

SE4831 Software Quality Assurance

Software Inspections and Reviews

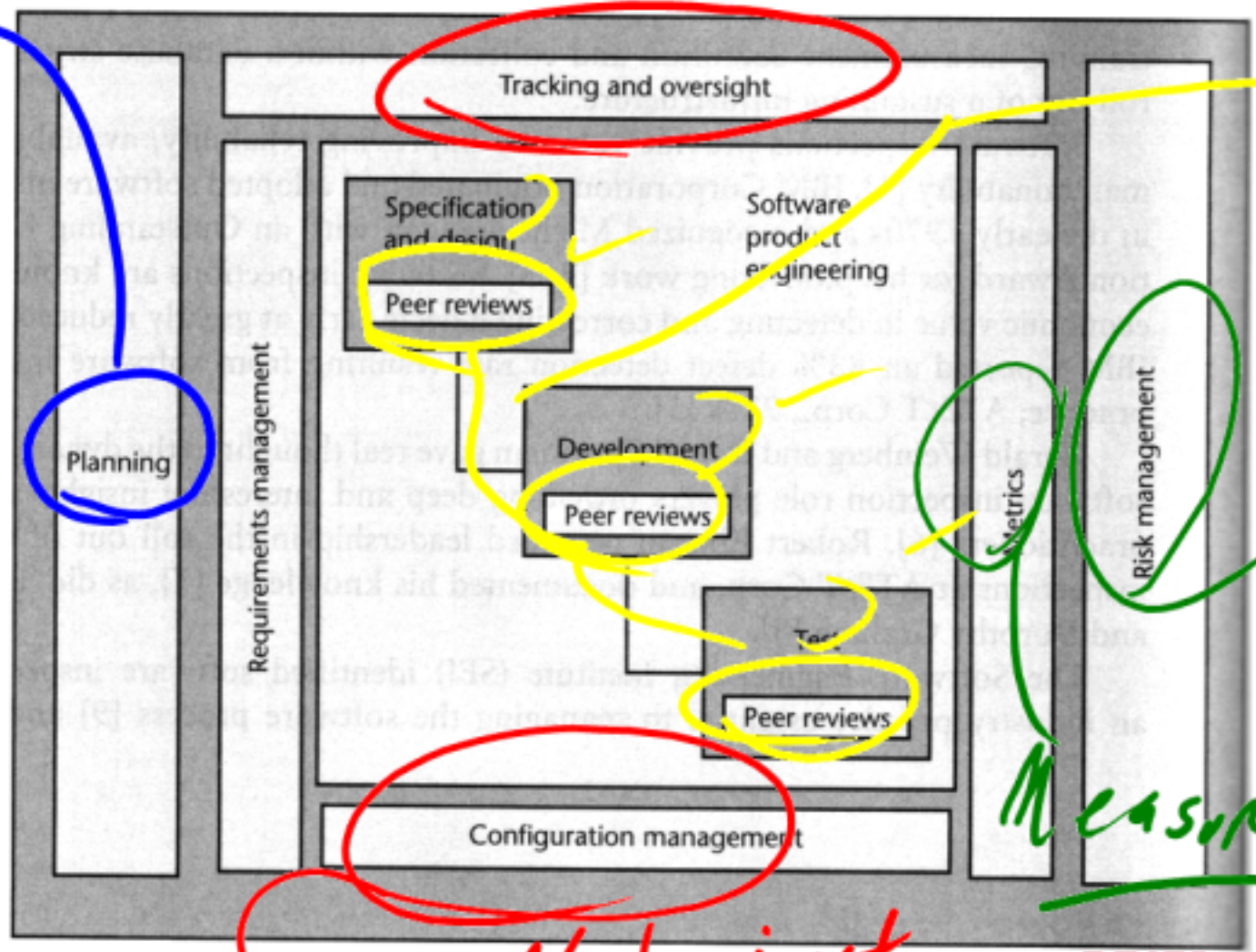
- Objectives

- Compare and contrast software inspections and walkthroughs.
- Explain how a software inspection can be used as a quality gate.
- List the elements of a peer review.
- List the roles for each participant in a software inspection and define their scope.
- Draw a flowchart listing the steps for a software inspection and describe the activities that occur in each phase.
- Explain how checklists can be used to improve the effectiveness of a review process.
- List the problems identified by the National Software Quality Experiment.



