Công Cụ & Phương Pháp Thiết Kế - Quản Lý (Phần Mềm)

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Reviewing the Review Process

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Question

- **All studies of Inspection have common results, the meeting will find very few errors compared to the reading code. Why are many companies still inspecting the code by meeting?**

  A. They use inspection for training

  B. Inspection can find the defect that the individual couldn't found

  C. Meetings create a schedule that people must work towards

  D. All above

Referenced from Prof.Redley of CMU

Question

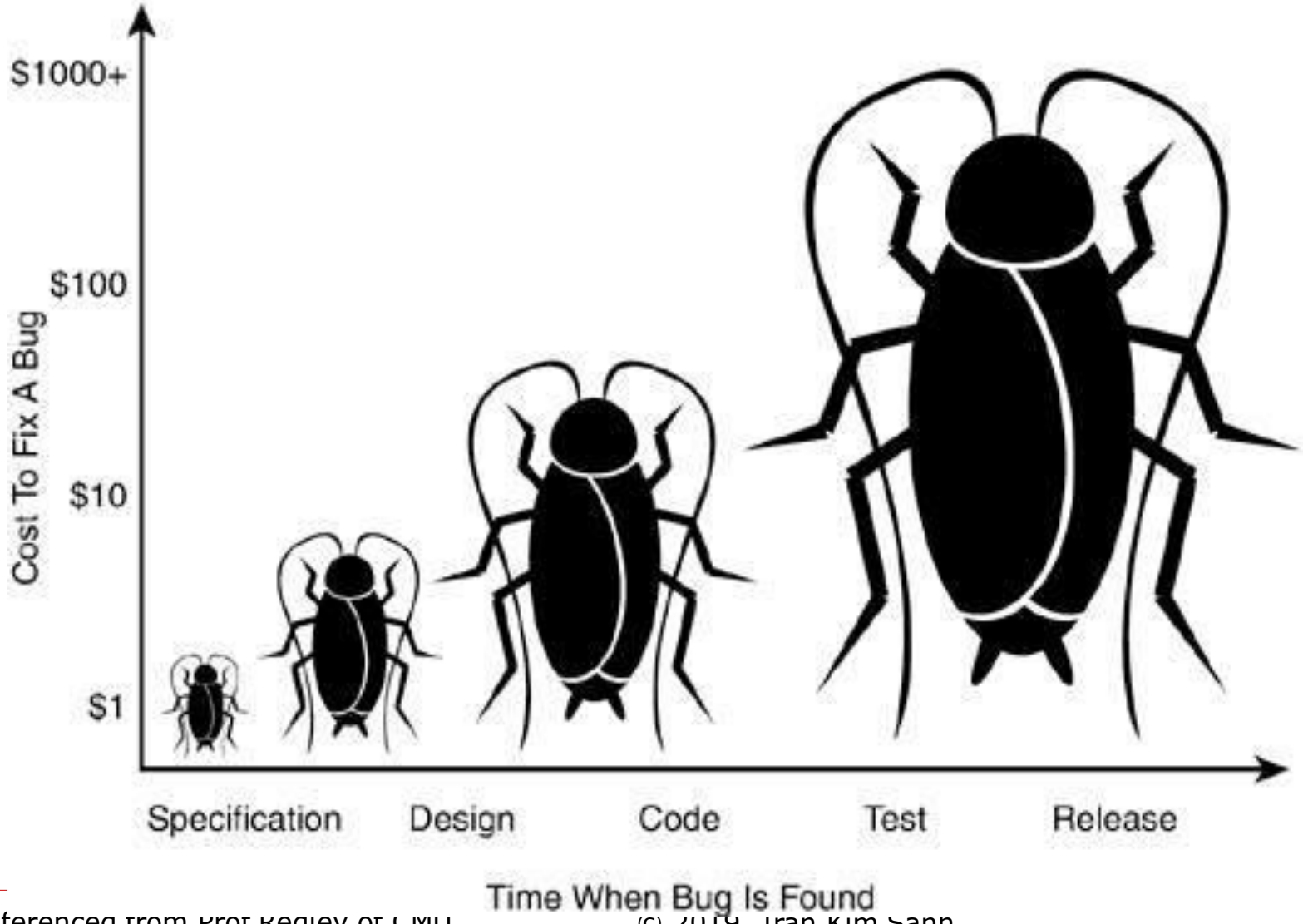
- **What is the maximum time to peer code review?**
  A. 30 minutes
  B. 60 minutes
  C. 90 minutes
  D. 120 minutes
- **What is the most successful type of Object Oriented's review?**
  A. Checklist review
  B. Systematic review
  C. Use-case review
  D. No solution is true

Referenced from Prof.Redley of CMU

Why Do Technical Reviews?

