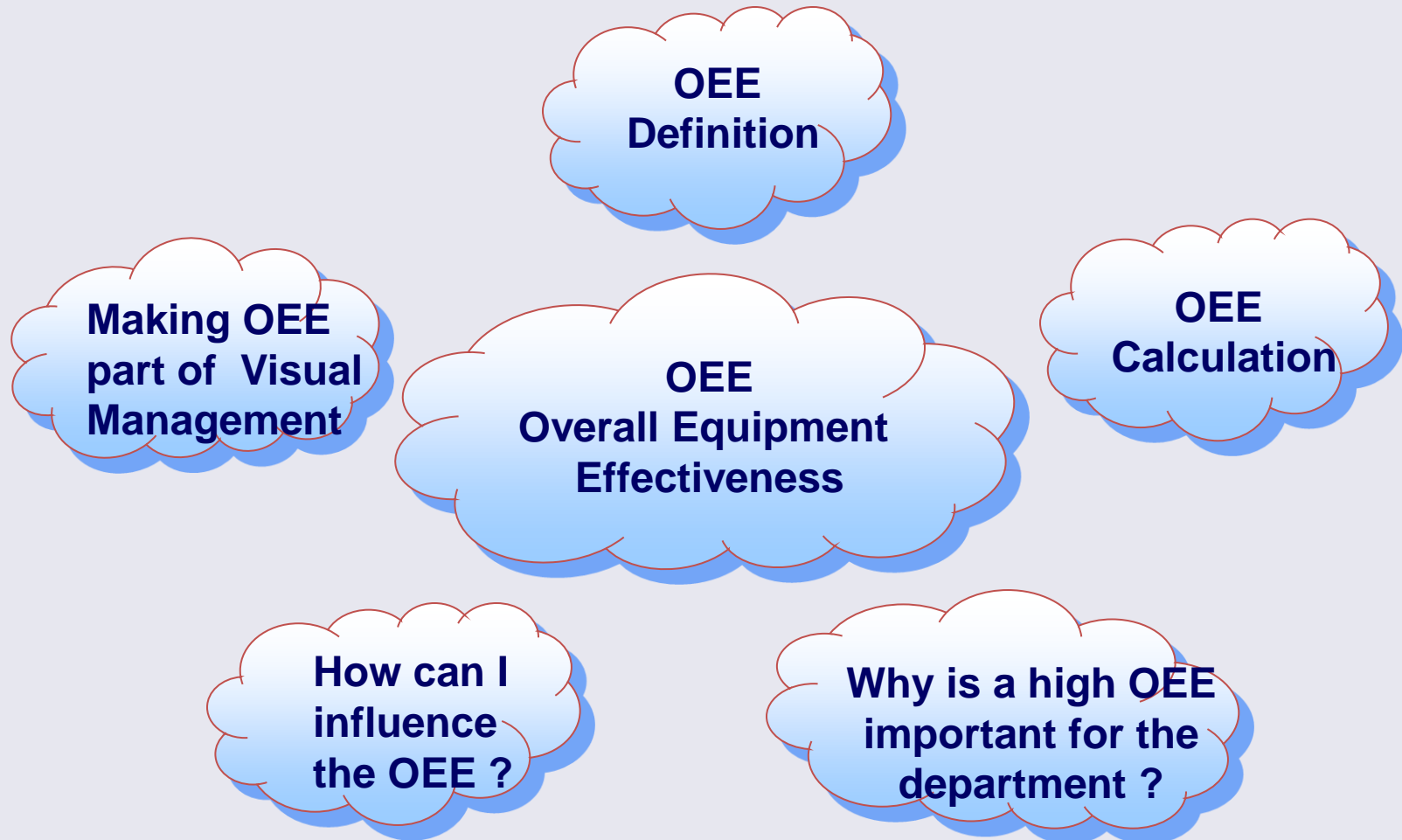

Overall Equipment Effectiveness (OEE)

