

Software Reviews

Kristian Sandahl

Agenda:

Inspections

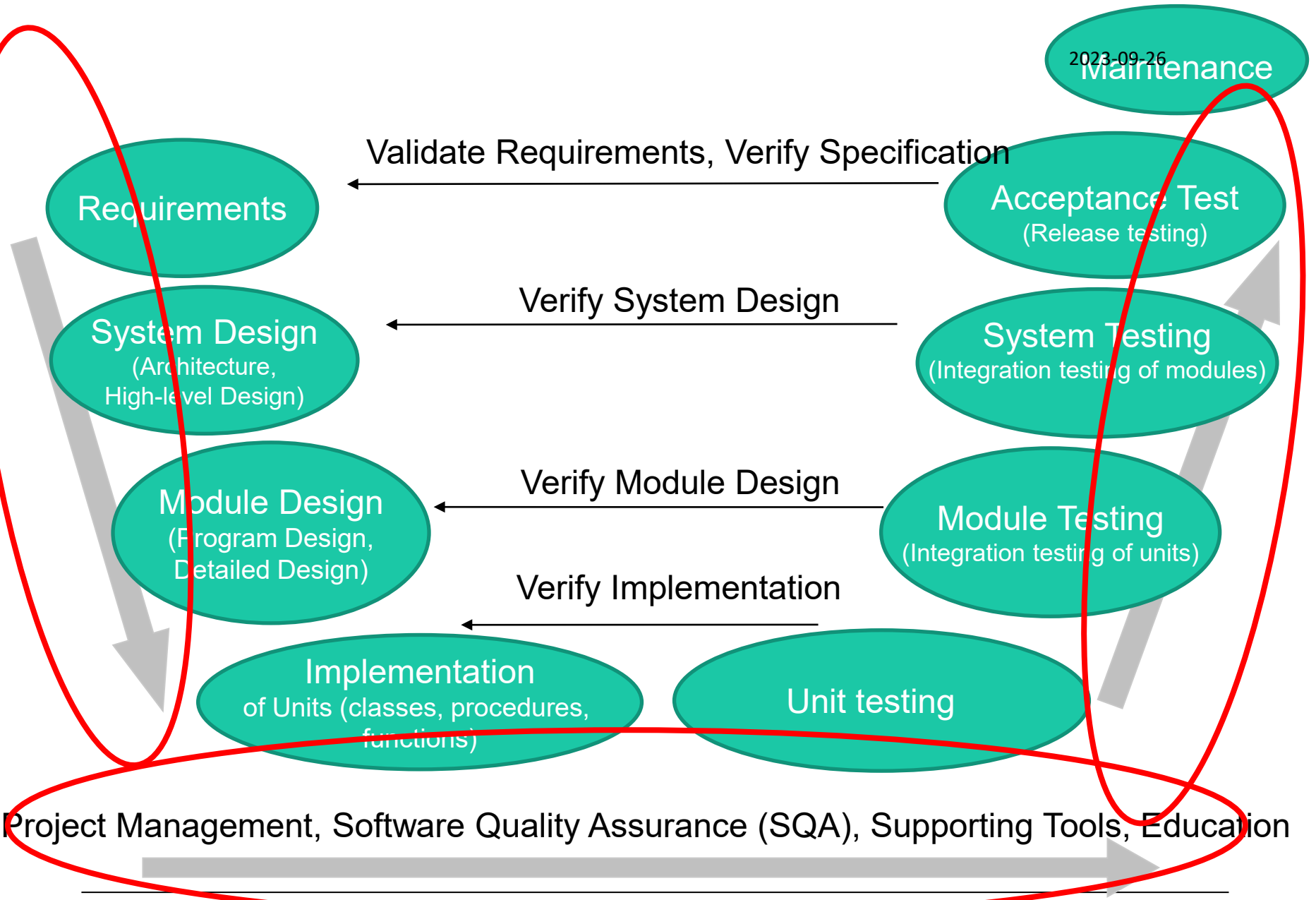
Participants

Process

Data collection

Other reviews

2023-09-26



What is an inspection?



