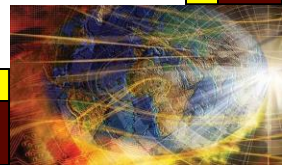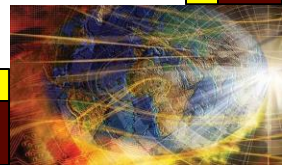# Chapter 22

Software Technical Reviews
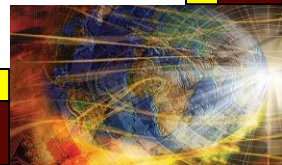
Software Technical Inspections

- Economics of Software Reviews
- Roles and Responsibilities in a Review
  - Responsible designer
  - Recorder
  - Review leader
  - Reviewer
- Types of Reviews
- An industrial-strength Review Process
- Effective Review Culture
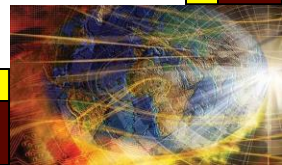
Reasons to Have Reviews
(circle all that apply)

- Communication among designers
- Training, especially for new personnel
- Management progress reporting
- Defect discovery
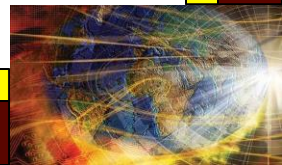- Performance evaluation
- Team morale

Ingredients of Successful Reviews

- Process credibility
- Reviewer competence
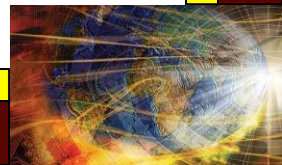- Reviewer preparation
- Mechanics

Software Inspections

- Economics of Software Reviews
- Roles and Responsibilities in a Review
  - Responsible designer
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  - Reviewer
- Types of Reviews
- An industrial-strength Review Process
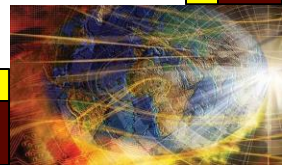- Effective Review Culture

Cost/Benefit Reports *

- Inspections can be 5% to 15% of total project cost
- "Jet Propulsion Laboratory estimated a net savings of $7.5 million from 300 inspections performed on software they produced for NASA."
- "another company reports annual savings of $2.5 million"
  - Cost to fix a defect found by inspection: $146
  - Cost to fix a defect found by customer: $2900
  - Cost/Benefit ratio is 0.0503

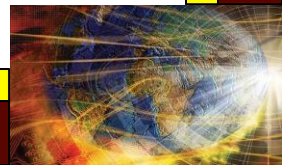* Karl E. Wiegers "Improving Quality Through Software Inspections"

Roles and Responsibilities (Inspection)

- Responsible designer (aka Producer)
- Recorder
- Review leader
- Reviewer
- To assure success, reviews must have
    - Reviewer credibility
    - Process credibility
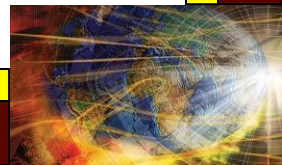   - Management and technical commitment

* Characteristics of a poor business meeting

- Participants find it to be a waste of time
- Wrong people in the meeting
- No agenda
- Little preparation
- No issues raised/identified
- Easily side-tracked
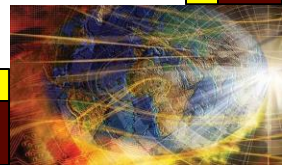- Too much time spent solving problems
- Interruptions are acceptable

Attributes of a Good Review Leader

- Technically competent
- Strong Personality
  - A "natural" leader
  - Well-organized
  - A facilitator or mediator (referee?)
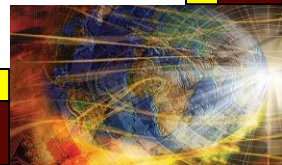- Able to prioritize

