CISC327 - Software Quality Assurance

Lecture 21

Inspection
Inspection Process

• Outline
  – Today we look at the inspection process
    • Steps in a formal inspection process
    • Example inspection documents
Inspection Process

• Inspection At Any Stage
  – Inspections may be used at any stage of software development
    • Requirements, design, coding, testing, acceptance
  – Ideally, inspections can be applied at every stage, to catch problems as early as they appear
  – No matter what stage inspection is applied to, the inspection process is roughly the same
A Generic Inspection Process

- **Independent of Stage**
  - The basic process of formal inspection is always the same, no matter the artifact being inspected

  - **Planning**
    - Choose team, materials, schedule for inspection
  
  - **Orientation**
    - Introduce artifact, process, goals to learn
  
  - **Preparation**
    - Individually check artifact, note issues
  
  - **Review Meeting**
    - Meet to discuss and consolidate issues
  
  - **Rework**
    - Correct defects noted
  
  - **Verify**
    - Verify artifact and process quality
(Recall) Inspection Roles

- **Moderator**
  - Chairs the meeting, *records* faults found
  - Helps others stick to the job, at the right *pace*
  - Keeps proceedings *objective*, professional, friendly

- **Inspectors (2 or 3)**
  - Knowledgeable *peers* who examine the artifact, in detail

- **Author**
  - Silent *observer* who assists or clarifies only when asked
Planning

• Objectives
  – Gather **review package**: artifact being inspected, references for it, checklists of inspection criteria, data sheets to record
  – Form inspection **team**
  – Set of **schedule**
Planning

• Procedure
  – Moderator assembles team and review package
  – Moderator customizes checklist to artifact
  – Moderator plans schedule
  – Moderator checks artifact is ready for review
  – Moderator helps Author prepare overview of artifact

Planning  Orientation  Preparation  Review  Rework  Verify
**Example Planning Document**

<table>
<thead>
<tr>
<th>Planning</th>
<th></th>
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<tbody>
<tr>
<td>1. Inspection ID</td>
<td>___________</td>
<td>Date: ___________</td>
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<tr>
<td>2. Team</td>
<td></td>
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<tr>
<td>Moderator</td>
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<tr>
<td>Authors</td>
<td></td>
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<tr>
<td>Reviewers</td>
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<td>3. Documents</td>
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<tr>
<td>Work Product</td>
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<tr>
<td>References</td>
<td></td>
<td></td>
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<tr>
<td>Checklist</td>
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<tr>
<td>4. Meetings</td>
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<tr>
<td>Orientation Review Meeting</td>
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<tr>
<td>Date</td>
<td>Location</td>
<td>Start</td>
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<tr>
<td>5. Planning Objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>References obtained for work product.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checklists obtained for work product.</td>
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<tr>
<td>Moderator is trained in TekInspect method.</td>
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<tr>
<td>Team members agree to proposed times/dates.</td>
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<tr>
<td>Moderator's quick review yields less than 5 major issues.</td>
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<tr>
<td>Reviewers understand responsibilities and are committed.</td>
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<td>6. Plan. Effort</td>
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<td></td>
<td>___________ min</td>
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(Johnson, U. Hawaii 2000)
Orientation Meeting

• Objectives
  – Author provides overview of artifact
  – Inspectors obtain review package
  – Preparation goals set
  – Inspectors commit to participating
Orientation Meeting

• Procedure
  – Moderator distributes review package
  – Author presents overview
  – Moderator outlines preparation procedure
# Example Orientation Document

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</thead>
<tbody>
<tr>
<td></td>
<td>__ min/pg</td>
<td>□ Reviewers understand scope and purpose of work product..</td>
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<tr>
<td></td>
<td>x __ pg.</td>
<td>□ Reviewers understand checking process, checklists, and references.</td>
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</tr>
<tr>
<td></td>
<td>= __ prep time/reviewer</td>
<td>□ Work product, references, checklists, and checking forms provided</td>
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<td></td>
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<td>□ □ □</td>
<td>□ min meet x __ particip. = __ min</td>
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</tbody>
</table>

(Johnson, U. Hawaii 2000)
Preparation

• Objectives
  – Find the maximum number of non-minor defects in the artifact
Preparation