Goal

- Find defects (anomalies)
- Improve software development process



Is and is not

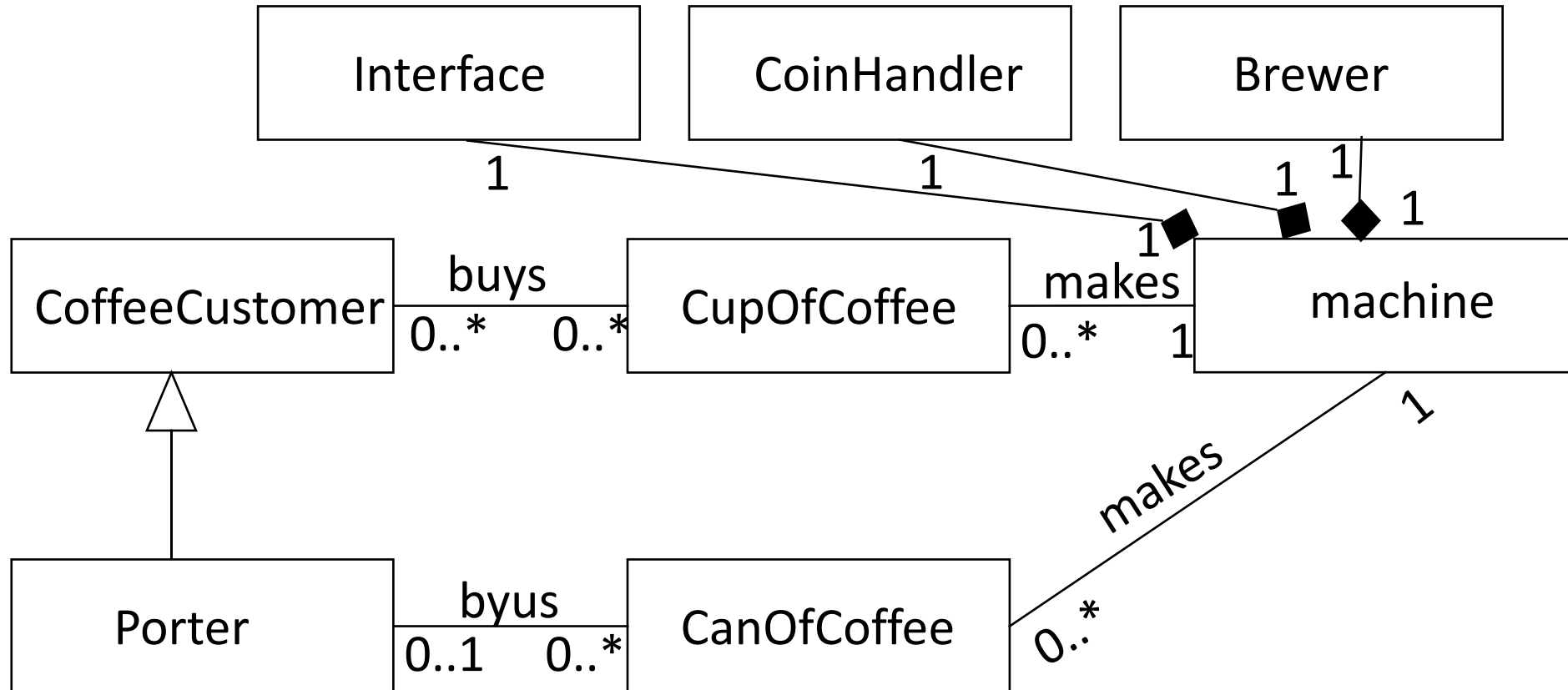
- It is systematic peer examination of software products/artifacts.
- It is not testing. Can be performed early on partially finished parts.



