
Test Automation Architectures: Planning for Test Automation

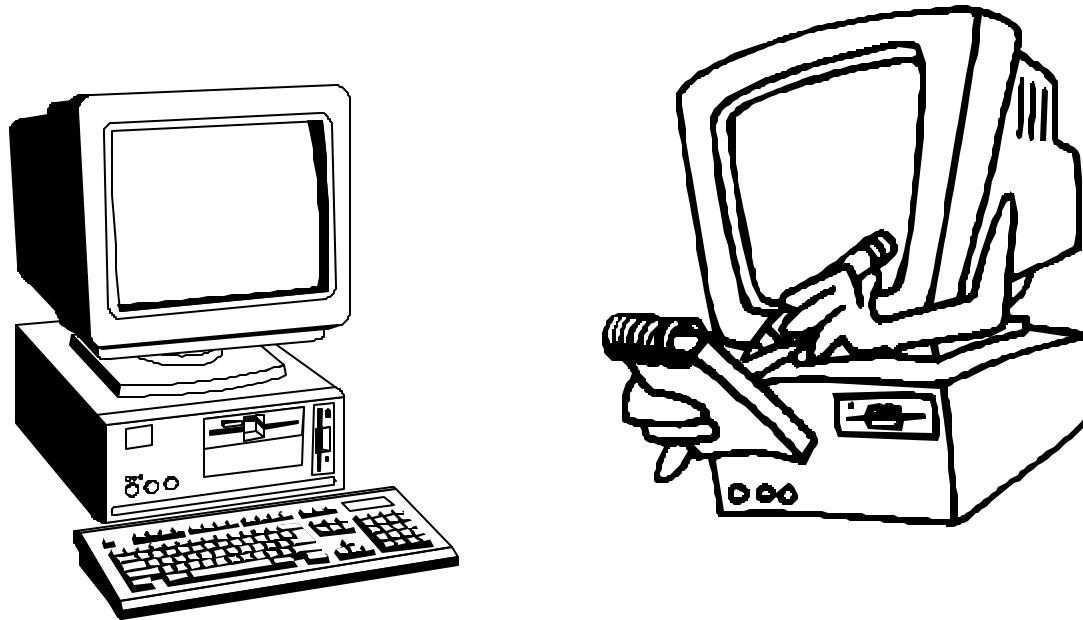
Quality Week '99

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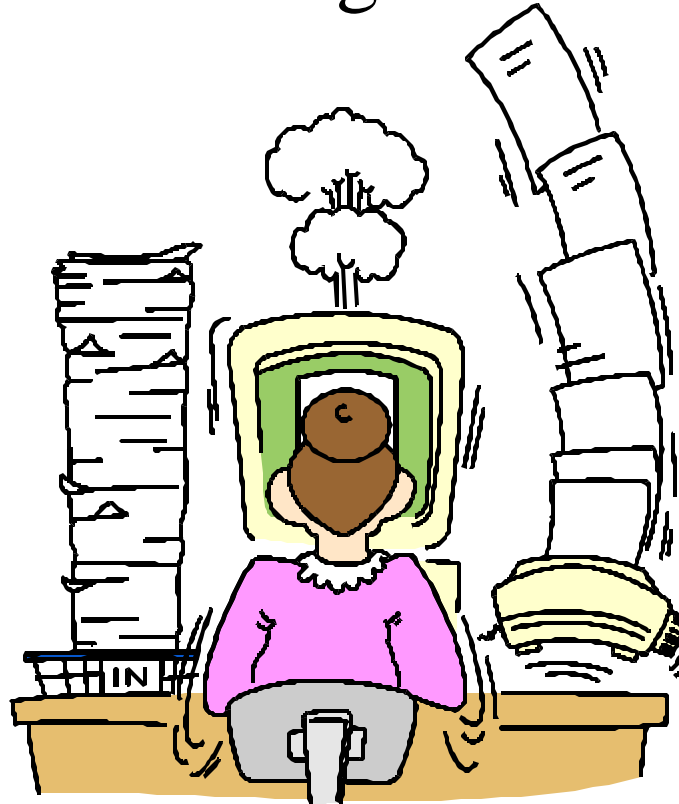
Test Automation

is not just machines running tests!



