

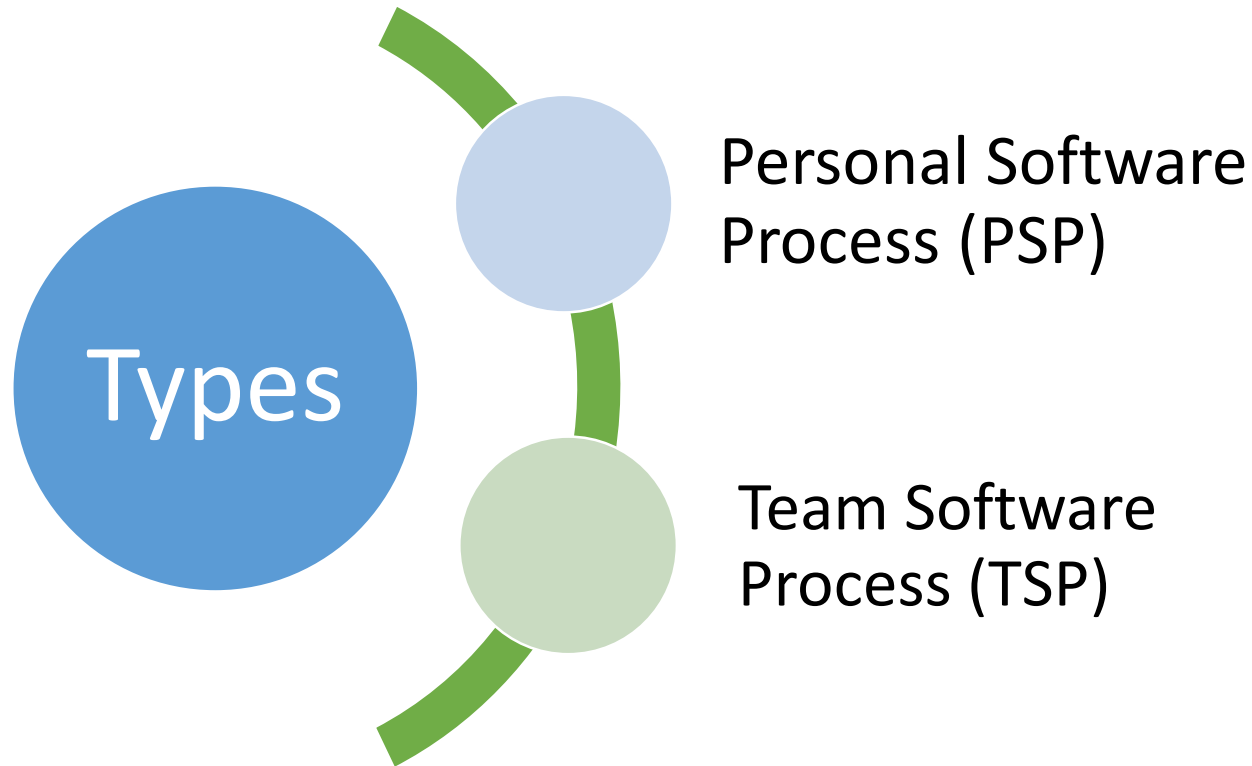
SNJB's KBJ College of Engineering
Chandwad-423101 (Nashik)