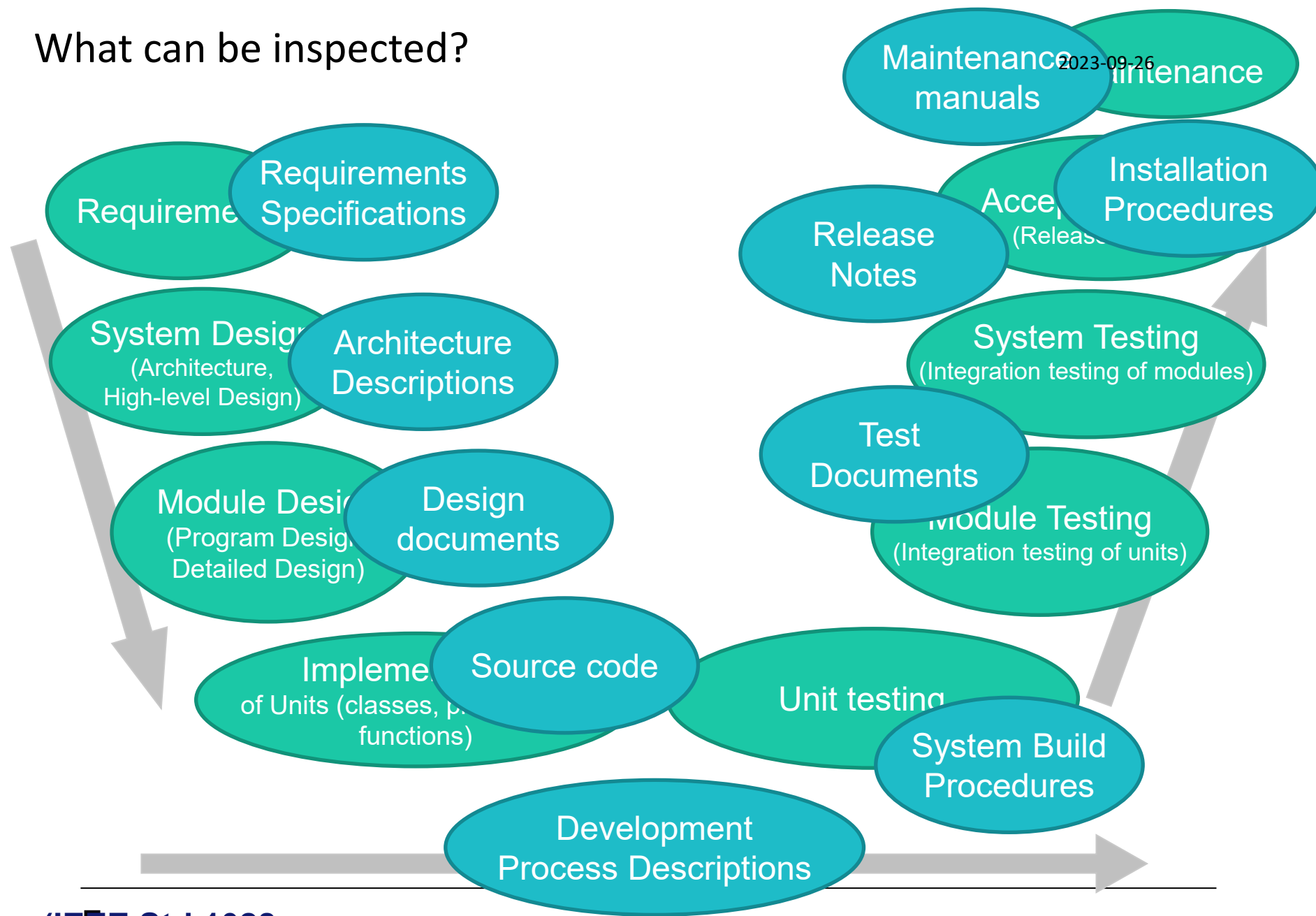
Several sources with proven history

- First introduced by Fagan at IBM (1976)
- Main book “Software Inspections” by Graham and Gilb (1993)
- IEEE Standard 1028 – 2008
- Several scientific studies show that defects are found using inspection, approx. 60-90% of total defects (Pfleeger & Atlee, 2010)

The coffee machine class model



What can be inspected?



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Who participates in an inspection?

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Inspection: 2-6 participants (IEEE Std 1028-2008)

Roles



Recorder



Reader



Author



**Inspection leader
(Moderator)**



Inspector

Who participates in an inspection?

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Inspection: 2-6 participants (IEEE Std 1028-2008)

Roles



Recorder



Reader



Author



Inspection leader
(Moderator)

Inspection leader

- Planning and organizing tasks
- Must be trained in the inspection process
- Ensure that inspection data is collected
- Issue inspection output



Inspector

Who participates in an inspection?

Inspection: 2-6 participants (IEEE Std 1028-2008)

Roles



Recorder



Reader



Author



Inspection leader
(Moderator)

Recorder

- Document e.g., defects, decisions, and recommendations.
- The inspection leader can be the recorder



Inspector

Who participates in an inspection?

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Inspection: 2-6 participants (IEEE Std 1028-2008)

Roles



Recorder



Reader



Author



Inspection leader
(Moderator)

Reader

- Informs about the software product to be inspected
- Highlight important aspects



Inspector

Who participates in an inspection?

Inspection: 2-6 participants (IEEE Std 1028-2008)

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Recorder



Reader



Author



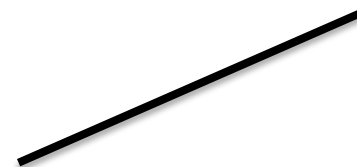
Inspection leader
(Moderator)

Author

- Perform rework to meet inspection exit criteria
- Responsible for meeting entry criteria
- Shall not be inspection leader, recorder, or reader



Inspector



Who participates in an inspection?