Test Automation Architecture

From selecting what to test



through reporting results

Manual Software Tests

- Person initiates each test case
- Person must interact with the test, SUT, or the environment during the test case
- Person is required to act in order that analysis of test results takes place
- Person summarizes and reports results

Automated Software Tests

- Able to run two or more specified test cases
- Able to run a subset of all the automated test cases
- No intervention needed after launching tests
- Automatically sets-up and/or records relevant test environment
- Runs test cases
- Captures relevant results
- Compares actual with expected results
- Reports analysis of pass/fail

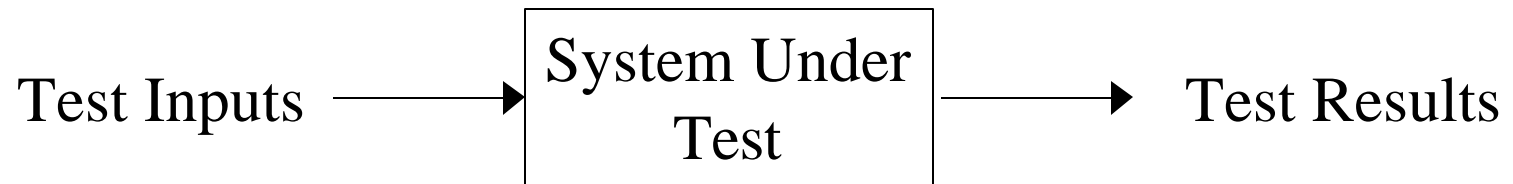
Levels of Automation

- Fully automated software testing
- Semi-automated software testing
- Manual software testing

