Sustainable Productivity Improvements

Nachhaltige Produktivitätssteigerung durch Stabilisierung und kontinuierliche Verbesserung von Fertigungs- und Logistikprozessen
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The System approach of BPS

- Targets
- Principles
- Elements

Current situation → Ideal condition

- Zero failure
- One piece flow
- 100% value added

→ Waste free production
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System approach based on value stream design

Target 2007: reduce lead time from 3 to 1.2 days

- Reduce setup time from 10 to 4 min with Quick Change Over
- Introduce Pull System with Kanban & Supermarket
- Implement Standardized work & Reaction Systems
- Reduce EPEI to 1 for Leveled Production
- Implement Milkrun with frequency 2x/h

Analyze and design value stream

Generate implementation plan

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsible</th>
<th>Date</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement milkrun assembly</td>
<td>……</td>
<td>……</td>
<td>……</td>
</tr>
<tr>
<td>Reduce lot size assembly to …</td>
<td>……</td>
<td>……</td>
<td>……</td>
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</tbody>
</table>
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From implementation to continuous improvement

→ Implementation of elements is insufficient to achieve sustainable business results

→ BPS – elements result in standards which are highly visible on the work floor

→ Standards enable team members and leaders to see abnormalities and fluctuation and react quickly with improvement activities
How can standards lead to continuous improvement? (1)

- **Standardized work on production line**
  - Cyclic operator movement, defined inventory
  - Defined cycle times (man, machine)
  - ... resulting in high transparency on the line
  - *What keeps the operator from working consistently to standard?*

- **Cyclic material supply**
  - Cyclic material supply routes
  - Defined timing of milk runs
  - Defined inventory (min/max) in locations
  - *resulting in high transparency in material supply*
  - *What keeps the material handler from working consistently to standard?*

- **Quick Change over**
  - Defined movement of setters, location of tools
  - Defined internal/external setup times
  - ......
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How can standards lead to continuous improvement? (2)

➤ Leveling
  - Repetitive production sequence
  - Leveled Volume
  - Defined finished goods Inventory, within min/max – limits
  - What keeps manufacturing and logistics to run according to the defined standard?

➤ Supermarket, Kanban
  - Fixed inventory positions in supermarket
  - Min/max – Inventory limits
  - Clear address and quantity on Kanban card
  - ….
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Problem solving leads to continuous improvement

Reality (actual condition) → Problems → Solve → Standard (intermediate target)

* Source „Mike Rother“

It is easy to set a standard (Milk run, Kanban, Work std., …)

But it is Hard Work !! to achieve a standard

Performance

Standard →

.................

Actual Performance

time
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Continuous Improvement at Bosch (CIP)

**System-CIP:** TOP DOWN planning of Targets and projects based on Value Stream Design (→Alignment, Periodically)

**Point-CIP:** Daily bottom up activities to stabilize and improve processes (→Speed, Daily)
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Standardized work in the „Real World“

If problem solving capability is insufficient,

• standardized work can not be developed,
• leveling will fail,
• pull System will not be effective…..

→ sustainable results cannot be achieved!

Challenge:
Develop leaders to perform and guide team members in practical problem solving activities
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Where do we start? Analyzing the current value stream…

Value stream analysis reveals many opportunities to reduce lead time, but:

• so many activities, what is priority?
• mainly working with average numbers. Fluctuations are not addressed systematically
• constant workflow (standards) not achieved, leading to insufficient cost reduction and frustration of team members
Where do we start? – Leveling is key!!

Start improvement activities on process next to customer (pacemaker)!

- Pacemaker process is connecting all processes from suppliers, fabrication with customers
- Pacemaker stability is key to achieve cost reductions in the value stream
- Without pacemaker stability improvements will not be effective (system collapse)

Create stable (leveled) condition on pacemaker process first!
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Summary: Improvement never stops!

- Intention of BPS-Elements is to set highly visible standards (target conditions) as base for continuous improvement activities.

- Continuous reduction of fluctuations is key for sustainable improvements enabling constant workload for team members and machines (no waiting time, no overburden, less confusion) resulting in high quality and productivity.

- Challenge is to enable leaders to set and communicate appropriate target conditions and to guide team members through the problem solving process. Beside training activities experienced coaches are necessary to develop those capabilities in practical applications.