HPI Hasso Plattner Institut
Digital Engineering · Universität Potsdam

Team Management & SM Tools

Scalable Software Engineering
WS 2021/22

Enterprise Platform and Integration Concepts

Tools in Software Engineering

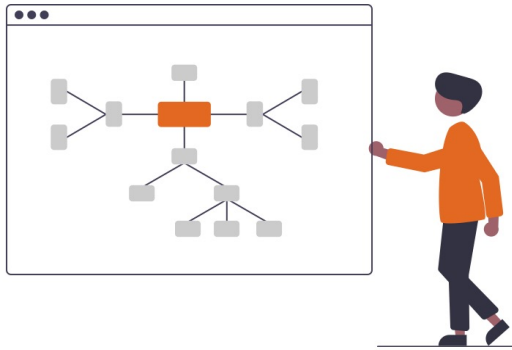
Noun

tool (*plural* **tools**)

1. Equipment used in a profession, e.g., **tools** of the trade.
2. Something to perform an operation; an instrument; a means.
3. (*computing*) A piece of software used to develop software or hardware, or to perform low-level operations.

- **git is a tool**, so is your IDE: Means to manage source code
- **Brainstorming is a tool**: Means to generate varied ideas

➡ Processes and procedures are tools in a wider sense
  - We don't edit images with IDEs, **choose your weapons!**
  - Don't worry about labels, use what's needed in the context

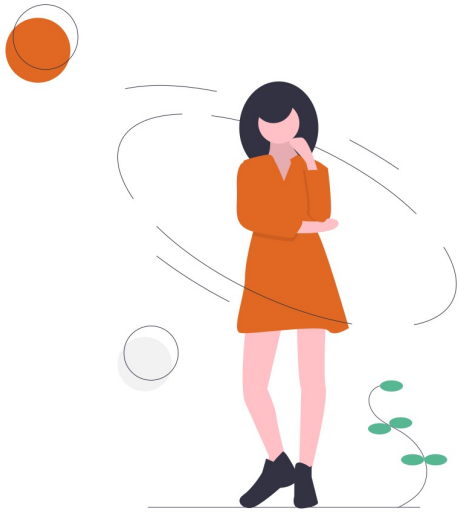


Source: https://en.wiktionary.org/wiki/tool

Scrum Master Tools

SM: maximize the value delivered by the Scrum Team

- Help team members **improve & practice Scrum methods and values**
- Needs support to
  - **Facilitate Scrum events** & workshops
  - Prepare Retrospective, **gather observations during Sprint**
  - Help the team identify and remove impediments
  - Support PO and Dev. Team in **making Scrum Artifacts transparent**



Team communication patterns are valuable!

- Especially relevant in distributed/remote teams
- Is everyone participating and is everyone's voice heard?

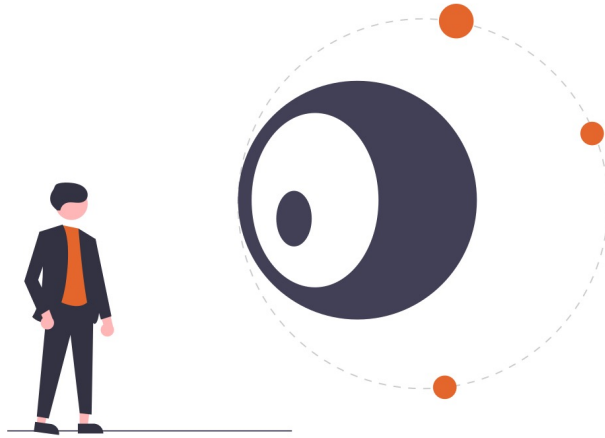
Source: J. M. Bass, *Scrum Master Activities: Process Tailoring in Large Enterprise Projects.* 2014 IEEE 9th International Conference on Global Software Engineering

Scrum Master Tools

Scrum Master: Keep an eye on the team & process

- Take the **meta-view** during meetings
  - What is currently happening in this team?

