

8. Testing new functionalities. Regression testing

How to test new functionality?

Questions

- What is Test Plan?
- What is regression testing?
- What are severity and priority?
- What is Software Testing Lifecycle?
- What is smoke testing?

Why do we need a Test Plan?

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- Writing a test plan guides our thinking
- Forces us to confront the challenges that await us
- Focus our thinking on important topics
- Serves as a vehicle for communicating with other members of the team
- Test plan is not required:
 - for simple projects/features
 - If time is insufficient



Why do we need a Test plan?(2)

- Repeatability
 - All testers should be able to execute the tests
 - Assures all critical elements are tested correctly
- Controllability
 - Knowledge of test data requirements, expected results, what to run
- Coverage
 - Ensures adequate coverage

Elements of a Test plan

Elements of a Test plan

- Test Scope
 - Defines what will be tested
- Test Objectives
 - Description of expected (measurable) test result, priority
- Assumptions
 - Include skill level of testers, budget, starting state of application, tools & equipment availability, etc.
- Risk Analysis
 - Things that could impact testing ability

Elements of a Test plan(2)

- Test Design
 - Identifies tests to run, stages to test
- Roles & Responsibilities
- Test Schedule & Resources
 - Major test activities, sequence of tests, estimates, dependence on other activities, people, tools
- Test Data Management
 - Methods for preparing test data, backup/rollback procedures

Elements of a Test plan(3)

- Test Environment
 - Version Control, hardware and software configurations, defect tracking tool, environment for each kind of testing
- Communication Approach
 - Meetings, processes, contact lists
- Test Tools
 - Automation, performance, etc.

Test Prioritization

Test prioritization

Criteria for prioritization of test cases may be:

- Usage frequency of a function
- Probability of failure
- Visibility of a failure
- Priority of the requirements
- Customer priorities
- Project risk



Entry Criteria

Entry Criteria

Test entry criteria define when to start testing

- E.g., at the beginning of a test level or when a set of tests is ready for execution

Entry criteria may cover the following:

- Test environment availability and readiness
- Test tool readiness in the test environment
- Testable code availability
- Test data availability

Test Estimation

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Test schedule is dependent on release schedule

- In order to make test schedule we need test estimates

Test estimation includes

- Time for writing test cases and preparing test data
- Time for executing test cases
- During test case creation new un-estimated test conditions may appear
- Test estimations are usually made by senior QAs

Estimates techniques

- If tasks are big break them into smaller tasks
- Time for re-testing should be considered

Test Execution

Test Execution

Test execution consist of:

- Testing new functionalities
- Regression testing

Smoke test

- Is done before start test execution
- Is fast test
- Verifies that the system works
- Concentrates on finding blocking issues

Testing new functionalities

- New test set is created for testing that feature corresponding to that cycle of that release
- Regression testing is included

How to Effectively Test a Functionality?

- Read the requirements or specification corresponding to that feature thoroughly
- Develop the test cases exclusively to test the functionality
- Knowledge of how the functionality has been implemented - this gives clarity on the impacted areas
- Start testing the feature early in the cycle and report the defects and the same process should be repeated throughout the release builds.

Regression testing

Regression:

- Happens after system changes
- it can be functional or non-functional

What causes regression?

- **Common code changed incorrectly**
- Incorrect version control (merging conflicts)
- Incorrect bug fixes



Regression testing

When should you do regression testing?

- At all levels - unit testing, integration testing, system testing, etc.
- At least one complete regression test before system deployment to production

Which test cases do you execute in regression testing?

- Select only test cases that cover the impacted components of the system (if time is short)

Regression testing suites

Fixed regression suite - covering all functionalities

- Fixed time to execute
- All functionalities are tested
- Changed functionalities might not be sufficiently tested

Variable suite - covering changed functionalities

- Estimates are needed for every execution
- Can miss bugs in case of incorrect affected functionalities analysis

Summary

- What are the elements of a Test plan?
- When do we start testing?
- How to test new functionality?
- Regression testing suites?

QUESTIONS