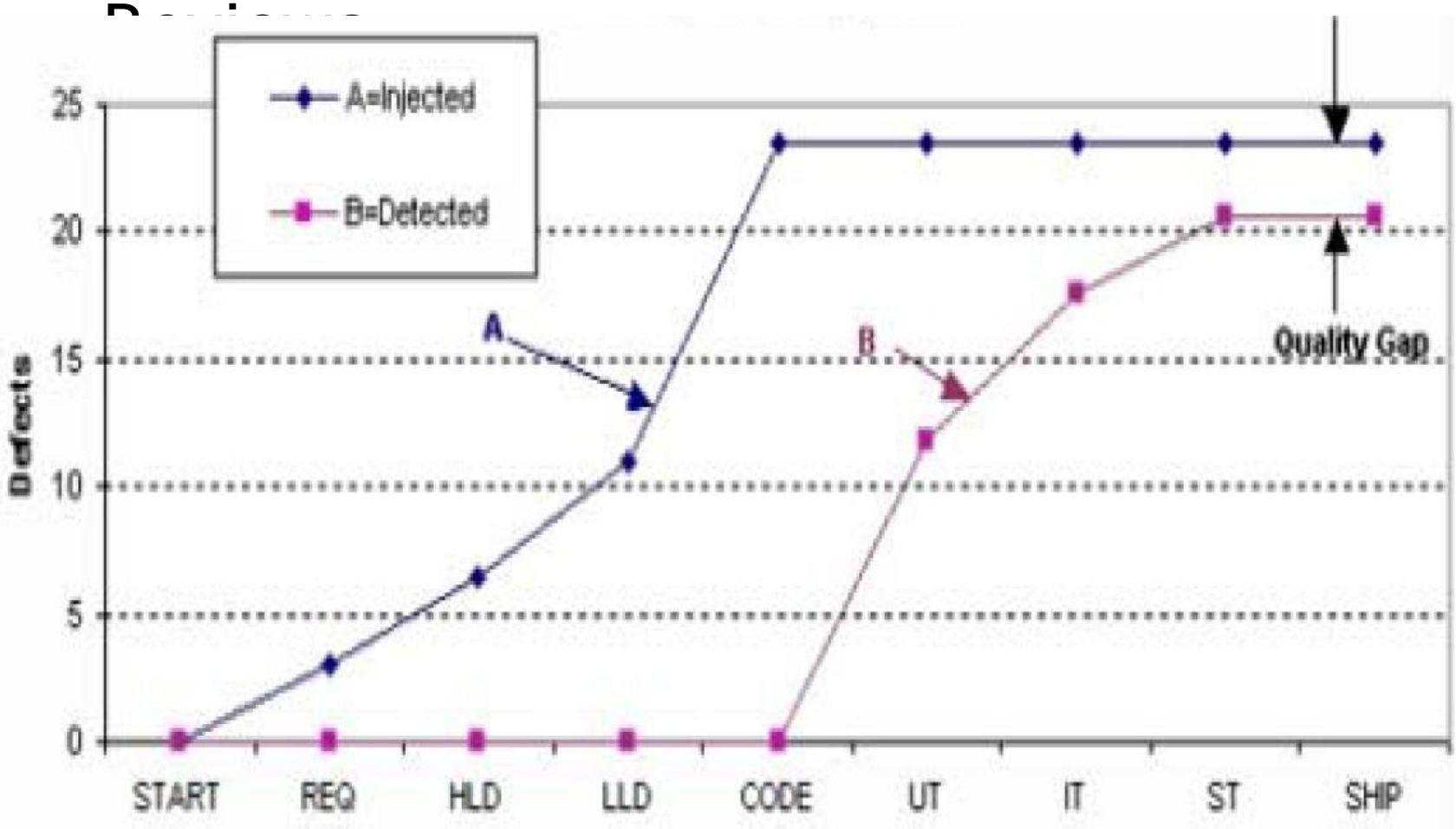
- Software Development Goal:
  - To Remove Software Defects at a Reduced Cost
- Technical Reviews remove defects early in the Life Cycle, and it is always cheaper to remove defects earlier than later
  - Note that Technical Reviews help remove defects, and prevent future defects