1. Design ? . . .
2. Define Requirements . . .
3.

Planning the project
Best Software Practices



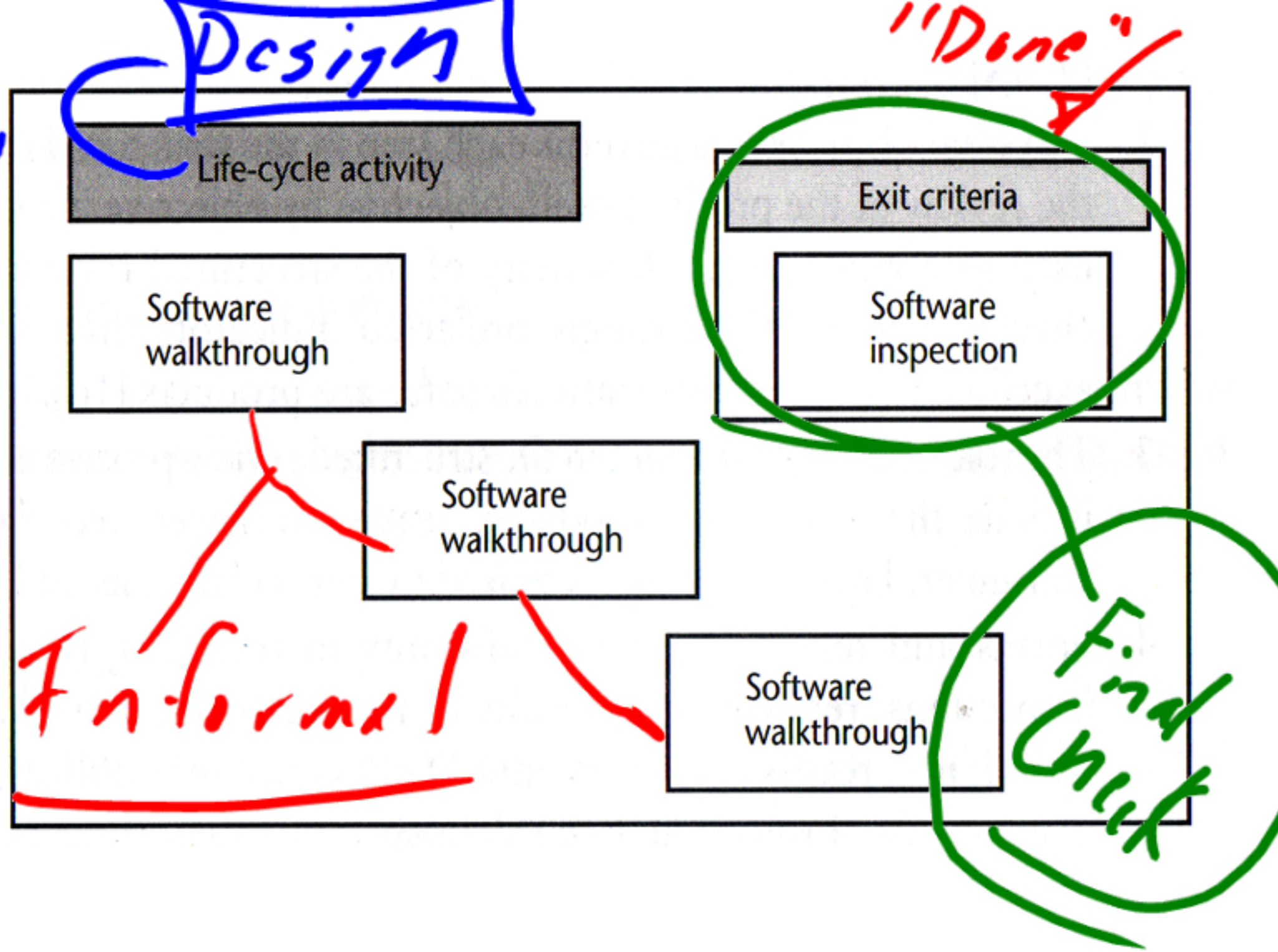
Checking quality

Not just source code



Life cycle activities and reviews

reviews



Review Activities

- Composed of software inspections and software walkthroughs -
- Integral part of each and every software life cycle activity ←

Reqs
Design
Implementation
Testing
.....

What is the difference?

- Review
 - most general term
 - many different types
 - Many levels of formality
- Inspection
 - Very Formal
 - Follows a specific process
- Walkthrough
 - Informal
 - Maybe ineffective @ finding details.



Inspection vs. Walkthrough

Specific Roles

PARTICIPANTS

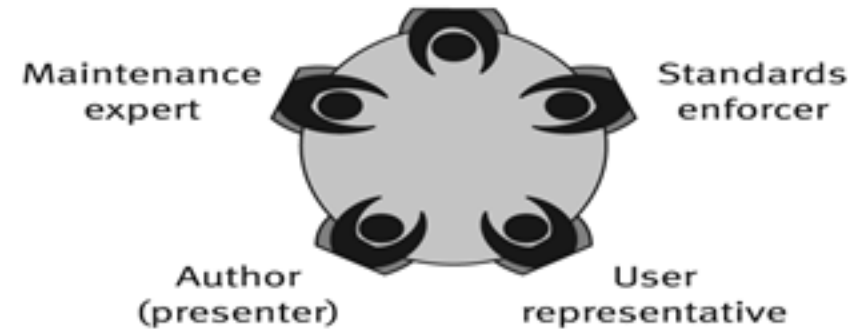
Inspection

Moderator (scribe)

