MTAT.03.295
Agile Software Development
L01 – Introduction

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The 3 P’s in Software Development Projects

Adapted from Dietmar Pfahl’s course on Software Engineering Management at UT
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People

• **Primary element of any project is the people**
  
  • People gather requirements
  
  • People interview users
  
  • People design software
  
  • People write software for people
Software product

- **Product**: each artifact that is consumed or produced in the context of engineering-style development
  - products can be refined by other products
  - examples are source code, specification document, problem description, configuration data, test case...

- **Product model** consists of a description of the info units of a software product (FR, NFR, design decisions) and the structure for arranging the i.u. (like table of contents for a requirements document)

Software process

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

• A **software process** is a goal-oriented activity in the context of engineering-style software development
  
  • systematic approach
  
  • examples are creation of a product, testing of a system, measuring of a code module...

Software process example

who does what, when, and how

merge A and B

software product

component A

component B

do everything for part A

do everything for part B
Process models

• a process model is a specification on how we can achieve the goals

• can be used for different purposes, e.g., for coordinating, synchronizing, monitoring, and improving software development, maintenance, and operation activities

Process models

Lifecycle models
- capture the complete lifecycle of a software product
- provide a broader view on the process
- e.g. waterfall, iterative enhancement, spiral, Unified Process, IBM Cleanroom Process, agile

Engineering process models
- describe a fraction of the complete software lifecycle process, and they can be very detailed
- e.g.: hybrid cost estimation, Extreme Programming

Process models

Waterfall

V Model

Scrum

RUP

Spiral

Process types

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Lifecycle models: RUP

Rational Unified Process – Published by Jacobson, Booch, and Rumbaugh in 1998 (UP)

• generic description of **phases and activities** that must be adapted for different types of organizations, project sizes, domains...

• is **component based**, i.e. the system to be built is compiled from software components that are interconnected via well-defined interfaces

Lifecycle models: RUP

Rational Unified Process – Published by Jacobson, Booch, and Rumbaugh in 1998 (UP)

- **Unified Modeling Language (UML)** is used to model all central artifacts describing the systems
- RUP is **use-case driven** [functional specification]

Lifecycle models: RUP

Rational Unified Process – Published by Jacobson, Booch, and Rumbaugh in 1998 (UP)

Factors in Choosing a Software Process

• Customer involvement
• Stable requirements
• Team size / proximity
• Developer experience
• Familiarity with technology
• Familiarity with domain
• Severity of impact of incorrect analysis
• Anticipated changes in technology
Why agile?

- originated in the software development industry as a new way to manage software development (00/01)
- projects were failing or taking too much time to complete
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/
Agile

- Agile is the ability to create and respond to change
- Deal with change in an uncertain environment
- Umbrella term
  - frameworks
  - practices

https://agilemanifesto.org/
Recap of today’s lecture

• The three P’s in Software development projects
  • People
  • Software product
  • Software process
    • Process models
      • Lifecycle and engineering models
      • Factors in choosing
      • Agile
Getting ready!

- This week there are no practice sessions nor consultations
- Set up the environment
- Check the additional readings on Moodle