Reviewer

- Responsible for objectively reviewing the product
- Must be accountable for review
  - organization must define accountability
  - (in society, accountability is liability)
  - must have confidence in the review process
- Personality attributes
  - Objective
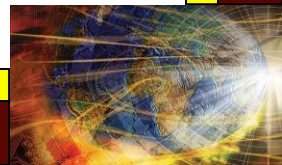 - Unbiased
  - Technically competent

Human Factors

- Duration? Maximum is 2 hours, 1 is better
- Environment? Quiet conference room with no interruptions
- Best time? 1 hour after work day begins
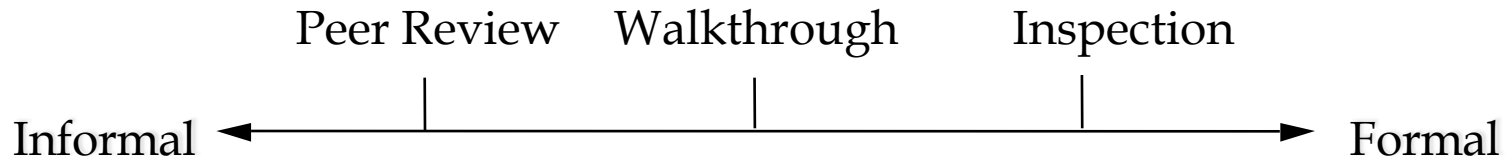- Worst time? Friday after lunch (or maybe Saturday morning!)

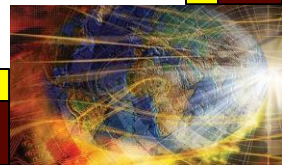# Management Participation in reviews? Bad Policy!

- Creates additional stress
- Conflict of interest
- Cannot be a spectator
- Evaluation of a product easily degenerates into evaluation of the producer
- Credibility as a reviewer?
- Possible compromise: earn right to participate by doing normal review preparation

Types of Reviews

Peer Review   Walkthrough   Inspection
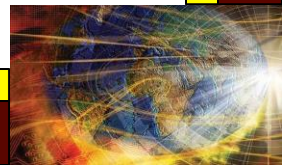
Informal ⟵————————————————⟶ Formal

- Formality
  - Peer reviews often involve just 2 engineers, short duration, no documentation, low credibility
  - More formal reviews involve commitment, preparation and responsibility
- Internal reviews: very effective
- External reviews: carefully planned, rehearsed
  - seldom very effective (at finding faults!)
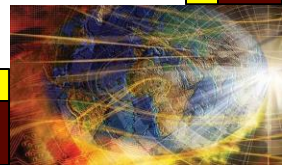 - easily degenerate into Dog and Pony shows

Walkthroughs

- Responsible designer is review leader
- Most common form of review
- Most questions stimulated by presenter
- Frequently a presentation
- Effectiveness depends on…
  - real goal of responsible designer
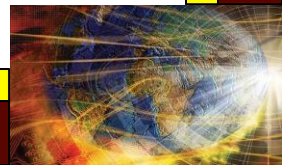 - preparation of reviewer(s)

Inspections

- Responsible designer is not the review leader
- Formal process
- Very participative
- Advance preparation required
- Centers on checklist
- Effectiveness depends on …
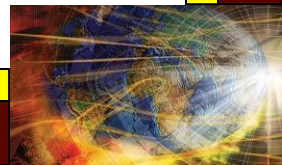 - reviewer preparation
  - nature of checklist

About Checklists

- Extremely valuable

- Organization dependent

- Refined by experience

- Not a secret! (at least not internally)
  - Helpful to designers
  - Essential to reviewers

