

CISC 327

Software Quality Assurance

Lecture 21

Inspection

Inspection Process

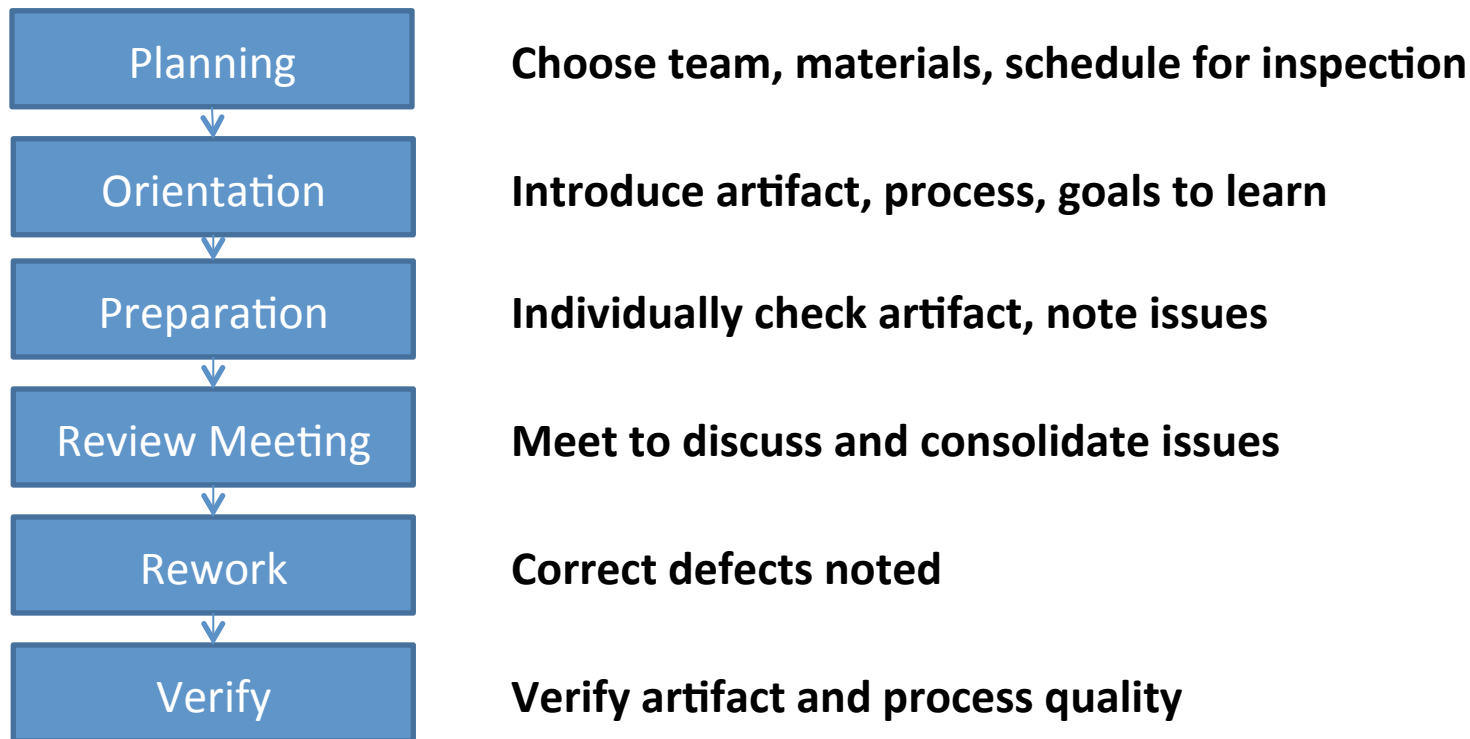
- Today we look at the **inspection process**
 - Steps in a formal inspection **process**
 - Example inspection **documents**

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

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



(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 schedule

Planning

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Rework

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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