Department
of
Information Technology

Subject : Software Testing & Quality Assurance
(STQA) of BE 2015 Pattern

UNIT – VI
SOFTWARE QUALITY
ASSURANCE TRENDS

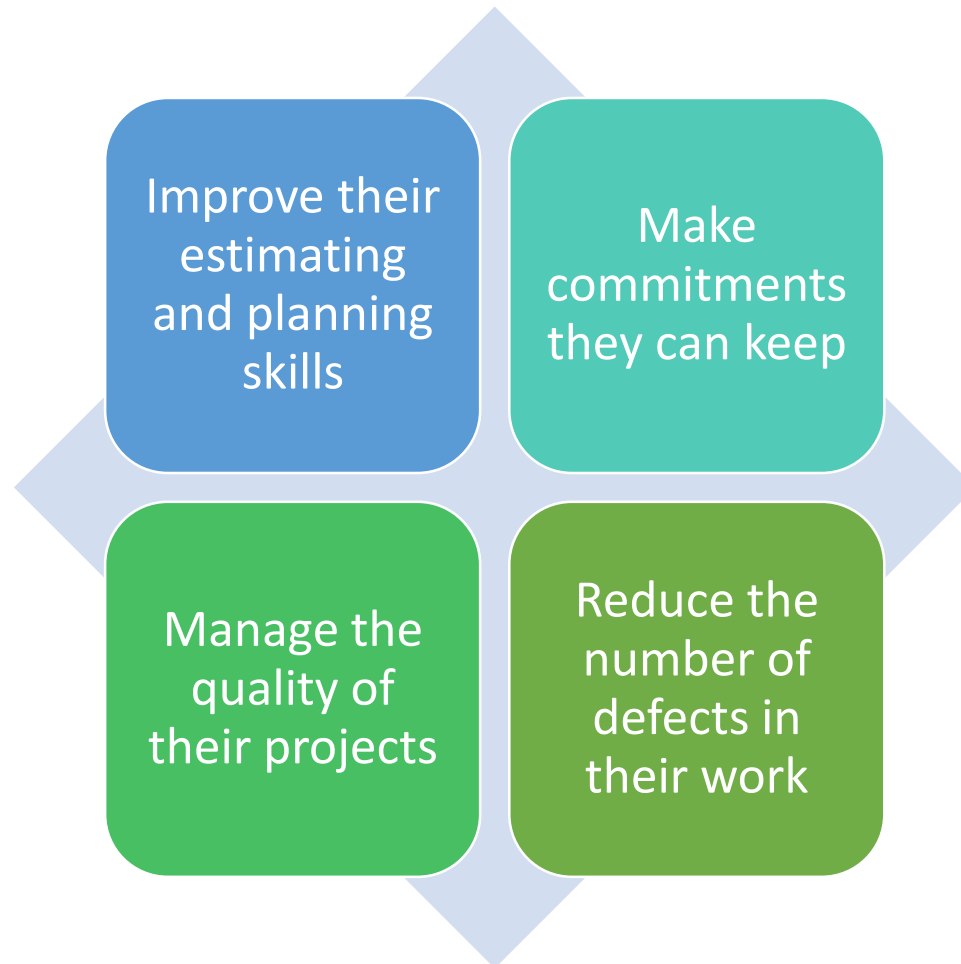
Software Process



Personal Software Process (PSP)

- Structured software development process
- Planned to help software engineers to improve their performance from predicted and actual development of code
- Created by Watts Humphrey to apply the principles of the CMM to the software development practices of a single developer
- Claims to give software engineers the process skills necessary to work on team software process (TSP)

PSP Objectives



PSP Structure

- Input to PSP is the requirements
- Requirement document is completed and delivered to the engineer
- An engineer learning to integrate the PSP into his or her process begins at the first level – PSP0
- And progresses in process maturity to the final level – PSP2.1

PSP Structure

PSP0, PSP0.1 Introduces process discipline and measurement

- PSP0 has 3 phases: planning, development & post mortem
- PSP0.1 advances the process by adding a coding standard, a size measurement and the development of a personal process improvement plan (PIP)

PSP1, PSP1.1 Introduces estimating and planning

- Based on data collected in PSP0 and PSP0.1, engineer estimates how large a new program will be and prepares a test report (PSP1)
- Accumulated data from previous projects is used to estimate the total time
- Each new project will record the actual time spent. This information is used for task and schedule planning and estimation (PSP1.1)

PSP2, PSP2.1 Introduces quality management and design

- PSP2 adds two new phases: design review and code review
- Defect prevention and removal of them are the focus at the PSP2
- Engineers construct and use checklists for design and code reviews. PSP2.1 introduces design specification and analysis techniques

