

# Software Inspections and Reviews

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## Definitions

Manual quality assurance in three variants

- ☐ Review through sending documents to the review team members
  - Fast, cheap, flexible, low performance
- ☐ Structured walkthrough
  - Medium use of resources and moderate performance
- ☐ Fagan inspection
  - Expensive and time consuming, but efficient and effective

## Definitions

- ☐ Software inspection
  - Manual quality control of a product
  - Small group of participants with defined roles
  - Aims at the detection of faults, not at finding the solutions
  - Requires a functioning development process
  - Executed as a formal process
    - Input and output criteria
    - Defined inspection phases
    - Skilled participants
    - Collecting and analysis of inspection data including feedback to the inspection process
    - Fault documentation
    - Objectives for the results (e.g. Fault detection rates, inspection rate)
- ☐ An inspection can be executed in every phase of a software development (inspection of the requirements, inspection of the design, inspection of the source codes, inspection of test cases)

## Definitions

- ☐ Reviews
  - Review here refers to methods which are no formal inspection, partially review is used in the literature as a generic term for all manual test methods (formal inspection included)
  - Often not only focused on the efficient detection of faults, but also as a means for
    - decision making
    - solving of conflicts (e.g. concerning design decisions)
    - exchange of information
    - brainstorming
  - Normally no formal procedure exists for the execution and the choice of the participants as well as their roles
  - Often no record and analysis of review data
  - Often no quantitative objectives

## Definitions

- ☐ The main differences between reviews respectively walkthroughs and formal software inspections are
  - Inspections have the sole aim to detect faults efficiently and effectively
  - Inspections are done as a defined process

## Why Software Inspections?

- ☐ Many quality characteristics – e.g. understandability, changeability, informational value of identifiers and comments – are testable only manually
- ☐ Undetected faults from the definition and design phase later cause high consequential costs
- ☐ As inspections are executed in a team, the knowledge base is enhanced
- ☐ Implements the principle of external quality control
- ☐ Delivery of high-quality results to the subsequent software development phase (milestone)
- ☐ Responsibility for the quality is assigned to the whole team

## Why Software Inspections?

- ☐ Manual testing of products is a useful complement of tool supported tests
- ☐ The compliance to standards is permanently monitored
- ☐ Critical product components are detected early
- ☐ Every successful inspection is a milestone in the project
- ☐ Every member of the inspection team becomes acquainted with the work methods of his colleagues
- ☐ As several persons inspect the products, the authors try to use an understandable style
- ☐ Different products of the same author contain fewer defects from inspection to inspection
- ☐ It turned out that functioning inspections are a very efficient means for quality assurance

## Requirements for Inspections

- ☐ The required time has to be scheduled → project planning
- ☐ The participants have to be skilled w.r.t. inspections
- ☐ The procedure of the inspections has to be written down and their observance has to be controlled
- ☐ The project has to be done well-structured and controlled
- ☐ There has to be a quality management process with defined quality objectives
- ☐ **The results of inspections must not be used in personnel evaluation**
- ☐ The period between registration and execution of an inspection has to be short, i.e., inspections are executed with high priority

## Inspection Team

- ☐ Moderator
  - Accepted specialist with special training as moderator
  - Chairs meeting and controls that the inspection is executed according to the scheduled procedure
- ☐ Author (editor)
  - Is responsible for the correction of faults detected during the inspection and normally has generated the product to be tested
  - The Author is never the moderator, reader or recorder
- ☐ Reader
  - Leads the inspection team through the session
  - Has to be able to describe illustratively the different parts of the work

## Inspection Team

- ☐ Recorder
  - Notes and classifies all faults and supports the moderator with the making of the remaining reports
- ☐ Inspectors
  - All members of the inspection team (also the moderator, author, reader, and recorder) are inspectors whose aim has to be the detection of faults
  - Further inspectors can be, e.g.
    - project members from the same project
    - consultants (standards!)
    - system specialists
- ☐ Size of the review team: 3 to 7 members

## Inspection Team

- ☐ The minimal number of participants in inspections is 3 (moderator/recorder, reader, author)
- ☐ If only 3 persons form an inspection team, the moderator is always the recorder at the same time
- ☐ In every inspection there is an author
- ☐ The inspection team should be as small as possible (max. 7 persons). Everybody should bring in a unique expertise. Additional participants reduce the efficiency and effectiveness of the inspection
- ☐ Inspections are a Peer-to-Peer technique. Managers should not participate