Inspection: 2-6 participants (IEEE Std 1028-2008)

Roles



Recorder



Reader



Author



Inspection leader
(Moderator)

Inspector

- Identifies and describes defects
- Chosen due to expertise and different view points (e.g., design, requirements, testing)
- Can be assigned specific topics (e.g., compliance to standards)
- All participants are inspectors



Inspector

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~~Participants~~

Process

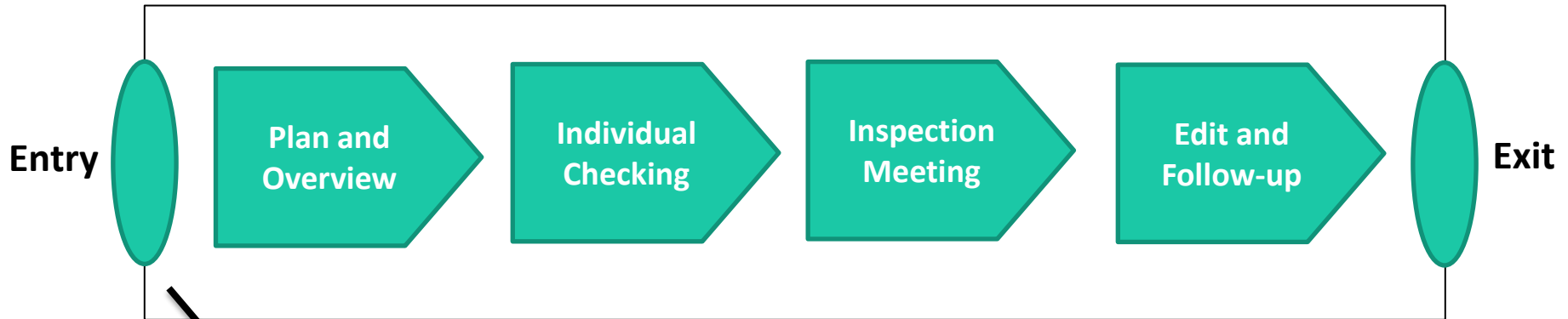
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Inspection Process

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Input (for entry)

- Objective statement
- Software products / artifacts (to be inspected)
- Inspection procedures
- Reporting forms
- Known defects
- Source documents