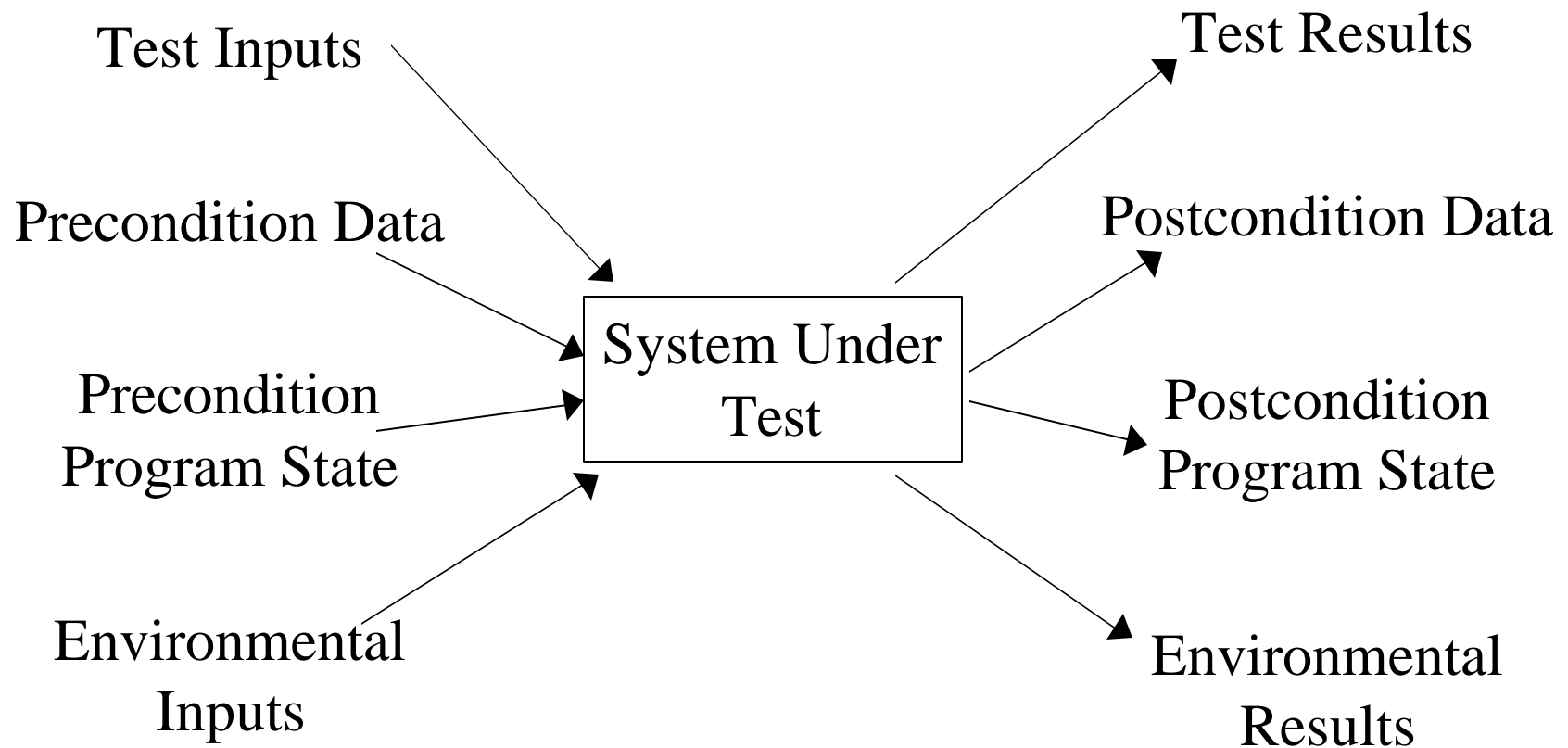
Key Automation Factors

- Components of SUT
- Important features and capabilities
- SUT environments