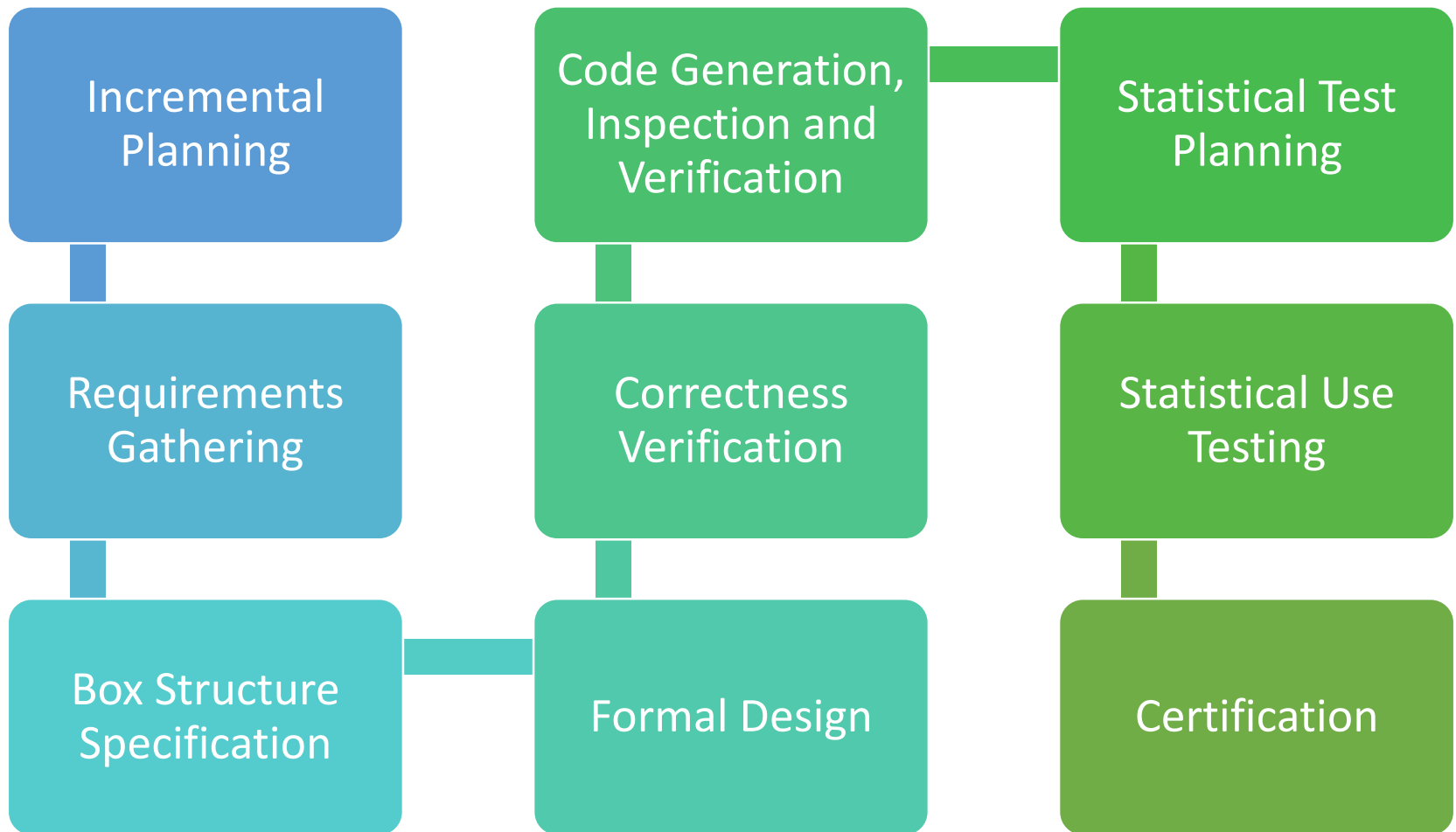
Team Software Process (TSP)

- Provides defined operational process framework designed to help teams of managers and engineers
- Intended to improve levels of quality & productivity of team's software development project
- Initial version of TSP was developed and piloted by Watts Humphrey in the late 1990s
- Technical Report for TSP sponsored by the U.S. Department of Defense was published in November 2000

Cleanroom Software Engineering

- Engineering approach which is used to build correctness in the developed software
- Main concept behind this is to remove dependency on the costly processes
- Includes quality approach of writing code from the beginning to finally gathers into a complete system

Tasks Occur in Cleanroom Engineering



Cleanroom Process Model

- Modeling approach uses a method called box structure specification
- A 'box' contains the system or the aspect of the system in detail
- Information in each box is sufficient to define its refinement without depending on implementation of other boxes
- Cleanroom process model uses three types of boxes

