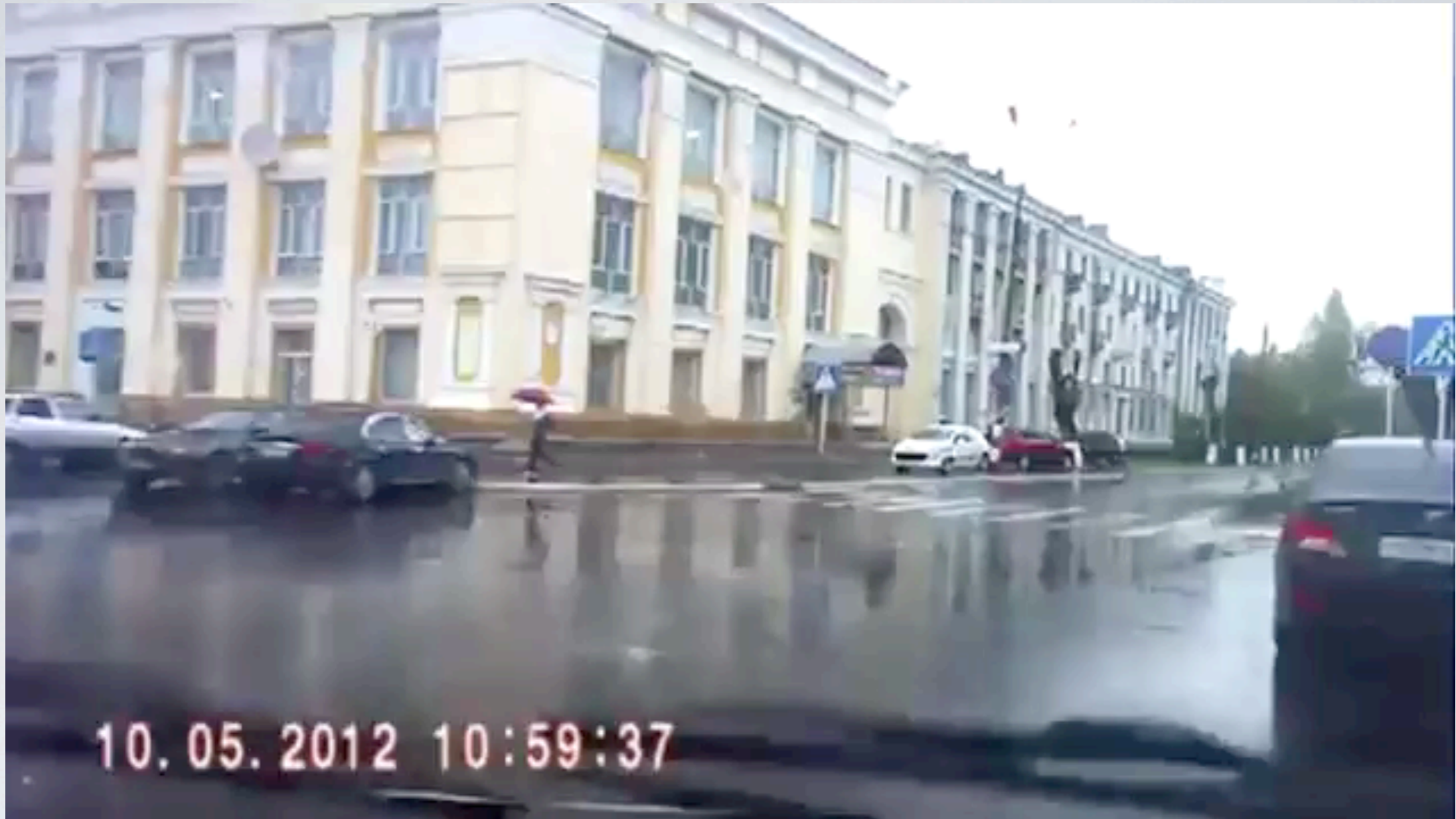


THE ART OF REVIEWING CODE

Arjan van Leeuwen





Yep, I see your problem,

there's a dude passed out in your engine.

Also, your mechanic is a pony.







There I Fixed It

WHY REVIEW CODE?

- Code review could find and fix defects much faster than testing
- Some defects that are hard or impossible to find in testing can be found in code review
- Could catch more than 50% of defects

WHAT IS A CODE REVIEW?

- A Quality Control activity aimed towards detecting defects in code before the software is released by systematically examining changes to the source code

WHAT IS A DEFECT?

- A deviation from quality
- Seen from the viewpoint of the code reviewer
- If the code review team finds an issue it is a defect

WHEN TO DO CODE REVIEW?