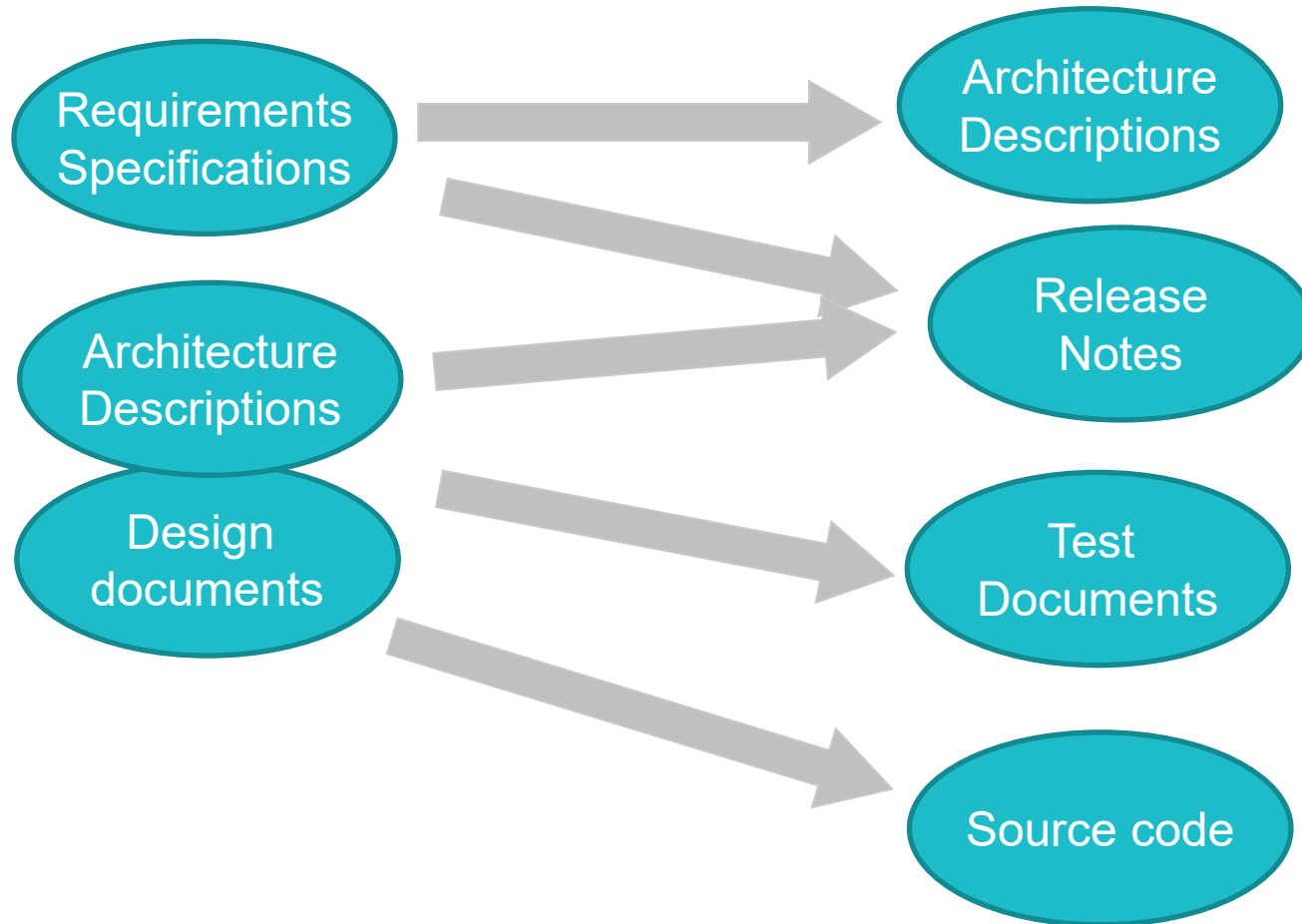


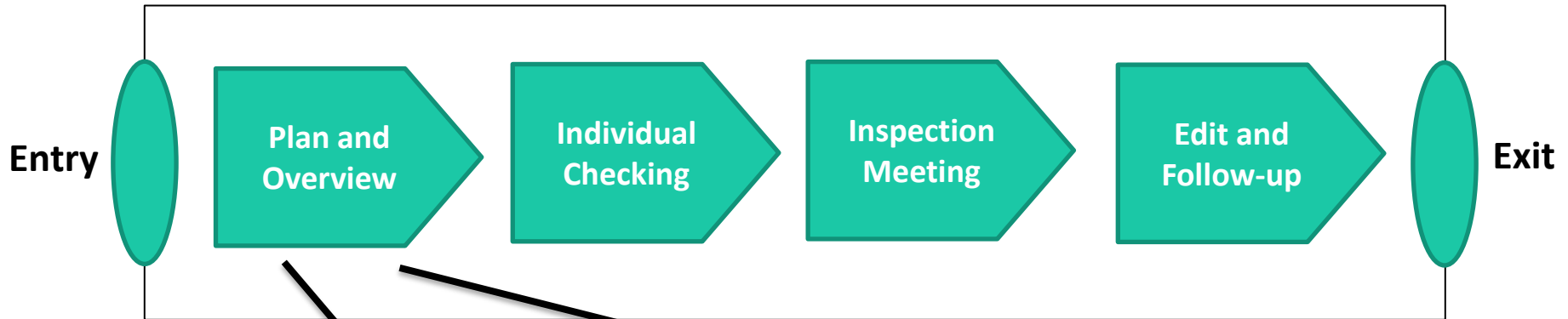
Author

**Responsible for meeting
entry criteria of the artifacts**

Source documents

Software products / artifacts





**Inspection
leader**

Planning the inspection

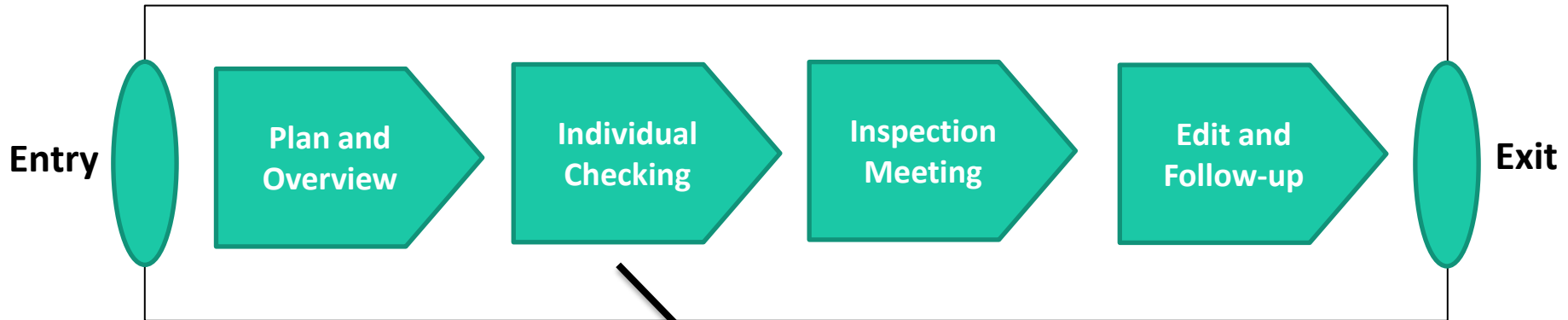
- Identify inspection team
- Assign responsibilities
- Schedule meetings
- Distribute material
- Specify scope and priorities

