
This lecture is based on two SCRUM presentations:
Agile Software Development with SCRUM by Shveta Mehtani (http://www.scribd.com/doc/6578688/SCRUMAEG)
What is Scrum? by Richard Fennell
(http://www.slideshare.net/businessquests/black-marble-introduction-to-scrum)
… as adapted by Michael Mateas
Quiz questions

All questions weighted evenly, all short answer.
Write your name on the paper, please!

1. (a) What is a user story?
   (b) What is the template for a user story?

2. (a) What is a story point?
   (b) What is one reason why story points are unitless?

3. What is the relationship of a release to a sprint?

4. What is the goal of playing planning poker?

5. What is the role of the scrum master in CS 170/171/172?
Upcoming deadlines

- **Short, in-class quiz Thursday (on today’s material)**
  - Geared for 25 minutes in length
  - Short answer questions
  - Chapter 4 and 6 in Agile Game Development with Scrum

- **Next quarter: Wednesday (Jan. 11): release plan due**
  - A big effort: plans what you will do over the quarter
  - Will likely require at least two team meetings to complete
  - Developing a draft this quarter would be helpful
  - Sprint 1 begins this day

- **Next quarter: Thursday (Jan. 12): sprint 1 plan due**
  - Describes what will be accomplished in first 3 weeks of quarter

- **Next quarter: Thursday/Friday (Jan. 12 or 13): first daily scrum meeting**
  - Some tasks already completed
Pre-Production Sprint (this quarter)

- This quarter, your pre-production activities will take place during one Sprint.
  - Since the focus is pre-production, there is no release.

- Monday, November 21: Sprint 1 planning complete
  - Set of user stories for the first sprint (i.e., your pre-production backlog)
    - Estimated using story points
    - Prioritized
    - Turn in a document with prioritized, estimated user stories
    - Also state who is product owner, and scrum master for this sprint
  - Set of tasks associated with each user story
    - Estimated using ideal work hours
  - Task board set up, and populated with user stories and tasks
  - Sprint burndown chart posted
    - Scrum master will update this chart during the sprint
  - Pre-production sprint officially begins November 21, and ends December 1
    - Includes Thanksgiving holiday – really short, you could start your sprint earlier
Planning Scrums

- As part of your Sprint planning
  - Each group needs to establish a minimum of 3 times during each week that they will hold a 15 minute (timeboxed) Scrum meeting
  - This is a face-to-face meeting – physical presence is important
  - The TA needs to be present for at least one of these three Scrums
    - There as an observer, mostly, but may give Scrum advice, and may ask follow-on questions once the Scrum is over
  - You need to schedule a time for that one with a TA
    - Acceptable times are between 10am and 7pm, M-F
Overview of Sprints
Releases: Multiple Sprints

- A Release occurs at the end of multiple Sprints
- In CS 171, there is one release, at the end of the quarter, and three Sprints

```
Release
  Sprint 1
  Sprint 2
  ...
  Sprint N
```
Scrum Process Overview

Product Backlog
As prioritized by Product Owner

Backlog tasks expanded by team

Daily Scrum Meeting

24 hours

10 - 30 days

Potentially Shippable Product Increment

Source: Adapted from *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.
Product backlog

- The requirements
- A list of all desired work on the project
- Ideally expressed such that each item has value to the users or customers of the product
- Prioritized by the product owner
- Reprioritized at the start of each sprint
## A sample product backlog

<table>
<thead>
<tr>
<th>Priority</th>
<th>Backlog item</th>
<th>Story Point Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Allow a guest to make a reservation</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>As a guest, I want to cancel a reservation.</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>As a guest, I want to change the dates of a reservation.</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>As a hotel employee, I can run RevPAR reports (revenue-per-available-room)</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Improve exception handling</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>...</td>
<td>30</td>
</tr>
</tbody>
</table>
Sprints

- Scrum projects make progress in a series of “sprints”
  - Analogous to Extreme Programming iterations

- Typical duration is 2–4 weeks or a calendar month at most

- A constant duration leads to a better rhythm

- Product is designed, coded, and tested during the sprint
Scrum framework

Roles
- Product owner
- ScrumMaster
- Team

Ceremonies
- Release planning
- Sprint planning
- Sprint review
- Daily scrum meeting

Artifacts
- Product backlog
- Sprint backlog
- Burndown charts
Sprint planning meeting

Sprint prioritization
- Analyze and evaluate product backlog
- Select sprint goal

