

* Maintenance releases & technical assistance are examples of external failure costs of quality

* Structural testing may not mimic real-world situations

* Testing is three dimensional sense: Time Organization Culture

* Developers & designers use static analysis tools

* Gray Box testing includes both Black-Box & White-Box

* Coverage ^{measurement} ~~management~~ tools & dynamic analysis tools are especially for developers.

* Static analysis can not find whether the value stored in a variable is correct.

* Successful test automation is difficult because the maintenance of test system is difficult

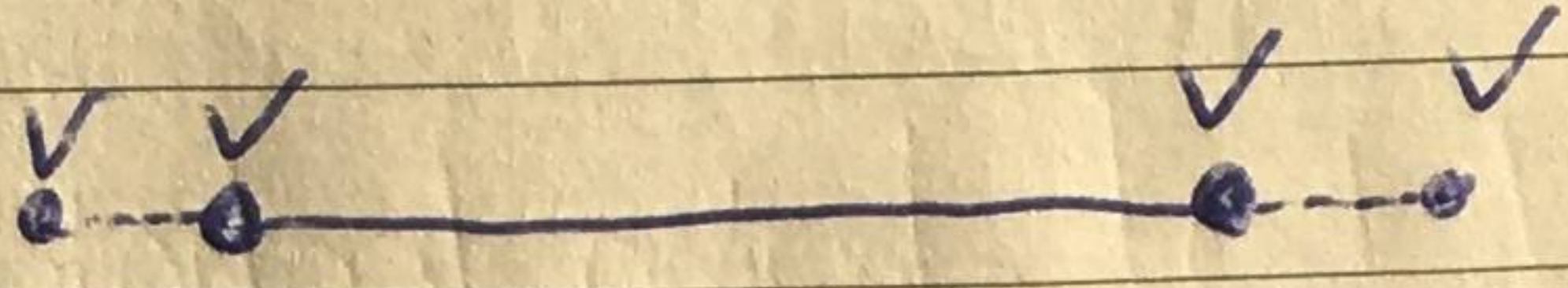
* Fault Masking: Error condition hiding another error condition

* Decision testing is not black-box testing

* Writing a test summary report for stakeholders is a major task of evaluating exit criteria & reporting

2

- * Static analysis is best described as the analysis of program code.
- * Equivalence partition: An input or output range of values such that only one value in the range becomes a test case.
- * Test data planning essentially includes test procedure planning.
- * Impact analysis assesses the effect of a change to the system to determine how much regression testing to do.
- * Selecting test metrics for monitoring & control will be undertaken during test planning.
- * Analyse the test basis documents - establish the traceability of test conditions - define the expected result - create test execution schedule (sequence)
- * State transition testing: Used to verify different system (re)operating on current condition or previous history.
- * Decision Table testing: Combines combinations of inputs that might not otherwise have been exercised during testing.

- * Enforcement of coding standards is a static analysis tool to be most useful
- * Reviews should be performed on specifications, code and test plans
- * Boundary values 
- * Test case: Set of input values, execution precondition and expected results
- * White box testing means glass box testing & clear box testing
- * Syntax testing is not a part of white box testing.
- * Contract & Regulation testing is a part of acceptance testing
- * The condition coverage ensures all paths through a module are executed, whereas the modified condition coverage decision coverage ensures each path in a decision can independently affect the outcome
- * Testing tools are not easy to implement & maintain
- * Code coverage is a measurement of test effectiveness

4

- * Record & Playback tools can be used for Regression Testing
- * All members of the reviewing team are responsible for the result of the review ~~is~~ is not a rule!
- * Purpose of test design technique is to identify test conditions & test cases
- * Implementation & Execution creates test suites for efficient test execution.
- * Test Suite: test cases grouped into manageable and scheduled units.
- * Statement coverage will not check missing statements.
- * Test cases derived from use cases are most useful in uncovering defects in the process flow during real world use of the system
- * Boundary value analysis is a form of functional testing
- * Achieving complete statement coverage possible but there may be still bugs because the failure may depend on the program's inability to handle specific data values, rather than on program's flow of control