- **Time**
  - Time-box activities & stick to them
  - Meeting agenda with breaks
- **People**
  - What team dynamics am I noticing?
- **You**
  - Facilitator vs. team member
  - Focus on others, Let them talk



Source: Rohit Arora, https://www.qtsc.com.vn/uploads/files/2018/11/27/AVC2018_Retrospective_Rohit.pdf

Scrum Master Tools

The (Scrum Master's) Diary

- SM main focus: team meetings
  - Active attendance
  - Organize and pay attention to the details
- Diary: help structure thinking & **identify common anti-patterns**
- **No need to share** the diary if you don’t want to

Source: https://medium.com/idealo-tech-blog/the-scrum-masters-diary-a-powerful-tool-to-derive-effective-interventions-ca5e5655ad49

Scrum Master Tools

The (Scrum Master's) Diary

Four questions for actively attending meetings:

- What did you **observe**? (describe what actually happened)
  - *"Rick is confused" vs. "Rick asks about what was done previously"*
- How do you **interpret and evaluate** the observation?
  - *Is this a normal process? How does it make you feel?*
- What are **questions** when evaluating the observation?
  - *Were last retrospective outcomes remembered?*
- What **changes** (for yourself?) & interventions do you plan?
  - *Interventions applied to systems not "onto" people*

Source: https://medium.com/idealo-tech-blog/the-scrum-masters-diary-a-powerful-tool-to-derive-effective-interventions-ca5e5655ad49

Scrum Master Tools

Scrum Checklists

- **Assess** the your team's **process state**
- **Compare** to Scrum Guide/experts/peers ideas, e.g.
  - Henrik Kniberg's "unofficial Scrum Checklist" (https://www.crisp.se/gratis-material-och-guider/scrum-checklist)
  - "Assess your agile engineering practices" by Corinna Baldauf (https://finding-marbles.com/2011/09/30/assess-your-agile-engineering-practices/)
  - Spotify's "Squad Health Check" (https://engineering.atspotify.com/2014/09/16/squad-health-check-model/)
  - Joe Little's "Nokia Test" (http://agileconsortium.blogspot.com/2007/12/nokia-test.html)

➡ **Discuss!** Does the team agree with the dimensions?

Image: Søren Cosmus (CC BY-SA 2.0) https://www.flickr.com/photos/cosmus/5812797323/

Scrum Master Tools

- [ ] Clearly defined **product owner (PO)**
  - [ ] PO is **empowered** to prioritize
  - [ ] PO has **knowledge** to prioritize
  - [ ] PO has direct **contact with team**
  - [ ] PO has direct **contact with stakeholders**
  - [ ] PO speaks **with one voice** (in case PO is a team)
- [ ] Team has a **sprint backlog**
  - [ ] Highly **visible**
  - [ ] **Updated** daily
  - [ ] Owned exclusively by the **team**
- [ ] PO has a **product backlog (PBL)**
  - [ ] Top items are **prioritized** by business value
  - [ ] Top items are **estimated**
  - [ ] **Estimates written by the team**
  - [ ] Top items in **PBL small enough to fit** in a sprint
  - [ ] PO understands **purpose** of all backlog items
- [ ] Have **sprint planning meetings**
  - [ ] **PO participates**
  - [ ] PO brings **up-to-date PBL**
  - [ ] **Whole team** participates

the unofficial Scrum Checklist
crisp
Henrik Kniberg

https://www.crisp.se/gratis-material-och-guider/scrum-checklist

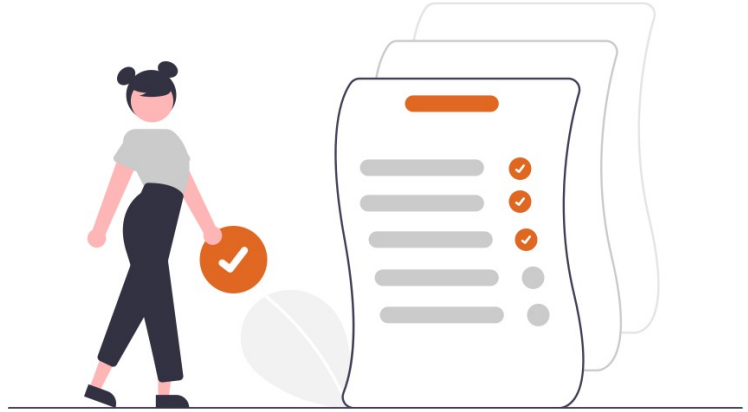
Scrum Master Tools

Custom team maintenance checklist

- Team members are experts for their own work processes
- Build a **team-specific checklist**, refer back to it regularly
  - Aspects that are **most important to the team**
  - Minimal consensus

Ideas: No meetings longer than 2 hours? No stories without mockup?

- Idea: 3 categories
  - "Is the **Product Owner** doing well?"
  - "Is the **Development Team** doing well?"
  - "How are our **engineering practices** doing?"



