

CZ3002 - Advanced Software Engineering

Verification Methods - Reviews

Faculty : Dr Shen Zhiqi
School : School of Computer Science and Engineering
Email : zqshen@ntu.edu.sg
Office : N4-02B-43

Lesson Objectives

At the end of the lesson, you should be able to:

- ▶ Identify the different techniques used for different defects
- ▶ Describe the purposes of different types of reviews
- ▶ Outline the technical review process



A big Picture

Software Development Life Cycle (SDLC)



**Specifications/
Requirements**

**Analysis and
Design**

Implementation

Testing

Maintenance

**Verification
and
Validation (V&V)**

Purposes of Verification



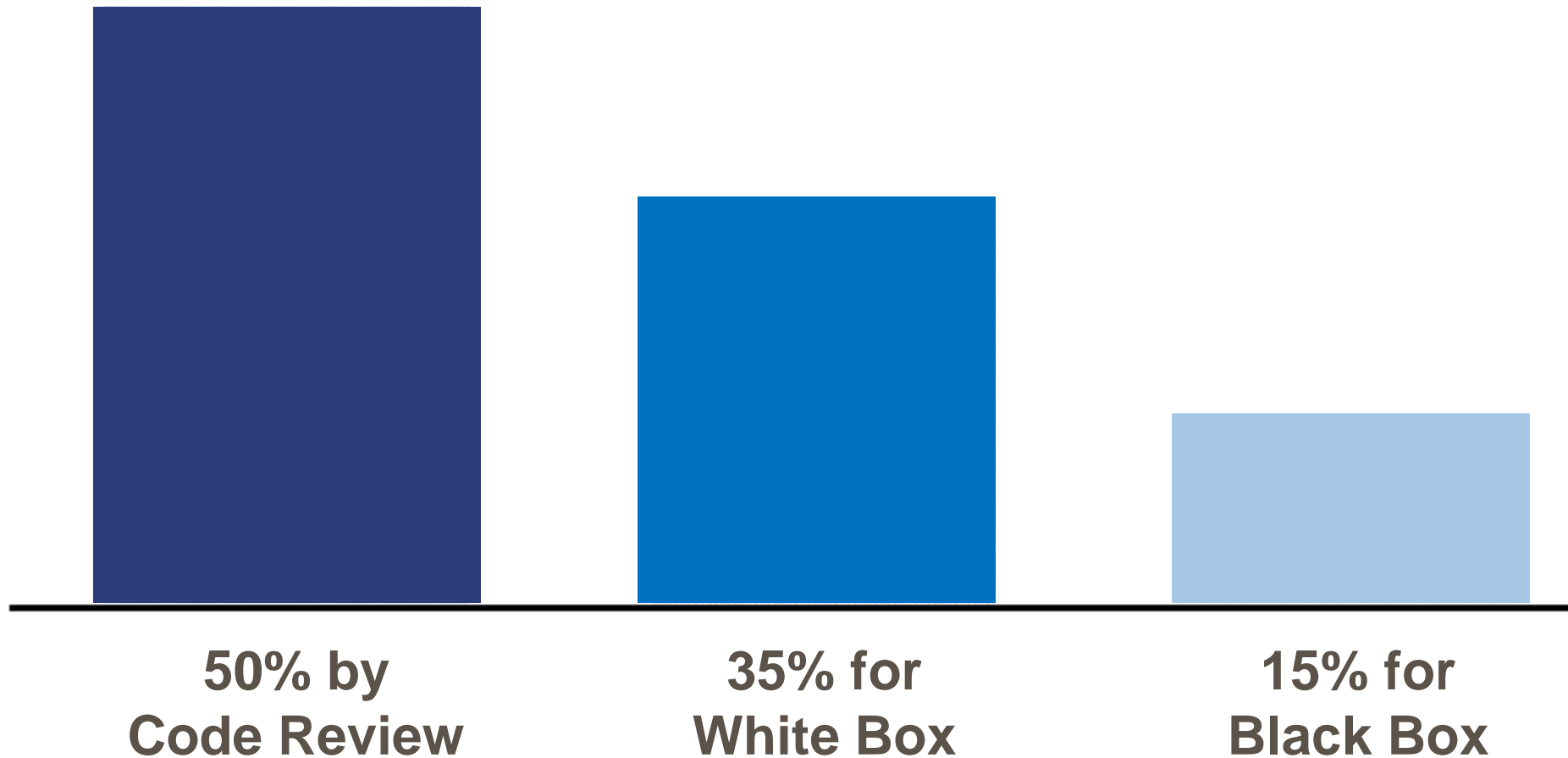
To confirm that the system fulfils the specified design requirements.