Overview

- Introduce the product



Author



Inspectors

Individual checking

- Exam the product individually
- Report all defects to the inspection leader
- Prepare for the inspection meeting

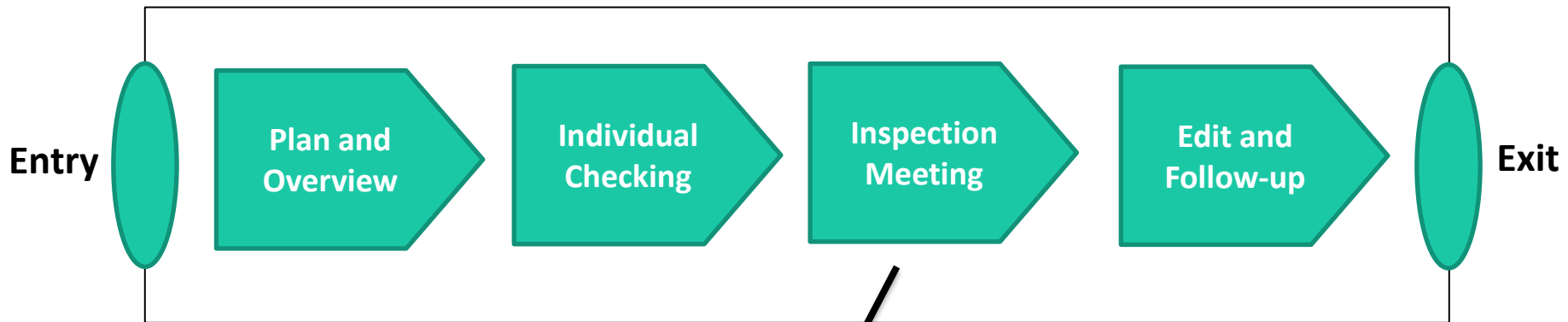
Inspection rate (IEEE Std 1028-2008)

- Requirements or Architecture (2-3 pages per hour)
- Source code (100-200 lines per hour)

Inspection Process

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Inspection leader



Recorder



Reader



Inspector

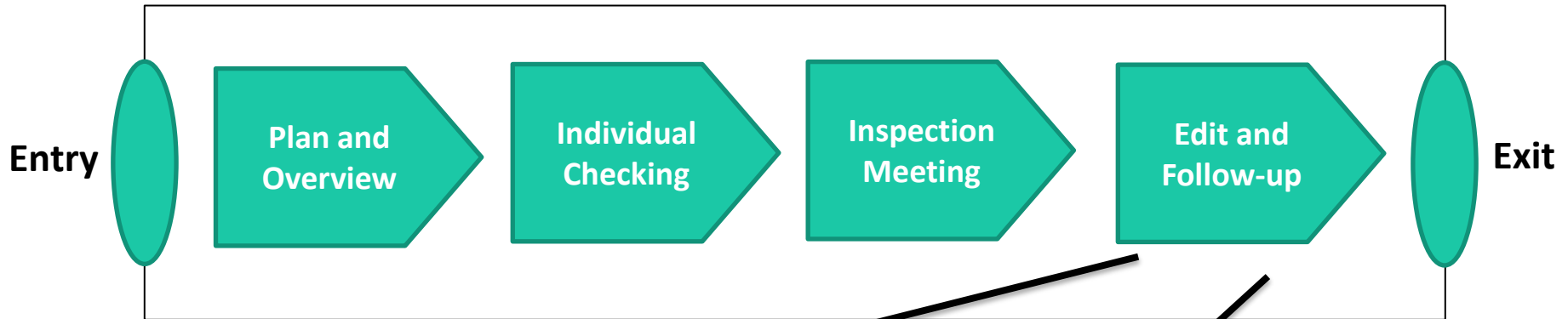
Meeting agenda

- Introduction of roles and purpose
- Reader presents the product (details)
- Inspect product, produce defect list (whole team)
- Review defect/anomaly list (completeness and accuracy)
- Make exit decision
Should detect, not resolve defects

Exit decisions (1, 2 or 3)

1. Accept with no further verification
2. Accept with rework verification (verify by one member)
3. Reinspect – redo the the process

