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1 Definition

Software testing is a formal process carried out by a specialized testing team in which a software unit, several integrated software units or an entire software package are examined by running the programs on a computer.

2 Objectives

Direct objectives

- To identify and reveal as many errors as possible in the tested software
- To bring the tested software, after correction of the identified errors and retesting, to an acceptable level of quality
- To perform the required tests efficiently and effctively, within the limits budgetary and scheduling limitations

Indirect objectives

- To compile a record of software errors for use in error prevention (by corrective and preventive actions)

3 Strategic approach to testing

3.1 General characteristics

- Software team should conduct effective formal technical reviews
- Testing begins at the component level and work outward toward the integration of the whole system
- Testing is conducted by the **developer** of the software and by **independent test group**.
- Testing and debugging are different activities, but debugging must be accomodated in any testing strategy.

3.2 Verification and validation

- Verification: (Are algorithms coded correctly?). The set of activities that ensure that software corrctly implements specfic function or algorithm.
- Validation (Does it meet user requirements). The set of activities that ensure that the software that has been build is traceable to customer requirements.

3.3 Organising software testing

Testing should aim at breaking the software

- Independent test group
  - Removes the inherent problems asociation with letting the builder test the software that has been built
  - Removes the conflict of interest that may otherwise be present
  - Works closely with the software developer during analysis and design to ensure that throughout testing occues.

3.4 Levels of testing

- Unit testing: Concentratest on each component/function of the software as implemented in source code
  - Exercises specific paths in a component's control structure to ensure complete coverage and maximum error detection.
  - Components are then assembled and integrated
- Integration testing: Focuses on the design and construction of the software architecture
  - Focuses on inputs and outputs, and how well components fit and work together
- Validation testing: Requirements are validataed against each constructed software
  - Provides final assurance that the software meets all functional, behaviour, and performance requirements
- System testing: The software and other system elements are tested as a whole
  - Verifies that all system elements (software, hardware, people, databases) mesh properly and that overall system function and performance is achieved

3.5 Testing strategy appliet to Object-Oriented Software

- Must broaden testing to include detections of errors in analysis and design models
- Unit testing loses some of its meaning and integration testing changes signifcantly
- Use the same philosophy but different approach as in conventional software testing
- Test "in the smal" and the work out to testing "in the large"
  - Testing in the small involves class attrivutes and operations, main focus in on communication and collaboration within the class
  - Testing in the large involves a series of regression tests to uncover errors due to communication and collabolration among classes
- ADD EXTRA

Reference section

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