Cost to fix a bug



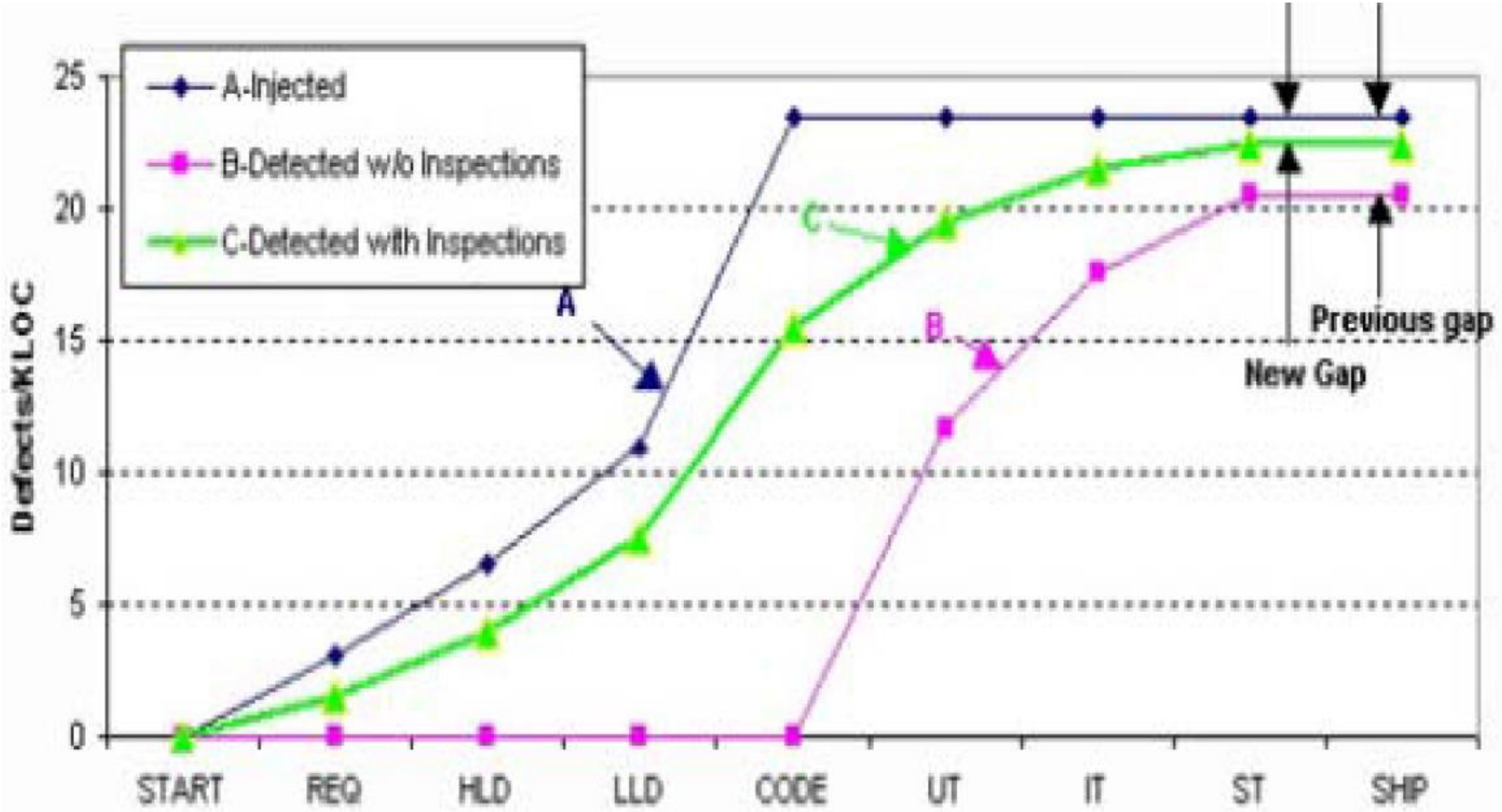
Technical Review Theory

- Software Defect Removal Without



Technical Review Theory

- Software Defect Removal With Reviews



Technical Review Benefits

- Early removal of defects
- Teams find faults that no individual reviewer would be able to find
- Less experienced developers and reviewers learn from their more experienced peers
- Meetings create a schedule that people must work towards
- Personal incentive to contribute & improve
- Significant knowledge sharing