- * Early test analysis & design
Different test levels are designed or defined with specific objectives are good practices for testing within the development cycle
- * Requirement specification, test cases & user guides are good candidates for manual static testing
- * Confirmation testing is testing fixes to a set of defects and regression testing is testing to establish whether any defects have been introduced as a result of changes.
- * Model based testing: Stochastic testing using statistical information or operational profiles. Here run time behavior of software under test is checked against predictions made by a model.
- * Requirement analysis is not a phase of fundamental test process. But evaluating exit criteria and reporting is a phase of fundamental test process.
- * Test procedure specification: Describes steps required to operate the system and exercise test cases in order to implement the associated test design
- * Validation helps to check that we have built the right product. Not verification

6

* In a risk based approach, the risks identified may not be used to determine the release date or project schedule

* Keyword driven testing: a scripting ~~language~~ technique that uses data files to contain not only test data and expected results, but also keywords related to the application being used

* ISO 9126 is the standard for software product quality.

* Easy to access info about tests & testing? ^{benefits of} test tools
Greater consistency of tests
Reduced maintenance of testware is not a benefit X

* Experience based techniques can identify tests not easily captured by formal techniques.

* Keyword driven test: a table with test input data, action words and expected results, controls the execution of the system under test.

* Writing a project test strategy, selecting tools to support testing and scheduling test are performed by a test leader.

* Preparing & acquiring data is done by a tester

- * Complete testing is discovering every bug in the program
- * Test plan and test design specification specify features to be tested, approach, pass/fail criteria.
- * Measurement dysfunction is a problem because even though the numbers you look at appear better, to achieve these numbers people are doing other aspects of their work much less well.
- * Heuristic approaches runs test execution & evaluation concurrently.
- * Component testing (unit testing, program testing, module testing, system component testing)
- * Arc testing is known as branch testing.
- * Reviews, static analysis and dynamic testing have the objective of identifying defects
- * Static analysis tools are typically used by developers
- * Menu structure model is a software model that cannot be used in functional testing

- * Equivalence partitioning test uses both valid & invalid partitions
- * Defect management process includes deliverable baselining
- * Software failure may cause loss of money, time, business reputation and in extreme cases injury & death. Therefore it is critical to have a proper test strategy in place
- * The purpose of exit criteria is to define when a test level is complete
- * Summary, variances & approvals are sections of test summary report based on IEEE standard.
- * In black box testing, test cases are derived systematically from the models of the system
- * Test incident report summarizes the testing activities associated with one or more test design specifications
- * Logging the outcome of test execution is not a major task of exit criteria.

- 9
- * Equivalence partitioning ensure that test cases test each input and output equivalence class at least once
 - * Debugging defect is not a test objective
 - * Deriving test case from use cases is helpful for component testing is false.
 - * Test completion criterion is to determine when to stop testing
 - * Functional testing is useful throughout the life cycle and can be applied by business analysts, testers, developers & users
 - * Test harness may facilitate the testing of components or parts of a system by simulating the environment in which test object will run.
 - * Testing without a real plan & test cases is called gorilla testing, monkey testing & ad hoc testing
 - * Exploratory testing is useful when there are limited specification documents are available & when testing is constrained due to time pressure.

10 Entry criteria:

- * Are the necessary documents (design & requirements information) available that will allow testers to operate the system and judge correct behavior?
- ? Is the test environment (lab, hardware, software) and system administrator support ready?
- ? Are the supporting utilities, accessories and prerequisites available in form that testers can use?

* Fault attacks have the benefit to evaluate the reliability of a test object by attempting to force specific failures to occur.

* Scope of maintenance test is related to the risk, size of changes and size of system under test.

* Exploratory testing: Poor specification & time pressure.

* Breadth Test & Depth test are methodologies applied while performing maintenance testing.

* Finalising & archiving testware is a key test closure task.

* Static analysis can not find memory leaks.

* Developers typically use static analysis and dynamic analysis.

* Formal review: Planning - Review Meeting - Rework - Follow up

* Test management tool builds traceability between requirements, tests & bugs.

* Static analysis = static testing.

* Purpose of exit criteria is to define when to stop testing, end of test level and when a set of tests has achieved a specific precondition

* Goal of functional tests is to find as many failures as possible so that the cause of the failures can be identified and fixed.

* Experience, defect & failure data, knowledge about software failures would be test basis for fault attack testing.