- After automated checks have been done:
 - Code compiles
 - Existing automated tests pass
 - New automated tests have been created and pass (part of review)

WHO REVIEWS THE CODE?

- Peers, developers with knowledge of the code base
- Code owners
- Experienced developers

WHERE IS THE CODE REVIEW?

- Public
- Trackable
- Tools can help

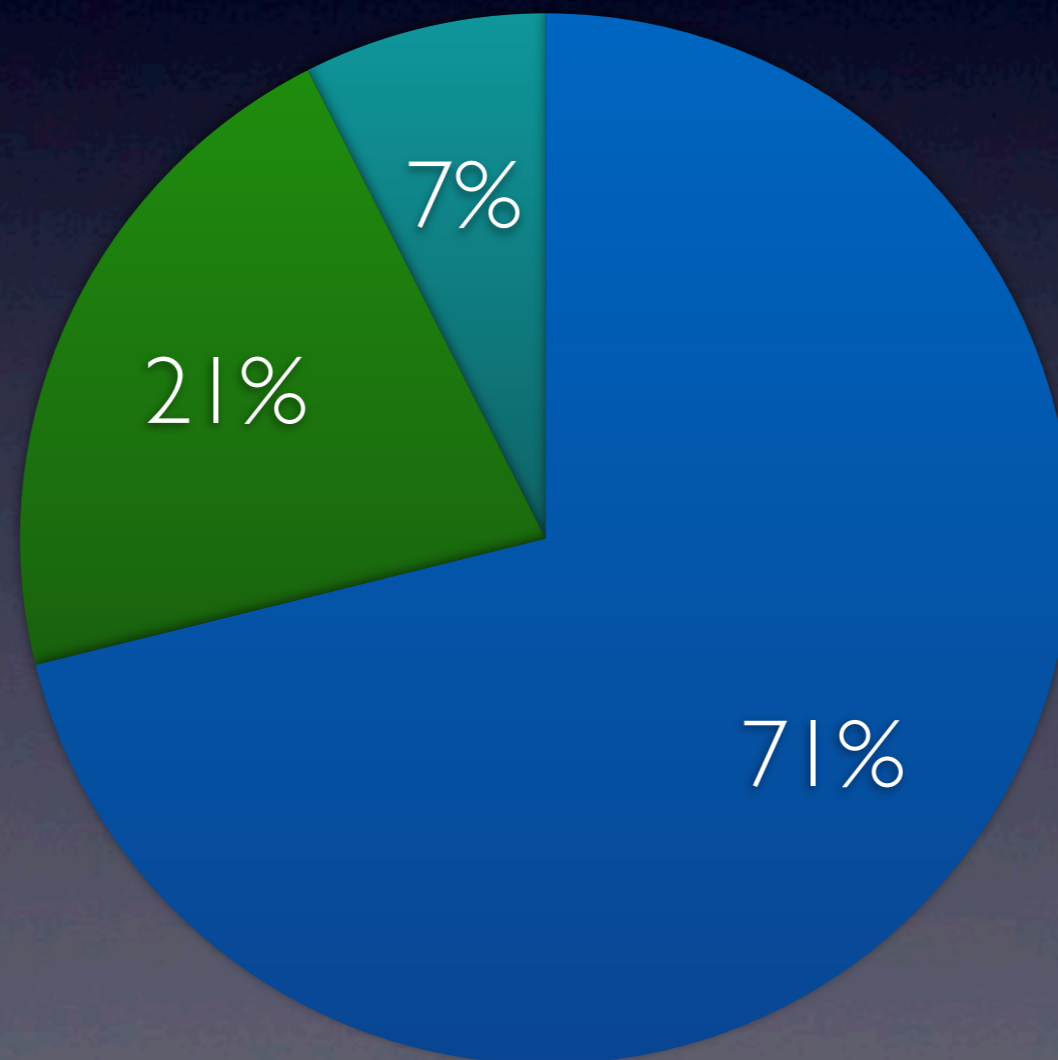
TYPE OF DEFECTS

- Functional defects
- Non-functional or maintainability defects
- False positives