- Testware elements
- Access to inputs and results
- Form of inputs and results

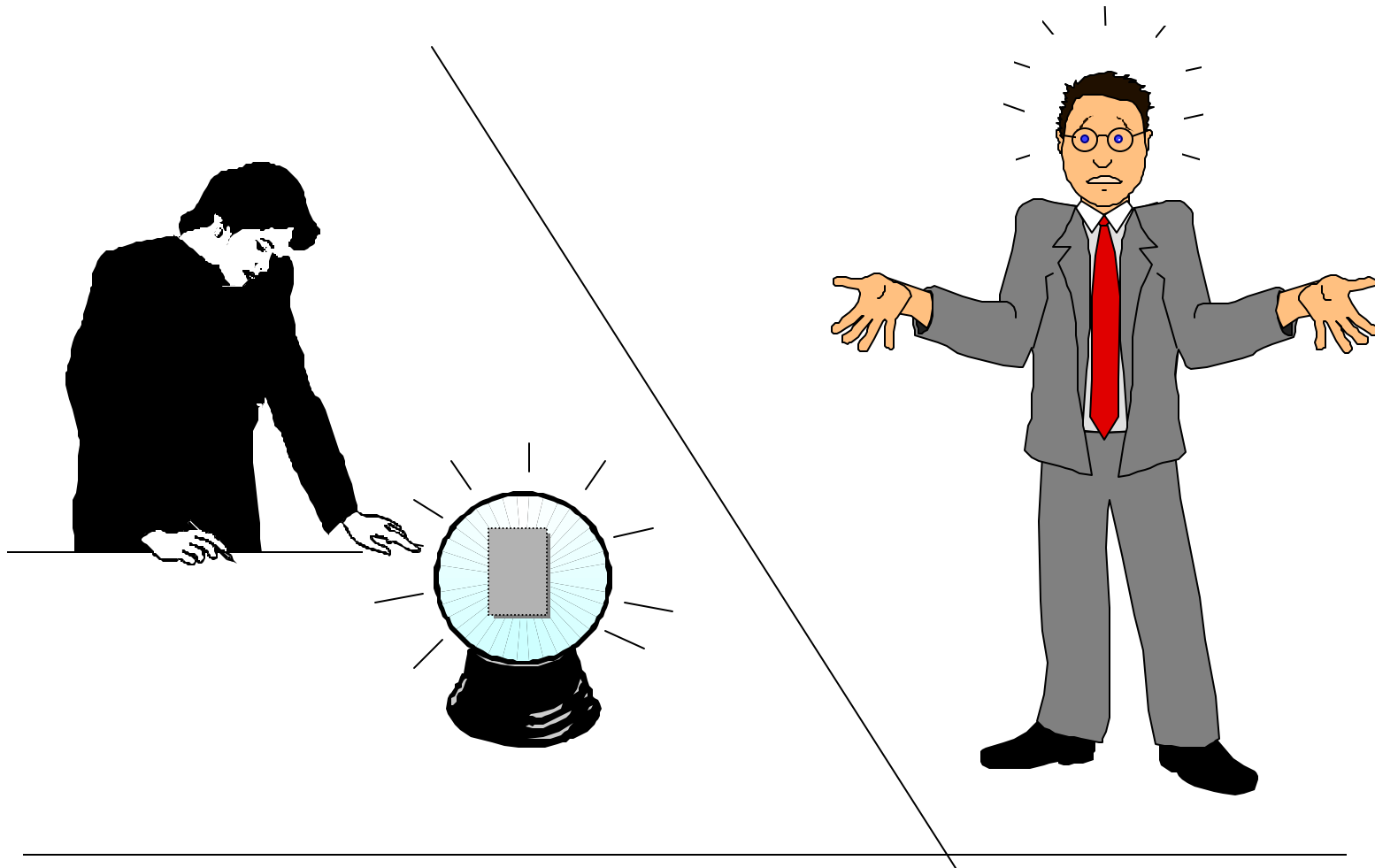
Simple Testing Model (Black Box)



