**Aalto University**

# CS-C2130 / CS-C2140 / CS-E4910 Software Project 1 / 2 / 3

# Lecture 1: Introduction to the Course

Jari Vanhanen

9.9.2020

# Agenda

- **16:15 - 17:40** Introduction to the Course
  - motivation and practicalities
  - Scrum
  - forming the teams and selecting a topic
  - greetings from Accenture

- **17:40 - 18:00** Scrum Masters introduce themselves

# Course = A Large Project Work

- SW development projects for real clients
  - from the client's idea to incremental deliveries of production quality code
    - the results will be utilized by the clients
  - different domains
  - different programming languages and technologies

What are the differences between small programming assignments and real software projects?
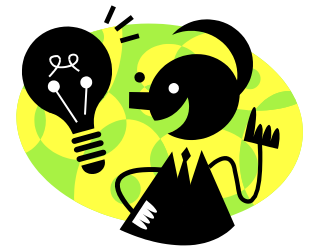
# A Typical SW Development Scenario in Industry

- External client and diverse end-users

- Large system

- Large team

- Every work hour costs money

- Bugs may cause serious consequences

- Maintenance by someone else

What needs attention in this scenario?

# A Typical SW Development Scenario in Industry

- External client and diverse end-users (understanding real needs)
- Large system (technical complexity, software design)
- Large team (communication, coordination, team spirit)
- Every work hour costs money (efficiency, prioritization)
- Bugs may cause serious consequences (quality, proof of quality)
- Maintenance by someone else (maintainability, knowledge transfer)

Programming skill is not the only element of success.

# Prerequisites

- SW Project 1 & 2
  - **1st year programming and databases courses / good programming skills (mandatory)**

- SW Project 3
  - **SW Project 1 & 2** or a similar project **(mandatory)**
  - **CS-C3150 Software Engineering (mandatory)**
  - various SW engineering courses (recommended)
    - SW Design and Modelling
    - SW Testing and Quality Assurance
    - SW Processes and Projects
    - Requirements Engineering
    - SW Architectures

# Educational Goals (1/2)

- Getting **hands-on experience** of a real SW development project
  - requirements engineering, design, programming, QA, project mgmt
  - seeing the common challenges related to these activities

- Learning to use **new technologies**
  - programming languages, frameworks etc.

- Learning to **apply Scrum** and various work practices and tools
  - **try new practices and tools, and analyze experiences**
    - enlarge your software engineering toolkit
    - understand the limits of practices and tools

# Educational Goals (2/2)

- Learning various academic / soft skills
    - social skills
    - team work
    - searching for information
    - note-taking
    - decision making
    - presentation skills
    - time management
    - independent learning
    - networking
    - business thinking
    - …

> … and learning the "**I can do this**"-attitude

# Educational Goals - Summary

- After this course you should
    - **understand the common challenges** involved in SW development
    - be a **better programmer**
    - be able to **apply Scrum** and suitable work practices and tools in your projects
    - have improved in many **academic/soft skills** applicable practically anywhere

Use this course as an opportunity for learning!