Source: https://geekbot.com/blog/project-management-tools-that-every-scrum-master-should-use/

SM Tools—Retrospectives

Retrospectives are easy

- **Just a fancy word for a meeting** with the goal of improving our process
- We can reflect on the past, because we were there

vs.

Retrospectives are hard

- Only effective if they lead to change
- **Change is hard**

Source: https://www.retrium.com/blog/10-things-all-agile-teams-need-to-know-to-run-effective-retrospectives

SM Tools—Retrospectives

Retrospective Prime Directive

> “Regardless of what we discover, we understand and truly believe that everyone did the best job they could, given what they knew at the time, their skills and abilities, the resources available, and the situation at hand.”
>
> — Norm Kerth, *Project Retrospectives: A Handbook for Team Review*

- Base assumption and **foundation of sucessful Retrospectives**
- Reminder to not focus on blame
- Start the meeting by reading it out? (priming)
- Refer back to it when related problems arise

The psychological concept of "priming" is disputed

Source: http://retrospectivewiki.org/index.php?title=The_Prime_Directive

SM Tools—Retrospectives

Common Retrospective Structure

- Five consecutive phases

1. Set the stage

- Check-in with everyone
- Gauge team spirit

2. Gather data

- Gather perceptions & data points on last sprint

3. Generate insights

- Identify common topics

4. Decide what to do

- Decide on (few) changes for next Sprint
- Find concensus

5. Close the Retrospective

- Wrap up Sprint in a positive manner

Source: Rohit Arora, https://www.qtsc.com.vn/uploads/files/2018/11/27/AVC2018_Retrospective_Rohit.pdf

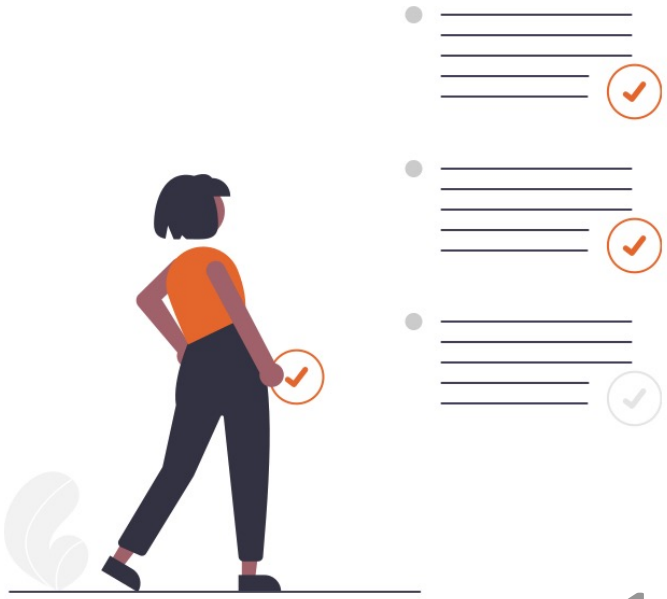
SM Tools—Retrospectives

Follow up (the 6th Retrospective phase)

- **Share results (Action Plan)** of meetings transparently
  - With team (and entire project?)
  - Add changes to issue tracker/learning backlog?
- Check the status of changes regularly (during Sprint?)
- **Review** at next Retrospective meeting

➡ No point in running a Retrospective if nothing changes

- **Focus on few (single?) actionable changes**
- Few things are ever perfect



Source: Rohit Arora, https://www.qtsc.com.vn/uploads/files/2018/11/27/AVC2018_Retrospective_Rohit.pdf

SM Tools—Retrospectives

Retrospective agendas & activities

- Collections of popular activities for Retrospectives by Agile practitioners
  - Usually divided into Retrospective phases
  - Retromat: **https://retromat.org (recommendation!)**

Try out "best retro for beginners": *https://retromat.org/blog/best-retrospective-for-beginners/*

- Different ways to do things, e.g. voting:
  - **Dot Voting**—3 votes per person, distribute
  - **Roman Vote**
    - thumbs up (support), down (I want to speak), side (whatever majority wants)
  - **"Was that a decision?"**
    - Loudly ask in unclear situations, turn silence into action

Source: https://wall-skills.com/2015/ways-to-vote/

SM Tools—Retrospectives

Retrospective anti-patterns

- Common issues to watch out for:
  - **Reporting to management**, little focus on collaborative improvement
  - **Few participants** instead of the whole team
  - Everybody is happy, **nothing to discuss** and no improvement
  - Blame game, i.e. **focusing on complaints** instead of possible improvements
  - **Lack of facilitation**, agenda and structure

- Identified your own common issues?
  - Share!
  - What helped?