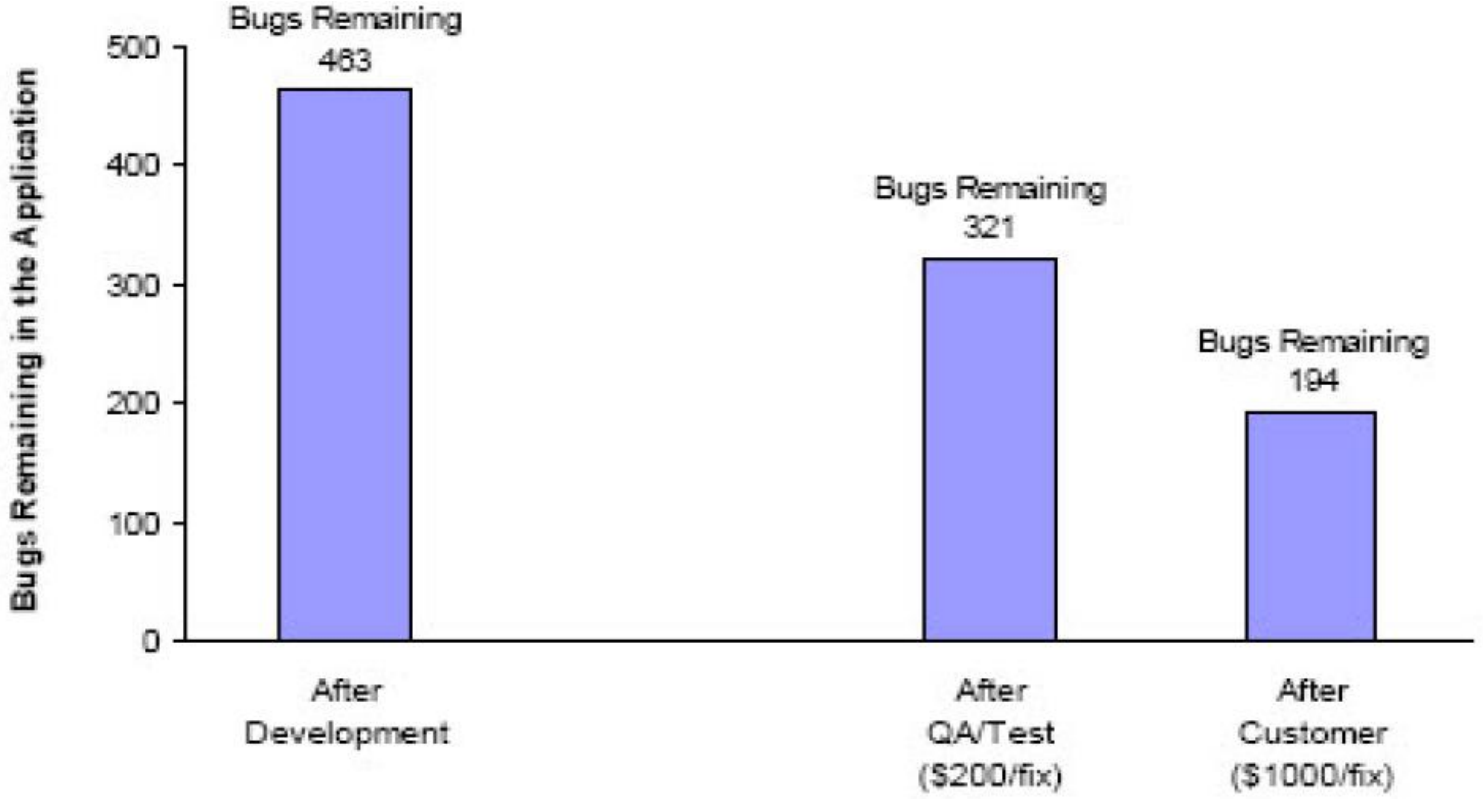
Ex. 1

- Three-month, 10KLOC project with 10 developers. How much $ would the company have saved if they had used technical reviews?
- The result:
  - Code review would have saved *half the cost of fixing the* bugs
  - Plus they would have found 162 additional bugs

