CMPT 473
Software Quality Assurance

Code Reviews

Nick Sumner - Fall 2014

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How many of you do code reviews as part of jobs / co-ops?

- Why do code reviews?

Why Do Code Reviews?

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What might you share?

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  - How it addresses intended problems
- Code someone else wrote

What might you give feedback on?

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  - Style (is another approach *more consistent*?)

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Code reviews build & maintain
institutional knowledge

How To Improve Code Reviews

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- Learning how to do code reviews is difficult, and the best way to improve is through practice.
- But... there are patterns & structure that help

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Why / when might you do audits?

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Also less formal approaches:
ad hoc reviews, pair programming, etc.

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  - e.g. Walkthroughs- informal feedback
  - e.g. Inspections- (Accept, accept w. change, redo)
  - e.g. Audits- Full reports on overall quality

What Are The Outcomes?

- Depends
  - e.g. Wall
  - e.g. Insp
  - e.g. Audi

MY REVIEW OF TOYOTA'S SOURCE CODE

Access to Toyota's "electronic throttle" source code
- In a secure room in Maryland
- Subject to confidentiality agreements
- For vehicle models with ETCS spanning ~2002-2010 model years
  Camry, Lexus ES, Tacoma, and others

Approximately 18 months of calendar time with code
- By a very experienced team of embedded systems experts
  Including 3 other engineers from Barr Group
- Building upon NASA's earlier source code review; digging deeper

5

NASA must reach a clear-cut conclusion by the end of August.
So they are under a fair amount of pressure.

TOY-MDL05951378
TOY-MDL05951378P-0001

BARR group

From Barr's audit of Toyota code:
http://www.safetyresearch.net/Library/BarrSlides_FINAL_SCRUBBED.pdf

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- Patches with explanations & feedback with {accept, accept w/changes, change & resubmit}
- More rigorous approaches (inspections,audits,...) are more likely to find bugs

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- Good approach:
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- Increasingly in depth reviews as necessary
- Regularly scheduled walkthroughs/inspections.

Why?

Passarounds

Not a formal term

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Why might reviewing smaller sections of code be reasonable?

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  - Why might smaller be a problem?
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- Review in short periods – Why?!
  - If your attention wanes, it is useless
  - Fast/prompt feedback is crucial to progress

Walkthroughs

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  - A middle ground of formality

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Why don't we want to fix the issues now?

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- Shouldn't last more than an hour

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Often, these are *required*,
although we won't use them in our exercises

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Keeps meeting moving.
Makes sure that reported items are acted on.

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Explains the code.
Answers questions of the Reviewer.

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Searches for issues in the code.
Prepares in advance for the inspection meeting.

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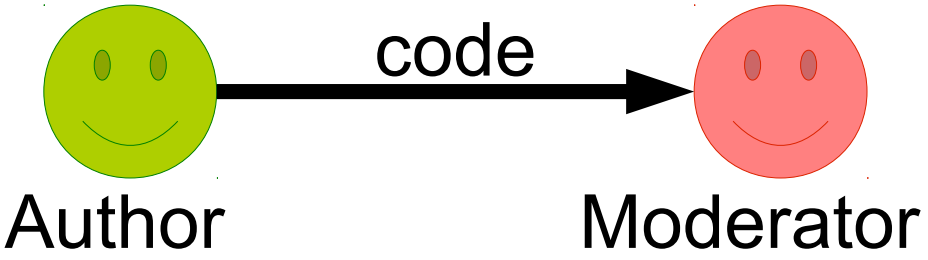
Records the issues and proposed actions.

Inspection

- Planning



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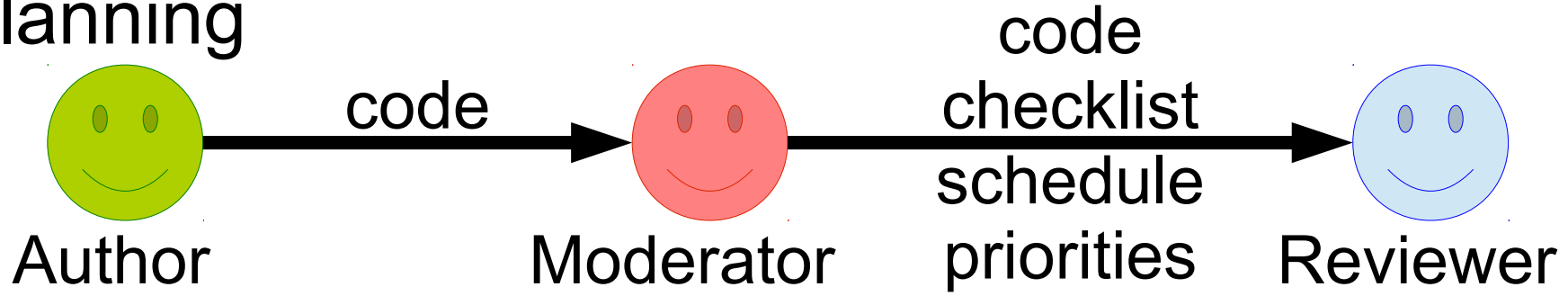