Question: Are you building it right?

Different Techniques for Different Defects

	Requirement Faults	Design Faults	Code Faults	Documentation Faults
Reviews	Fair	Excellent	Excellent	Good
Prototypes	Good	Fair	Fair	N.A.
Testing	Poor	Poor	Good	Fair
Correctness Proofs	Poor	Poor	Fair	Fair

Error Detection Rates for Code Faults



- ▶ A method involving a structured encounter in which a group of technical personnel **analyses** or **improves the quality** of:
 - ❖ Original **work product**
 - ❖ **Method**

Types of Reviews

- Management Reviews
- Technical Reviews
 - Inspections
 - Walk-Throughs
- Audits

Purposes of Different Types of Reviews

Management Reviews

- Monitor **progress**
- Determine **status** of **plans** and **schedules**.
- Confirm **requirements** and system **allocation**
- Evaluate effectiveness of **management approaches**

Technical Reviews

- Determine **suitability** for intended **use**
- Identify **discrepancies** from approved specs and standards

Audits

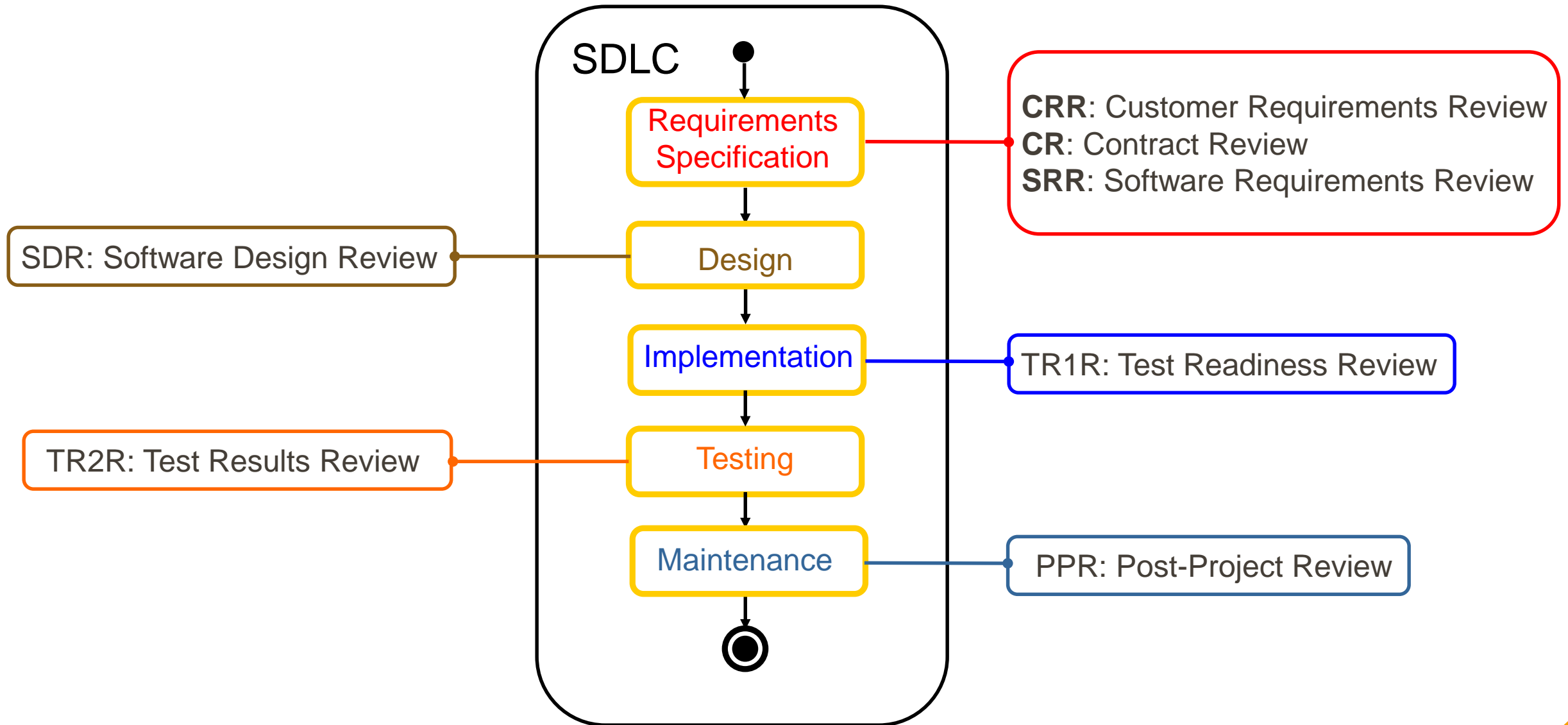
- Provide **independent evaluation** of product conformance to regulations, standards and plans