* Analysis of specification is not a part of highlevel test plan

* Main objective of a formal review or inspection is to find defects

* Test manager plans, organizes and controls the testing activities, while the tester specifies, executes and executes tests.

12

* 70% of life cycle costs of a software are spent on maintenance

* IEEE does not come under International standard

* Procedure is the step by step method followed to ensure standards are met.

* Smoke testing is a confidence testing

* Component integration testing is link testing.
Here we test whether modules are properly linked

* Structural testing can be performed at all levels.

* CAST: Computer Aided Software Testing

* Fixing defects found typically done by author

* Planning, Kick Off, Individual Preparation, Review Meeting, Rework, Follow up

* Most of the errors occur in the requirements phase

* Equivalence partitioning technique can be used to achieve input/output coverage

* Failure is incorrect program behavior due to a fault in program

- 13
- * Quality is conformance to requirements.
 - * Test case specification defines the expected result of a test
 - * Black Box techniques: A procedure to derive test cases based on the specifications of a component.
 - * Static testing requires the running of tests through the code is false
 - * Inspection is led by a trained moderator or leader and uses entry-exit criteria
 - * Walkthrough is led by author
 - * Exhaustive testing is impractical and impossible.
 - * Stop testing when scheduled time for testing expires.
 - * The code is not a test oracle
 - * Beta testing can be used to get market feedback
 - * Variances, comprehensive assessment, evaluation & summary of activities are included as part of test summary report

14

- * Maintenance testing is testing a released system that has been changed
 - * Creating test specifications is done by tester
 - * Adapting planning based on test results
~~Creating test specifications~~
Planning test
Writing and reviewing test strategy
- } Done by test leader
- * Planning phase of a formal review includes selecting the personnel and allocating roles.
 - * Test case specification: A document specifying a set of test cases for a test item (objective, input, test action, expected result and execution condition)
 - * Test procedure specification: A document specifying a sequence of actions for the execution of a test also known as test script or manual test script.
 - * Test design specification: A document specifying test condition (coverage items) for a test item, the detailed test approach and the associated high level test cases.
 - * Failure is incorrect program behaviour due to a fault in the program

* Test plan: A document describing the scope, approach, resources and schedule of intended test activities. It identifies amongst others, test items, features to be tested, the testing tasks, who will do each task, degree of tester independence, test environment, test design techniques, entry & exit criteria to be used and the rationale for the choice, and any risks requiring the contingency planning

* For a formal review, personal selection occur during planning phase, fixing defects found happens during rework phase

* Throughness measures, reliability measures, test cost, schedule state of defect correction & residual risks are typical test exit criteria.

* Benefits of test support tools are reducing repetitive work & gaining easy access to test information.

* A formal assessment of a work product conducted by one or more qualified independent reviewers. is inspection

* Identified risks can not be used to determine cost of project
Determine the test technique to be employed

#5 ↓
Identified risks can be used to determine

16

* Static testing are used in requirements, design & coding

* Moderator leads review of documents, plus the review, run the meeting, and follow-up after the meeting.

* Functional testing is mostly validation techniques.

* FPA: Function Point Analysis
is used to measure the size of the functionality of an information system that is provided to a user.

* Configuration management procedures should be implemented during test planning.

* Debugging is the process of analyzing & removing causes of failures in software

* Causing as many failure as possible so that faults can be identified and corrected is a valid goal for testers

* Grey box testing is a test technique that requires devising test cases to demonstrate that each program function is operational.

* Cyclomatic Complexity: $2 - N + P$
L: nodes, E: edges, P: independent paths.

- * Methods used in verification are reviews, walkthrough (inspections) & desk-checking. Methods used in validation are black-box testing, white box testing and non-functional testing. It checks whether the software conforms to specification or not
- * ~~fault~~ = bug = ~~file~~ defect
- * A system may not be more reliable after debugging for the removal of a fault.
- * Test data planning essentially includes test procedure planning
- * Environment fault & Documentation fault are can be reasons for failure
- * Finalizing & archiving testware is a key test closure task
- * Procedures & standards are individual work benches to produce the right output.
- * Causes to stop tests
Deadlines, test budget, percentage of tests passed, extent of functionality or requirements covered, minimum accepted bug rate, duration of alpha or beta testing periods.