Think about your personal learning goals and make decisions (project topic, your responsibilities in the team etc.) that support them!
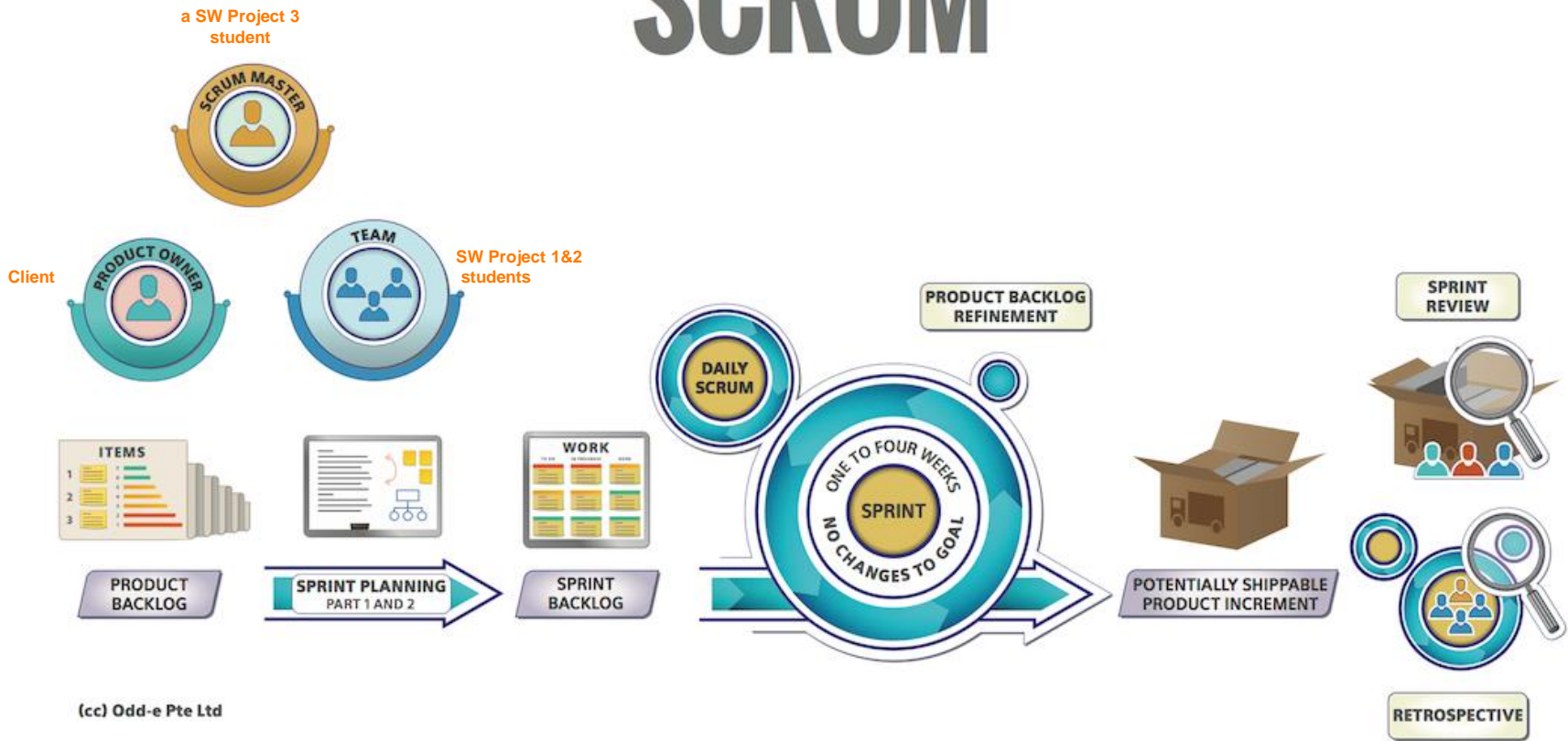
# SCRUM

# Scrum

- Iterative and incremental agile software development framework for **managing** product development

Does not cover design, implementation, or concrete testing practices

- Widely used in software industry

- On this course all projects use Scrum

# SCRUM

**a SW Project 3 student** — SCRUM MASTER

**Client** — PRODUCT OWNER

**SW Project 1&2 students** — TEAM

ITEMS
1
2
3

**PRODUCT BACKLOG**

**SPRINT PLANNING** PART 1 AND 2

WORK

**SPRINT BACKLOG**

DAILY SCRUM

PRODUCT BACKLOG REFINEMENT

ONE TO FOUR WEEKS
SPRINT
NO CHANGES TO GOAL

**POTENTIALLY SHIPPABLE PRODUCT INCREMENT**

SPRINT REVIEW

RETROSPECTIVE

(cc) Odd-e Pte Ltd

# Scrum Roles – Product Owner (PO)

- **Someone from the Client's organization**

- Responsible for
  - maximizing the value of the product and the work of the development team
  - managing the Product Backlog