Source: Rohit Arora, https://www.qtsc.com.vn/uploads/files/2018/11/27/AVC2018_Retrospective_Rohit.pdf

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Organizing Work & Dev Team Tools

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Development Team Tools

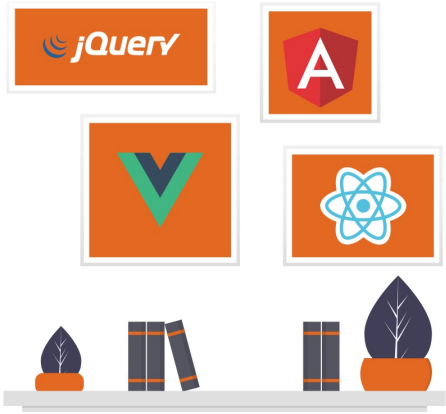
Software development tools

- SCM, issue trackers, CI, static code analysis, IDEs, plugins...
  - **Have a favorite** (that works well with the tech stack)? **Share!**
- Organizationals tools & techniquest
  - No such thing as a specific "PO Tool"/"SM Tool"
  - **Adapt tools** to your (technical) context!

Let's talk about Emacs vs vi in a separate lecture

Technologies and frameworks

- Your problem has probably already been solved somewhere
- Using something new means **everyone needs to learn it (costs)**



Development Team Tools

User stories & tasks in (GitHub's) issue tracker

- **Assign issues** to developers
- **Milestones** to assign user stories to sprints
- **Issue tags**, e.g. to denote responsible teams or status
- Project management tools with **overviews of issues**, e.g. GitHub Projects, or Zenhub
- **Tag versions** that can be presented to stakeholders

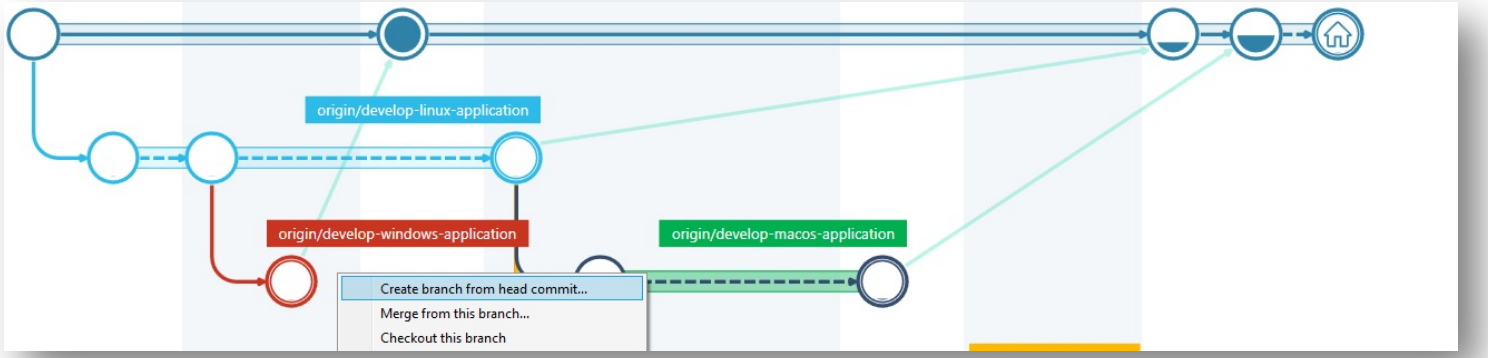
```
$ git tag –a v0.1 –m 'version after Sprint#1 without US #2'
```

Identifiable user names really help when assigning: "Who is Gronkh12?"

Development Team Tools

Project Data Investigation

- Especially valuable for large projects: **keeping up to date with project progress**
- What are the most interesting recent changes?
  - In the issues/stories of the current Sprint
  - In the history of the git repository
- Use visualization tools, tags and references (e.g. *refers to #3* in commit message)