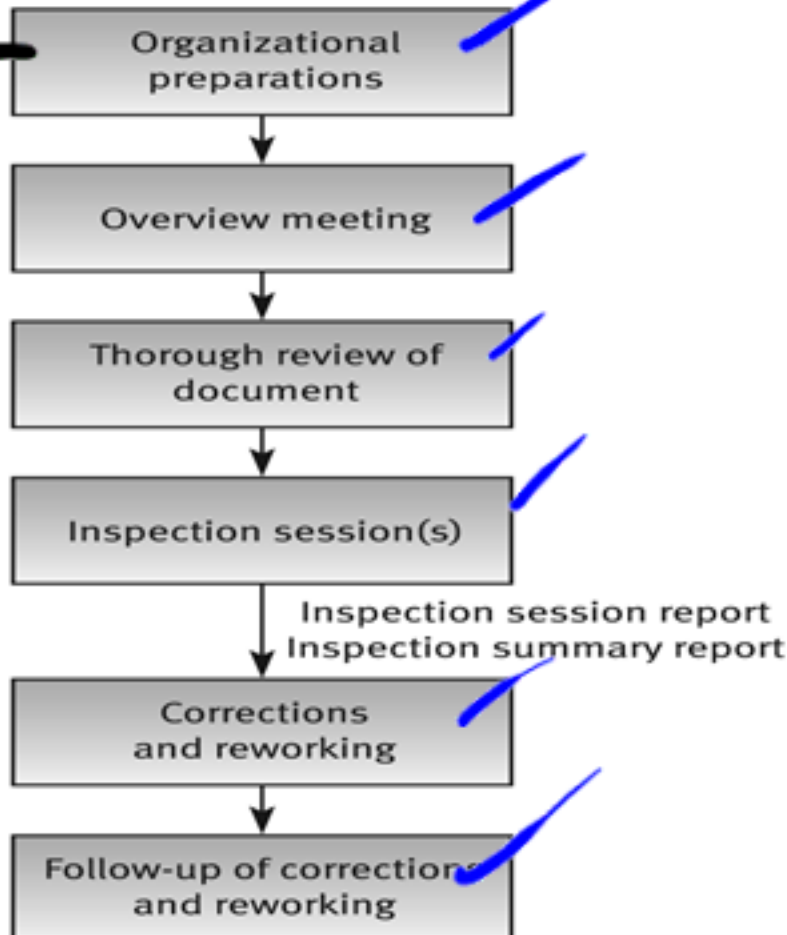


Walkthrough

Coordinator (scribe)



PROCESS



More Complex

Less complex



Software Walkthrough

- Intended to be a learning experience for the author
- Forges a shared vision among reviewers and a consensus among participants on approaches, practices, or capabilities of the system
- Initiated and led by the author
- Single metric
 - Count of the number of software walkthroughs held