- Participates to Sprint Planning and Sprint Reviews

# Scrum Roles – Development Team

- **Students from SW Project 1 & 2 courses**

- *Self organizes* to do the work of delivering a potentially releasable increment of "*Done*" product at the end of *each Sprint*

- Responsible for
  - programming, testing, analysis, design and any other tasks required to successfully deliver the project
  - actively thinking "How can I best proceed the project now", instead of waiting that someone tells what to do

**Help others**, ask if you could do something for them. But also **take responsibilities** and be ready also to get an idea yourself what the team could do next. Don't just wait others to babysit you. – Student N.N.

# Scrum Roles – Scrum Master

- **Students from SW Project 3 (5-8cr) course**
- Ensures that the Scrum Team understands and uses Scrum
- Responsible for
    - study, plan, teach and ensure the application of Scrum
    - prepare and lead the Scrum events
    - manage team building
        - recruitment, communication channels, team spirit
    - initiate discussions on any problems, if the team does not react
        - e.g. overseeing that team learns to proceed the project on their own
    - give tips about methods and tools:
        - e.g. architecture, testing, user requirements, teamwork etc.
    - (some work also as a development team member, if their time budget allows)

# SCRUM TRAINING

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# Scrum Lectures

- We 16.9. Scrum Basics
  - Basics of Scrum and applying it in the course project

- We 30.9. Scrum Master's role in the Course project
  - **for the scrum masters only**

# Certified Scrum Master Training

- **For scrum masters only**

- Arranged by agile42/Lasse Ziegler

- Interactive introduction to the principles and practices of Agile and the Scrum framework

- Qualifies you to receive the Scrum Alliance Certified Scrum Master certification

- Th-Fr 24.-25.9. 9:00 – 17:00 @ Zoom

- **Register ASAP to Google Sheet**, DL 15.9.
  - you will get some materials by e-mail before the course

# Scrum Simulation



- **For Scrum Masters and developers**
- 3-4 hour Scrum simulation
  - designing a GUI prototype instead of coding
- 4 sessions for 2-4 teams in October
- Preferably the whole team in the same session
  - the simulation is an important team building activity also
  - if you arrive alone, you will be assigned to some random team
- Everyone should **register to one session in Google Sheet**
  - register ASAP when the Scrum Master and ≥3 members agree on a suitable slot
  - try to fill the first sessions first
  - you can change your session as long as there are free slots

- **Mandatory participation** OR an essay will be required

# Scrum Materials

- [Scrum Guide](#)
  - official definition of Scrum

- [Scrum Primer](#)
  - a more concrete presentation of Scrum

- CS-C2130 Project Manual
  - applying Scrum in the course project

# OTHER SUPPORT TO THE PROJECTS

# Coach (1/2)

- Course personnel

- Coaches the team with Scrum and other work methods
  - non-technical focus

- Helps the teams identify potentially serious problems and may give suggestions

- Evaluates compliance with the required work methods (Scrum)

- Several meetings (in Zoom)
  - Sprint 0 plan
  - Sprint 0 review
  - three project reviews
  - other meetings (a few times)

- Other forms of participation
  - continuously observes the project
  - answers questions by e-mail
  - evaluates the team
    - points and feedback

# Coach (2/2)

- Help the coach help you!
  - keep him up-to-date
  - prepare questions and send them to the coach before the meetings
  - invite him to some work sessions
    - increases visibility to your work practices

- Every project will face problems
  - instead of hiding them, identify and solve them quickly
  - ask help when needed

- Budgeted effort per team (~30h)
  - ~10h for meetings
  - ~4h for reading, grading and feedback after each project review (*3)
  - ~8h for observing the project, e-mails, preparing for meetings

# Experience Exchange Sessions (EES)

- About 5 sessions during the project
    - varying themes related to what the teams have recently been working with
- Participants
    - 1-2 students per team, teacher and some guest expert(s)

