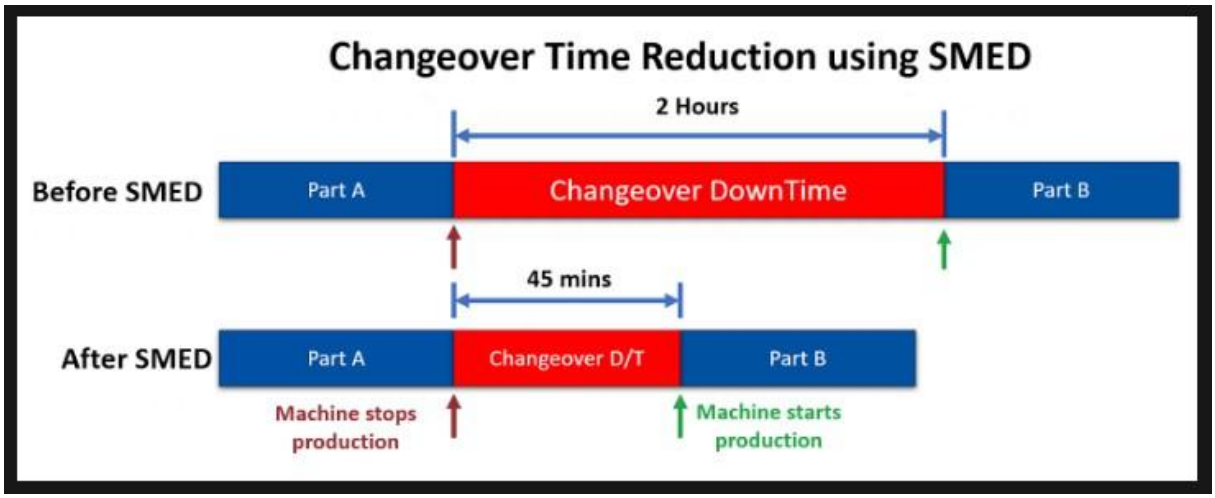
Study Guide: Changeover Reduction (SMED)

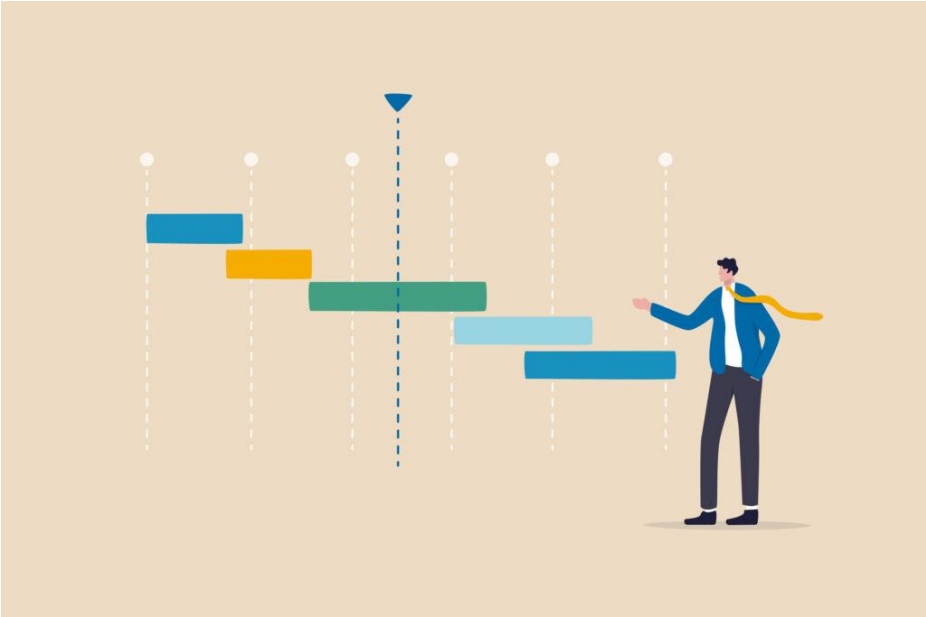
What is a changeover reduction (SMED)

- SMED is a method for analyzing and reducing changeover and cycle times.
- It stands for Single Minute Exchange of Dies because it came from someone trying to improve the changeover time of Dies
- SMED is a powerful and industry agnostic tool
- SMED is about reducing cycle time and changeover time. Cycle time is the time it takes a process to do a cycle. Changeover time is the time that takes from making one part, then the process has to stop, changeover, set-up again, until it can start making the next part. So changeover is a sort of downtime.



How to reduce changeover time in seven steps:

1. **Map the process**
    - Take a video and analyze the process. Write down every step, ideally, put it into a Gantt chart which will help you see all the steps of the changeover and how they fit into each other.