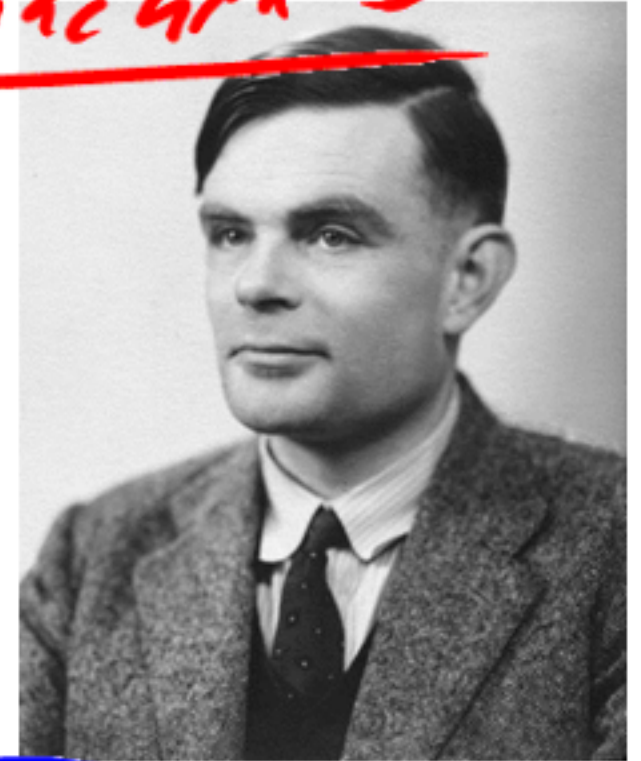


Software Inspection

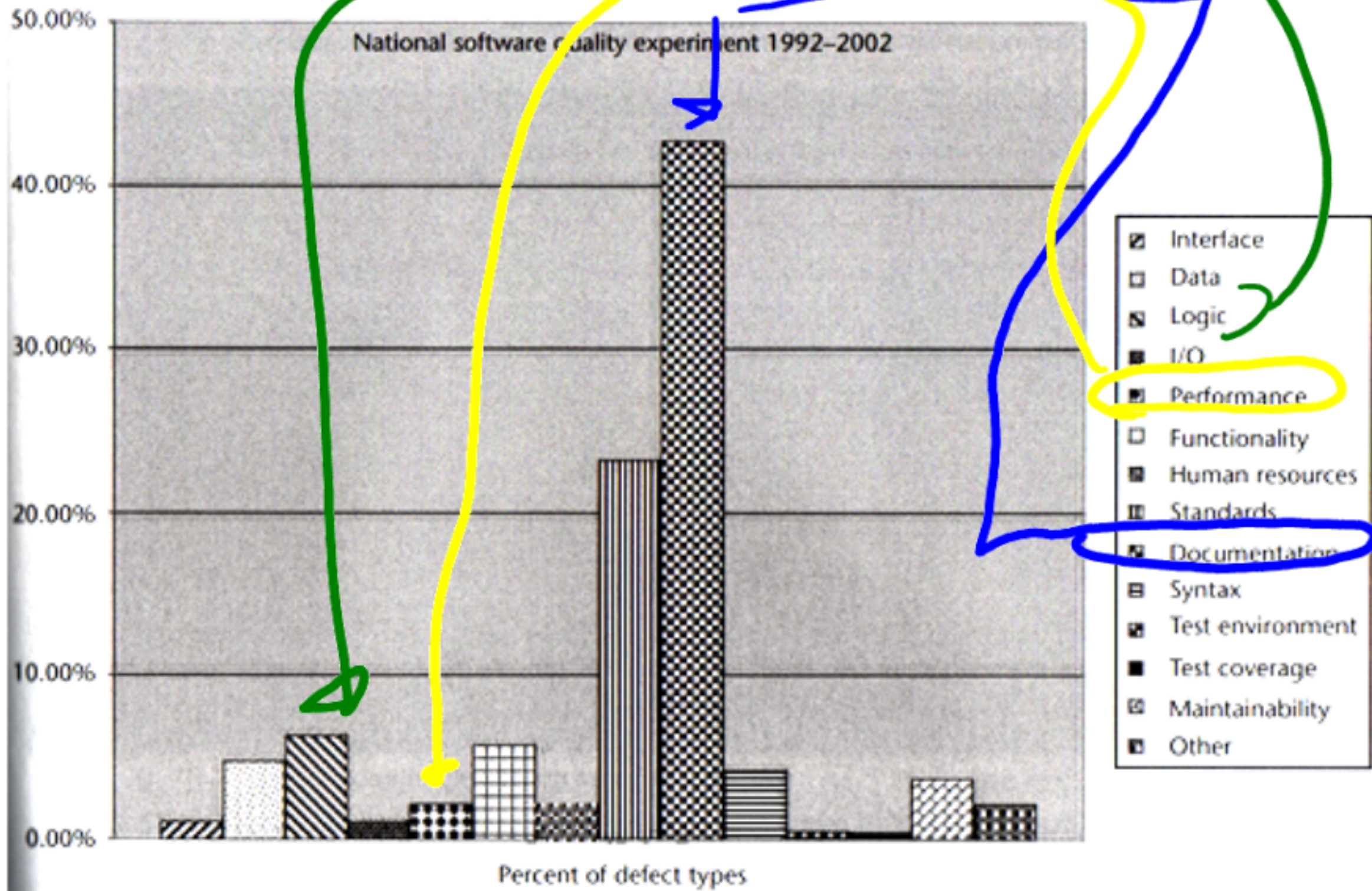
- Structured to meet the needs of quality management in verifying that the software artifact complies with standards of excellence for software engineering artifacts
 - AKA Do the job right — *'DONE'*
- Typically held at the conclusion of a software lifecycle activity
 - Serves as a quality gate — *Is it good enough!*
- Significantly more formal and structured than a walkthrough

