Introduction on Lean, six sigma and Lean game

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Lean is:

- a philosophy
- a method
- a set of tools

- Waste reduction
- User value
- Create flow
- Improve performance
Lean is..

- A methodology that involves all parts of the organisation in a continuous process of improvements
- Goals are set by the management
- All staff are participating in developing and continuously improving work processes
The lean methodology...

....is based on the understanding of the business along three dimensions

- Process
- Management
- Culture
The Lean Pedigree - ancestors within Venetian Ship builders to a lean management approach

**Henry Ford 1910-1920**
- Ford T (1908)
- Time is money. Cost effective
- Taylor and “Scientific management” First assembly lines (1913)
- Standardizing: “Any colour as long as it is black..”

**Alfred Sloan / GM 1930**
- Proces layout
- Lead time

**Toyota Production System (TPS)**
- Postwar WW2 Japan was short on resources
- Industrial buildups.
- Inspired by Ford, but focus is flow instead of economies of scale
- Deming & Juran
- Reduced stock / JIT
- Built-in-quality / JIDOKA
- Teamorganisation & continuous improvement / KAIZEN.
- Pull/ KANBAN.

**Lean**
- Late 80’s: Toyota factories in US and Europe. Toyota suppliers
- Same high level of quality and efficiency. **TPS**
- Benchmark by MIT on efficiency and quality of the global car industry.
- 1990. Womack. Based on principles of TPS, he named it «LEAN»
- Formally introduced in Statistics Norway in 2012
- Formally introduced in Statistics Netherlands in 2014
Lean thinking - 5 basic principles

Value
- What is value and what creates value for your customer?
- Customer/user oriented approach

Value stream
- Mapping the value stream enables common understanding. Remove waste and what's non-value-adding. Visualisation & Involvement

Flow
- Tasks should flow through processes with fewest possible stops, bottlenecks, responsibility swaps, fixing or error corrections

Pull
- Improve management principles
- Overview. Involve and engage
- Standardize work processes. Best practice

Continuous improvement
- Strive for perfection (the optimal delivery)
- Openness and Confidence: challenge the current
- Ensure learning
To reduce waste is an essential part of lean thinking.

<table>
<thead>
<tr>
<th>TIMWOODS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>Unnecessary movements of products, files, dossiers, etc.</td>
</tr>
<tr>
<td>Inventory</td>
<td>Finished goods or half products (also contents of mailbox, physical dossiers, files, etc.)</td>
</tr>
<tr>
<td>Motion</td>
<td>Unnecessary movements of the employee, like getting tools and materials, switching apps, etc.</td>
</tr>
<tr>
<td>Waiting</td>
<td>Waiting time between activities (also response times applications)</td>
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<tr>
<td>Overprocessing</td>
<td>Produce better quality than required</td>
</tr>
<tr>
<td>Overproduction</td>
<td>Produce more than requested (more responses, more output)</td>
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<tr>
<td>Defects</td>
<td>Reject products due to flaws (resulting in creating a new one of repairing)</td>
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<tr>
<td>Skills</td>
<td>Not using capacity and knowledge of employees</td>
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process time: 50% decrease
productivity: 20% increase
Lean offers a set of facilitating tools and techniques
History of Six Sigma and Lean Six Sigma

1920: Statistical Quality Control
- Walter Shewhart
- Control charts
- PDCA
- Variance is a root cause of defects

1980: Motorola
- Bill Smith / Bob Galvin
- Six Sigma company-wide
- Focus on quality
- Less variance results in less defects
- 6σ = 3 defects per million
- Data driven

1988: General Electric
- Jack Welch
- DMAIC as project structure
- Belt structure
- Focus on price, quality and leadtime

2000: Adoption by Healthcare, Finance, Supply Chain

2010: Adoption by Government

2001: Lean Six Sigma first mentioned in some books
- Combining the best of both worlds:
  - Focus on customer
  - Combining the Lean and Six Sigma toolset and applying when needed
  - DMAIC project structure
  - Belt structure

2000: Lean Six Sigma adoption by Healthcare, Finance, Supply Chain

2010: Lean Six Sigma adoption by Government
Lean game

Chinese hats
As of 1999, our product is on the European market.

There are six production locations.

Production of “Chinese hats”

Chinese hats in the colour white with:
- Black edge,
- Blue edge, or
- Red edge
Organisation: 7 people

- Manager (1)
  - Logistics (1)
    - Production (3)
      - Drawer
      - Cutter
      - Folder
  - Staff (1)
    - Quality Assurance (1)
  - Quality Assurance (1)

- Customer
- Belt
Rules

- Do not change anything!
- Carefully read the instruction and perform your tasks as described
- Work hard!

- Pay attention to the start and end-signal:
  if time has finished, please put everything down