Jason Cohen. Best Kept Secrets of Peer Code Reviews

Ex. 2 - Before

- Before Code Reviews

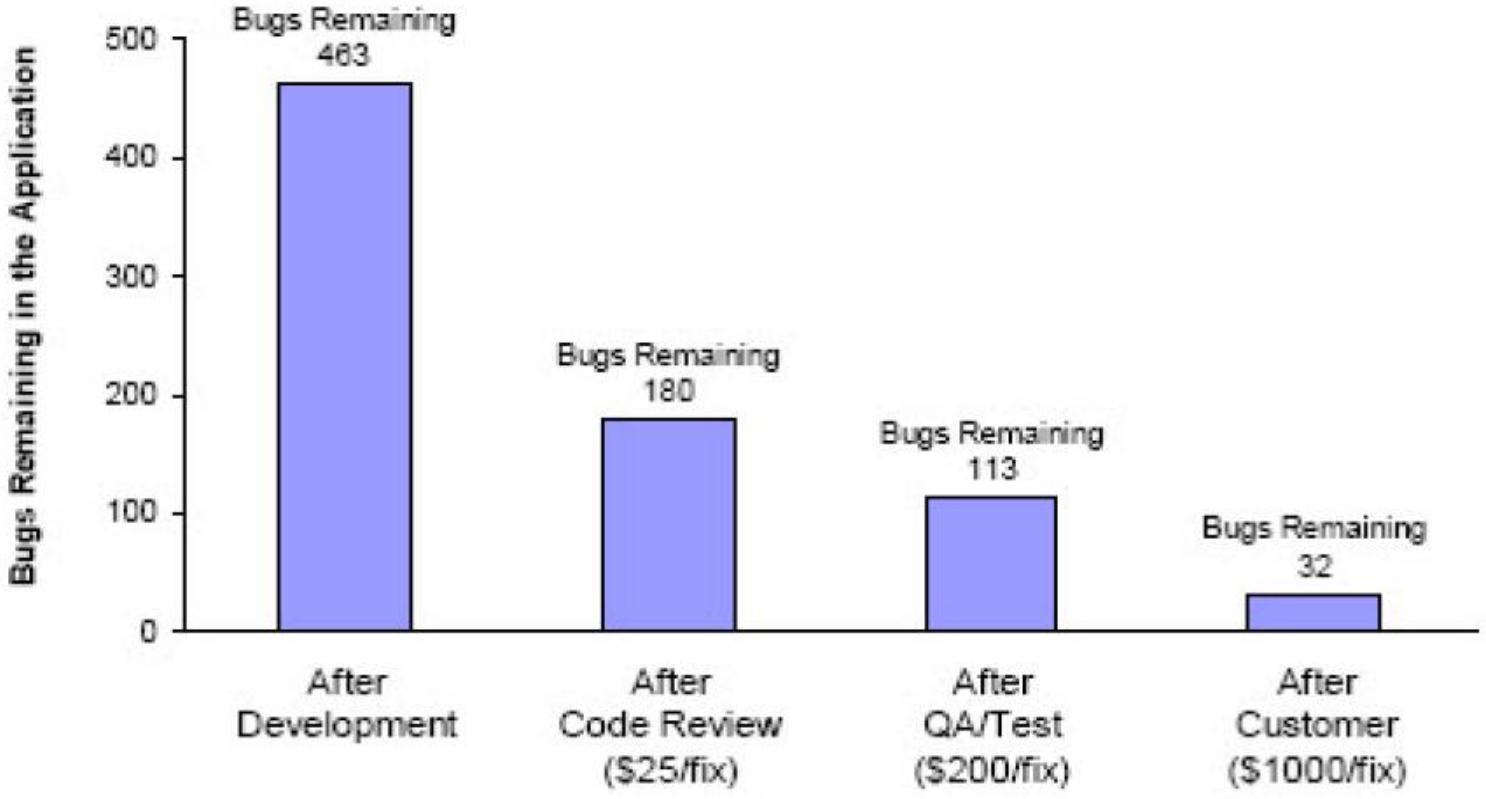


Jason Cohen. Best Kept Secrets of Peer Code Reviews

Cost of fixing bugs: $174k
\+ Cost of 194 latent bugs: $194k
Total Cost: $368k

Ex. 2 - After

- After Code Reviews



Jason Cohen. Best Kept Secrets of Peer Code Reviews

Cost of fixing bugs: $120k
\+ Cost of 32 latent bugs: $ 32k
Total Cost: $152k

Benefits from Other Studies

- Design & Code Inspections usually remove 70 – 85% of product defects
  - Capers Jones. *Software Defect Removal Efficiency, IEEE Computer. April 1996*
- Inspections increase productivity ~ 20%
  - Multiple citings

Technical Review Costs

- ~ 10-15% of project budget
  - If designs and code are inspected
- Vary Widely Depending on review type
  - Effort associated with preparing, doing and documenting the review
  - Cost of training
  - Cost of tools

- Hurt Feelings
  - Any criticism is an opportunity both for growth and for embarrassment
  - Criticism can feel like a personal attack
  - Will review data affect annual reviews?

Addressing Hurt Feelings

- Be consistent in pointing out that:
  - Finding defects is good, not evil
  - Defect density is not correlated with developer ability