## Inspection Phases

- ☐ Planning: Organizational preparation
- ☐ Overview: The author informs
- ☐ Preparation: Every inspector prepares
- ☐ Inspection meeting
- ☐ Rework: Fault correction
- ☐ Follow-up: Inspection of the fault corrections

## Inspection Phases Inspection Planning

- ☐ Planning is done at the start of the project. Time, resources, involved persons, etc. must be assigned
- ☐ The author informs the moderator that his product is ready for inspection
- ☐ The moderator checks whether the product fulfils the input criteria (usually very simple things, like „no syntax errors“)
- ☐ If the product does not fulfill the input criteria the moderator informs the author about the required modifications
- ☐ Finally, the moderator invites

## Inspection Phases Overview

- ☐ The overview is optional. It serves as information for the inspectors about the product. The following reasons may exist for an overview
  - The product is critical inside the project, i.e., it has a key position
  - The product is extensive, complex or is connected to numerous other positions
  - The used technology is new
  - etc.
- ☐ The overview normally takes roughly 2 to 3 hours
- ☐ Faults already detected during the overview have to be corrected before the material is distributed to the inspectors for preparation

## Inspection Phases Preparation of Inspection

- ☐ Every inspector individually prepares for the inspection meeting and formlessly notes down all detected faults and ambiguities
- ☐ For this purpose every inspector gets a complete set of the required documents
- ☐ The documents must not be changed until the review
- ☐ There should be a guide value for the preparation rate to schedule the preparation time
  - Too low values cause an insufficient knowledge of the inspectors during the inspection meeting
  - Too high preparation times reduce the efficiency
- ☐ The main objective of the preparation is the understanding of the product, not fault detection

## Inspection Phases

### The Inspection Meeting



- ☐ The moderator introduces the agenda of the meeting and introduces the participants and their roles
- ☐ The reader reads through the documents explaining the content, with appropriate speed and piecewise
- ☐ The inspectors search for faults during the talk
- ☐ Discussions are allowed only concerning faults and their types. The moderator has to make sure that all inspectors concentrate on the fault detection
- ☐ Detected faults are classified if possible (type, priority) and noted by the recorder
- ☐ The author answers questions
- ☐ Checklists can facilitate and systematize the inspection

## Inspection Phases

### The Inspection Meeting



- ☐ The goal of the inspection is synergy for the purpose of fault detection. Maximum duration: 2 to 3 hours
- ☐ There should be a guideline for the inspection speed (e.g. LOC/hour)
- ☐ It is determined whether the product is accepted, conditionally accepted or a reinspection is required

## Inspection Phases

### Rework of Inspection



- ☐ The author corrects the faults listed in the inspection protocol
  - Fault correction
  - Initiation of a fault correction elsewhere if a correction by the author is not directly possible (e.g. faulty requirement detected in the code inspection)
  - It turns out that an assumed faulty position is correct. A comment of the author in the follow-up is necessary
  - It is possible that faults should not be corrected directly. The fault is then put into the change request system to be dealt with later
- ☐ The author gives the revised version of the product to the moderator, if the product was conditionally accepted in the inspection meeting or a reinspection is necessary
- ☐ If the product was accepted, this phase is completed. The product is brought under configuration control

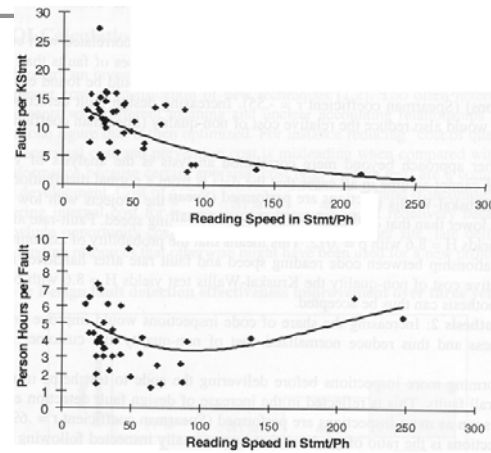
## Inspection Phases

### Follow-Up of Inspection



- ☐ If the product was conditionally accepted during the inspection meeting the verification can be done, e.g., by the author and the reader alone
- ☐ If a reinspection was decided a conventional inspection meeting takes place that is focused on the faults
- ☐ Inspection reports are to be made

## Software Inspections and Reviews



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## Literature

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