- Often company confidential
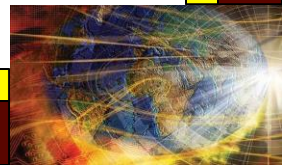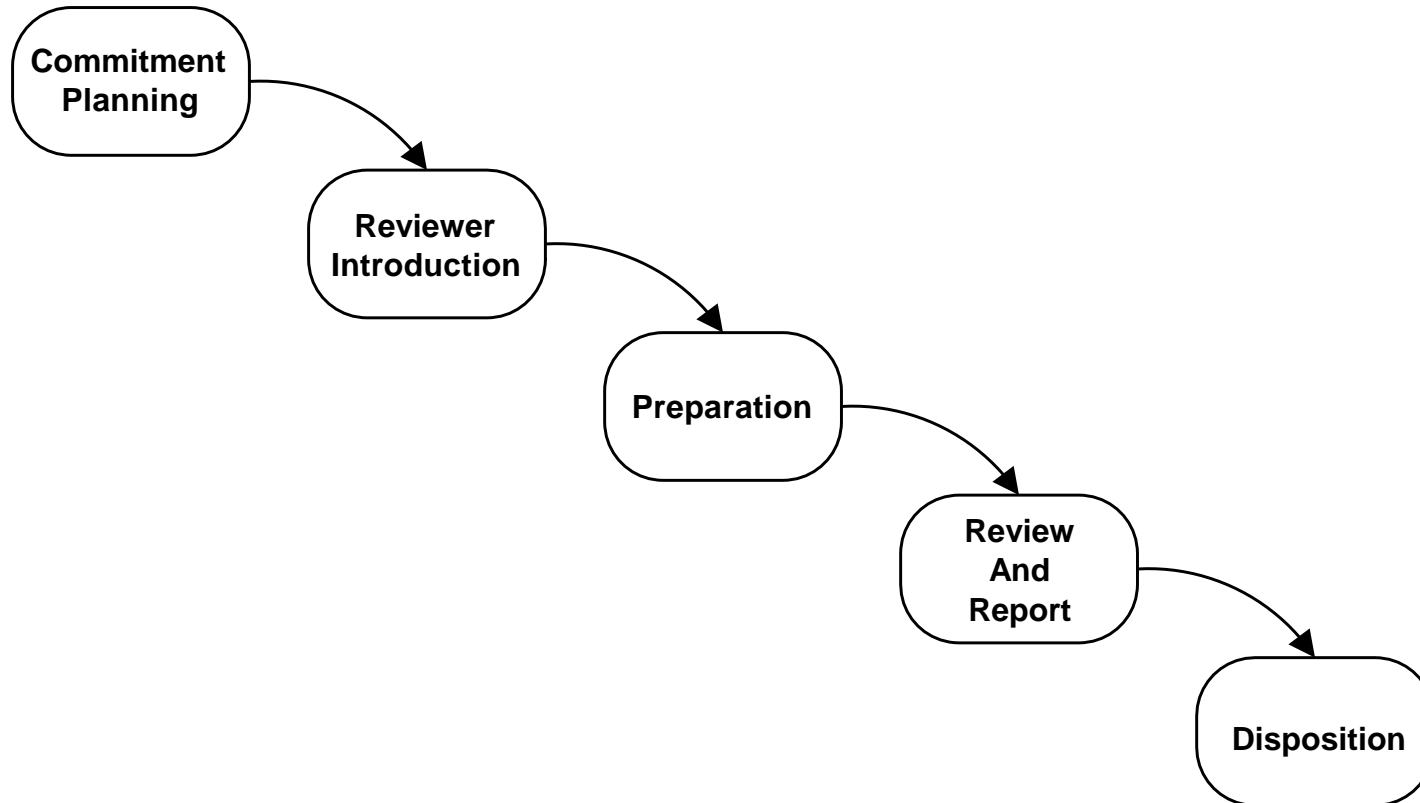 - (who wants to advertise their weaknesses?)

An Industrial-Strength Inspection Process

- Commitment planning
- Reviewer introduction
- Preparation
- Review meeting and report
- Disposition
- Review Etiquette
- Accountability
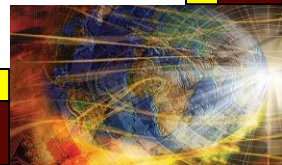- Importance of public information