Cleanroom Process Model

Black Box

- Identifies the behavior of a system
- System responds to specific events by applying the set of transition rules

State Box

- Consist of state data or operations that are similar to the objects
- Represents history of black box i.e. data contained in state box must be maintained in all transitions

Clear Box

- Transition function used by state box is defined in clear box
- It simply states that a clear box includes the procedural design for the state box

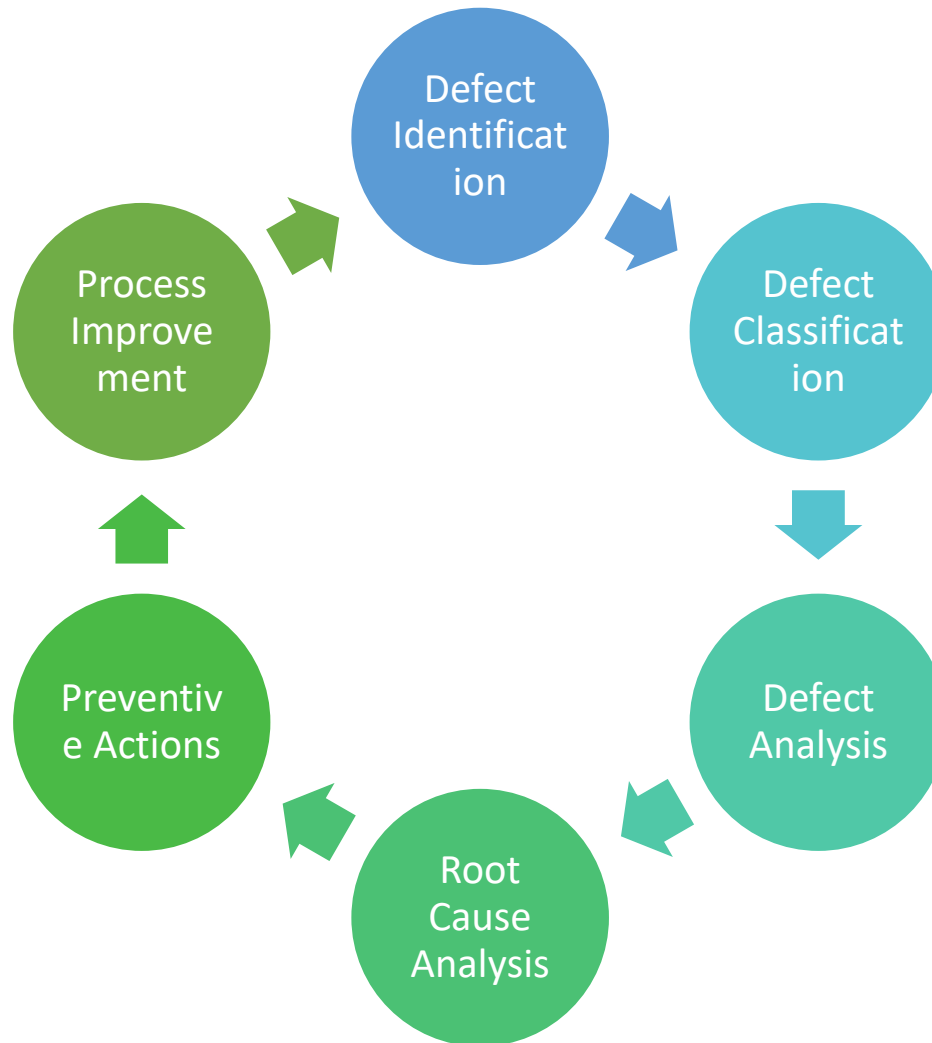
Defect Injection and Prevention

- Purpose of Defect Prevention is to identify the Root cause of defects and prevent them from recurring
- Involves analyzing defects that were encountered in the past & taking specific actions to prevent the occurrence of those types of defects in the future
- It also enhances the productivity
- It reduces rework effort

Methods of Defect Preventions

- Reviews & Inspections:
 - Self-Review, Peer Review & Inspections
- Walkthroughs:
 - Prototyping of actual design that gives you basic idea of the product functionality along with its look & feel
- Defect Logging and Documentation:
 - Provide key parameters that supports Defect Analysis and Measurements
- Root Cause Analysis

