Objectives

- Agile Development
- SE Culture: Mythical Man Month, No Silver Bullet
- Version Control Systems

1

Review: Agile Development

- What is Agile Development?
- How does Scrum work?
  - Use the vocabulary/terms
- What tools are used for Scrum?
  - What are the benefits of using the tools?
  - Tradeoffs?

2

Agile Development

- Iterative approach to project management and software development
  - ➤ Work in small, launchable increments
  - ➤ Frequent review of requirements, plans, results
- Goals:
  - ➤ Respond to change quickly
  - ➤ Deliver application faster
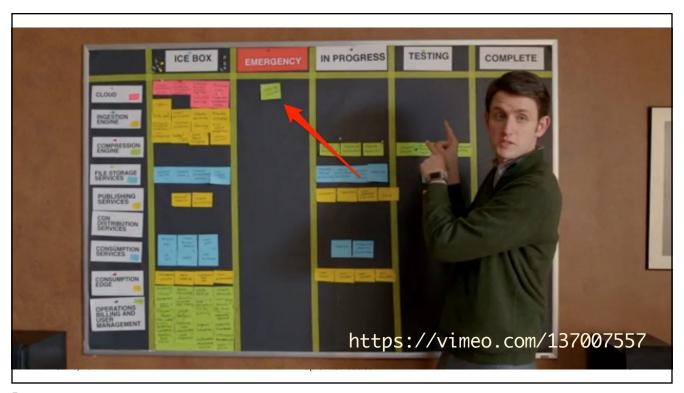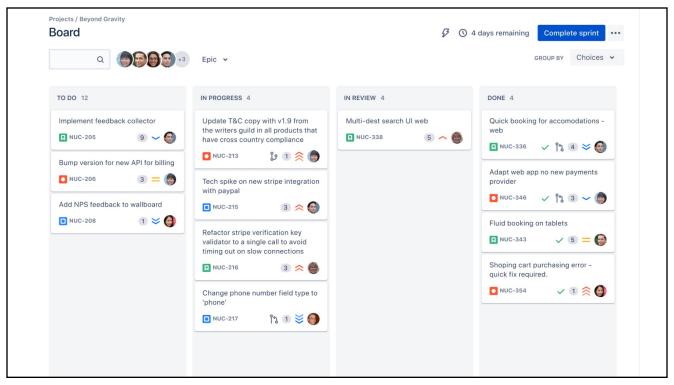 - ➤ Fewer conflicts about requirements

3

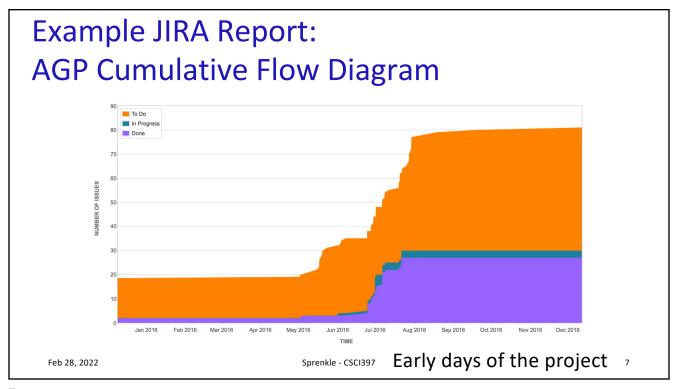# Agile Development Framework: Scrum

- Product owner creates a prioritized wish list: *product backlog*
- Team works in a *sprint*, usually 2-4 weeks
  - ➤ During planning, team picks a subset of wish list, *a sprint backlog*, and decides how to implement those pieces
  - ➤ Daily Scrum ("Stand up meeting"): team meets daily to assess its progress
    - Scrum Master keeps the team focused on its goal
  - ➤ At end of sprint, work should be potentially shippable:
    - Ready to hand to a customer, put on a store shelf, or show to a stakeholder
  - ➤ Sprint ends with a sprint review and retrospective
- Repeat sprint

https://www.scrumalliance.org/

4

https://vimeo.com/137007557

5

6

Example JIRA Report:
AGP Cumulative Flow Diagram

Early days of the project

Feb 28, 2022   Sprenkle - CSCI397   7

7

Example JIRA Report:
AGP Cumulative Flow Diagram

Feb 28, 2022   Sprenkle - CSCI397   8

8

2/28/22

Related Approaches/Tools

- Kanban approach: continuous flow
  - ➤ Optimize work flow
  - ➤ How many tasks can your team work on at a time?
- Trello
- Asana
- …

Feb 28, 2022   Sprenkle - CSCI397   9

9

Speaker at Entrepreneurship Summit

- Ted Elliott '94, Keynote Speaker
  - ➤ Chief Executive Officer at Copado

Copado is focused on helping our customers realize the reality of
high quality *agile development*. We are focused on providing development pipelines
with testing embedded that can be used across packaged software like Salesforce,
…, Heroku, … and other business platforms used for business transformation.
We bring the shadow IT assets into the fold with the rest of the business. …
Ted believes that when momentum is lost in the software release process,
trust in the technology vanishes.