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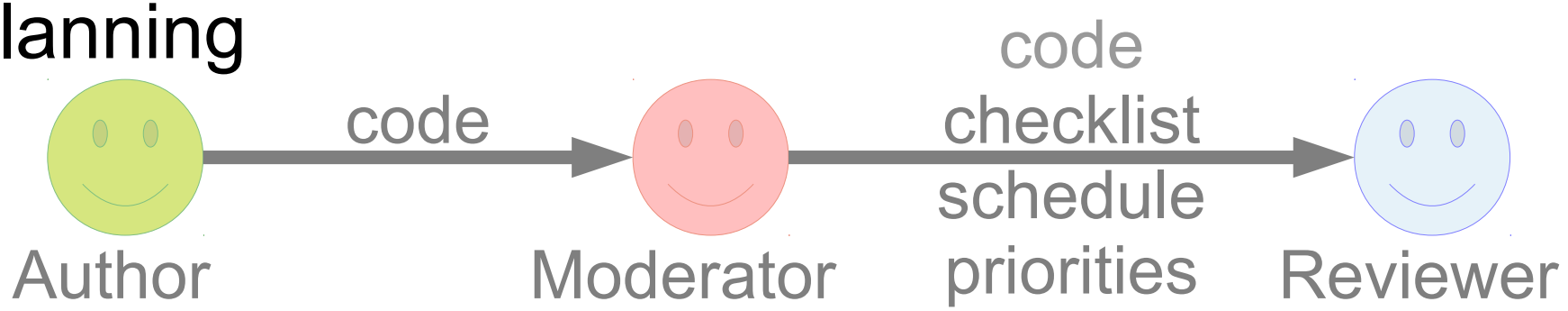

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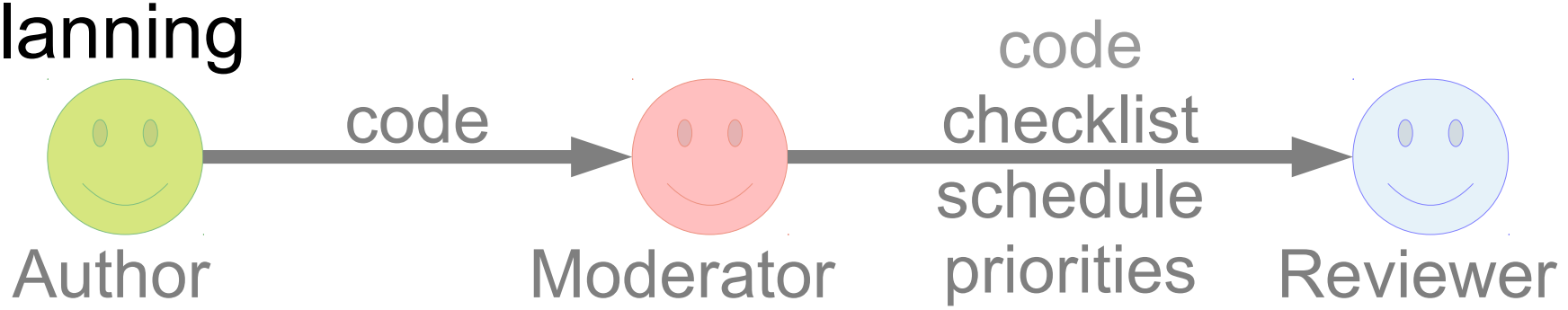

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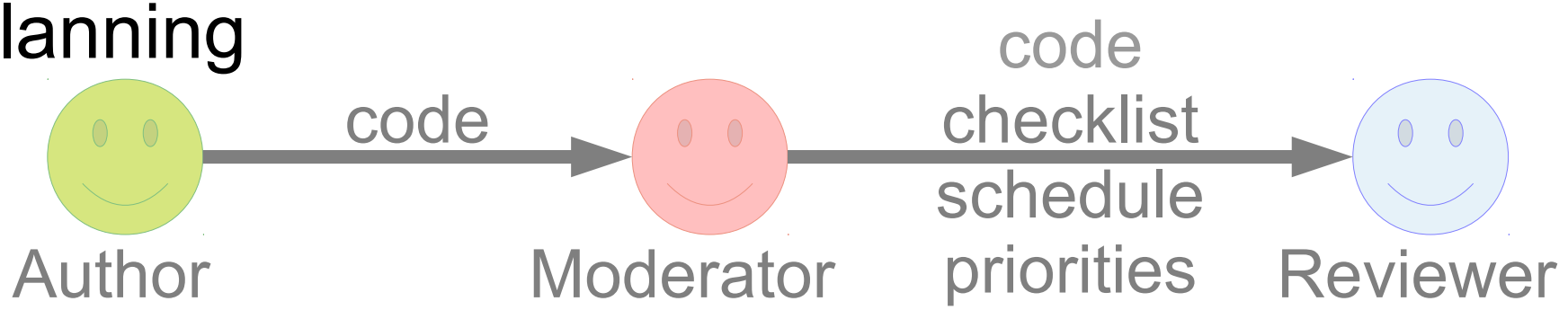

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Why isn't it fixed?

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- Report
  - Each defect along with checklist violation & severity is disseminated

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- Fixing & Followups
  - Fixes are assigned & ensured by the moderator

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- Effective reviews ***must be egoless***

Exercises

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- Let's walk through *your* code.
  - Have one author and one scribe for each session.
  - The moderator shouldn't be the scribe, but for us....
  - Turn in your notes at the end.
  - Record the names of the author, reviewer, & scribe for each.