Principles of Software Design
Agile, Lean

Robert Lukoťka
lukotka@dcs.fmph.uniba.sk
www.dcs.fmph.uniba.sk/~lukotka

M-255

Agile

- Listen to this presentation: M Fowler, N. Ford: Explaining Agile.
- Read the Manifesto for Agile Software Development.
- Go through the Principles behind the Agile Manifesto.
- Finally, one more presentation: M. Fowler: Agile in 2018.

Lean software development

- Translation of lean manufacturing principles and practices to the software development domain.
- Adapted from the Toyota Production System.
- Lean software development has strong connections with agile, it is often regarded as subculture of the agile community.

Toyota Production System

Toyota Production System/Just-in-time manufacturing.

- Developed between 1948 and 1975.
- Comprises of management philosophy and practices.
- Became well known in the rest of the world in the 1990's when westerners started writing books to explain why the Japanese were beating the US at so many industries. [3]
- Main concepts:
  - Making only what is needed, only when it is needed, and only in the amount that is needed.
  - Automation with a human touch

Lean manufacturing [2]

- Derived from Toyota production system.
- The term “Lean” was coined in 1988.
- Key principles (1996):
  - Precisely specify value by specific product
  - Identify the value stream for each product
  - Make value flow without interruptions
  - Let customer pull value from the producer
  - Pursue perfection

Lean manufacturing [2]

Precisely specify value by specific product

- Form a team for each product to stick with that product during its entire production cycle.
- Enter into a dialogue with the customer.

Lean manufacturing [2]

Identify the value stream for each product

- Challenge all of the wasted steps, e.g. (from Toyota Production System)
  - Overproduction
  - Waiting (time on hand)
  - Unnecessary transport or conveyance
  - Overprocessing or incorrect processing
  - Excess inventory
  - Motion
  - Defects
- Eliminate waste through the process of continuous improvement. (Also from Toyota Production System)

Lean software development [5]

Principles:

- Eliminate waste
- Amplify learning
- Decide as late as possible
- Deliver as fast as possible
- Empower the team
- Build integrity in
- Optimize the whole

Eliminate waste [5]

Waste examples:

- Partially done work
- Extra features
- Relearning
- Task switching
- Waiting
- Handoffs
- Defects
- Management activities

Lean SD - other principles [5]

Amplify learning, what does it mean? E.g.:

- Instead of adding more documentation or detailed planning, different ideas could be tried by writing code and building.

Build integrity in, what does it mean? E.g.:

- Checking quality of the product continuously as integral part of the development. This includes both
  - external aspects - e.g. frequently collecting customer's feedback to improve the product,
  - internal aspects - e.g. maintaining and frequently running good automated tests.

Resources I

- M Fowler, N. Ford: Explaining Agile
- Manifesto for Agile Software Development.
- Principles behind the Agile Manifesto
- M. Fowler: Agile in 2018
- Wikipedia: Lean software development

References I


Wikipedia: Toyota Production System


Wikipedia: Lean manufacturing


M. Fowler: AgileVersusLean


Wikipedia: Kanban


Wikipedia: Lean software development