https://2022wluesummit.sched.com/speaker/ted_elliott_94.23kvzcol

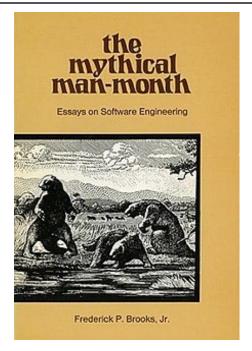Feb 28, 2022   Sprenkle - CSCI397   10

10

5

SOFTWARE ENGINEERING CULTURE

11

Mythical Man-Month

- Can't measure how much meaningful work a person can do in a month

- Brooks' Law:
"Adding manpower to a late software project makes it later."

12

No Silver Bullet

- "there is no single development, in either technology or management technique, which by itself promises even one order of magnitude [tenfold] improvement within a decade in productivity, in reliability, in simplicity."

-- Fred Brooks

13

Fred Brooks

- Founded UNC's Computer Science Department

"The most important single decision I ever made was to change the IBM 360 series from a 6-bit byte to an 8-bit byte, thereby enabling the use of lowercase letters. That change propagated everywhere."

14

VERSION CONTROL SYSTEMS

15

Version Control Systems

- What is a Version Control Systems?
- What do they do?
- What are their components?
- What are their benefits?

16

Why Version Control Systems?

- Collaborate on code with a team
- Roll back/restore older version of code
  - ➢ Granularity: Individual files or collection of files
- Store ownership of files/changes and when occurred
- Record reasons for changes
- Track progress
- Each developer has own sandbox of code
- Maintaining multiple branches

17

Centralized vs Distributed VCS

Centralized

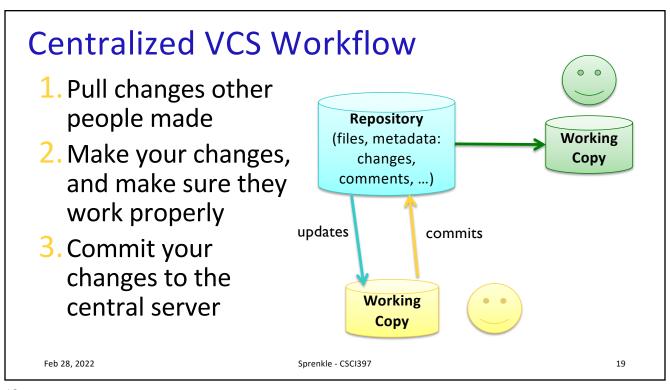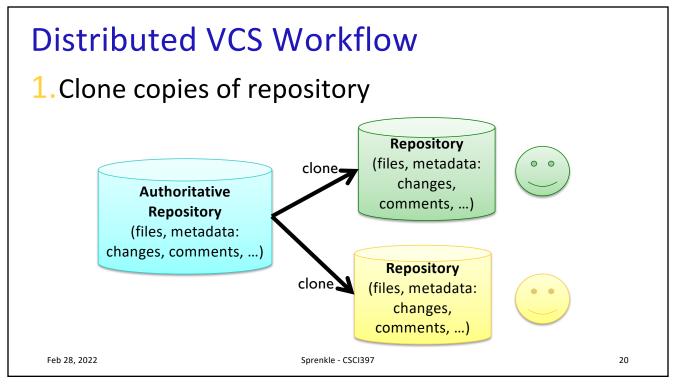- One central repository: the gold standard
- All updates made against central repo
- No access to repo? No updates
- Must sync with central repo before adding updates
- Examples: CVS, Subversion

Decentralized

- Multiple copies/clones/forks of repositories
- You can always have a local repo
- You can optionally have a central repo
- More distributed sharing options
- Examples: Git, Mercurial, Bazaar

18

Centralized VCS Workflow

1. Pull changes other people made
2. Make your changes, and make sure they work properly
3. Commit your changes to the central server

Repository
(files, metadata: changes, comments, …)

Working Copy

updates   commits

Working Copy

19

Distributed VCS Workflow

1. Clone copies of repository

Authoritative Repository
(files, metadata: changes, comments, …)

clone

Repository
(files, metadata: changes, comments, …)

clone

Repository
(files, metadata: changes, comments, …)

20

2/28/22

Centralized vs Distributed Repo Tradeoffs

- CVCS: Mostly remote operations
  - ➢ Requires network connectivity for updates, commits
    - More expensive operations
  - ➢ Less space for each client

- DVCS: Mostly local operations (faster)
  - ➢ Does not require network connectivity
  - ➢ Whole copy of the repository
  - ➢ More space for each "client"

Feb 28, 2022   Sprenkle - CSCI397   21

21

Looking Ahead

- Watch Software Engineering at Google talk
  - ➢ Answer questions on Canvas
  - ➢ Before class on Friday

Feb 28, 2022   Sprenkle - CSCI397   22

22