- A team will earn 0.5p from each EES, if
    - team proposes 2 discussion topics for the EES (DL 1pm the day before the session)
        - practical problems and/or good solutions to a common problem
    - someone participates to the EES

- Agenda
    - free discussion on problems and good practices/tools
        - teacher prepares the agenda
        - each proposed topic will be discussed in a small team with other interested people

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1-2 of the EESs will be arranged in a slightly different format by Accenture

# Infrastructure

- HW & SW
    - Students' own devices
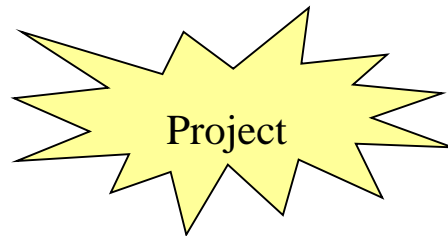    - Aalto IT
    - open source
    - clients

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# THE PROJECT

# Summary of the Project Stakeholders and their Goals

**Students**

- learn about SW development and Scrum
- good grade
- become famous by producing great SW
- network with other students and employers

**Client organization**

- get useful SW and new ideas
- get experiences of new technologies etc.
- network with students

Project

**Coach & Course**

- provide a good learning environment, i.e. a realistic but safe sandbox
- help to notice *serious* problems before it is too late
- ensure the fullfillment of educational goals

# Project Duration and Effort

- Duration
  - ~21 weeks

| 19.10.2020 | Projects begin |
|---|---|
| 30.11.2020 | Project Review 1 |
| 1.3.2021 | Project Review 2 |
| 19.4.2021 | Project Review 3 |

- Effort per person
  - 25*(credits-1) hours
    - e.g. 25*(10-1) = 225 hours for the project
  - 225h / 21weeks = **11h / week**

> e.g. 2 team work sessions/wk
> + some independent work
> = lots of work!

- All students are REALLY expected to invest this amount of effort
  - In student feedback, the real project is the most praised component of the course
    - real projects are possible only thanks to the motivated students and great results achieved each year

- This will be an exhaustive, but educational course
  - Course feedback: usefullness 4.67 / 5

# Project Scope

- Fixing the project effort means that the **scope must be flexible**
  - deliver the most important features first
  - adjust the scope with PO during the project based on progress

- Aim for high quality
  - selected exceptions allowed, if explicitly asked and understood by the PO
    - Definition of Done in Scrum

# Forming the Team (1/2)

- Registration deadline was already on Monday
  - send e-mail to the teacher immediately,
    - if you cancel your registration
    - If you missed the deadline

- Student list published in Google Drive (GD) on Th 10.9.
  - **add your personal preferences immediately**
    - work times, technologies, project topics, …

> Check your aalto email

> **Optimal team composition:**
> -common weekly work times
> -similar technology and topic prefs
> -at least one, who is familiar with the required main technologies

| B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Team ID | Subteam ID | Role | Name | E-mail (@aalto.fi) | Course | Cr | Prefs: | Preferred project IDs | Technologies that I know already | Technologies that I would like to learn | Possible weekly teamwork times | Work languages | Favorite Team (IDs) | Other notes |
| | | Dj | Example, Eric | eric.example | CS-C2130 & 40 | 10 | | C,H,L,M,T | Scala, SQL | | The evenings after 16 on weekdays (except tuesday after 18), weekends and some day times in the weekdays ok if necessary | fin, eng | 6, 9 | A second year computer science student with one summer of experience from HTML, CSS, PHP and JS. |
| | S20 | Ds | Example, Andy | andy.example | CS-C2130 & 40 | 10 | | L,T,V,Y | About 3,5 years of work experience (development) with Ruby on Rails, Python, HTML,CSS,JavaScript (AngularJS, jQuery, Backbone), Java, SQL, Git. | | flexible | fin, eng | | We have already formed a subteam with NN1, NN2 and NN3. |
| | | S | Master, Mike | mike.master | CS-E4910 | 8 | | all fine | testing tools, CI tools, Agilefant backlog management tool, requirements analysis | | Monday and Thursday 9-18, We-Fr 16-22, Saturday 10-16 | eng | | Developers can choose the topic. I can be the Scrum Master for any team. |
| | S20 | Dj | NN1 | | CS-C2130 & 40 | 10 | | | | | | | | |

