

# *System Testing and Implementation*

## *Testing Process*

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## Types of System Testing

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- ***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 (implementation).
- ***Post-implementation testing.***  
Part of system maintenance.

## Cost of Pre-Implementation Testing

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- Building the defect into the system.
- Identifying existence of the defect.
- Correcting the defect.
- Testing to determine that the defect is removed.

## Cost of Post-Implementation Testing

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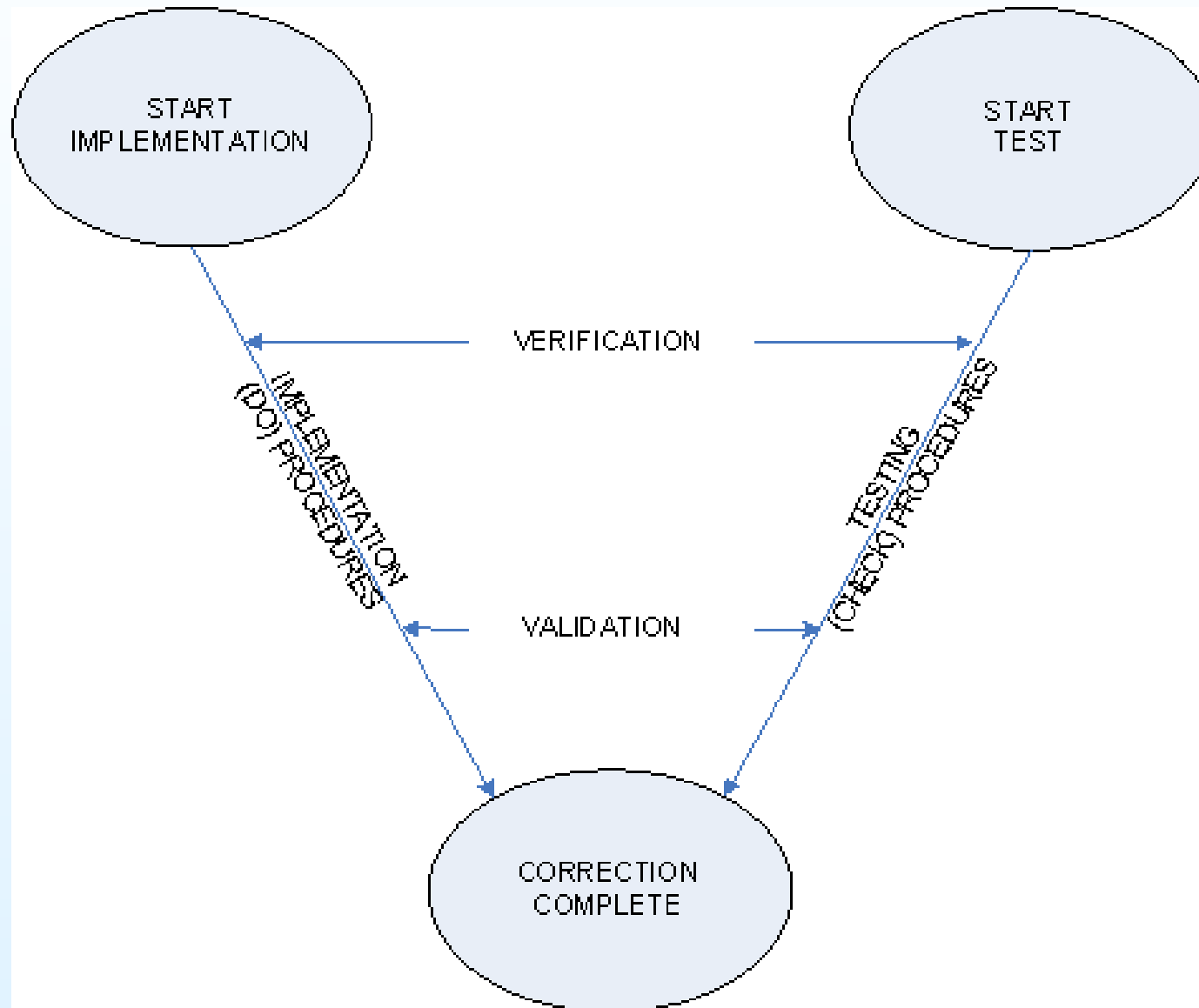
- Specifying and coding the defect into the system.
- Detecting the problem within the application system.
- Reporting the problem to information services and/or the user.
- Correcting the problems caused by the defect.
- Operating the system until the defect is corrected.
- Correcting the defect.
- Testing to determine that the defect no longer exists.
- Integrating the corrected program(s) into production.

## Cause of Defects

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- Improperly interpreted requirements.
- Users specify wrong requirements.
- Requirements are incorrectly recorded.
- Design specifications incorrect.
- Program specifications incorrect.
- Program coding error.
- Program structural or instruction error.
- Data entry error.
- Testing error.
- Error correction mistake.
- Corrected condition causes another defect.