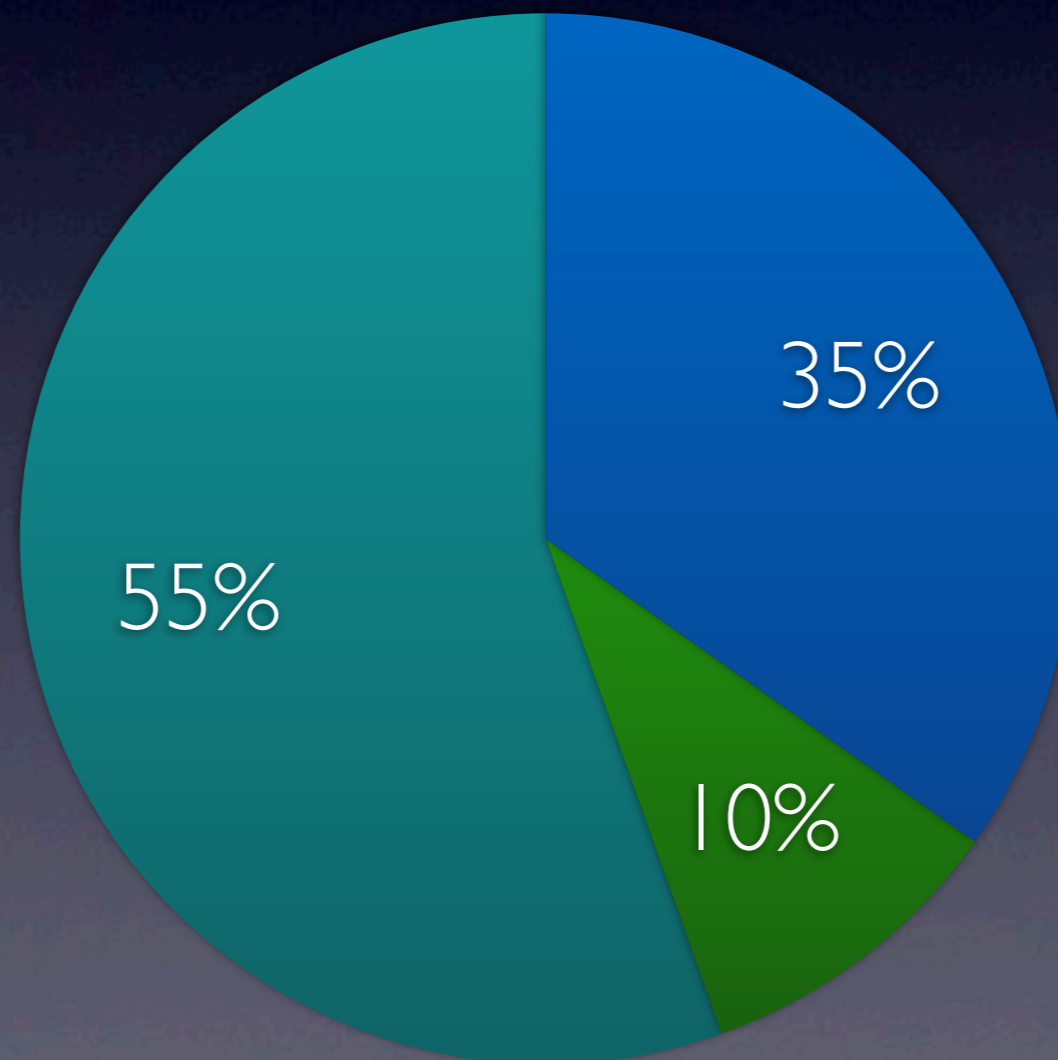
Distribution of Defects

based on research by Mika V. Mäntylä and Casper Lassenius, helsinki university of technology

