Agile Software Development

L5 – Scrum

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Agenda

• Recap

• ASD with Scrum

• Scaling Scrum
Recap

- Software development processes, agile terminology
- Current state of Agile worldwide
- Test-driven Development (TDD)
- Handling requirements in ASD
  - Writing user stories
  - Organizing User Stories
- Refactoring and code smells
- HW1 deadline: **Friday 8.10**
About HW1...

• Do you already have a teammate?
About HW1…

• Have you already started?
Agenda

• Recap

• **ASD with Scrum**

• Scaling Scrum
Agile Software Development with Scrum

• An article published in Harvard Business Review (1986) is the inspiration for the Scrum framework.

• Ken Schwaber and Jeff Sutherland co-present Scrum at the OOPSLA Conference

• https://www.scrumguides.org/scrum-guide.html
Agile Software Development with Scrum


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What is Scrum?

• Scrum is a **process framework** used to manage **product development** and other knowledge work

• Scrum is **empirical** → it provides a means for teams to:
  • set a hypothesis of how they think something works,
  • try it out,
  • reflect on the experience, and
  • make the appropriate adjustments

• Scrum is structured in a way that allows teams to **incorporate practices from other frameworks**
Subway map to agile practices

https://www.agilealliance.org/agile101/subway-map-to-agile-practices/
When is Scrum applicable?

• **Cross functional team** is working in a product development setting

• There is a **non trivial amount of work** that lends itself to being split into more than one 2 – 4 week iteration

• The essence of Scrum is a **small team** of people (3 to 9 team members)

• The individual team is **highly flexible and adaptive**

• Scrum has been used to develop software, hardware, embedded software, networks of interacting function, autonomous vehicles, schools, government, marketing, managing the operation of organizations and **almost everything** we use in our daily lives, as individuals and societies.

https://www.scrumguides.org/scrum-guide.html
Scrum roles

Product Owner: Owns “what” is desired and “why” it’s desired

ScrumMaster: Keeper of Scrum Process, facilitator

Scrum Delivery Team: Owns “how” and “how quickly” work is delivered

Direct communication encouraged
Scrum phases

• Pregame:
  • Planning: Definition of a new release based on currently known backlog, along with an estimate of its schedule and cost
    New system → conceptualization and analysis
    Existing system → limited analysis
  • Architecture: Design how the backlog items will be implemented. This phase includes system architecture modification and high-level design

• Game:
  • Development Sprints: Development of new release functionality, with constant respect to the variables of time, requirements, quality, cost, and competition
    • Interaction with these variables defines the end of this phase

• Postgame:
  • Closure: Preparation for release, including final documentation, pre-release staged testing, and release
Timebox

“A timebox is a previously agreed period of time during which a person or a team works steadily towards completion of some goal.”

<table>
<thead>
<tr>
<th>Event</th>
<th>Timebox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Scrum</td>
<td>15 minutes (strict)</td>
</tr>
<tr>
<td>Sprint review</td>
<td>4 hours (max) *</td>
</tr>
<tr>
<td>Sprint retrospective</td>
<td>3 hours (max) *</td>
</tr>
<tr>
<td>Sprint planning</td>
<td>8 hours (max) *</td>
</tr>
</tbody>
</table>

(*) for 1-month sprint
https://scrumguide.org/
https://www.agilealliance.org/glossary/timebox/
The Scrum framework
**User Stories**

As a user, I can cancel a reservation.

- Verify that a premium member can cancel the same day without a fee.
- Verify that a non-premium member is charged 10% for a same-day cancellation.
- Verify that an email confirmation is sent.

* Must take less than 1 second

**Details behind the user story come out during conversations with the Product Owner**
Definition of Done vs Acceptance Criteria

- List of requirements that a user story must adhere to
- Common to all user stories
- The criteria must be met to complete the story
- Examples:
  - Unit tests passed?
  - Acceptance test passed?
  - Product owner accepted?

- Test scenarios that verify the functional correctness of the user story
- Particular to a user story
- The criteria must be met to complete the story
- Examples
  - The password must contain more than 8 characters
  - The query must be resolved in less than 1 sec (99% of the time)
Backlogs

Product Backlog

Sprint Backlog

Product Goal

Sprint Goal
Sprints (a.k.a. iterations)

- The Sprint is a **container** for all other events
- They are **fixed length events** (<1 month) to create consistency
- A new Sprint starts **immediately** after the conclusion of the previous Sprint
- A Sprint could be **cancelled** if the Sprint Goal becomes obsolete. Only the Product Owner has the authority to cancel the Sprint

**During** the Sprint:
- No changes are made that would hinder the Sprint Goal
- Quality does not decrease
- The Product Backlog is refined as needed; and,
- Scope may be clarified and renegotiated with the Product Owner as more is learned
How many stories fit in a sprint?
The Scrum framework
Agile Estimating and Planning

Size $\rightarrow$ Calculation $\rightarrow$ Duration

300 kilograms $\div$ 20 iteractions = 15 iterations
Agile Estimating and Planning

Size $\rightarrow$ Calculation $\rightarrow$ Duration

300 kilograms $\newline$ Velocity $= 20$ $\newline$ $300 \div 20 = 15$ iterations

It’s usually known after 3 iterations
Size

• Expert estimation is the dominant strategy when estimating software development effort *
• Analogy-based estimation (e.g. Function points)
• Parametric models (e.g., COCOMO)
• Group estimation: Wideband delphi (Boehm 1970), then **Planning Poker**

Story points

• How long a User Story will take to develop (effort)

• Influenced by:
  • Complexity
  • Risk
  • Uncertainty
How to determine story points?

• One popular alternative is **Planning Poker**

• Scrum poker or planning poker is a consensus based, gamified technique to estimate the complexity and effort of a software feature.

• All the team members discuss using **cards**

• The dialogue improves **accuracy** (Hoest and Wohlin 1998)

• Different **scales** can be used
  
  • Fibonacci (e.g., 1, 2, 3, 5, 8, 13, 20, ... )

  • T-shirt sizes
Planning Poker

Online version: https://scrumpoker.online/
Demo time
Planning Poker (demo!)

User story: As a user, I want to be able to register online, so that I can start shopping online.

Acceptance criteria:

☐ User can only submit a form by filling in all required fields
☐ The email user provided must not be a free email
☒ Submission from same IP can only be made three times within 30 minutes
☐ User can only submit a form by filling in all required fields
☐ User will receive a notification email after successfully registration

Online version: https://scrumpoker.online/
Building a Release Plan

The allocation of User Stories to iterations is done according to **story points, velocity** and **sprint goals**
The Scrum framework

- **Product Increment**
- **Product Integration**
- **Feedback**
- **Self-reflection**
- **Celebration**
- **Improvements**

- **Closing the Sprint**
  - Building of Product Backlog
  - Configuration of development environment
  - Distribution of workstations

- **Planning the Sprint Backlog**
  - Sprint Backlog
  - Planning Poker

- **Organizing and Preparing User Stories**
  - As an User I want...
  - As an User I want...

- **Daily Scrum 24 HS**

- **Controlling and Monitoring Sprint Work**

- **Product Owner**

- **Agile Coach**

- **Scrum Master & Scrum Team**
What’s next?

• Next lecture (next week):
  • **Exam Warm up**
  • Agile at Scale

• HW1 deadline soon!
  • Submission deadline: **Friday 09.10.20 at 23:59**
  • Submit via Moodle