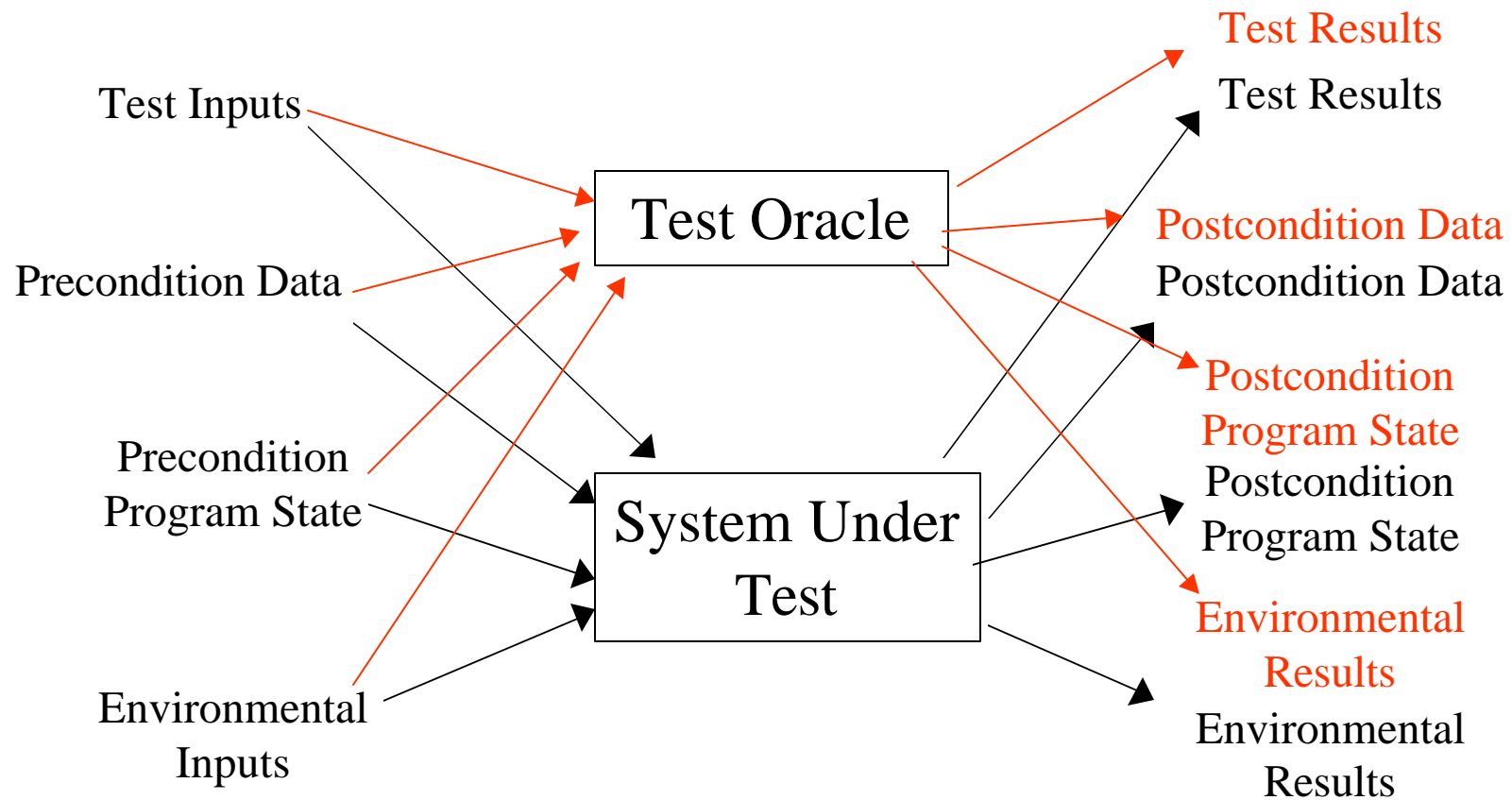
Expanded Testing Model (Black Box)



