Design and code reviews by inspection


- Keys points:
  - Checklists focus the reviewers’ attention on areas that have been problematic in the past.
  - Emphasis on defect detection, not correction.
  - Reviewers prepare for the inspection meeting beforehand and arrive with a list of the problems they have discovered.
  - Distinct roles for participants.
Key points (cont.)

- Moderator is not the author.
- Moderator receives specific training
- Data is collected at each inspection for future improvement
- Management does not attend the inspection meeting.
Roles at an inspection (I)

- **Moderator:**
  - Keeps the inspection moving at a productive pace.
  - Must be technically competent
  - Distributes codes to the reviewers, prepares the checklist, does inspect report, and conducts inspection follow-ups.

- **Author:**
  - Clarify if code is not clear
  - Explain what seems to be defects are actually acceptable
  - Give overview of the project if participants are unfamiliar with the area.
Roles at an inspection (II)

- **Reviewer:**
  - Anyone who might have an interest in the production work, e.g.,
    - Programmer who will implement the design
    - Testers who will test the code.
  - Find defects, primarily during preparation and more during the meeting.

- **Scribe:**
  - Record errors detected and assignment of action items.
  - Can be the moderator; Cannot be the author or reviewers.
Inspection procedure

- Planning. upon receiving code from the author:
  - Moderator decides who will be the reviewers and when and where the inspection will take place.
  - Distribute checklist to reviewers.
Inspection procedure (II)

- Overview:
  - Author spends up to an hour to do the overview the project if reviewers are not familiar.
  - Might be dangerous in misleading the reviewers and should be done if unnecessary.
Inspection procedure (III)

- Preparation
  - Each review spends for 1.5 hrs to get familiar with the design or code
  - Use checklist to stimulate and direct attention.

- Review rate:
  - 700 lines/hour for application code
  - 125 lines/hour for system code
  - Rate varies; keep record.
Inspection procedure (IV)

- Inspection meeting
  - Author paraphrase the design or read the code.
    - All logic explained for each branch of a logical structure.
  - Scribe record errors and their severity as they are detected
    - Discussion of error stops as soon as it is recognized as one; the inspection moves on.
Inspection procedure (V)

- Inspection meeting (cont.)
  - The pace should not be too slow nor too fast:
  - Keep record (line of codes per hour).
  - Don’t discuss solutions during the meeting.
  - Should not last more than two hours.
  - No more than one inspection per day for each participant.
Inspection procedure (VI)

- Inspection report
  - Report listing each defect and its type and severity within one day of the meeting.
  - Ensures that all defects are tracked.
  - Organization-wide checklist maintenance
  - Records rates (hard-data vs. general feeling)
Inspection procedure (VII)

- **Rework**
  - Usually done by the author

- **Follow-up**
  - Moderator is responsible for reviewing the rework.
  - If more than 5% code changes, call for a new inspection.
Inspection procedure (VIII)

- Third-hour meeting: setup side meeting for interested participants to discuss solutions.

- Fine-tuning the inspection
  - Checklist
  - rates
Effective inspection checklist

- Do you have the checklists that focus reviewers' attention on areas that are known to be problematic in the past?
- Is the emphasis on defect detection rather than correction?
- Are inspects given enough time for preparation before the meeting, and is each one prepared?
- Does each participant have a distinctive role to play?
Effective inspection checklist (II)

- Does the meeting move at a productive rate?
- Is the meeting limited to two hours?
- Has the moderator received specific training in conducting inspection?
- Is data for each type error collected so that you can tailor the checklist?
- Is data about preparation and inspection meeting collected for process improvement?
Effective inspection checklist

(III)

- Are the action items assigned at each inspection followed up, either personally by the moderator or with an re-inspection?

- Does the management understand why it should not attend inspection meetings?
What to include in a generic OO inspection checklist?

- Corporate coding style
  - Variable naming, indentation, comments

- Basic OO principles
  - Encapsulation, polymorphism, delegation, etc.

- Idioms:
  - smart pointers (pointer surrogate)

- Patterns

- “Smells” in refactoring
  - Duplicated codes, long methods, feature-envy, etc.
Domain-specific items

- Depends on the domain
- Errors committed in past projects
- Literature