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Example Planning Document

Planning	1. Inspection ID	_____	Date:	_____
	2. Team			
	Moderator	_____		
	Authors	_____		
	Reviewers	_____		
	_____	_____		
3. Documents				
Work Product	_____			
References	_____			
Checklist	_____			
4. Meetings				
Orientation	_____	_____	_____	_____
Review Meeting	_____	_____	_____	_____
5. Planning Objectives				
	<input type="checkbox"/>	References obtained for work product.		
	<input type="checkbox"/>	Checklists obtained for work product.		
	<input type="checkbox"/>	Moderator is trained in TekInspect method.		
	<input type="checkbox"/>	Team members agree to proposed times/dates.		
	<input type="checkbox"/>	Moderator's quick review yields less than 5 major issues.		
	<input type="checkbox"/>	Reviewers understand responsibilities and are committed.		
6. Plan. Effort	_____	<u>min</u>		

(Johnson, U. Hawaii 2000)

Orientation Meeting

- Objectives

- Author provides **overview** of artifact
- Inspectors obtain **review package**
- Preparation goals set
- Inspectors **commit** to participating

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Orientation Meeting

- Procedure
 - Moderator distributes review package
 - Author presents overview
 - Moderator outlines preparation procedure

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Example Orientation Document

Orientation	7. Prep. Goals	<u> </u> min/pg	x	<u> </u> pg.	=	<u> </u> prep time/min viewer
	8. Orient. Objectives	<input type="checkbox"/>	Reviewers understand scope and purpose of work product..			
		<input type="checkbox"/>	Reviewers understand checking process, checklists, and references.			
		<input type="checkbox"/>	Work product, references, checklists, and checking forms provided			
	9. Orient. Effort	<u> </u> min. meet	x	<u> </u> particip.	=	<u> </u> min

(Johnson, U. Hawaii 2000)

Preparation

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

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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

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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

1. Inspection ID _____		2. Document: _____		3. Name: _____		
4. Critical, Severe, and Moderate Issues						
<i>Num</i>	<i>Location</i>	<i>Severity</i>	<i>CHK/Ref</i>	<i>Description</i>		
_____	_____	_____	_____	_____		
_____	_____	_____	_____	_____		
_____	_____	_____	_____	_____		
_____	_____	_____	_____	_____		
_____	_____	_____	_____	_____		
5. Effort: _____ <i>min</i>		6. Issue Totals				
		<i>critical</i>	<i>severe</i>	<i>moderate</i>	<i>minor</i>	<i>author Q's</i>
7. Preparation Objectives		<input type="checkbox"/> Work product has been completely checked.				
		<input type="checkbox"/> All critical, severe, and moderate issues are noted on this form.				
		<input type="checkbox"/> All minor issues and author questions are noted on the work product.				

(Johnson, U. Hawaii 2000)

Why Not Write On Artifact Directly?

- **Advantages of Reviewer Report Form**
 - Minor issues pre-filtered, saving review meeting time, 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

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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**

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Example Review Summary Defect Report

Review Meeting	Aggregate Checking Data						Total
	R1	R2	R3	R4	R5	R6	
10. Prep. Effort	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>min</u>
11. Critical Iss.	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>iss.</u>
12. Severe Iss.	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>iss.</u>
13. Moderate Iss.	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>iss.</u>
14. Minor Iss.	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>iss.</u>
15. Author Q's.	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	_____ + _____	= _____ <u>Qs</u>
16. Rev. Meet. Objectives	<input type="checkbox"/> All reviewers present. List absent: _____ <input type="checkbox"/> All reviewers prepared sufficiently for meeting. <input type="checkbox"/> All issues noted by Scribe and understood by Author for rework <input type="checkbox"/> Any problems with inspection process have been noted.						
17. R.M. Effort	_____ <u>min. meet</u> x _____ <u>particip.</u> = _____ <u>min</u>						

(Johnson, U. Hawaii 2000)

(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

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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

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Example Author Action Report

1. Inspection ID _____	2. Document _____	3. Author _____	
4. Issue Disposition			
<i>Num</i>	<i>Freq</i>	<i>Type</i>	<i>Explanation</i>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
5. Effort _____ <u>min</u>			
6. Rework Objectives	<input type="checkbox"/> Outcome of all Review Meeting Data Sheet issues are noted on this form.		
	<input type="checkbox"/> All minor issues have been addressed.		
	<input type="checkbox"/> 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

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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)

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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