Prosessien kehittäminen - erityisesti ketterän toimintamallin mukaisesti

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Esityksen runko

B Osa 1: Ohjelmistoprosessin mittaaminen ja parantaminen
  B Ohjelmistoprosessin laatu - mitä se on? Tärkeimmät/tyypilliset mitattavat asiat/indikaattorit -- Keskeiset standardit ja mallit - mitä standardeja ylipäättään on ja mihin niitä voi käyttää?
  B Standardien ominaisimmat sovellusalueet (minkä tyypisiin sovelluksiin parhaiten soveltuvat)
  B Kokemuksia prosessien kehittämisestä – osana kaikkea

B Osa 2: Ketterä kehittäminen
  B ketterän kehittämisen ja lean-ajattelun yleispiirteet
  B Keskeisimmät ketterän kehittämisen käytännöt ja mittarit
  B Mistä ketteryydessä juuri nyt puhutaan?

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Why process quality in software engineering?

- Immature vs mature organisations may have different capabilities to deliver quality products
- Software can be difficult to measure directly because it has no physical characteristics (weight, speed, ...)
  - It may be measured indirectly via high quality process
  - Also experience from end users matters
- Some process attributes have a major impact on software quality, for example ability to make continuous changes in software
- Bad process can destroy good product quality
  - Numerous examples in market
- Good process can produce at least “good enough” product quality
Immature Organisations – no managed process

- Immature organisations are fighting fires:
  - constantly reacting - no time to improve
  - the extinguished fire can explode later or in another place - no cause analysis
  - firemen get burned - guilty driven organisation

- Possible sources of chaos:
  - no estimations
  - no commitments
  - no planning
  - no records from the past
  - no change management

Mature Organisations – high quality process

- increasing visibility into project performance
- increasing predictability of results
- increasing product quality
- increasing ability to manage complexity
- increasing staff morale
How process and product quality could work together?


Integrating process and product quality (SPICE and SQUARE)

- Process Evaluation
- Standards And Criteria
- Development Process
- Process Quality (SPICE)
- Internal and External Product Attributes
- Product in Use Attributes
- Other Quality Attributes
- Attribute X
- Product Quality (SQUARE)
- Product Evaluation
Harmonised view between product and process quality standards (SQUARE and SPICE)

- **Product quality (SQUARE)**
  - Product quality (sub)characteristics
  - Product quality attribute

- **Process quality (SPICE)**
  - Process quality (sub)characteristics
  - Process quality attribute

Process quality characteristics, some candidates:

- **Agility**
  - coordination
  - dexterity
  - flexibility

- **Controllability**
  - set and control goals
  - measurement

- **Capability**
  - achieving business goals
  - organizational maturity

- **Efficiency**
  - performance
  - predictability
  - improvability

- **Robustness**
  - dependability
  - risks
  - information security

Process Quality
Capability and maturity of the process and organisation

- achieving business goals (Capability)
  - characterization of the ability of a process to meet current or projected business goals
  - SPICE (ISO/IEC 330xx) is the leading standard

- organizational maturity
  - the extent to which an organization consistently implements processes within a defined scope that contributes to the achievement of its business goals
  - CMMI is the leading model

Agility

- Coordination
  - coordination of work performed (between teams)
  - adjustment and linking activities

- Dexterity
  - skillfulness in process management under pressure
  - quick and clever actions to amend a process

- Context adaptability
  - process can be applied to different and changing environments and situations
Agile vs Plan-Driven process

1) Potential conflicts in principles, need to choose your approach
2) Best fit for agile
3) Best fit for Plan-Driven (may include hw design, business factors etc)
4) Problem!

Extended 3D Quality framework: Product, Process, Resources
The ultimate algorighm of quality...?

- **Quality** \((Q) = Q(\text{process}) \times Q(\text{product}) \times Q(\text{resources})\)

- Of course, we can add more dimensions and elaborate algorithm further

- Key message is that dimensions are all required;
  - If any \(Q(n)\) = Zero, then also Quality is Zero
  - Note that quality means different things depending on the framework and abstraction level, this slide is not the only correct concept!

