Software Quality Management

Software Quality Control

Lecturer: **Nguyễn Ngọc Tú**
Email: *Tu.NguyenNgoc@hoasen.edu.vn*
Web: *sites.google.com/site/QuanLyChatLuongPhanMem/*
Face Group: *www.facebook.com/groups/SoftwareQualityManagement/*

#AdTekDev #ICoTek #VNASQ #VNSQA #VNSoftwareTesting

Outline

- Testing Concepts
- Developing Testing Methodologies
- Verification and Validation Methods
- Software Change Control
- Defect Management

Testing Concepts

- Workbench
- Test Stages
- Independent Testing
- Static versus Dynamic Testing
- Verification versus Validation
- Test Objectives
- Reviews and Inspections

Testing Concepts – Workbench

- The programmers' workbench for one of the steps to build a system
  - Input (program specifications)
  - Work (coding and debugging)
  - Work is checked to ensure the product meets the specifications and standards, and that the procedure was followed.

Testing Concepts – Test Stages

- Unit Testing
- Integration Testing
- System Testing
- User Acceptance Testing

Testing Concepts – Independent Testing

- The primary responsibility of individuals accountable for testing activities is to ensure that quality is measured accurately. Often, knowing that quality is being measured is enough to cause improvements in the applications being developed.
- Testers
  - Developing test cases and procedures
  - Planning, capturing, and conditioning test data
  - Reviewing analysis and design artifacts
  - Executing tests
  - Utilizing automated test tools for regression testing
  - Preparing test documentation
  - Tracking and reporting defects

Testing Concepts – Static versus Dynamic Testing

- Static testing is another name for in-process reviewing. It means that the test is being performed without executing the code
- Dynamic testing (also known as program testing) implies that the code is being executed on a machine.

Testing Concepts – Verification versus Validation

- Verification ensures that the system (software, hardware, documentation, and personnel) complies with an organization's standards and processes, relying on review of non-executable methods.
- Verification ensures that the system (software, hardware, documentation, and personnel) complies with an organization's standards and processes, relying on review of non-executable methods.

Verification Example	Performed By	Explanation	Deliverable
Requirements Reviews	Developers, Users	The study and discussion of the computer system requirements to ensure they meet stated user needs and are feasible.	Reviewed statement of requirements Ready to be translated into system design
Design Reviews	Developers	The study and discussion of the computer system design to ensure it will support the system requirements.	System design Ready to be translated into computer programs Hardware configurations Documentation Training
Code Walkthroughs	Developers	An informal analysis of the program source code to find defects and verify coding techniques.	Computer software ready for testing or more detailed inspections by the developer.
Code Inspections	Developers	A formal analysis of the program source code to find defects as defined by meeting computer system design specifications. Usually performed by a team composed of developers and subject matter experts.	Computer software ready for testing by the developer.

Validation Example	Performed By
Unit Testing	Developers
Integrated Testing	Developers
System Testing	Developers, Users
User Acceptance Testing	Users

Testing Concepts – Test Objectives

- A test objective (goal) is a statement of what the test team or tester is expected to accomplish during a specific testing activity.
- Test objectives, are usually defined during requirements analysis, and guide the development of test cases, test scripts, and test data
- Test objectives enhance communication both within and outside the project team by defining the scope of the testing effort, and enabling the test manager and project manager to gauge testing progress and success.

Testing Concepts – Reviews and Inspections

- Reviews are conducted to utilize the variety of perspectives and talents brought together in a team.
- The main goal is to identify defects within the stage or phase of the project where they originate, rather than in later test stages; this is referred to as "stage containment."
- As reviews are generally greater than 65% efficient in finding defects, and testing is often less than 30% efficient, the advantage is obvious. In addition, since defects identified in the review process are found earlier in the life cycle, they are less expensive to correct.

Developing Testing Methodologies

- Acquire and study the test strategy
- Determine the type of development project
- Determine the type of software system
- Determine the project scope
- Identify the tactical risks
- Determine when testing should occur
- Build the tactical test plan
- Build the unit test plans

Verification and Validation Methods

- Verification and validation represents both static testing (verification) and dynamic testing (validation). Together they comprise the test activities.

Software Change Control

- Software Configuration Management
- Change Control Procedures

Defect Management

- The general principles
  - The primary goal is to prevent defects
  - The defect management process
  - Defect measurement should be integrated into the development process.
  - As much as possible, the capture and analysis of the information should be automated
  - Defect information should be used to improve the process.

Defect Management – report

- are recorded for four major purposes:
  - To ensure the defect is corrected
  - To report status of the application
  - To gather statistics used to develop defect expectations in future applications
  - To improve the software development process

Q/A ?!