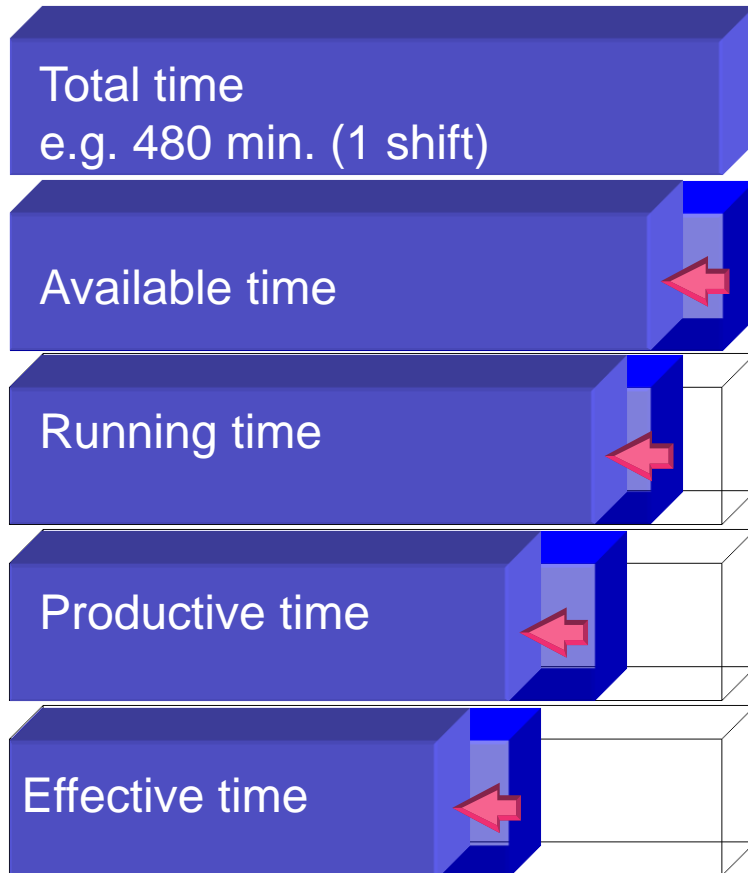
Sistem Perawatan

What is OEE ?



Overall Equipment Effectiveness

**OEE is the way to measure how effectively machine / equipment hours are used
(Value Adding)**



OEE is loss due to:

Depending on definition TPM® knows 6-16 different losses

Planned Downtime

- breaks, planned maintenance, training

Downtime

- breakdowns, repairs
- changeover
- adjustment
- start up

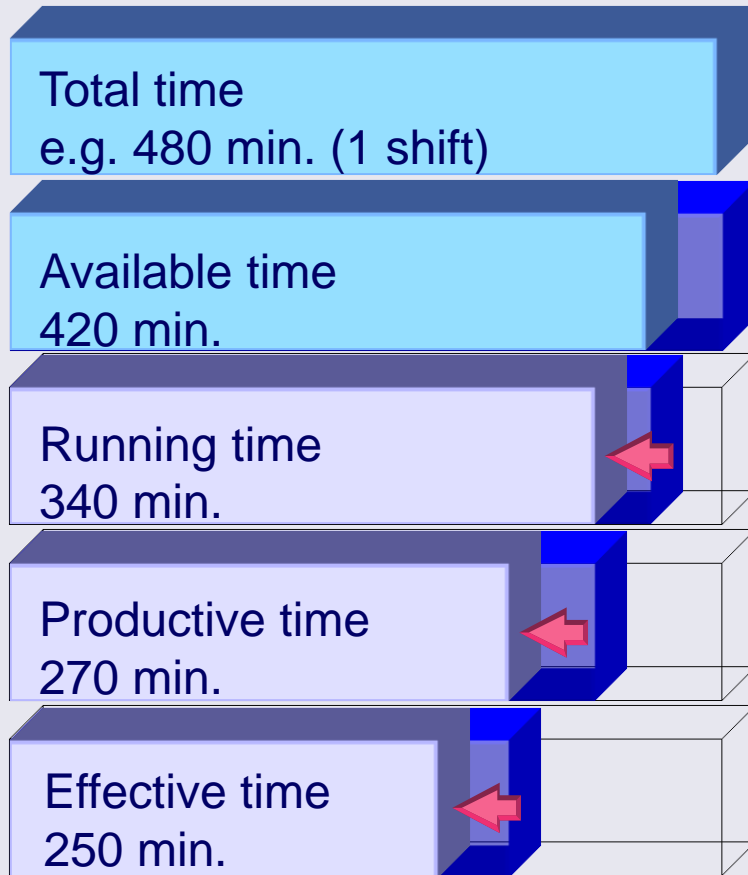
Performance Losses

- machine speed
- short stoppages
- lower yield

Quality Losses

- scrap
- reject
- rework

Calculation of LOSSES



Total losses = 170 min / shift

Planned Downtime

- breaks, planned maintenance, training

Downtime

- breakdowns, repairs
- changeover
- adjustment
- start up

Performance Losses

- long cycle time
- minor stoppages
- reduced yield

Quality Losses

- scrap
- rework
- rejects

Calculation of OEE

$$\text{Availability (Running Efficiency)} = \frac{\text{Available time} - \text{Downtime}}{\text{Available time}}$$