  - We want to find defects so we can honestly evaluate our own behavior and productivity
  - Reviewers are doing a good job if they find lots of defects
  - Defect density will never be used for performance evaluations
  - Negative attitudes will not be tolerated

What Review Data Should We Collect?

- Depends on what our goals are
  - Goal: Cost to find defects using reviews
    - ✓ # defects found
    - ✓ Effort (hours) to find each defect
    - ✓ Other review costs
  - Goal: # defects found by reviews that unit test won't find (should we do unit test & reviews?)
    - ✓ # defects found
    - ✓ For each defect found, indicator as to whether it would be found by unit test (author's assessment)

What is a Defect?

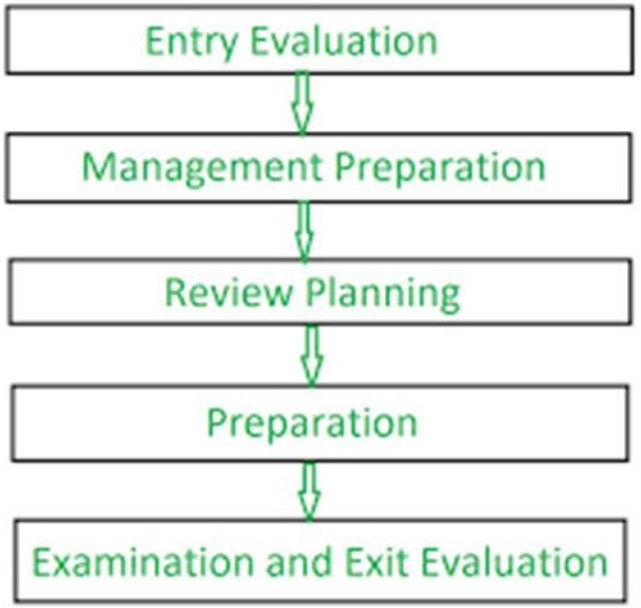
- *When a reviewer or consensus of reviewers determines that code must be changed before it is acceptable, it is a "defect"*
  - If the algorithm is wrong, it's a defect
  - If the code is right but unintelligible due to poor documentation, it's a defect
  - If the code is right but there's a better way to do it, it's a defect
- For the purposes of reviews:
  - A defect is an improvement to the code that would not have occurred without review