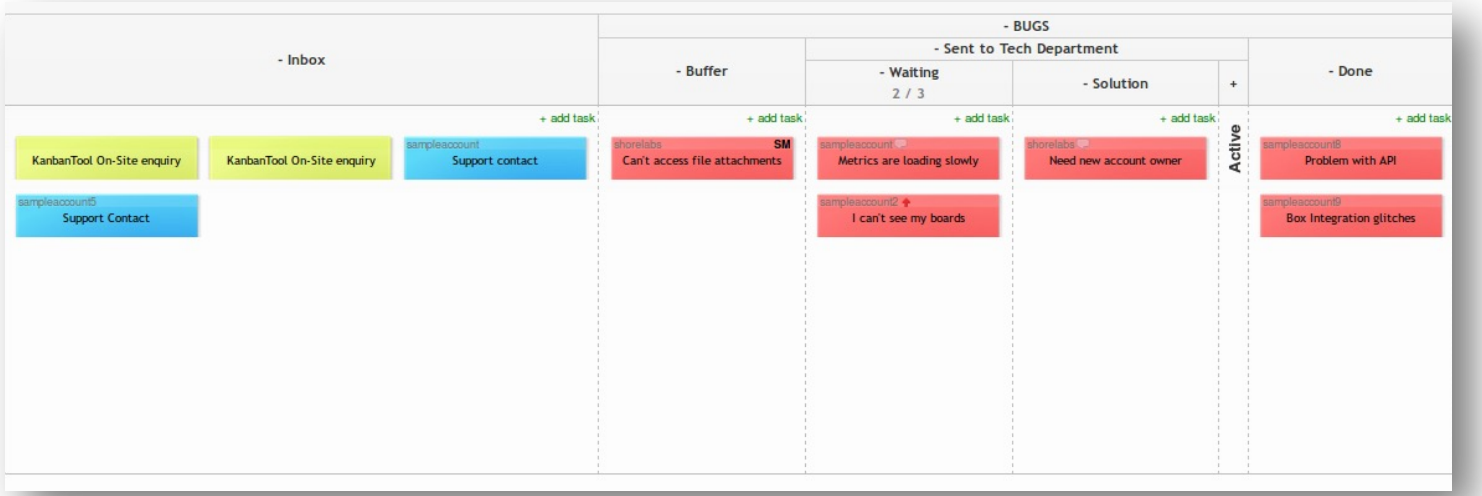


Source: https://livablesoftware.com/tools-to-visualize-the-history-of-a-git-repository/

Development Team Tools

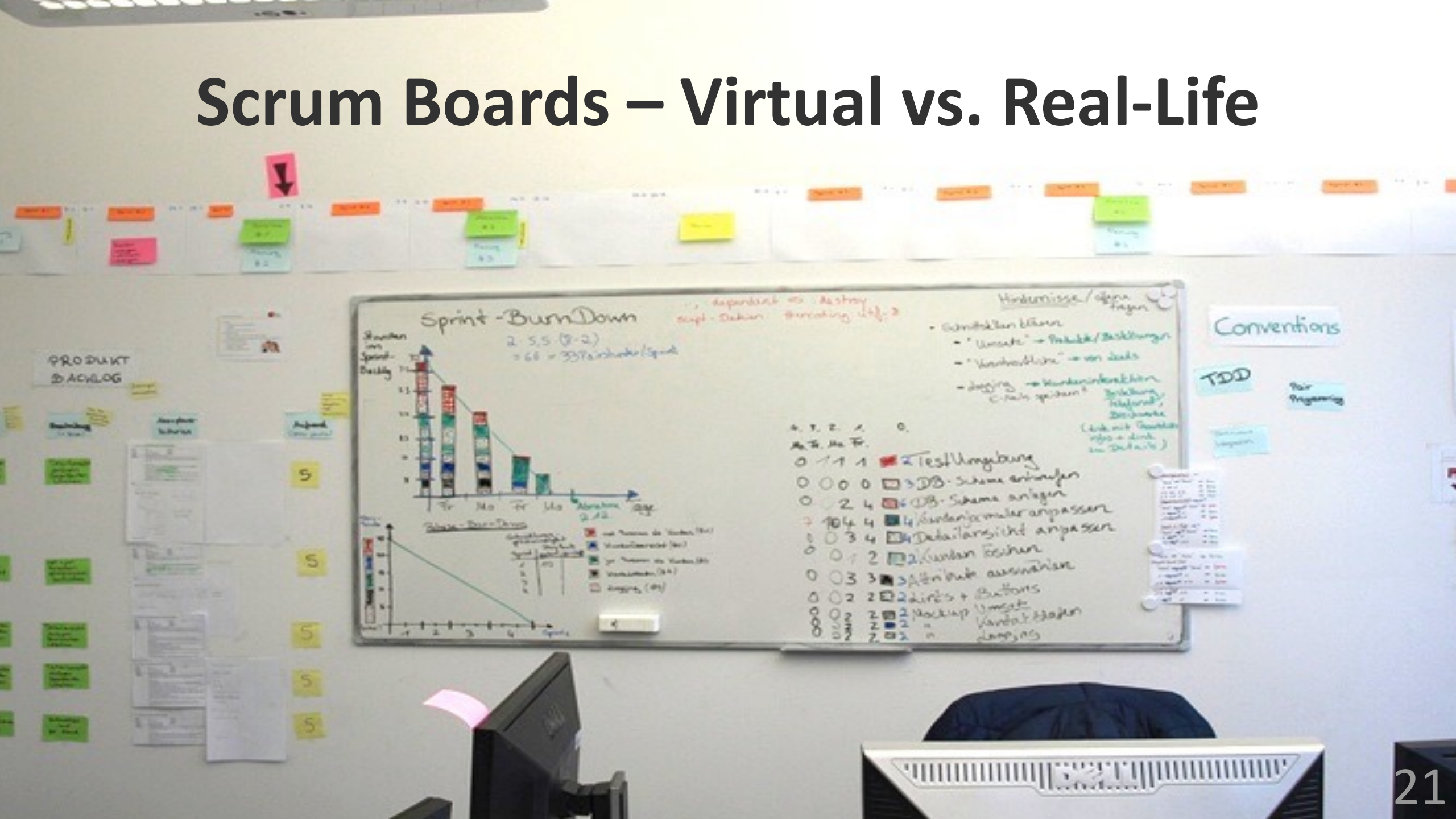
Task Board (Scrum Board/Kanban Board)