$$= \frac{420 \text{ min} - 80 \text{ min}}{420 \text{ min}}$$



OEE (in %) =

factor 81%

$$\text{Productive Performance (Performance efficiency)} = \frac{\text{Running time} - \text{Performance loss}}{\text{Running time}}$$

$$= \frac{340 \text{ min} - 70 \text{ min}}{340 \text{ min}}$$



X

factor 79.4%

$$\text{Quality} = \frac{\text{Productive time} - \text{Quality loss time}}{\text{Productive time}}$$

$$= \frac{270 \text{ min} - 20 \text{ min}}{270 \text{ min}}$$



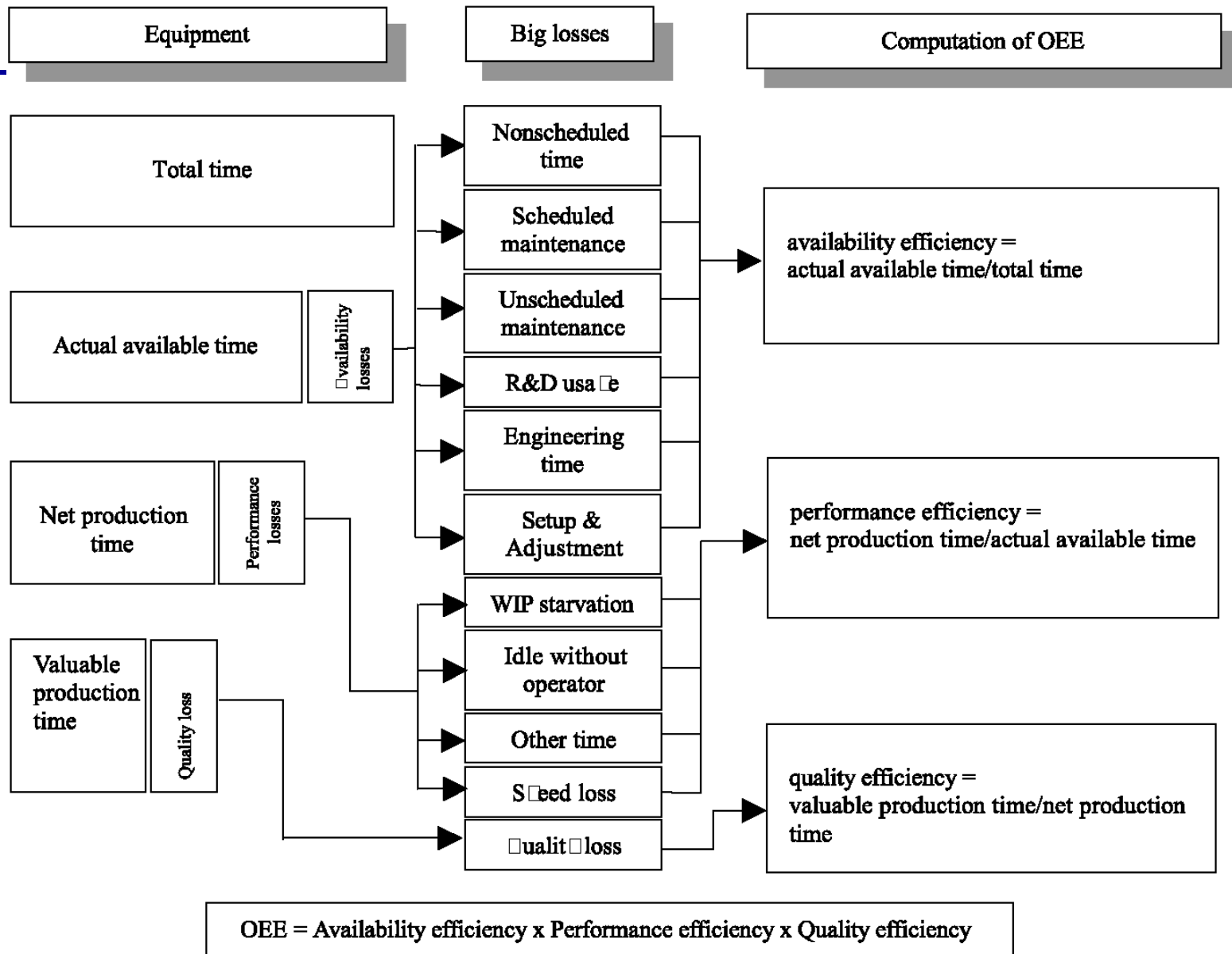
X

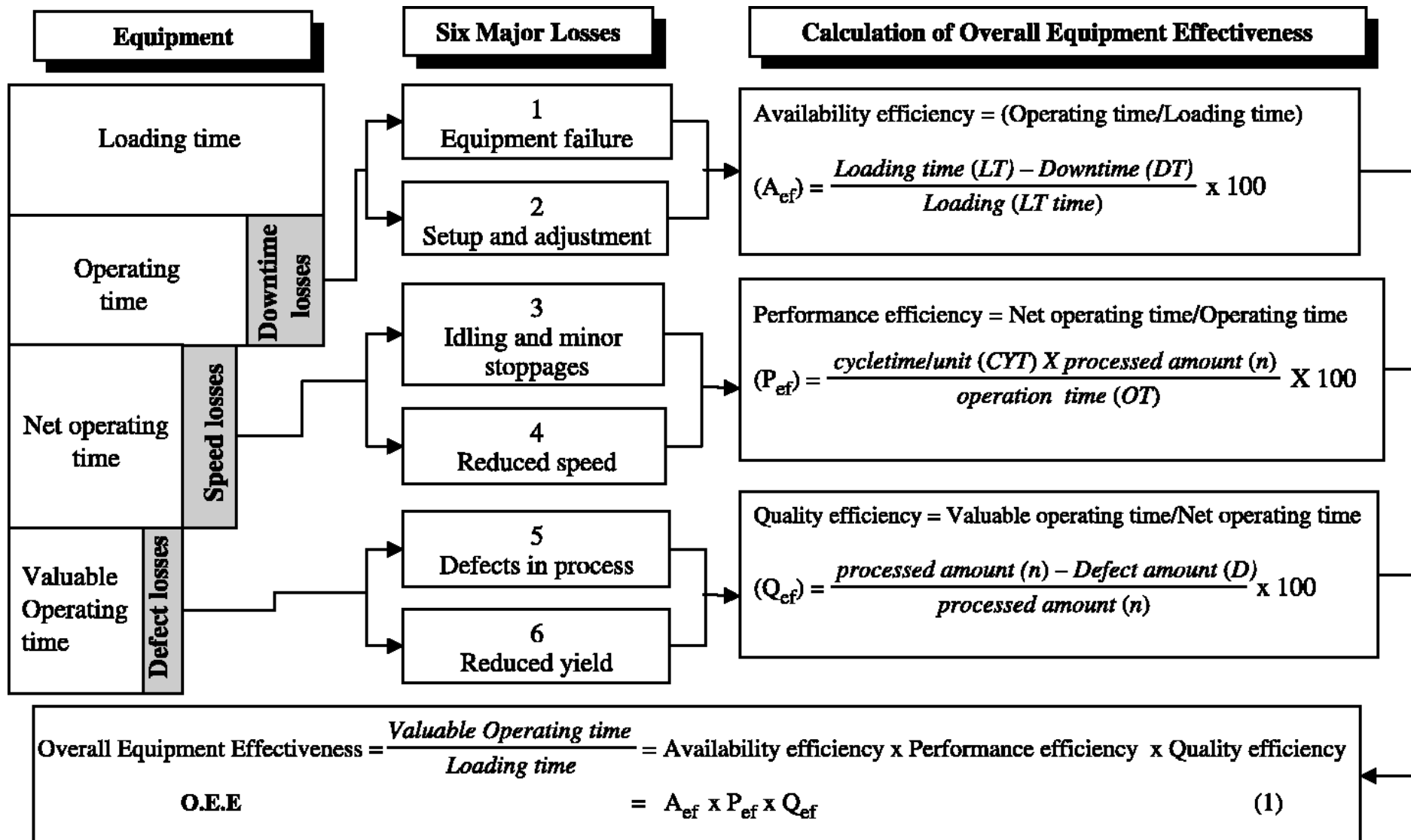
factor 92.6%

Overall Equipment Effectiveness



= 59.6%





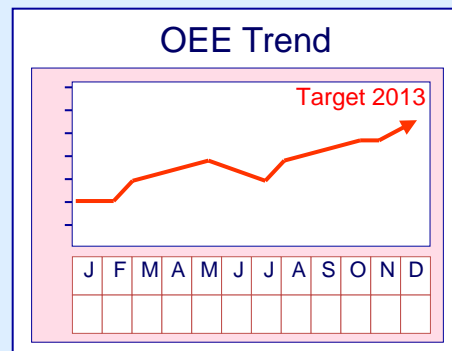
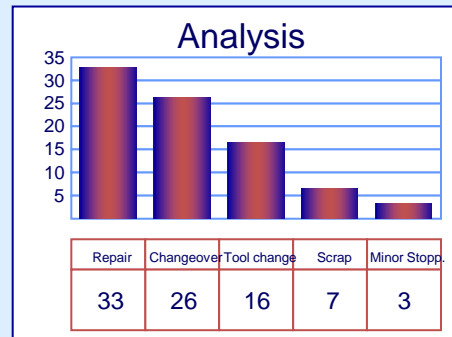
How to increase OEE ?

Data collection is the very important basis to increase OEE

Collect data for all downtime and losses on the machine

- Repairs
- Change over, Adjustm.
- Tool change
- Minor stoppages