Targeting Process Improvement



Internal Auditing & Assessments

- An audit is systematic & independent examination of books, accounts, statutory records, documents and vouchers of an organization
- Part of Quality Assurance of the system
- Must be carried out by trained people
- Well defined process must be designed to conduct the internal auditing
- Generally known to be primary mechanism for the assessment

Internal Auditing & Assessments

- Types of audit

First Party Audit

- Internal audit
- Done by organization

Second Party Audit

- Carried out by customer
- Pre-contract survey

Third Party Audit

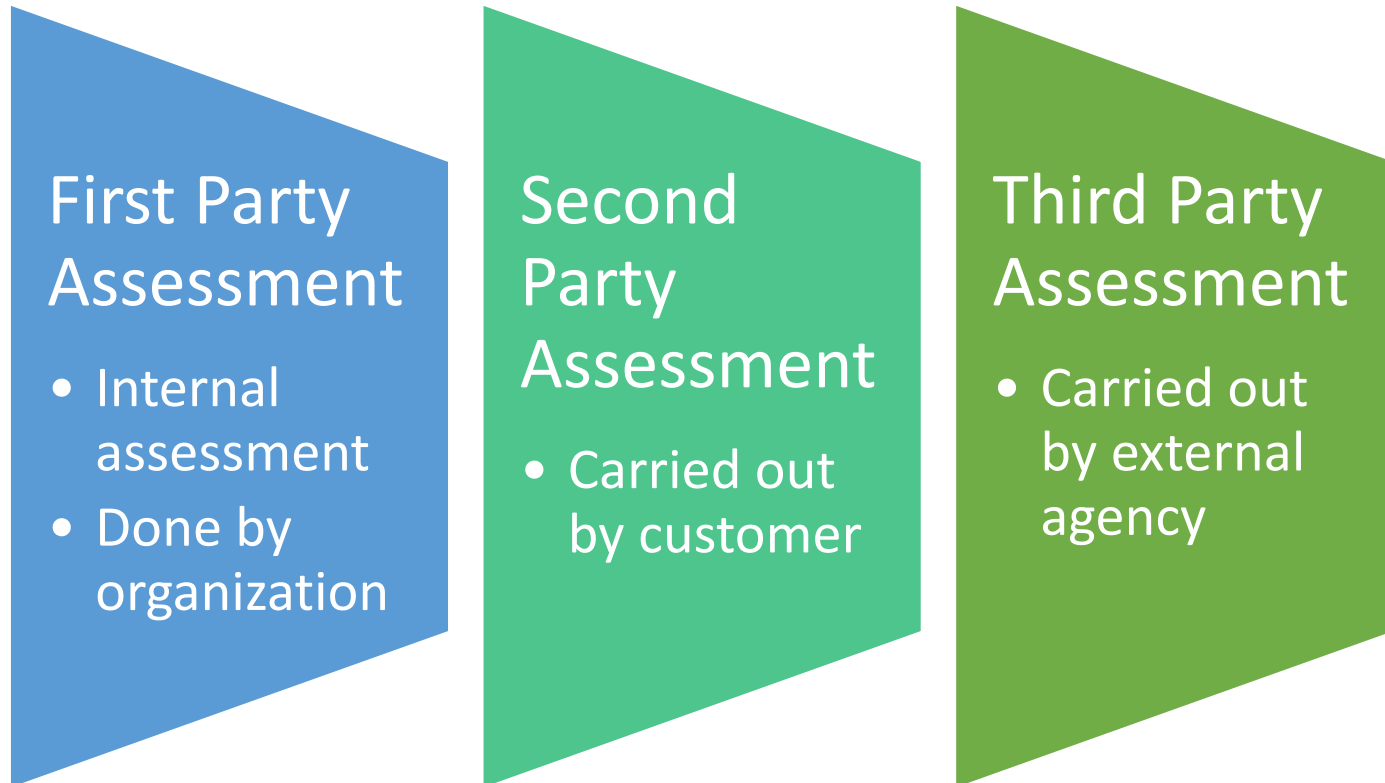
- Carried out by external agency
- As per standards or ISO