- Team's home base, everyone has access and modifies (**artifact transparency**)
- Visual representation of tasks & progress
- **Swim lanes/multiple boards by topic**



This is where data for a Burndown-Chart could come from

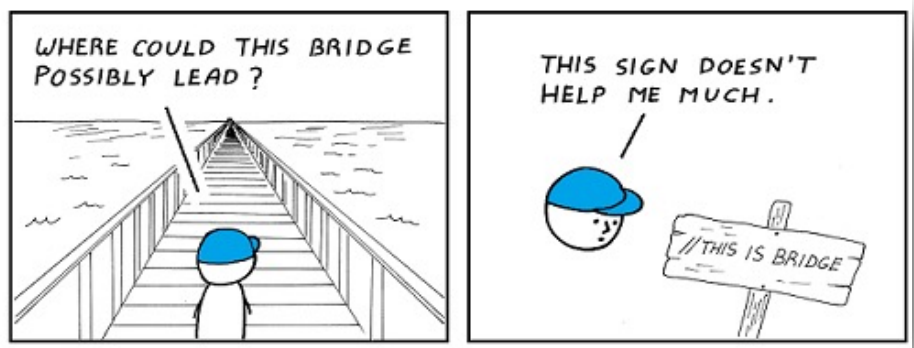
Scrum Boards – Virtual vs. Real-Life



Development Team Tools

Communicating technical details

- How do I find out about architecture changes?
- How do I know how to use other people's code?



Tools that might help:

- (GitHub) wiki to (briefly!) document components
- **Code comments** explaining the larger context, common pitfalls
- Common communication channel for announcing (breaking?) changes
- **Automated tests** that show component functionality
  - Documentation stays current

Development Team Tools

Debugging

> “If debugging is the process of removing software bugs, then programming must be the process of putting them in”
>
> —Edsger W. Dijkstra (allegedly)

- Debuggers & Stack Overflow are helpful
- Taking a walk is underrated

Using others as "rubber ducks": "cardboard superman"