- ▶ Process
 - ❖ Phases (orientation, etc.)
 - ❖ Procedures (checklists, etc.)
 - ❖ Input and Output, Entry and Exit Criterion
- ▶ Roles and Responsibilities
 - ❖ Moderator, Reviewer, Scribe, Author, etc
- ▶ Objectives
 - ❖ Defect removal, requirements elicitation, etc
- ▶ Measurements
 - ❖ Forms, consistent data collection, etc

Review Objectives

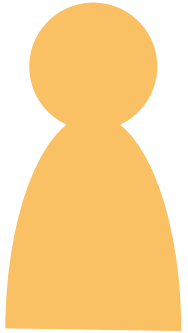
- ▶ Technical **soundness**
- ▶ Conformance to **requirements**
- ▶ Conformance to **standards**
- ▶ **Consistency** between various levels of **documents**
- ▶ **Traceability** throughout the product life cycle

Reviews at SDLC Milestones



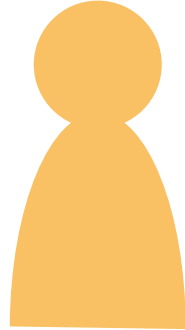
- ▶ Notification
 - ❖ Notify stakeholders on review objectives, time, venue
- ▶ Distribution
 - ❖ Distribute relevant material
- ▶ Choose participants
 - ❖ Knowledge of material being reviewed
 - ❖ Trained in review techniques

Inspection Roles



Reader

Presents the
material
(paraphrasing)



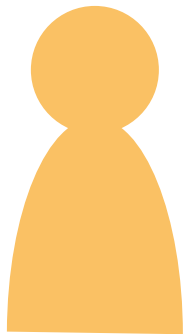
Author

Corrects
misconceptions



Inspectors (reviewers)

Identify
errors



Recorder

Completes the
inspection
minutes/ log



Moderator

Enforces
procedures and
keeps meeting
on track

Issue Classification

CRITICAL

Defects that may cause the system to hang, crash, produce incorrect results or behaviour, or corrupt user data. **No known work-arounds.**

SEVERE

Defects that cause incorrect results or behaviour with **known work-arounds**. Large and/ or important areas of the system is affected.

MODERATE

Defects that affect limited areas of functionality that can either be **worked around** or **ignored**.

MINOR

Defects that can be overlooked with **no loss** of functionality.

- ▶ Sole Purpose: To **find** errors (**not fix** them!)
 - ❖ Very important for review to stay “on track”

- ▶ Keep **Review Minutes**
 - ❖ Who **attended**
 - ❖ How **long** the review lasted
 - ❖ Record **errors** found & **action items** assigned to correct them
 - ❖ Amount of preparation **time** used
 - ❖ **Summarise** review

- ▶ Correction of errors
- ▶ Re-review
 - ❖ A “review” should not be considered complete until **all** the errors found are **corrected** and the corrections are reviewed/ approved



The Formal Technical Review Process

