Agile Software Development

L01 - Introduction

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Software products
The three P’s in Software Development Projects

Adapted from Dietmar Pfahl’s course on Software Engineering Management at UT
The three P’s in Software Development Projects

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Software process

• A process defines **who** does **what**, **when**, and **how** to reach a specific goal.

• In **software engineering**, the goal is to build a software product or to enhance an existing one.

• Software engineering is an engineering discipline that is applied to the development of software in a **systematic approach** (called a software process).

Software process example

who does what, when, and how

do everything → software product
Software process example (2)

Who does what, when, and how?

Do everything

Software product
Software process example (3)

- **do everything for part A**
- **do everything for part B**
- **merge A and B**

Who does what, when, and how?

- Component A
- Component B
- Software product
Software process examples

**Waterfall**
- Requirements
- Design
- Implementation
- Verification
- Maintenance

**V Model**
- Requirement Design
- System Design
- Architecture Design
- Module Design
- Unit Test
- Integration Test
- System Test
- Acceptance Test
- Verification Phases
- Validation Phases
- Coding

**RUP**

**Scrum**
- Product Owner
- Product Backlog
- Daily Meeting
- Sprint

**Spiral**
- Determine Objectives, Alternatives, Constraints
- Operational Prototype
- Evaluation and Verification
- Iteration and Feedback
- Develop, Verify andival Product
Process types

Adapted from Dietmar Pfahl’s course on Software Engineering Management at UT
Example: RUP
Published by Jacobson, Booch, and Rumbaugh in 1998 (UP)

Iterative Development
Business value is delivered incrementally in time-boxed cross-discipline iterations.

<table>
<thead>
<tr>
<th>Inception</th>
<th>Elaboration</th>
<th>Construction</th>
<th>Transition</th>
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<tbody>
<tr>
<td>I1</td>
<td>E1</td>
<td>E2</td>
<td>C1</td>
</tr>
</tbody>
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- Business Modeling
- Requirements
- Analysis & Design
- Implementation
- Test
- Deployment

Time
Example: RUP

Workers, activities, and artifacts.
Example: RUP
The Agile Manifesto

**Individuals and interactions** over processes and tools

**Working software** over comprehensive documentation

**Customer collaboration** over contract negotiation

**Responding to change** over following a plan

http://agilemanifesto.org/
What is Agile Software Development?

• Agile software development is more than **frameworks** such as Scrum, XP, or FDD.

• Agile software development is more than **practices** such as pair programming, TDD, stand-ups, planning sessions and sprints.

• Agile software development is an **umbrella term** for a set of frameworks and practices based on the **values** and **principles** expressed in the Manifesto for Agile Software.

https://www.agilealliance.org/agile101/
The Agile Umbrella

Scrum
FDD
Kanban
ASD
DSDM
XP
Lean
Crystal
Subway map to agile practices
https://www.agilealliance.org/agile101/subway-map-to-agile-practices/
Current status of Agile

The survey was conducted between August and December 2018. Sponsored by CollabNet VersionOne. Only 17% of the respondents (N=1319) were CollabNet VersionOne customers, indicating the range and diversity of respondents.
Agile methods and practices

Scrum and Scrum/XP Hybrid (64%) continue to be the most common agile methodologies used.
Engineering practices

The overall rank order of engineering practices employed remained the same this year with exception of one new addition to the survey: Continuous delivery.
What happens in Estonia? (HELENA)


Frameworks/Methods
Which of the following frameworks and methods do you use?

- Scrum 58%
- Iterative Development 17%
- Kanban 17%
- DevOps 17%
- Classic Waterfall Process 67%
- eXtreme Programming (XP) 58%
- Lean Software Development 25%
- Domain-Driven Design 50%
- ScrumBan 33%
- Feature Driven Development (FDD) 67%
- V-shaped Process (V-Model) 75%
- Phase / Stage-gate model 83%
- Model-Driven Architecture (MDA) 50%
- Scaled Agile Framework (SAFe) 67%
- Team Software Process 83%
- Personal Software Process 75%
- Nexus 83%
- Large-Scale Scrum (LESS) 17%
- SSADM 83%
- Spiral Model 67%
- Dynamic Systems Development Method 67%
- Crystal Family 67%
- PRINCE2 58%
- Rational Unified Process 17%

- Do not know it
- We never use it
- Do not know if we use it
- We rarely use it
- We sometimes use it
- We always use it
- We often use it
What happens in Sweden? (HELENA)
Worldwide trend – HELENA survey

Warm up for this week

• Check the additional readings on the course site
  https://courses.cs.ut.ee/2019/asd/fall/Main/Lectures

• Get ready for the practice sessions - install the software
  • Elixir  https://elixir-lang.org/install.html
  • Code editor  https://code.visualstudio.com/download
  • Git client  https://git-scm.com/

• Get acquainted with Elixir and Git