- Maintainability
- False positives
- Functional

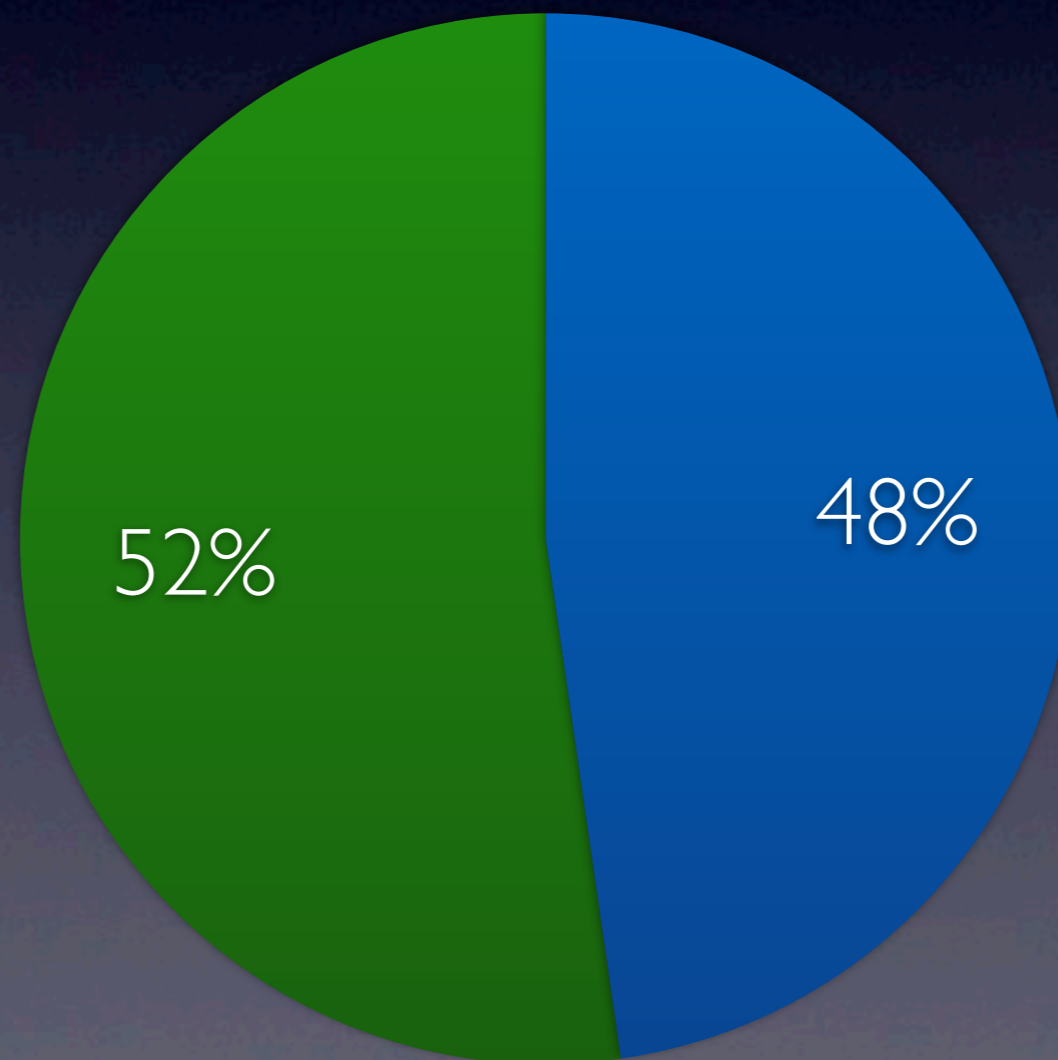


Maintainability Distribution



Structural Defects Distribution

● Organization ● Solution approach



USE OF CHECKLISTS

BASED ON RESEARCH BY GUOPING RONG, JINGYI LI, MINGJUAN XIE AND TAO ZHENG

- Can make it easier for beginning developers to review code
- Helps focus on the code, because there is something to look for
- People working with checklists do not find more defects
- Does not improve quality of defects found
- Does not improve efficiency

USE OF OTHER GUIDELINES

- Describe desired behavior of reviewers and developers whose code is under review
- Describe processes related to the review
 - What happens when a review is approved or rejected?
 - What happens when issues cannot be resolved?

SUBJECTIVITY IN NON-FUNCTIONAL DEFECTS

- Non-functional defects are often subjective in nature
- Nonetheless, research shows inter-rater agreement of 82%
- When in doubt add reviewers
- Long discussions between reviewers and authors should probably be moved offline, but summarize conclusions

DISAGREEMENTS: HAVING CODE REVIEWED

- Don't take it personal. The review is of the code, not you
- Explain why code exists
- Seek to understand the reviewer's perspective
- When disagreeing with a suggestion for improvement, make alternative suggestions
- Ask for a second opinion (in agreement with reviewer)

DISAGREEMENTS: REVIEWING CODE

- Seek to understand the author's perspective
- Understand why the code is necessary
- Communicate whether you feel strongly about something or not
- Offer alternative implementations
- Ask for a second opinion (in agreement with author)

WHY DO CODE REVIEW

- Improve maintainability / quality of code
- Find defects that can not be found by testing (automated or manual)

OTHER EFFECTS OF CODE REVIEW

- Improve knowledge of code and changes in team
- Create a more uniform code base

WHAT CODE REVIEW DOES NOT DO

- Find all bugs before going into production
- Save time on testing / testers
- ‘Check on the new guy’
- Enforce check lists

ARGUMENTS AGAINST CODE REVIEW

- ‘I’m a good developer, I don’t need my code reviewed’
 - Research shows defects are found by reviewers in all code, from experienced to non-experienced developers
- Reviews take time
 - Maintainability issues can make adding new functionality 28% slower and fixing errors 36% slower (See Bandi, Vaishnavi, Turk: Predicting Maintenance Performance Using OO Design Complexity Metrics)

TAKE AWAY

- Code reviews find defects that cannot easily be found in other ways
- Even though defects are subjective, people mostly agree

Some Useful Links Stuck To The End

- Critic (Git, weak code ownership):
<https://github.com/jensl/critic>
- Gerrit (Git): <https://github.com/jensl/critic>
- Review Board (all):
<http://www.reviewboard.org>



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