Sprint planning
- Decide how to achieve sprint goal (design)
- Create sprint backlog (tasks) from product backlog items (user stories / features)
- Estimate sprint backlog in hours

Team capacity
Product backlog
Business conditions
Current product
Technology

Sprint goal
Sprint backlog
Sprint planning

- Team re-evaluates user stories from the release plan and product backlog they can commit to completing
- Sprint backlog is created
  - User stories are subdivided into tasks
  - Tasks are identified and each is estimated (~8 hours)
  - Collaboratively, not done alone by the ScrumMaster
- High-level design is considered

As a vacation planner, I want to see photos of the hotels so I can have a better idea of facilities

Priority 4 [10 Story Points]

Code the middle tier (8 hours)
Code the user interface (4)
Write test fixtures (4)
Code the foo class (6)
Update performance tests (4)
User stories and tasks
Sprint planning (2)

- **Task estimation**
  - Performed as a group, using Planning Poker
  - Here, units of estimation are “ideal work hours”
    - The amount of work you can get done under ideal conditions
      - Full knowledge, no interruptions
    - Actual hours elapsed will be greater than ideal hours
  - Task estimates are a **commitment** to accomplish a development task in a certain period of time

- **How many ideal work hours can each person perform?**
  - Good question – so far, your group has no track record on this
  - For now, pick a conservative figure, such as 10-12 ideal hours/week
  - So, each group member can do 30-36 ideal hours of work per 3 week Sprint
Sprint planning (3)

- A likely scenario is that your team will find they don’t have enough time to implement all user stories in the release
  - In this case, need to assess user stories
    - Are the priorities all still the same?
    - If so, drop the lowest priority user stories until estimated work agrees with team’s work capacity
    - Can pick these up in later Sprints
  - What if the team finishes too soon (i.e., systemic over-estimation of task length)?
    - Very unlikely to occur – the opposite problem (under-estimation) is far more common
    - If it does happen, the team can add another user story midway through the Sprint
The sprint goal

A short statement of what the work will be focused on during the sprint

Database Application
Make the application run on SQL Server in addition to Oracle.

Life Sciences
Support features necessary for population genetics studies.

Financial services
Support more technical indicators than company ABC with real-time, streaming data.
Managing the sprint backlog

- Individuals sign up for work of their own choosing
  - Work is never assigned
- Estimated work remaining is updated daily
- Any team member can add, delete or change the sprint backlog
- Work for the sprint emerges
- If work is unclear, define a sprint backlog item with a larger amount of time and break it down later
- Update work remaining as more becomes known
Output of Sprint planning (for CS 171)

- Task listing (with time estimate), organized by user story (prioritized)
  - User story 1:
    Task 1 (time estimate)
    Task 2 (time estimate)
    ...
  - User story 2:
    Task 1 (time estimate)
    Task 2 (time estimate)
    ...
- Team roles
  - Team member 1: role
  - Team member 2: role
  - ...
- Initial task assignments
  - For each person, what is the first task they are working on?
- Initial task burndown chart
- Initial scrum board set up
- Schedule of Scrum meetings
  - When/where for 3 weekly face-to-face scrum meetings
Project Management During Sprints
Key project management challenges

- Awareness of the work of others
- Awareness of the current status of the project
- Clarity on what is your current task, and what is your next task
- Awareness of whether current sprint activity is completing tasks fast enough to meet sprint goals
- Making mid-course corrections if implementation activity is too fast or too slow.

Tools for addressing challenges:
- Scrum meetings
- Scrum board
- Burndown chart
The daily scrum

- **Parameters**
  - Daily
  - 15-minutes
    - **Strictly** timeboxed
    - Can follow-up after meeting on bigger issues
- **Stand-up**
- **Not for problem solving**
  - Whole world is invited
  - Only team members, ScrumMaster, product owner, can talk
- **Helps avoid other unnecessary meetings**
Everyone answers 3 questions

1. What did you do yesterday?
2. What will you do today?
3. Is anything in your way?

These are not status for the ScrumMaster
- They are commitments in front of peers
Scrum pitfalls

- Being late, missing the meeting
  - If you’re not present, the team doesn’t know what you’re doing
    - This is demoralizing – people assume nothing is happening
  - If someone needs information from you to move forward, they’re stuck
  - Disrespectful of other team members

- Grandstanding
  - Going into excessive levels of detail to make it seem like you’ve done more that you have (especially in front of TA)