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# Forming the Team (2/2)

- Scrum Masters recruit team members (up to team size of **1 ScM + 3 devs** )
  - start recruiting immediately
  - use the sheet in GD
    - to contact developers
      - who have similar preferences with each other and/or with you
    - to inform what kind of developers your team is still looking for
      - developers may also contact the Scrum Masters
    - to **mark immediately who have joined your team**


- Teacher assigns the remaining students to all the teams on **Fr 18.9.**
  - update "team membership" OR "team preference" info **by 18.9. 13:00** in GD
  - Final team size: 1ScM + 5-6 devs

… or you will be randomly assigned to some team

# Project Topics

| Project Proposal | Client organization |
|---|---|
| A+ as LTI provider | Aalto University |
| The Shadow of Digitalization | Aalto University |
| TRASE: Traceability, generation and security of Digital Calibration Certificates | Aalto University |
| Lucky Charms | BaseN |
| Timesheets | Bytecraft |
| SPC data Monitoring | Cencorp Automation |
| Well-being questionnaire and reporting app | CGI |
| Secure Identity Manager | CSIT Finland |
| Droppe Real-Time Demand | Droppe |
| Eficode Recruitment Tool | Eficode |
| Enhance Streaming Video Playback Experience using Machine Learning | Elisa |
| E-reader App | Elisa |
| Snowflake Data Modeling | Ellie Technologies |
| Foot Scanner Mobile App | FootBalance |
| External expert search | Futurice |
| Video shows between artists and art collectors | JTL |
| DataAPI | Mandatum Life |
| Multi-Vendor Shipping App | Posti |
| App-R-App (approach app) | Rubit |
| Sensor data in cloud | Savox |
| Contract data collector | Sievo |
| GPS geofencing for outdoor robots | Surrogate |
| Creating a Drone Based Racing Game | Surrogate |
| IntelliDev 3D - AI tool for making 3D-printable models | ThreeDCrafter |
| Next generation sales portal for real-estate | TILAVA |
| Road-Weather application to Android Automotive OS | Vaisala |
| Air Quality based recommendation and warning application for consumers | Vaisala |

# Project Topics – Which one to choose?

- What do the development team members want to learn?
  - technologies
  - problem domain
  - getting to know a certain client organization

> Scrum Master does not have to know the technologies or domain. She will be the Scrum expert.

- Too easy a topic?
  - boring
  - not optimal for learning new things
  - no "bonus" points in the evaluation
  - the topic might be more suitable for some other team

- Too demanding a topic?
  - unsatisfied client
  - fulfilling client's goals overrides other educational goals of the course

# Project Topics – Legal Issues

- Standard contract by Aalto
  - Intellectual property rights (**IPR**)
    - Client gets IPRs, or
    - open source

  - Confidentiality
    - Sec. 8 in the standard contract is enough for most clients
    - project documentation should always be public
      - except code and technical specs

- Signing the standard contract
  - **ASAP when the project starts**
  - First, the client fills the basic information and their signature
  - Next the team members sign
  - Finally, send a scanned PDF to Jari

- Participation fee for Clients
  - 0e / 1500e / 3 000e
  - commitment
  - course costs

# Project Topics – Selection Process

- Teams apply for topics
  - choose 2-5 favorite topics
  - make your choices visible to other teams in GD
  - send a team CV to 2-5 clients **8.-12.10.**

- Have a 10-minute meeting with all your favorite clients after the pitches on 14.10.

- Each client prioritizes the teams after discussing with all interested teams on 14.10.
- Each team prioritize clients after discussing with them on 14.10.

- Based on the prioritizations, Jari makes the final pairing on 15.10.

Do not contact the clients before 8.10. Contact Jari, if you want something to be clarified in some topic proposal.