- Scrap, rework

Data analysis and visible measure

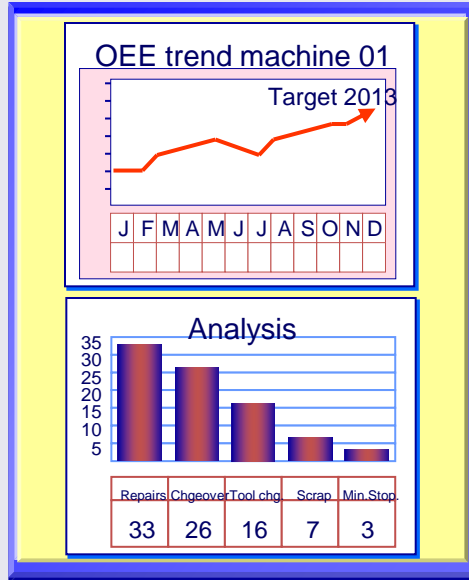


Make improvements visible and implement

- Autonomous Mainten.
- Preventive Maintenance
- Changeover reduction
- Standardize tooling
- Improved machine reliability
- Standardisation
- Kaizen

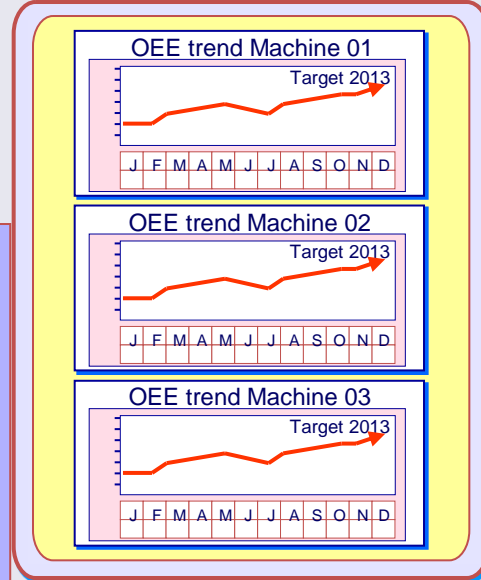
Making OEE visible

Machine Information



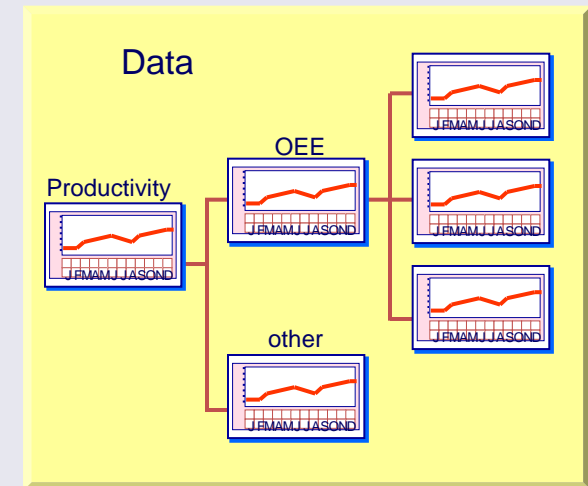
shows the current situation of the machine or plant