- Going over time
  - Scrums are strictly 15 minutes, timeboxed.
  - Big issues are discussed by involved parties after the Scrum.
    - The Scrum just identifies the issues

- Failure to commit to work items
- Failure to update Scrum board

The scrum board

- A visual representation of **all** work that needs to be performed during the sprint
- Allows team members to clearly see tasks remaining
- Either put up on a wall, or put online (using a web-based scrum tool)
- A big chart
  - Rows are user stories and associated tasks
  - Columns are current status of tasks (To Do, In Progress, Done)
  - Tasks written on index cards or post-it notes

[joshuahoover.com/2009/03/22/bitter-scrum-a-task-board-gone-wrong/](joshuahoover.com/2009/03/22/bitter-scrum-a-task-board-gone-wrong/)
Sample task board
## Updating the Scrum board

- During the scrum meeting, tasks are updated.
- If a task is completed, it is moved from “In Progress” to “Done.”
- If a task was “In Progress” at the last meeting, and is still “In Progress,” the time estimate for the task needs to be updated with remaining time.
  - As well, if there is anything preventing completion of the task, this should be the answer to question #3 (“Is anything in your way?”).  
- If a new task is assigned:
  - The name of the person working on the task is added to the task card.
  - The task is moved from “To Do” to “In Progress.”
- If a task is blocked (no further progress possible):
  - Move it back to “To Do” but mark it as obviously blocked (e.g., change the color of the card, add a sticker, etc.).

[joshuahoeover.com/2009/03/22/bitter-scrum-a-task-board-gone-wrong/]
Keeping Scrum board up to date

- The primary value of the Scrum board comes from it being an accurate, up-to-date representation of the work of the team
- If it is not kept current, its value diminishes quickly
- It is the job of the Scrum Master to ensure the Scrum board is up-to-date
  - The grade they receive for their role performance depends on this
  - If someone misses a Scrum meeting, they need to proactively contact that person to find out what they have been doing, and update the board
  - Scrum master also needs to ensure team updates task cards during daily Scrum
Sprint burndown chart

- Burndown chart represents the total amount of work remaining in the sprint.
- As the sprint progresses, the remaining work should trend to zero.
- Typically posted on scrum board.
- Scrum Master maintains the burndown chart.
  - After each Scrum meeting, a new chart is created.
  - Sum the estimated time for all remaining tasks.
    - This is the data point (y-value) for that day (x-value).
- Ideal burndown trend.
  - Rate at which work is ideally performed so that all tasks are completed in sprint.

aydsoftware.blogspot.com/2009_01_01_archive.html
Sample burndown chart
Sample burndown chart
When sprints go bad

- The burndown chart gives you early warning that your sprint will not achieve its objectives
  - Tasks clearly taking too long to complete, consistently
  - Need to take action
- How to adjust
  - Identify root cause
    - Under-estimation?
    - Impediments?
    - Flaky team members?
  - Get help
    - Contact TA/Professor
  - Reduce scope
    - Reduce number of user stories
    - Re-estimate tasks to ensure estimates reflect reality

scalingsoftwareagility.wordpress.com/2008/10/19/jeff-sutherland's-sprint-emergency-landing-procedure/
Evaluating the Sprint
The sprint review

- A sprint postmortem – occurs at the end of a sprint
- Team presents what it accomplished during the sprint
- Typically takes the form of a demo of new features or underlying architecture
- Informal
  - 2-hour prep time rule
  - No slides
- Whole team participates
- Invite the world
Sprint retrospective

- Periodically take a look at what is and is not working
- Typically 15–30 minutes
- Done after every sprint
- Whole team participates
  - ScrumMaster
  - Product owner
  - Team
  - Possibly customers and others
Whole team gathers and discusses what they’d like to:

- Start doing
- Stop doing
- Continue doing

This is just one of many ways to do a sprint retrospective.
Study questions

- What is a task? How do tasks relate to user stories?
- What is a sprint?
- What are the outputs of sprint planning?
- What is a daily scrum meeting? How long does it last?
- What are the three questions each person answers during the daily scrum?
- What is a scrum board (task board)? What are the rows, and what are the columns? How are tasks represented on the task board?
- What happens to a task board during a daily scrum meeting?
- What is a sprint burndown chart? What is the indicator of a sprint going bad (unable to accomplish goals?)
- What is a sprint review?