Test Oracles



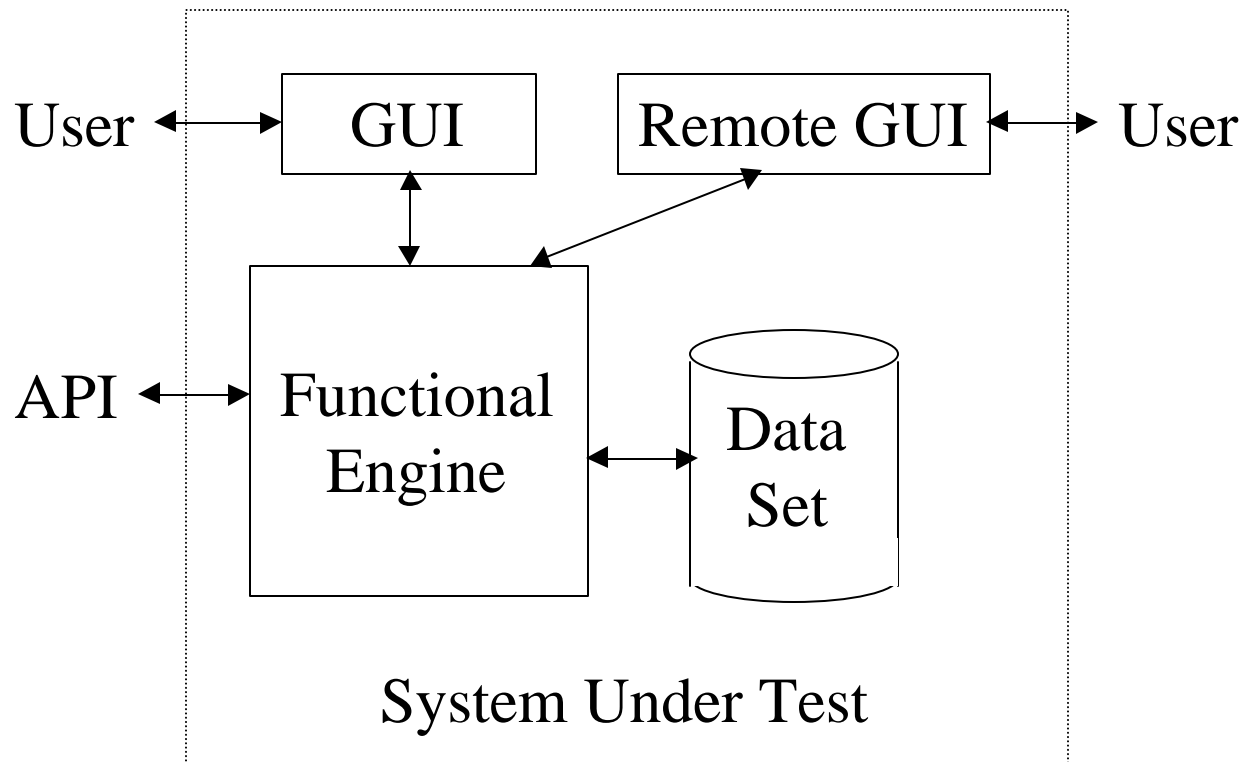
Testing Model With Oracle



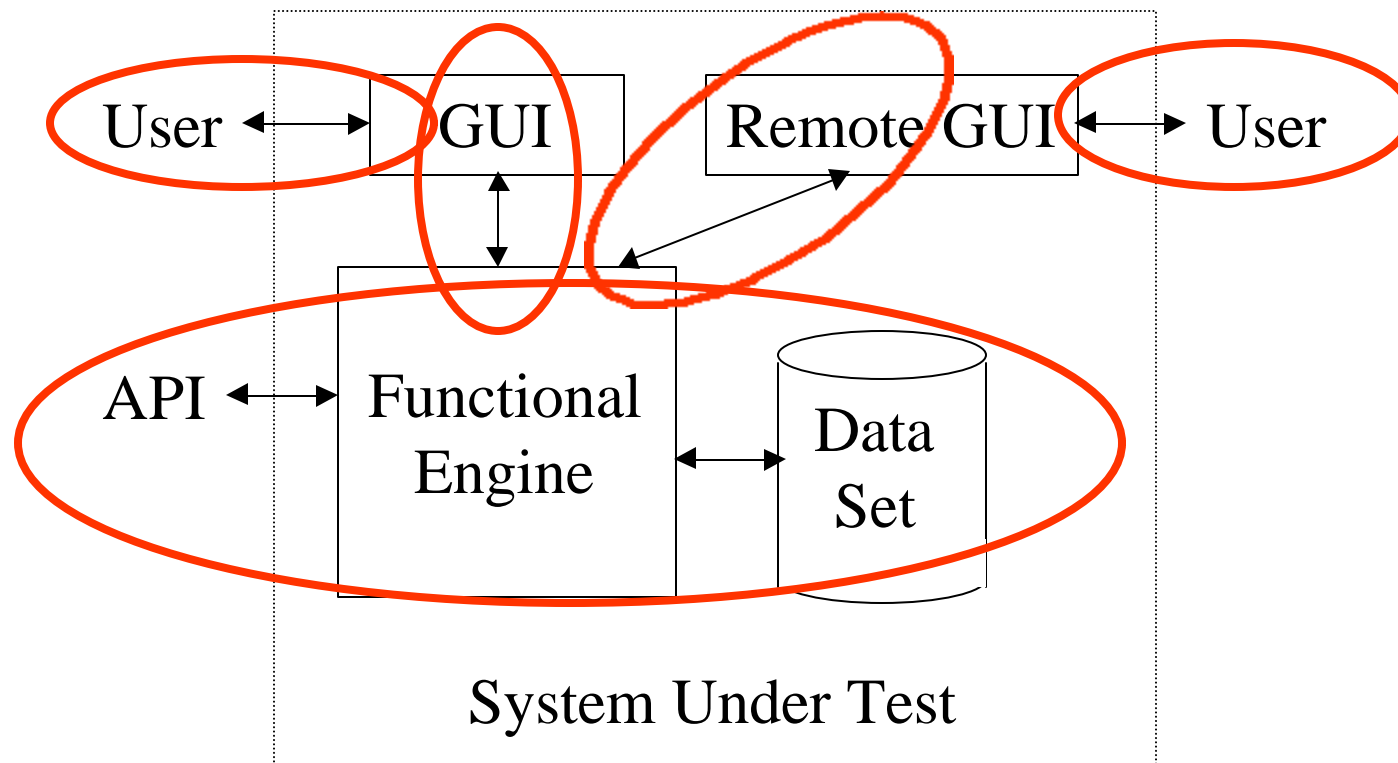
Architecting Automation

- Model for SUT and environment
- Break down software testing problem
- Decide on location(s) of automation
- Decide on level(s) of automation
- Describe automation architecture