Inspection Process



Author

Edit

- Author resolves items



Inspection leader

Follow-up

- Inspection leader verifies that all items are closed

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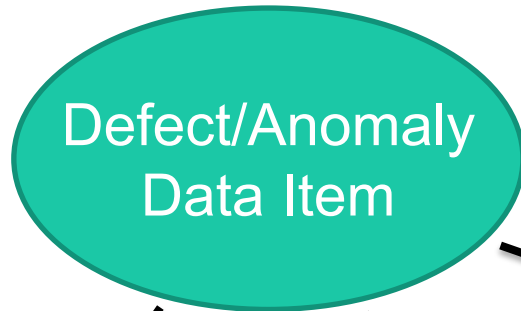
Inspections

~~Participants~~

~~Process~~

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Defect/Anomaly
Data Item

General inspection data

- Software product identification
- Date and time of inspection
- Inspection team
- Inspection time (meeting and individual)
- Volume of inspected material

Classification

E.g., logic problem,
data sensor problem
(see IEEE Std 1044-1993)

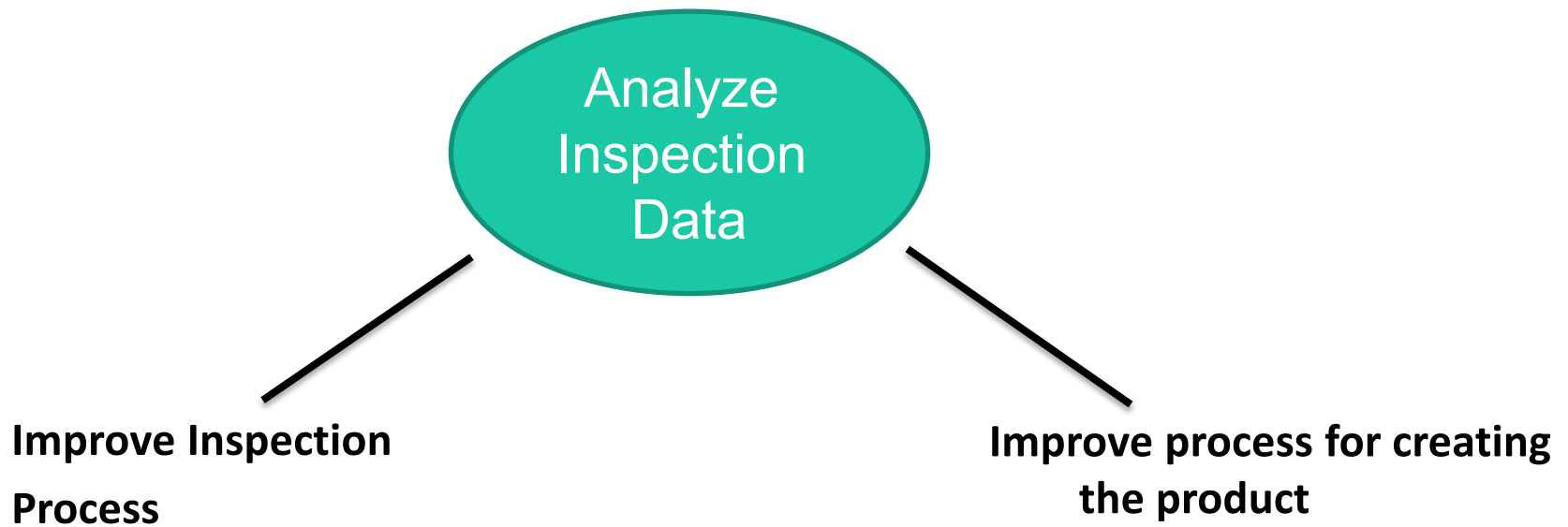
Categories

E.g., missing, extra,
ambiguous, incorrect, not
conforming to standards
etc.

Ranking

E.g., catastrophic, critical,
marginal, negligible

Process Improvements



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Management reviews

- Monitor progress
- Check deviations from plans, risk management
- Products are plans and reports
- Performed by management staff for a decision maker
- Examination may be done in series of meetings
- Output: corrective actions (date and responsible)

Audits

- External 3rd party (independent) evaluation of conformance to specification and standards
- An initiator (manager, customer, user representative) decides on the need for an audit
- Evidence collection, investigative actions
- The audit team gets information form liaison within the audited organization
- Output: Findings (major, minor)

Technical reviews

- Determine the technical status of the product
- Evaluate conformance to specifications and standards
- Evaluate if the software is complete and suitable for intended use
- Performed by technical leadership and peers for a decision maker
- Higher volume of material than inspections
- Output: corrective actions (date and responsible), status, recommendations