Internal Auditing & Assessments

- Assessment - Quality assessment is assessment of the overall precision and accuracy of your data, after you've run the analyses
- Used to compare actual output of the system & expected output
- Done by trained and expert engineers
- Requires various test cases

Internal Auditing & Assessments

- Types of assessment



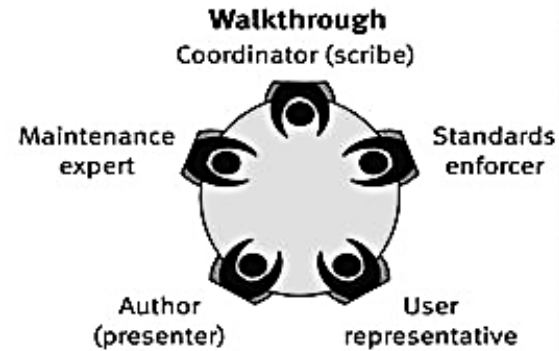
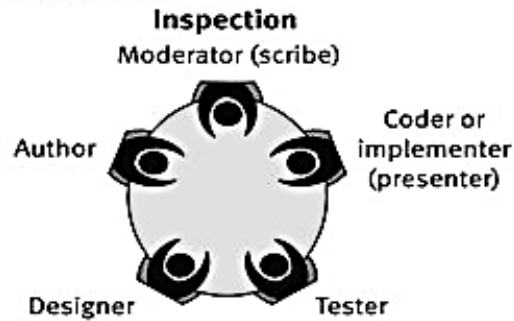
Inspections & Walkthroughs

- Types of static testing
- Classes of formal technical review (FTR)
- FTR is verification activity carried out by the software engineers
- Used to reduce some risks in SDLC process

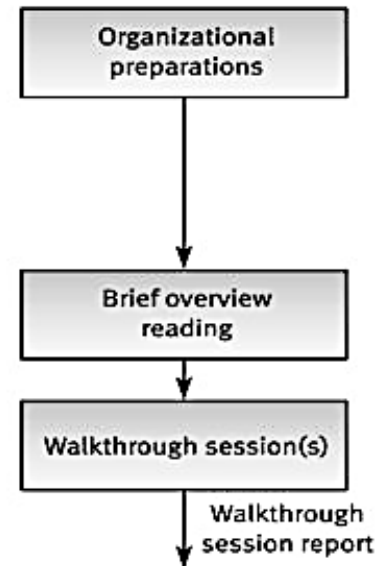
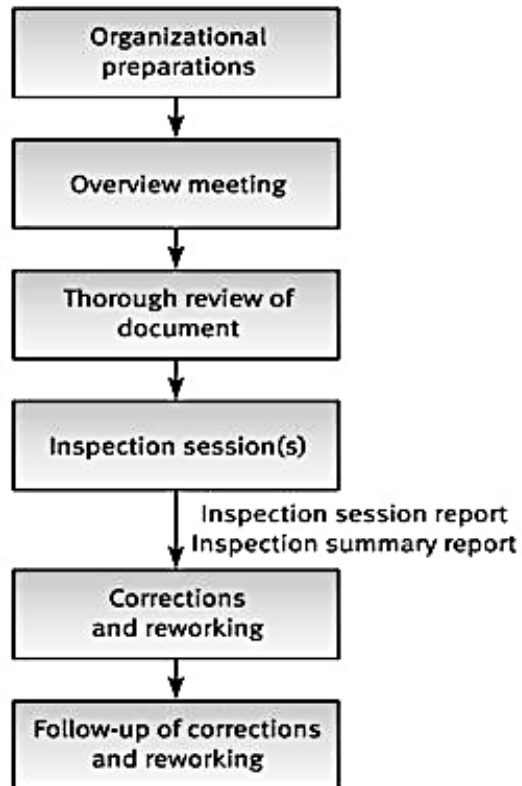
Walkthroughs

- Also known as team debugging or peer code review
- Designer or programmer involves members of team & other interested people
- Participants ask questions & make comments about
 - Possible errors
 - Violation of development standards &
 - Other problems

PARTICIPANTS



PROCESS



Inspections

- Used for detecting and correcting defects in software and improve the quality of the product
- Collects defect data to analyze the quality of the product
- Major role of inspection is to train the juniors with various expertise
- Increases effectiveness of the software validation testing

Inspections