• Procedure (for Inspectors only)
  – Allocate scheduled time
  – Do detailed individual inspection of the artifact
  – Use checklists as a guide to focus on potential issues
  – Use references for calibration of what is expected or needed
  – Note critical, severe, and moderate level defects on reviewer report form
  – Note minor defects and questions for author clarification on artifact document
Example Defect Classification

• **Critical**
  – Defects that will cause the system to *hang, crash*, or produce *incorrect results* or behaviour, with no known workarounds

• **Severe**
  – Defects that will cause *incorrect results* or behaviour, but have known workarounds

• **Moderate**
  – Defects that affect limited areas of functionality that can either be worked around or ignored

• **Minor**
  – Defects that can be overlooked without loss of functionality
Example Checklists and References

• Checklists
  – Checklists often include questions concerning completeness, style, adherence to company standards, etc.
  – Code inspection checklists often include detailed questions about use of language features (e.g., no gotos), naming of variables, methods and classes, depth of nesting, etc.
Example Checklists and References

• References
  – May include:
  – Company standards documents
  – High quality examples of artifacts similar to the one being inspected
  – Chapters of reference textbooks on quality practice for artifacts
  – Online resources on quality practice for artifacts
Example Preparation Document

• Reviewer Report Form

(Johnson, U. Hawaii 2000)
Why Not Write On Artifact Directly?

• **Advantages of Reviewer Report Form**
  – Minor issues pre-filtered, saving review meeting time and focusing review meeting on important issues
  – Forces inspectors to write down issues clearly, saving meeting time
  – Defects can be considered in order of importance
  – Easy to gather inspection stats
Why Not Write On Artifact Directly?

• Disadvantages (?) of Reviewer Report Form
  – Requires more preparation time (15 minutes?)
  – Discourages last minute preparation
  – Makes quality of inspector preparation more visible
Review Meeting

• Objectives
  – Make consolidated, comprehensive list of non-minor defects to be addressed
  – Help provide group synergy
  – Help provide shared knowledge of artifacts
Review Meeting

• **Procedure**
  – Moderator requests defects sequentially, in order of **importance**
  – Inspectors point out defects found, compare notes
  – Moderator (or note taker) writes down consolidated list of defects found and summarizes results of meeting in **review summary defect report**
Example Review Summary Defect Report

(plus a detailed description of each defect)
Rework

• Objectives
  – Assess each defect listed in the review defect report, determine if really a defect, and repair as necessary
  – **Written report** on handling of each non-minor defect
  – Resolve minor issues as necessary and appropriate
Rework

• Procedure (for Author)
  
  – Author gets review defect summary report as well as marked-up copies of inspected artifact with details
  
  – Author assesses each defect, categorizes root cause and notes actions taken in an author action report
  
  – When finished, Author provides author action report and reworked artifact to Moderator for verification
Example Author Action Report

<table>
<thead>
<tr>
<th>1. Inspection ID</th>
<th>2. Document</th>
<th>3. Author</th>
</tr>
</thead>
</table>

4. Issue Disposition

<table>
<thead>
<tr>
<th>Num</th>
<th>Fixed</th>
<th>Type</th>
<th>Explanation</th>
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5. Effort _____ min

6. Rework Objectives
   - Outcome of all Review Meeting Data Sheet issues are noted on this form.
   - All minor issues have been addressed.
   - No known defects remain in the work product.

(Johnson, U. Hawaii 2000)
Verify

• Objectives
  – Assess reworked artifact quality
  – Assess inspection process
  – Pass or fail the artifact
Verify

• Procedure (for Moderator)
  – Obtain reworked artifact and author action report
  – Review reworked artifact and action report for remaining problems
  – Provide recommendation for artifact (pass / fail)
  – With inspectors, sign off on artifact
  – Compute summary statistics for inspection and archive review documents in quality database
  – Generate process improvement proposals (if any)
Summary

• Inspection Process
  – No matter what artifact of development is being inspected, inspection process is much the same
  – **Six steps**: planning, orientation meeting, preparation, review meeting, rework, verify

• Reference
  – O’Regan, Ch. 2.1-2.5
    “Overview of Fagan Inspections”

• Next Time
  – Inspections in practice: Code inspections