Walk-throughs

- The author presents, leads, and controls the discussion
- Overview of the software, often scenarios
- Find anomalies
- Improve the software product
- Consider alternative implementations
- Experience exchange, training
- Informal atmosphere
- Output: recommendations, actions, anomalies

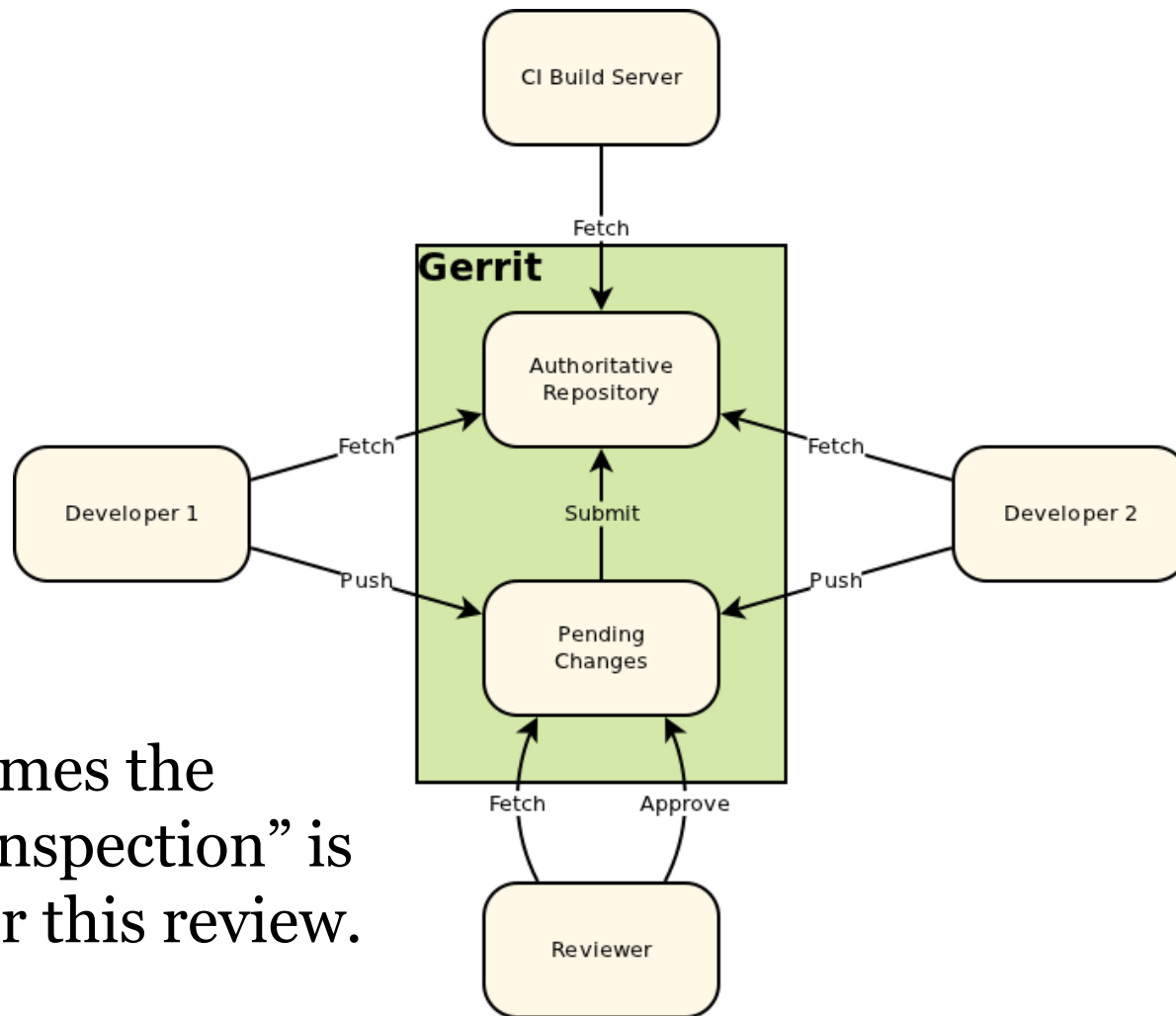
Peer-review (buddy-check)

- Purpose is anomaly detection and education with short lead-time
- A number of close colleagues reviews a single or a few work-products
- Part of development practices, e.g. pull requests in Git
- Done automatically in pair programming
- Output: list of actions, recommendations, issues in Git, oral feedback

Tool-based code review in Gerrit

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Sometimes the term "inspection" is used for this review.

Summary

- The inspection process, the devil is in the details
- Other reviews:
 - Management reviews
 - Audits
 - Technical reviews
 - Walk through
 - Peer review

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