Ensure that the client:

•is committed to the project

•understands the domain and has prepared the project well enough

•provides needed infrastructure

•is confident that possibly required SW/HW works

•doesn't expect skills that the team doesn't have/cannot acquire quickly

•appreciates the educational context

If you are not sure, try another client.

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# Learning diary

- Each student must write four entries to a learning diary

- After the Scrum Simulation
    - What you learned about Scrum
    - Feedback to the organizers about the simulation

- Just before each Project Review

    1) three educational observations related to the use of Scrum or other work methods

    2) a summary of your main contributions to the project since the previous entry

    > Submitted individually to MyCourses.

# Evaluation Principles

- The students are evaluated as a team
  - team can propose individual changes of +/-1 grade
- Product Owner and Coach evaluate separately
- Results and work methods

| Component | When | PO | Coach | TOTAL (max) |
|---|---|---|---|---|
| Work practices | After each project review | - | 0-5p | 15p |
| Project progress | After each project review | 0-5p | | 15p |
| Final results | After the last project review | 0-15p | 0-15p | 30p |
| EES participation | After each EES | - | 0-0.5p | 2p |
| TOTAL (max) | | | | 62p |

Evaluation Principles:
https://mycourses.aalto.fi/mod/page/view.php?id=599322

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# In order to pass the course

1. Participate to a team that gets enough points from the project (see Evaluation Principles)

2. Spend (credits - 1) * 25 hours to the project work (i.e. 225h for 5+5cr)

3. Participate to a Scrum Simulation session
   -(or write a compensatory essay)

4. Write four learning diary entries during the project
   -(or write a compensatory essay after the course)
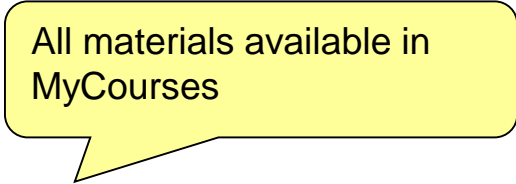
# Student Feedback

Ennen kurssin käyntiä olisin jopa ollut epäileväinen, että **riittävätkö koodaustaitoni** tällaiseen projektiin. Projektin aikana olen tajunnut, kuinka ohjelmointitaito ei sinänsä ole kiinni siitä, kuinka paljon tiedät käytettävästä ohjelmointikielestä, vaan enemminkin yleisestä ohjelmointitiedosta ja loogisesta älykkyydestä.

Project taught the importance of good teamwork. It's **more important to have right attitude than a great skillset** (of course it helps).

Tuntien täyttyessä ja lyhyen projektin loppuessa elämään syntyi hetkeksi aukko - mitä tehdä nyt kaikella tällä ajalla? Onneksi kovin kauaa tästä ei tarvinut kärsiä, kun osa-aikaiset **työt jo kutsuivat ja johon hakiessa projektista oli selvä etu** - oli jotain mistä kertoa!

# Materials Related to this Lecture

- Student's Manual (Read carefully if you missed the lecture)

- Evaluation principles

- Project proposals

- Project Contract

All materials available in MyCourses

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# Next Steps

- Make sure that you have registered to the course in WebOodi

- Teacher e-mails the **important link to Google Sheet** on Th 10.9.
  - add your preferences to the Student list immediately
    - work times, work language, project topics, technologies
  - other sub sheets will be used for many other purposes during the course

- Start forming the teams
  - wait that a Scrum Master contacts you OR contact a Scrum Master yourself

# Introduction of the Scrum Masters

1. Aaltonen Roope
2. Autti Juhana
3. Feng Hansen
4. Gonzalez Carceller Felipe
5. Kerajärvi Ivar
6. Kuusisto Niklas
7. Ogenda Dancun
8. Saarinen Aatos
9. Stefanova Veneta (Topic J - Eficode)
10. Tran Henry (Topic Q - Posti)
11. Vuorjoki Aleksi

- Something about you

- SW engineering background (school & work, if any)

- Preferences, e.g. work times, topics

- Anything else…

… **in max. 60 seconds**