Project a timeline or schedule, planning for resources on working tasks, development plan, deadline to launch product, workflow concept, businessman project manager review project timeline Gantt chart.

2. Remove unnecessary activities.

- Ask yourself if each step is really necessary

3. Convert internal steps into external steps

- This is about moving activities are that commonly done within the changeover time whilst the machine is stopped and doing them before the machine is stopped or right after the machine is stopped

4. Do the internal steps simultaneously

- Do the steps you still have to perform inside the changeover, simultaneously or in parallel to each other, this reduces the critical path.

5. Speed up/Shorten the remaining internal processes

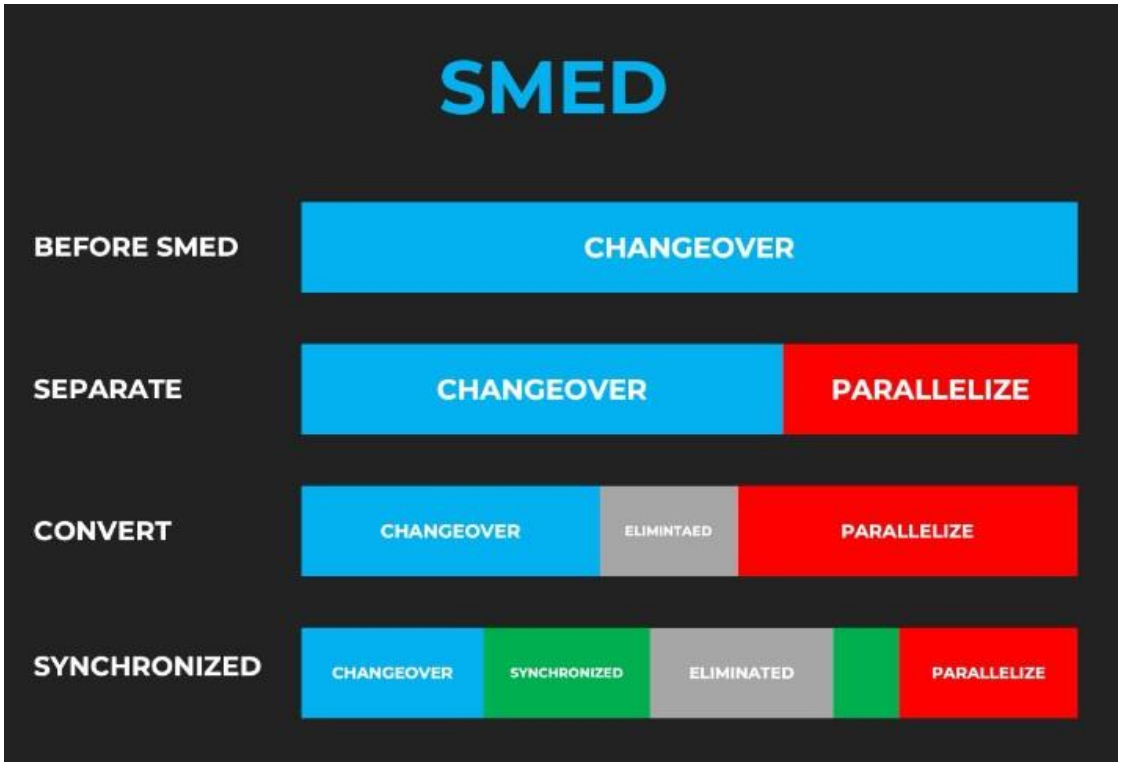
- This step is fifth in line because we do not try to improve a process, before we have tried to eliminate it, or we've tried doing them in parallel, or move them outside of the critical path into external steps
- Some ways we could make our steps faster are:
    - Through better programing
    - Through ergonomic changes, so there is less physical work and less moving around
    - Through Engineering redesigns using quick release fixtures or pre-mark settings, etc.

6. Speed up/Shorten the external processes

- These are the processes that are no longer part of the changeover
- These are the preparation activities, either before we start the changeover or afterwards
- These step won't make the changeover shorter, but it might help the operators who might not have the time to do all these external changeover tasks when the process is running otherwise

7. Do the entire process again

- SMED is an iterative process and the opportunities you saw the first time you went through it are great, but you most likely will see new opportunities that weren't possible to see back when your process looked so different at the beginning.
- Start again, remap the process, and go through the steps we just learned. This cycle can be repeated several times.


SMED
BEFORE SMED
CHANGEOVER
SEPARATE
CHANGEOVER
PARALLELIZE
CONVERT
CHANGEOVER
ELIMINTAED
PARALLELIZE
SYNCHRONIZED
CHANGEOVER
SYNCHRONIZED
ELIMINATED
PARALLELIZE