History of inspections

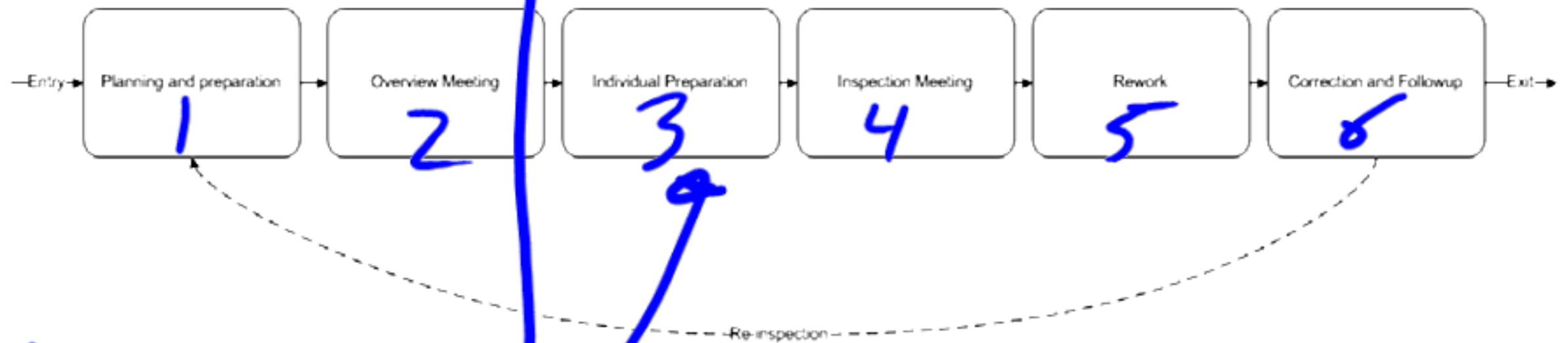
- 1940's — Turing machines
 - Alan Turing discussed desk checking as both an individual and shared activity
- 1970's — IBM
 - Fagan published proverbial paper “Design and Code Inspections to reduce errors in program development”
 - “Grandfather” of all inspection processes
 - Widely used in different industries



What do we find?



Phases of an inspection



- 1 Planning
- 2 Overview Meeting (Optional)
- 3 Individual Preparation
- 4 Inspection Meeting
- 5 Artifact Rework
- 6 Inspection Follow-up / Re-Inspection



Planning

- Initiated by author of artifact indicating it is ready for inspection
 - ✦ – Not all artifacts are always inspected ✦
 - Typically involves interaction between project manager or head of software quality control
- Artifacts to come out of planning:
 - A list of the team participants – who
 - Directions about what the team members should be looking for in the artifact
- Gateway question:
 - Does the artifact meet the inspection entry requirements?
 - Yes -> Proceed with review planning
 - No -> Continue working on artifact and / or use other QA technique

Is the artifact archived?



Key Point

- A formal inspection should only inspect reviewed products

optional Overview Meeting

- Author / Organizer may call overview meeting
 - May walk-through the artifact to familiarize reviewers with material
- Provides inspection goals to reviewers
- May assign reviewers to “target” areas of document
- May inform reviewers of known issues
 - There shouldn’t be any, but there always are

Individual Preparation

- Individual members become familiar with artifact
 - May have occurred in overview meeting
- Individual checks artifact using checklists and other background
- Faults discovered are logged on an individual log sheet
 - May be tracked electronically
- Reviewer should simply find the faults
 - No time should be spent attempting to identify a solution
 - No time should be spent attempting to organize the faults

*Dinean singularly
own*



Independent

Inspection Meeting

- Goal is to separate actual faults from false positives
- Moderator leads the inspection
- Output of the meeting is a final list of faults found which is delivered back to the author
- Output may also include a general quality
- Recommendation
 - Accept as is, revise and verify, revise and re-review
- Gateway questions:
 - Have all reviewers properly prepared for the review?
 - Have all inspection criteria been met for artifact?
 - Yes -> Proceed with inspection meeting
 - No -> Reschedule inspection meeting.

Why?



Important aspects of inspections



- Importance of preparation
 - Majority of defects are discovered by individuals during their reviews
 - Not in the group meeting
- Size and composition of team vary based on artifact
 - Larger artifacts require multiple inspection sessions
 - Smaller artifacts may be inspected by smaller teams



Size Recommendation

- Large teams mean a large investment in staff time
 - Preparation time
 - Familiarization with material
 - Meeting time
- Small teams can be just as effective as large teams
 - Weller (1993)
 - 3 person inspection team with a lower preparation rate does as well as a four person team with a higher rate
 - Preparation rate rather than team size determines maximum effectiveness



Checklists

Problems with inspections

- False Sense of security
 - Weller(1993)