Industrial-Strength Inspection Phases

Commitment Planning

Reviewer Introduction

Preparation
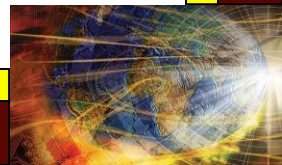
Review And Report

Disposition

Preparation

- Reviewers examine review packet with respect to:
  - Checklist
  - Individual concerns
- For each fault identified, reviewers
  - Circle/highlight fault in reviewer packet
  - Provide brief explanation
  - Assess fault severity
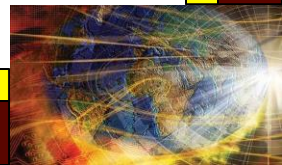 - Make entry in reviewer issues spreadsheet

Preparation (continued)

- Each reviewer prepares preliminary "issues list" of faults, forwards these to Review Leader.
  - (Deadline: one full working day prior to review meeting.)

- Review Leader makes Go/No go decision
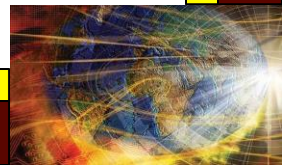 - (cancel/postpone if "showstopper"faults found.)

Preparation (continued)

- Reviewers record preparation time.

- Review Leader prepares review meeting agenda to reflect priorities of preliminary issues lists.

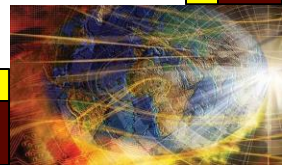- Review Leader distributes agenda to review team prior to review meeting.

Disposition

- Recorder prepares review report:
  - prioritized issues list
  - summary of individual ballots
  - summary of process evaluations
- Review Leader distributes review report to:
  - review team
  - producer's supervisor
- This is where technical responsibility ends and management responsibility begins.
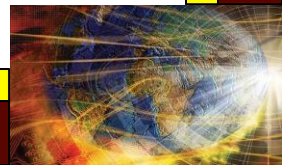
Review Etiquette

- Reviewers should be prepared.
- Review the product, not the producer.
- Stick to technical issues.
- Be constructive; reviews are not the place for
  - negative comments
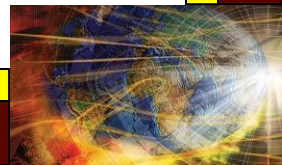 - "pats on the back"

Review Etiquette (continued)

- Identify issues, don't resolve them.
- Provide minor comments (e.g., spelling corrections) in writing to the producer at the end of the review meeting.
- Avoid discussions of style.
- Record all issues in public.
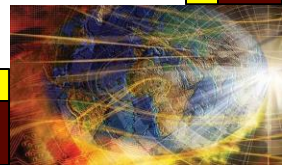- Above all: Don't waste time!

A Worst-Case Review

- producer picks friendly reviewers

- short lead time

- no approved preparation time

- deliverable not frozen

- postponed twice

- some reviewers absent
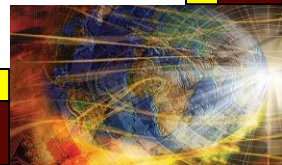
- top designers excused (from reviews and reviewing)

A Worst-Case Review (continued)

- no checklist
- no issue list, no action items
- page-by-page agenda
- faults are resolved
- coffee and lunch breaks needed
- reviewers leave and return
- producer's supervisor is review leader
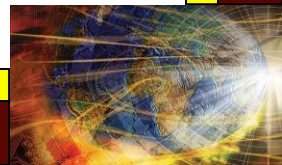- "cast of thousands"

Desirable Review Culture

- producers do not dread reviews
- reviewers have approved preparation time
- materials delivered with sufficient lead time
- trained review leaders
- reviewers perceive reviews as productive
- management perceives reviews as productive

Desirable Review Culture (continued)

- review meetings have high priority
- checklists are actively maintained
- top designers are frequent reviewers
- reviewer effectiveness is considered during performance evaluation
- management actively supports reviews
- management uses results of reviews

Accountability and Openness

- Scenario 1: A software module is reviewed and approved by the reviewers and by management. During testing, major faults are found in the module. Who is responsible?

- Scenario 2: A software module is reviewed and rejected by the reviewers but is approved by management. During testing, major faults are found in the module. Who is responsible?

- Keeping the review process open and public resolves issues such as these.