Departement Information



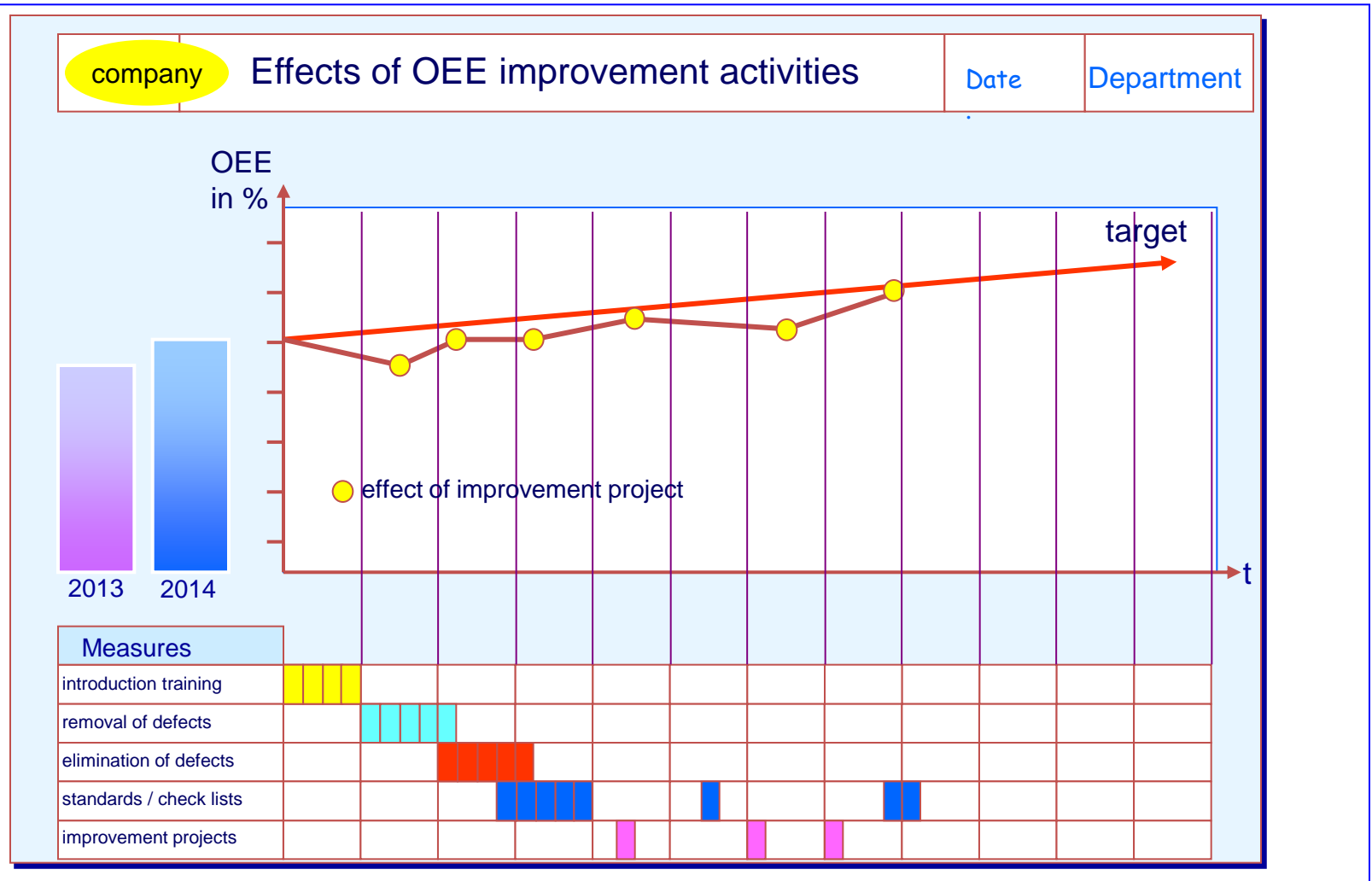
shows the machine in the area

Company Information

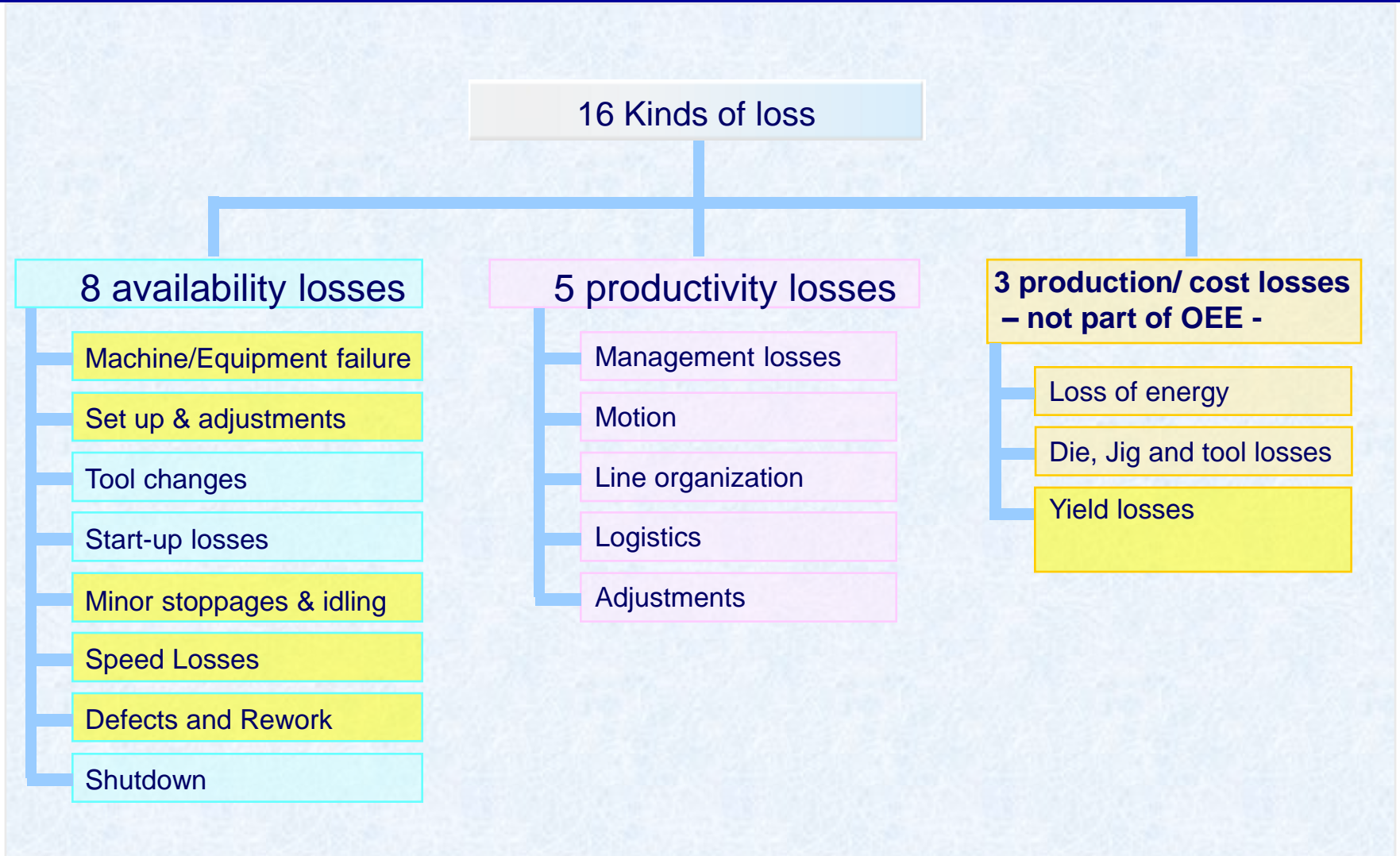


shows development, trends and links between targets and achievements

Structured matrix sheet



Fundamental concept of plant effectiveness



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- Terima kasih