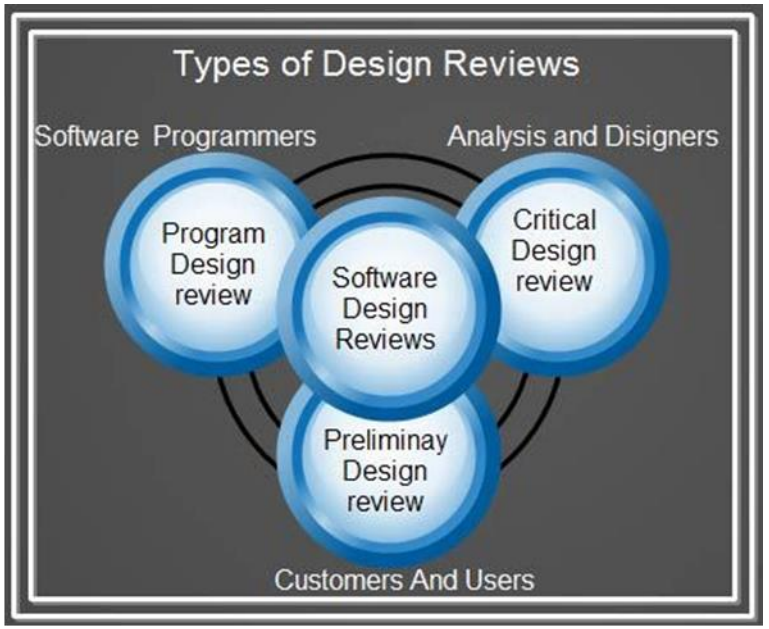
Group discussion

- Compare **defect**, **error, bug**
- (2 students – 5 minutes)

Why Are Technical Reviews Not More Widely Used?

- Significant data supporting the effectiveness of technical reviews (for the past 30 years), so why aren't technical reviews more widely used?





Why Are Technical Reviews Not More Widely Used?

- Perception that there is just one way to do reviews (inspections), and that they are not easy to do
  - Multiple types of reviews
- Viewed as an added cost
  - True, but if done correctly they will save $
- Viewed as taking too long
  - True, but if done correctly they will save time

Ron Radice. *Software Inspections. Methods & Tools. Summer, 2002*

Why Are Technical Reviews Not More Widely Used?

- Not needed with modern languages and development techniques
  - Modern developers still create defects
- "Tried it and it doesn't work"
  - Don't confuse a good idea with a poor implementation
  - The process is often not well implemented or is changed without supporting data
- Developers don't like to do them
  - They can become tedious, but they can also be fun

Ron Radice. *Software Inspections. Methods & Tools. Summer, 2002*

Why Are Technical Reviews Not More Widely Used?

- Our developers are very good
  - Even very good developers create defects
  - Most developers want to learn from their mistakes
- Developers don't take the feedback well
  - Most developers want to learn from their mistakes
- Unit testing is just as effective
  - Unit testing doesn't catch everything
  - Unit testing can give a false sense of quality

Ron Radice. *Software Inspections. Methods & Tools. Summer, 2002*

Why Are Technical Reviews Not More Widely Used?

- They are a competitive advantage!
  - No one wants to give away the secret of how to release fewer defects efficiently

Jason Cohen. Best Kept Secrets of Peer Code Reviews

Summary

- If implemented properly, reviews are a proven method for:
  - Significantly reducing the number of delivered bugs
  - Keeping code maintainable
  - Getting new hires productive quickly and safely
- Methods and tools can be misapplied, treated as a failure, and then dismissed as a bad experience by users who were not enabled for success
- Quality techniques such as reviews and testing are not mutually exclusive
- Cost, benefit and category data must be collected to verify and improve your review process!

Ron Radice. *Software Inspections. Methods & Tools. Summer, 2002*

Video link

- https://www.youtube.com/watch?v=FTN_93Px-Qc
- https://www.youtube.com/watch?v=5KB5KAak6tM

References

- Capers Jones. *Software Defect Removal Efficiency, IEEE Computer.*
- Jason Cohen, Steven Teleki, Eric Brown. *Best Kept Secrets of Peer Code Review*