

Reviews: software *and* midterm

CSE403: Software Engineering

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Reviews, etc.

- Reviews, walkthroughs, and inspections are all in a family of activities where an artifact (specification, code, etc.) is studied by a peer group to improve the artifact's quality
- There is a large and increasing literature that demonstrates the effectiveness (although not always the cost-effectiveness) of these approaches

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2

Reviews, etc.

- N-heads are better than one
- Intended to
 - identify defects
 - identify needed improvements
 - encourage uniformity and conformance to standards
 - enforce subjective rules

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3

Purposes

- Increase quality through peer review
- Provide management visibility
- Encourage preparation
- Explicit non-purpose
 - Assessment of individual abilities for promotion, pay increases, ranking, etc.
 - Management usually not permitted at reviews

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4

Walkthrough

- A formal activity
- A programmer (designer) presents a program (design)
- Values of sample data are traced
- Peers evaluate technical aspects of the design

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5

Inspections [Sommerville]

- Formal approach to code review
- Intended explicitly for defect *detection* (not correction)
- Defects include logical errors, anomalies in the code (such as uninitialized variables), non-compliance with standards, etc.

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6

Inspection requirements

- A precise specification must be available
- Peers must be knowledgeable about organizational standards
- Code should be syntactically correct and basic tests passed
- Error checklist must be provided

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7

Inspection process

- Plan
- Overview
- Individual preparation
 - Code, documentation distributed in advance
- Meeting
- Rework
- Follow-up

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8

Inspection teams

- Four or more members
- Author of code
- Reader of code (reads to team)
- Inspector of code
- Moderator chairs meeting, takes notes, etc.

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9

Inspection checklists

- Checklist of common errors drives inspection
- Checklist dependent on programming language
 - Weaker type systems usually imply longer checklists
- Examples
 - Initialization, loop termination, array bounds, ...

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10

Inspection rate

- 500 statements/hour during overview
- 125 statements/hour during individual prep
- 90-125 statements/hour during review
- Inspecting 500 statements can take 40 person-hours
 - For 1MLOC, this would be about 40 person-years of effort

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11

Issues in inspections

- Can groupware technology significantly improve inspections?
- Can you have inspections without meetings?
 - Since meetings are expensive to hold and schedule
 - Since the preparation may catch more defects than the meetings

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12

Software quality assurance

- What are we assuring?
- Why are we assuring it?
- How do we assure it?
- How do we know we have assured it?

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13

What are we assuring?

- Validation: building right system?
- Verification: building system right?
- Presence of good properties?
- Absence of bad properties?
- Identifying errors?
- Confidence in the absence of errors?
- Robust? Safe? Secure? Available? Reliable?
Understandable? Modifiable? Cost-effective? Usable? ...

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14

Why are we assuring it?

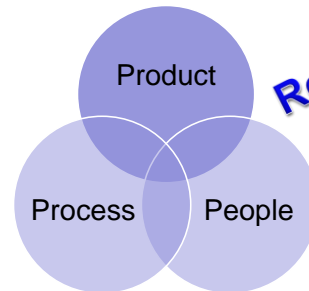
- Business reasons
- Ethical reasons
- Professional reasons
- Personal satisfaction
- Legal reasons
- Social reasons
- Economic reasons
- ...

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15

How do we assure it?



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16

How do we know we have assured it?

- Depends on "it"
- Depends on what we mean by "assurance"
- ...

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17

Midterm: the course web sez

- Both examinations will consist entirely of questions that will require you to bring together information from the lectures, from the readings (not including optional ones), and (to a much lesser degree) from your projects. ...
- They are open-book and open-note, but closed-any-other-sentient-being; all material not produced directly by you must be appropriately cited.
- To allow you to type the answers (which allows me to read the answers more easily), ~~these exams will be handed out at 2:30PM in the classroom on the two examination days. See email to sign up for your two-hour slot via a Catalyst "quiz".~~ You may work on the exams anywhere you wish.
- They are due, electronically (details to be announced), ~~four hours later (at 6:30PM on the same day).~~ ~~two hours after your starting time into the dropbox (which marks the time submitted).~~
- ~~I will need significant notice in advance if either of these four hour periods are infeasible for you. [too late for significant advance notice]~~

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18

Expectations

- One hour of work in two hours of time
- Read the required readings
- Review the lecture materials
- Expect questions such as
 - “No Silver Bullet’ preceded the development of agile methods by over a decade. What do you think Brooks’ reaction to the Agile Manifesto would be, based on specific content in his paper?”
 - “Briefly discuss how Michael Jackson might react to a proof of correctness, using Hoare triples, of a priority queue assignment in CSE326.”
- Answers that are short-and-sweet are much preferred to long-and-rambling responses for which you hope to get partial credit because you said something that is true even if it doesn’t relate to the question

Questions?