# V-Testing Concept

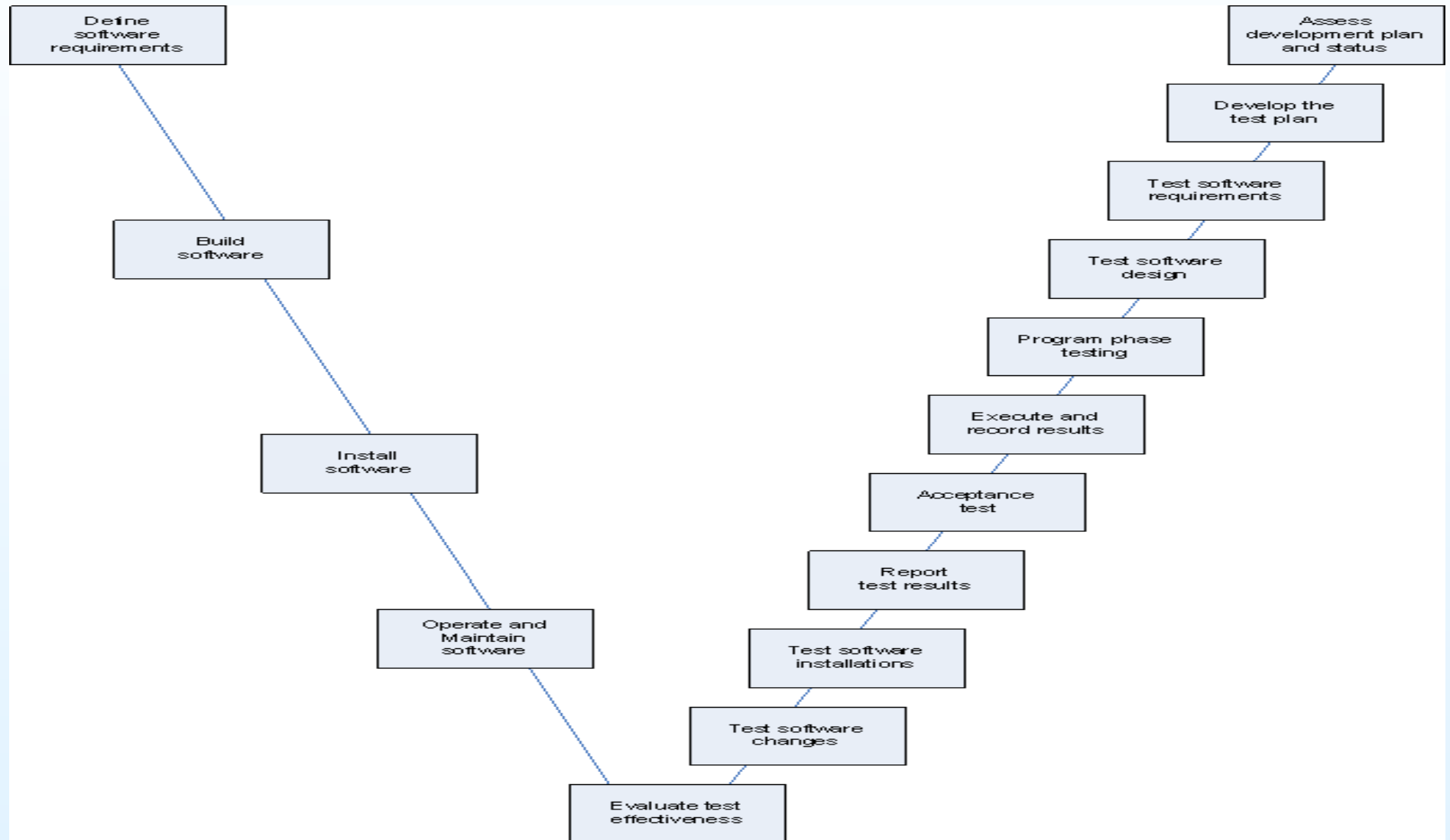


## Eleven-Step Testing

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- Asses development plan and status.
- Develop the test plan.
- Test software requirements.
- Test software design.
- Program phase testing.
- Execute and record results.
- Acceptance test.
- Report test results.
- Test software installation.
- Test software changes.
- Evaluate test effectiveness.

# Eleven-Step V-Testing





## Step 1: Asses development plan and status

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- Testing the validity of the software estimate.
- Testing the status of the software system.

## Step 2: Develop the test plan

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- Form the test team.
- Understand the project risks.
- Build the test plan.
- Inspect the test plan.

## Step 3: Test software requirements

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- Prepare a risk matrix.
- Perform a test factor analysis for the requirements phase (methodology, correctness, ease-of-use, maintainable, portable, coupling, performance, ease-of-operations, reliability, authorization, file integrity, audit trail, continuity-of-processing, service level, security).
- Conduct a requirements walk-through.

## Step 4: Test software design

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- Score success factors.
- Analyze test factors.
- Conduct design review.
- Inspect design deliverables.

## Step 5: Program phase testing

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- Desk debug the program.
- Perform program phase test factor analysis.
- Conduct a program peer review.

## Step 6: Execute and record results

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- Build test data.
- Execute tests.
- Record test result.

## Step 7: Acceptance test

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- Define the acceptance criteria.
- Develop an acceptance plan.
- Execute the acceptance plan (conduct acceptance tests and reviews)
- Reach an acceptance decision.

## Step 8: Report test results

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- Report software status.
- Report interim test results and individual component test results.
- Report final test results.



## Step 9: Test software installation

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- Test installation of new software.
- Test changed version (of software).
- Monitor production.
- Document problems.

## Step 10: Test software changes

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- Develop/update the test plan.
- Develop/update the test data.
- Test the control change process.
- Conduct testing.
- Develop/update the training material.

## Step 11: Evaluate test effectiveness

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- Establish assessment objectives.
- Identify what to measure.
- Assign measurement responsibility.
- Select evaluation approach.
- Identify needed facts.
- Collect evaluation data.
- Assess the effectiveness of testing.

# References

- [1] William E. Perry, *Effective Methods for Software Testing*, 2<sup>nd</sup> ed., John Wiley & Sons, 2000.