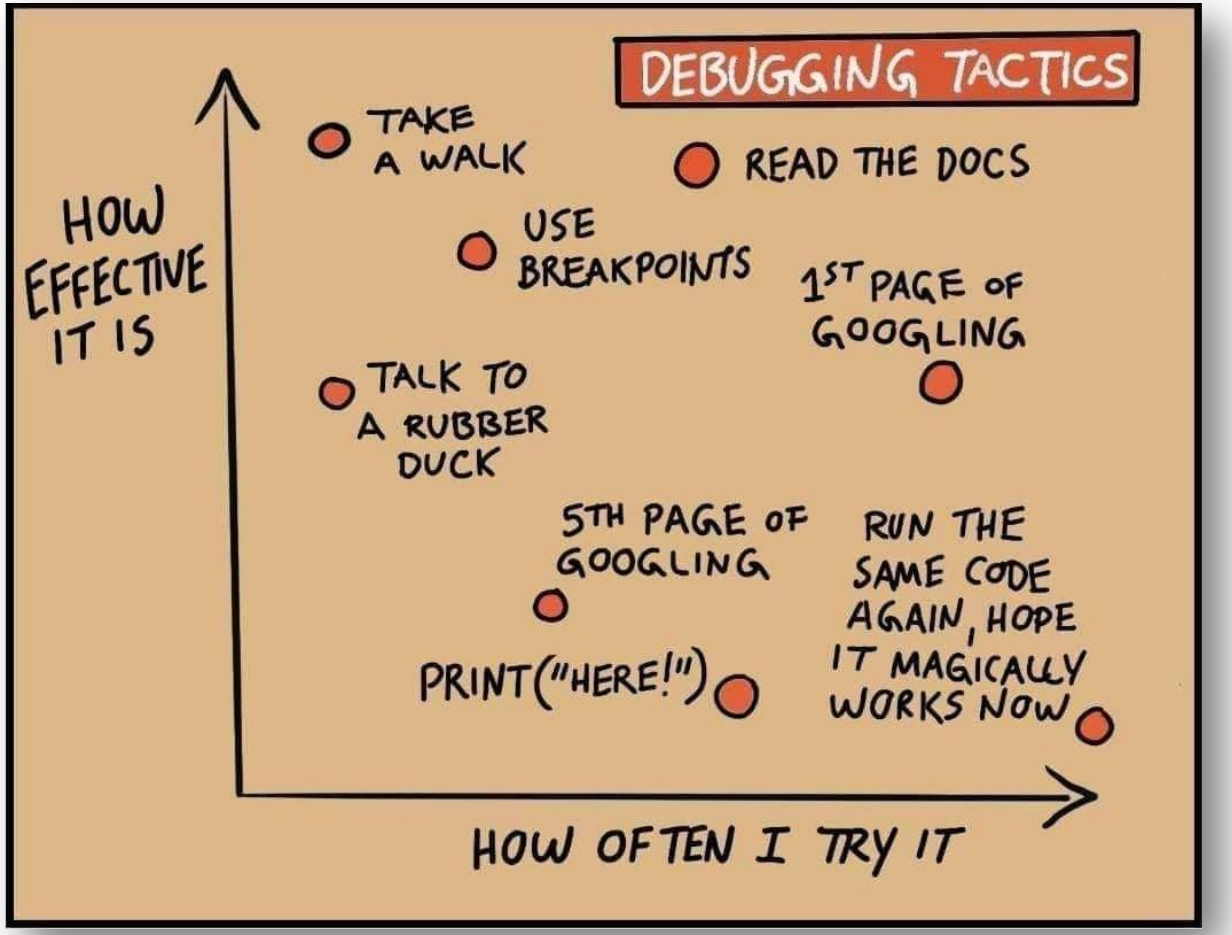


Image source: *u/Demobeast* on https://www.reddit.com/r/ProgrammerHumor/comments/gozf5t

Git — amend, interactive staging

HPI

Change commit message of previous commit

(Careful, don't do this if you already pushed the commit)

```
$ git commit --amend -m "new message"
```

Forgot to commit files?

```
$ git add [missing files]
$ git commit --amend  #uses the previous commit's message
```

Undo the amending

```
$ git reset --soft HEAD@{1}
$ git commit -C HEAD@{1}
```

Interactive staging (`git add -i`) is probably the most powerful git feature you're not using yet.

Interactive staging (also allows committing only parts of files)

```
$ git add -i
$ git add --patch [file]
```

Git — log, blame, rebase

Shorter version of the git log

```
$ git log --abbrev-commit --pretty=oneline
```

Show pretty graph of git history

```
$ git log --graph --decorate --pretty=oneline --abbrev-commit
```

Show changesets in the log

```
$ git log -p
```

Show what revision and author last modified each line

```
$ git blame --date=short [file]
```

History is becoming cluttered with merge commits

```
$ git rebase <branch>
```

Do not rebase commits that others have worked with!
"people will hate you, and you'll be scorned by friends and family."