A Model For SUT



Break Down The Testing Problem



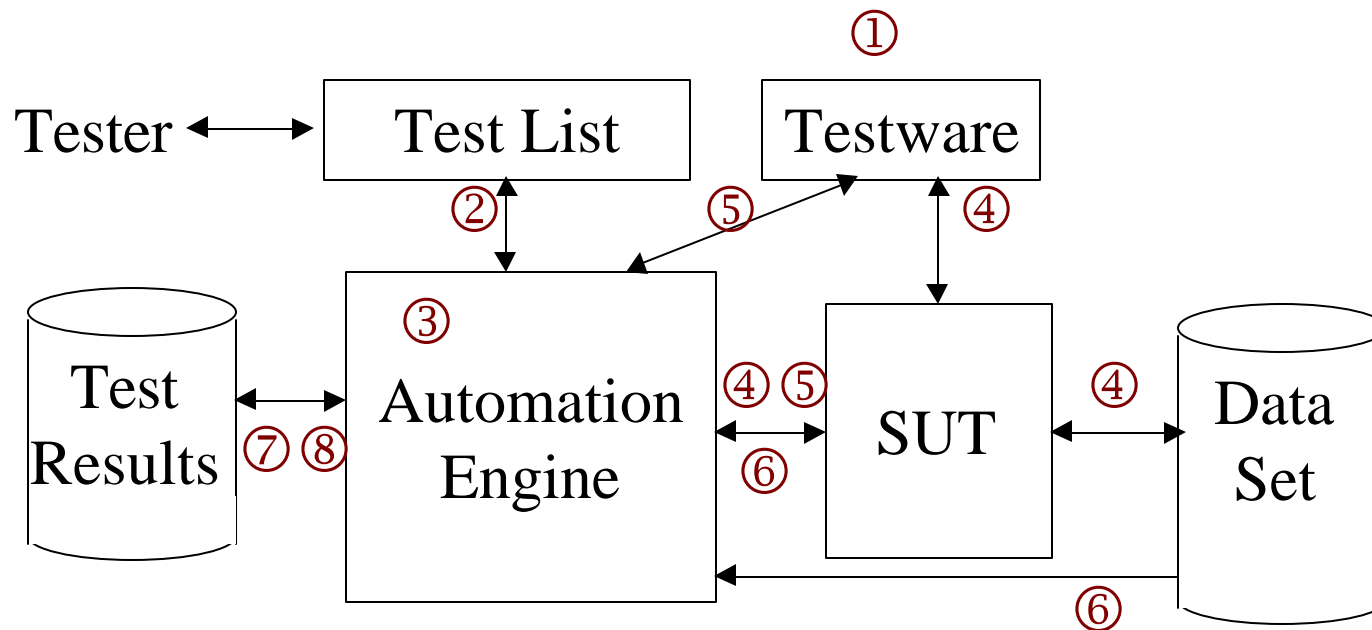
Location and Level for Automated Testing

- Availability of inputs and results
- Ease of automation
- Stability of SUT
- Practicality of Oracle creation and use
- Priorities for testing

Automated Test Sequencing

- Testware version and configuration management
- Select the subset of test cases to run
- Set-up and/or record environment
- Run test exercises
- Monitor test activities
- Capture relevant results
- Compare actual with expected results
- Report analysis of pass/fail

An Automated Software Testing Process Model



Automation Process

- List the sequence of automated events
- Identify elements of each event
- Decide on location(s) of events
- Determine flow control mechanisms
- Design automation mechanisms

Conclusions

- Architecture design begins with analysis
- Model the SUT
- Break down testing problem
- Model the testing process
- Design the automation architecture
- KISS