Resource quality – wide definition

- **Resources**: People, Infrastructure, Some organisational abilities
  - **People**: Competences (individual, teams), tacit knowledge etc
  - **Infrastructure**: Systems, tools, environments, Repositories, experience collections, work spaces etc
  - **Abilities**: Decision making, cultures (especially safety and security), improvability
Software process, 3 recommended measures from FiSMA (2014)

**β Recommend metrics: Maturity of the software process**
- **Type:** Indicator, indirect measure
- **Main content:** An operational level derived from a summary of selected processes. Well-known and widely suggested methods are CMMI and SPICE. Self-assessment is best method.
- **What the measure explains:** Process based capability of supplier organisation to deliver.

**β Recommend metrics: Agility of the software process**
- **Type:** Indicator, indirect measure
- **Main content:** A level of agility adoption within the whole software organisation. A recommended method is a survey or an employee inquiry.
- **What the measure explains:** An ability to react to external changes or requests.

**β Recommend metrics: Improvability of the software process**
- **Type:** Indicator, indirect measure
- **Main content:** A rate of planned and decided improvement efforts which get completed accordingly. A recommended method is set of workshops or surveys.
- **What the measure explains:** A capability to execute when needs for changes and development activities have been identified.

What is happening in SwE related standards and models

- Some new or upgraded frameworks, especially in IT service area: IT4IT (ITIL), COBIT5, new ISO/IEC 20000...
- DevOps, the latest hype in integrated development + operation
- Next generation of SPICE: ISO/IEC 330xx set. It will include new models for process quality and organisational maturity.
  - New improvement standard ISO/IEC 33014
  - Several domain specific variants: Automotive, Healthcare, Space and Aviation, Nuclear Power...
- New guides from CMMI, especially “A Guide to Scrum and CMMI®: Improving Agile Performance with CMMI”
- And numerous others...
OSA 2: AGILE BASICS AND TRENDS

The agile Manifesto

Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools
Working software over comprehensive documentation
Customer collaboration over contract negotiation
Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

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Goals and areas of management and measurement in SwE

- Creation of value
  - Immediate benefits
  - Strategic positioning
  - Competitiveness, efficiency
  - Changeability, adaptability

- Cost savings
- Creation of growth
- Image, position
- Capability to deliver

- Competence
- Management
Some key ceremonies and measures in Agile development

- Backlog Grooming
- Continuous Build / Continuous Integration
- Daily Standup / Daily Scrum
- Definition of Done
- Epics
- Team Estimating Game (Fibonacci Game) & Planning Poker
- Pair Programming
- Product Backlog
- Refactoring
- Release Burn-Down Chart
- Release Planning
- Sprint / Iteration
- Burn-Down Chart
- Sprint Demo / Sprint Review
- Sprint Planning
- Team Agreements
- Technical Debt
- Test Driven Development
- User Stories
- Velocity

Scaled Agile Framework™ Big Picture
Arguments for and against agile (Tor Stålhane)

Believer arguments:
- Agile development is cheaper because:
  - Only what is needed will be developed
  - Misunderstandings and errors are discovered early
  - Communication is more efficient
  - Better conditions for creativity
  - Changes cannot be controlled. Thus, it is better to emphasize change responses and change control
  - Self-organizing groups perform better

Sceptics arguments:
- Customer attention is luxury
- Customer will not accept "no plan – no estimates"
- Small releases will only fit small problems and small projects
- Agile development does not fit in traditional project management framework
- Compliance with important standards such as IEC 61508 is not clear

Modern Agile as a next step? One opinion (from hundreds):

- Make Users Awesome
- Apply Lean UX
- Leverage Lean Startup
- Conduct Blameless Retrospectives
- Respect & Appreciate People
- Experiment & Learn Rapidly
- Make it Safe to Fail
- Evolve Solutions
- Collaborate & Integrate Frequently
- Deploy & Release Continuously
- Test & Refactor
- Form Product Communities
- Deliver Value Continuously
- Focus on Flow

Modern Agile
Joshua Kerievsky
Industrial Logic
DevOps, the new "super" hype

Wikipedia: **DevOps** (a clipped compound of "software DEVelopment" and "information technology OPerationS") is a term used to refer to a set of practices that emphasize the collaboration and communication of both software developers and information technology (IT) professionals while automating the process of software delivery and infrastructure changes.

Discussion

- Is focus changing in and between process, product and resource quality? Which comes first now?
- How some market trends effect on business, for example "time to market" and system markets (we need to fit with number of other systems)?
- What is different between highly regulated and disciplined domains vs fast changing and competing ecosystem markets?