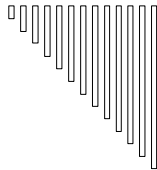# Life Cycle Testing Approach

Oleh :

Ir. I Gede Made Karma, MT

The Cost of Computer Testing

Two general categories of testing

1. **Pre implementation Testing**
   → to determine that the system functions as specified and that defects in the system are removed prior to placing the system into production.
2. **Post implementation Testing**
   → occurs after the system goes into operation and is normally considered part of system maintenance.

The Cost of Computer Testing (1)

□ There are two types of testing:
   1. Preimplementation
   Consist of 4 points:
      1. Building the defect into the system
      2. Identifying existence of the defect
      3. Correcting the defect
      4. Testing to determine that the defect is removed

The Cost of Computer Testing(2)

2. Postimplementation
   1. Specifying and coding the defect into system
   2. Detecting the problem within the application system
   3. Reporting the problem to Information services and/or the user
   4. Correcting the problems caused by the defect

(continues…)

The Cost of Computer Testing(3)

2. Postimplementation (continued)
   5. Operating the system until the defect is corrected
   6. Correcting the defect
   7. Testing to determine that the defect no longer exist
   8. Integrating the corrected program(s) into production

Quantifying the Cost of removing Defects (1)

- ❑ 60 defects per 1000 source statements
- ❑ 40 out of the 60 defects per 1000 lines of source code
- ❑ These defect include 11 issues:
  1. Improperly interpreted requirements
  2. User specify wrong requirements
  3. Requirements are incorrectly recorded
  4. Design specifications incorrect

(continues…)

Quantifying the Cost of removing Defects (2)

5. Program specifications incorrect
6. Program coding error
7. Program structural or instruction error
8. Data entry error
9. Testing error
10. Error correction mistake
11. Correction condition causes another defects

Quantifying the Cost of removing Defects (3)

- ❑ Three types of costs required for correcting the programs:
  1. Defects encountered during requirement and design
     - ❑ Cost=cost for correcting the defect (CDs)
  2. Defects corrected during the system test phase
     - ❑ Cost = CDs x 10
  3. Defects corrected after the system goes into production
     - ❑ Cost = CDs x 100

Life Cycle Testing Concept

- ☐ Life cycle testing involves continuous testing of the systems during the developmental process.
- ☐ Life cycle testing cannot occur until a formalized system development process has been incorporated.
- ☐ Life cycle testing is dependent upon the completion of predetermined deliverables at specified points in the developmental life cycle.
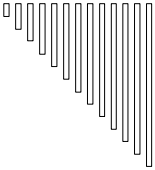
Four Composition of the Test Team (1)

| Test team approach	Composition of test team members	Advantages	Disadvantages
1. Internal IS	Project team	☐Minimize cost ☐Training ☐Knowledge of project	☐Time allocation ☐Lack of independence ☐Lack of objectivity

Four Composition of the Test Team (2)

Test team approach	Composition of test team members	Advantages	Disadvantages
2. External IS	□Professional tester □Quality assurance	□Independent view □IS professionals □Multiple project testing experience	□Cost □Overreliance □Competition

Four Composition of the Test Team (3)

Test team approach	Composition of test team members	Advantages	Disadvantages
3. Non-IS	□Users □Auditors □Consultants	□Independent view □Independent in assessment □Ability to act	□Cost □Lack of IS knowledge □Lack of project knowledge

Four Composition of the Test Team (4)

Test team approach	Composition of test team members	Advantages	Disadvantages
4. Combination	Any or all the above	□Multiple skills □Education □Clout	□Cost □Scheduling review □Diverse background

Testing Concern

Testing Concern (1)

□ The test factors (there are 15 test factors) describe the broad objectives of testing. The concerns for each of the test factors are briefly described next.

Testing Concern (2)

1. Reliability test factor
   - testing the reliability of data, control, function
2. Authorization test factor
   - making sure the authorization suits the specifications
3. File integrity test factor
   - testing the integrity of file, used
4. Audit trail test factor
   - testing the functional testing

Testing Concern (3)

5. Continuity of processing test factor
- Problems while integrating the new system and how to make contingency plan for updating and testing the new system.

6. Service level test factor
- Test the new system in both normal and above normal pressure.

7. Access control test factor
- Concern in security problems

8. Methodology test factor
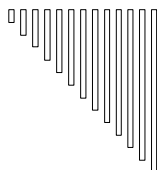- All process in building the new system must compliance with chosen methodology

Testing Concern (4)

9. Correctness test factor
- All requirements are properly implemented

10. Ease of use test factor
- The application is easy to use

11. Maintainable test factor
- The new system is easy to be maintained

12. Portable test factor
- The new system is easy to be implemented in the different platform.

Testing Concern (5)

13. Coupling test factor
- To ensure that the interface between systems functions properly

14. Performance test factor
- The program are design and implemented to achieve the performance criteria

15. Ease of operation test factor
- To ensure that the operational needs is fully implemented

Responsibility for Establishing a Test Plan

Responsibility for Establishing a Test Plan

- Responsibility of project manager
- Identify testing factor to be applied during testing process
- Test factor → test requirements
- Test plan must be customized for each individual application.

Conclusions (1)

- Life cycle testing means performance testing in parallel with systems development.
- There are four various composition of a test team: internal IS, external IS, non IS and combination. Each composition have their own pros and cons.

Conclusions (2)

- There are four concepts in life cycle testing:
1. continuous
2. needs a formalized system development process that has been incorporated.
3. Dependent upon the completion of predetermined deliverables
4. Best accomplished by the formation of test team.
- Life cycle testing main purpose is to reduce the total cost of testing that is needed in the overall process of software development.

Reference

- Perry, William., *Effective Methods for Software Testing.* New York: John Wiley & Sons, Inc.,1995