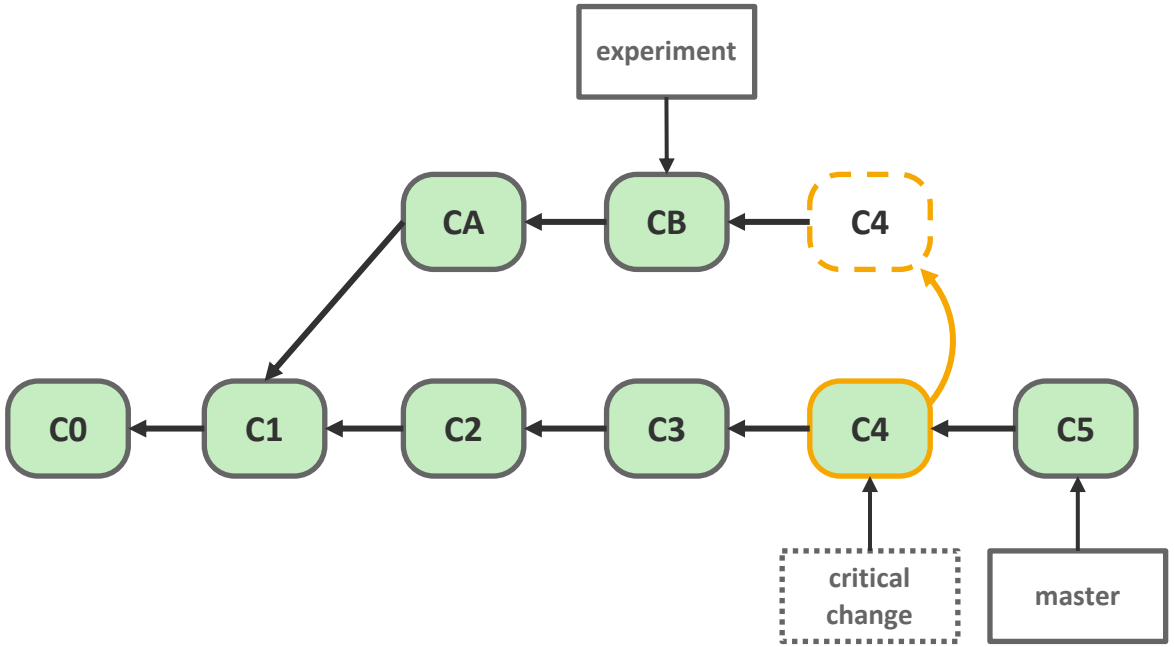
https://git-scm.com/book/en/v1/Git-Branching-Rebasing#The-Perils-of-Rebasing

Git cherry-pick

- **Problem**: Quickly get changes from other commits without having to merge entire branches
- `git cherry-pick`
  - apply the changes introduced by existing commits

```
$ git checkout master
$ git log --abbrev-commit --pretty=oneline
d7ef34a  C3: Implement feature
0be778a C4: critical change introduced
```

```
$ git checkout experiment
$ git cherry-pick 0be778a
```



https://git-scm.com/book/en/v1/Git-Branching-Rebasing (MIT)

Tooling Ideas

Git tooling

- GUIs (https://git-scm.com/downloads/guis)
  - Simplify complex interactions
  - Draw commit graphs, overviews of branches and merges
- GitHub Integration
  - GitHub also provides git tools: https://desktop.github.com/
- Git helpers
  - Common git commands bundled (https://github.com/tj/git-extras)
  - Git shortcuts for common operations (https://github.com/scmbreeze/scm_breeze)

Further Reading

- *Learn Wireframing.* https://github.com/dwyl/learn-wireframing
- Scott W. Ambler. *The Product Owner Role: A Stakeholder Proxy for Agile Teams*. http://agilemodeling.com/essays/productOwner.htm
- Esther Derby & Diana Larsen. *Agile Retrospectives—Making Good Teams Great.* https://pragprog.com/titles/dlret/agile-retrospectives/
- J. M. Bass, *Scrum Master Activities: Process Tailoring in Large Enterprise Projects.* 2014 IEEE 9th International Conference on Global Software Engineering, 2014, pp. 6-15. https://doi.org/10.1109/ICGSE.2014.24
- Akif, R. and Majeed, H. 2012. *Issues and challenges in Scrum implementation*. International Journal of Scientific & Engineering Research. 3(8). pp.1-4. https://communities.bentley.com/cfs-file/__key/communityserver-discussions-components-files/5917/Issues_2D00_and_2D00_Challenges_2D00_in_2D00_Scrum_2D00_Implementation_2800_1_2900_.pdf

Summary

Team Management & SM Tools

- Goals of SM (Tools)
- The (Scrum Master's) Diary
- Scrum Checklists
  - Build your own
- Retrospectives
  - Prime Directive
  - Phase Structure
  - Follow up

Organizing Work & Dev Team Tools

- The cost of technologies and frameworks
- Project data
  - Task board
  - Issue tracker
- Communicating technical details
- Debugging
- git tricks