BEST PRACTICE
Prerequisites to Test Reporting

From the developer and user perspective the value of software testing is in the reports issued by the testers. The testers uncover facts, document those facts into a finding, and then report that information to developers and users. They may also provide opinions and recommendations under findings. The test reporting process begins with the prerequisite to collect test status data, analyze the data, and supplement the data with effective metrics.

It is recommended that a database be established in which to store the results collected during testing. It is also suggested that the database be put online through client/server systems so that those with a vested interest in the status of the project can readily access that database for status update

The prerequisites to the process of reporting test results are:

- Define the test status data to be collected
- Define the test metrics to be used in reporting test results
- Define effective test metrics

Define and Collect Test Status Data

Processes need to be put into place to collect the data on the status of testing that will be used in reporting test results. Before these processes are built testers need to define the data they need to collect. Four categories of data that testers collect more often are:

- Test results data
- Test case results and test verification results
- Defects
- Efficiency

Test Results Data

This data will include, but not be limited to:

- Test factors – The factors incorporated in the plan, the validation of which becomes the test objective.
- Business objectives – The validation that specific business objectives have been met.

- Interface objectives – Validation that data/objects can be correctly passed among software components.
- Functions and sub-functions – Identifiable software components normally associated with the requirements for the software.
- Units – The smallest identifiable software components.
- Platform – The hardware and software environment in which the software system will operate.

Test Case Results and Test Verification Results

These are the test techniques used by the test team to perform testing. They include, but are not limited to:

- Test cases – The type of tests that will be conducted during the execution of tests, which will be based on software requirements.
- Inspections – A verification of process deliverables against deliverable specifications.
- Reviews – Verification that the process deliverables/phases are meeting the user's true needs.

Defects

This category includes a description of the individual defects uncovered during testing. The description of defects should include, but is not limited to:

- Data the defect uncovered
- Name of the defect
- Location of the defect
- Severity of the defect
- Type of defect
- How the defect was uncovered (i.e., test data/test script)

The results of later investigations should add to this information in the form of where the defect originated, when it was corrected, and when it was entered for retest.

Efficiency

As the Test Plan is being developed, the testers decompose requirements into lower and lower levels. Conducting testing is normally a reverse of the test planning process. In other words, testing begins at the very lowest level and the results are rolled up to the highest level. The final Test Report determines

whether the requirements were met. How well documenting, analyzing, and rolling up test results proceeds depends partially on the process of decomposing testing through a detailed level. The roll-up is the exact reverse of the test strategy and tactics. The efficiency of these processes should be measured.

Two types of efficiency can be evaluated during testing: efficiency of the software system and efficiency of the test process. If included in the mission of software testing, the testers can measure the efficiency of both developing and operating the software system. This can involve simple metrics such as the cost to produce a function point of logic, or as complex as using measurement software.

Define Test Metrics used in Reporting

The most common Test Report is a simple matrix, which indicates the test cases, the test objectives, and the results of testing at any point in time.

The following six tasks define how a test team can define metrics to be used in test reporting. An important part of these tasks is to assure that the data needed (i.e., measures) to create the test metrics is available.

1. Establish a test metrics team.

   The measurement team should include individuals who:

   - Have a working knowledge of quality and productivity measures.
   - Are knowledgeable in the implementation of statistical process control tools.
   - Have a working understanding of benchmarking techniques.
   - Know the organization's goals and objectives.
   - Are respected by their peers and management.

The measurement team may consist of two or more individuals, relative to the size of the organization. Representatives should come from management and development and maintenance projects. For an average-size organization, the measurement team should be between three and five members.

2. Inventory existing IT measures.

   The inventory of existing measures should be performed in accordance with a plan. Should problems arise during the inventory, the plan and the inventory process should be modified accordingly. The formal inventory is a systematic and independent review of all existing measures and metrics captured and maintained. All identified data must be validated to determine if they are valid and reliable.

The inventory process should start with an introductory meeting of the participants. The objective of this meeting is to review the inventory plan with management and representatives of the projects that are to be inventoried. A sample agenda for the introductory meeting is:

- Introduce all members.
- Review scope and objectives of the inventory process.
- Summarize the inventory processes to be used.
- Establish communication channels to use.
- Confirm the inventory schedule with major target dates.

The inventory involves these activities:

- Review all measures currently being captured and recorded. Measures should include, but not be limited to, functionality, schedule, budgets, and quality.
- Document all findings. Measures should be defined; samples captured, and related software and methods of capture documented. Data file names and media location should be recorded. It is critical that this be as complete as possible in order to determine the consistency of activities among different projects.
- Conduct interviews. These interviews should determine what and how measurement data is captured and processed. Through observation, the validity of the data can be determined.

3. Develop a consistent set of metrics.

To implement a common set of test metrics for reporting that enables senior management to quickly access the status of each project, it is critical to develop a list of consistent measures spanning all project lines. Initially, this can be challenging, but with cooperation and some negotiating, a reasonable list of measures can be drawn up. Organizations with mature processes will have an easier time completing this step, as well as those with automated tools that collect data.

4. Define desired test metrics.

The objective of this task is to use the information collected in tasks 2 and 3 to define the metrics for the test reporting process. Major criteria of this task includes:

- Description of desired output reports
- Description of common measures

- Source of common measures and associated software tools for capture
- Definition of data repositories (centralized and/or segregated)

5. Develop and implement the process for collecting measurement data.

The objective of this step is to document the process used to collect the measurement data. The implementation will involve these activities:

- Document the workflow of the data capture and reporting process
- Procure software tool(s) to capture, analyze, and report the data, if such tools are not currently available.
- Develop and test system and user documentation.
- Beta-test the process using a small to medium-size project.
- Resolve all management and project problems.
- Conduct training sessions for management and project personnel on how to use the process and interrelate the reports.
- Roll out the test status process.

6. Monitor the process.

Monitoring the test reporting process is very important because the metrics reported must be understood and used. It is essential to monitor the outputs of the system to ensure usage. The more successful the test reporting process, the better the chance that management will want to use it and perhaps expand the reporting criteria.

References

Guide – CSTE Common Body Of Knowledge, V6.1