

What IS a Good Test Case?

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For more details, *read the paper* that comes with this presentation.

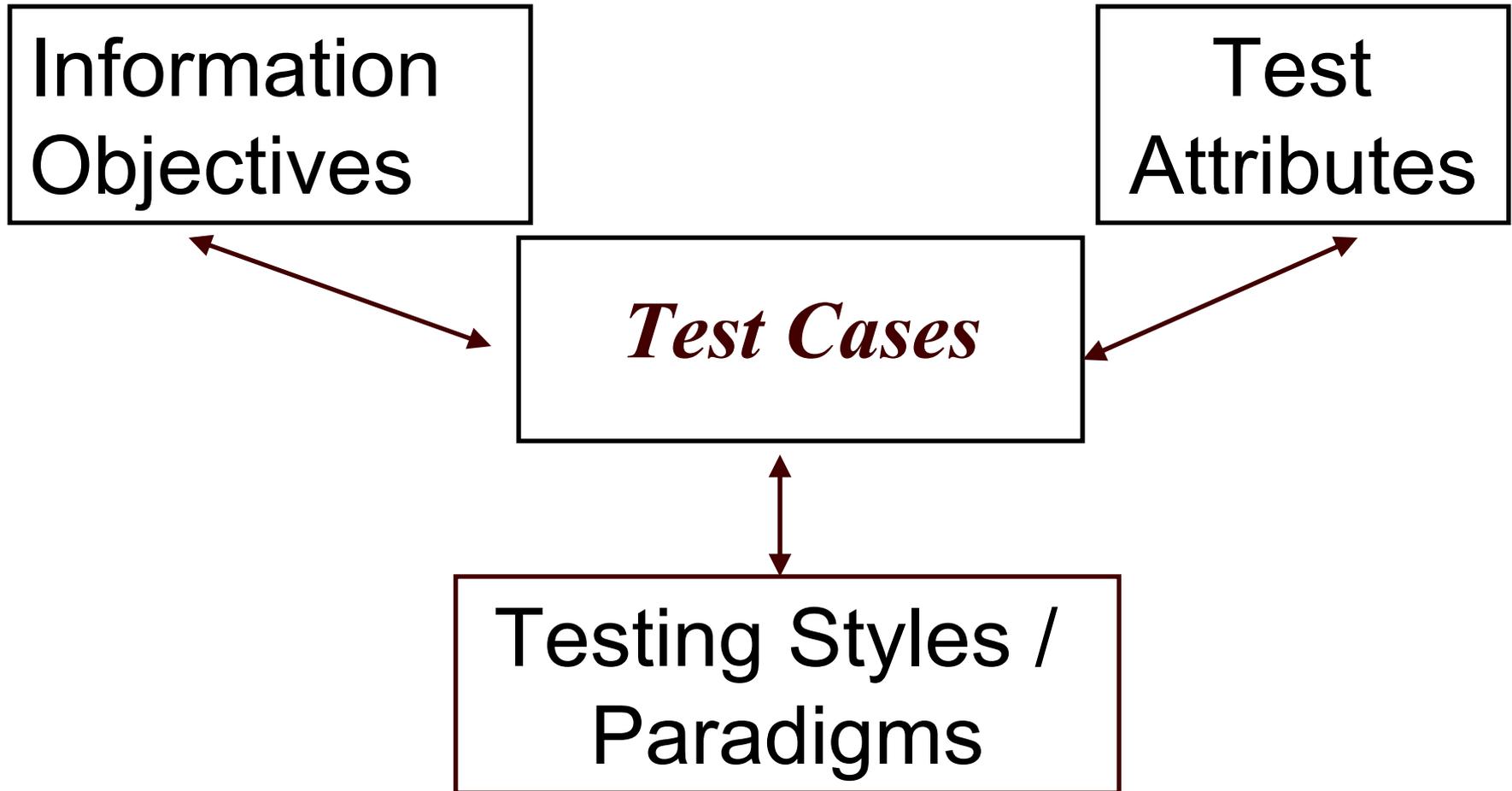
What's a Test Case?

- Focus on procedure?
 - “A set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular program path or to verify compliance with a specific requirement.” (IEEE)
- Focus on the test idea?
 - “A test idea is a brief statement of something that should be tested. For example, if you're testing a square root function, one idea for a test would be ‘test a number less than zero’. The idea is to check if the code handles an error case.” (Marick)

Test Case

- In my view, a test case is a question that you ask of the program. The point of running the test is to gain information, for example whether the program will pass or fail the test.
- Implications of this approach:
 - The test must be CAPABLE of revealing valuable information
 - The SCOPE of a test changes over time, because the information value of tests changes as the program matures
 - The METRICS that count test cases are essentially meaningless because test cases merge or are abandoned as their information value diminishes.

Factors Involved in Test Case Quality





Test Cases: Information Objectives

- ❑ Find defects
- ❑ Maximize bug count
- ❑ Block premature product releases
- ❑ Help managers make ship / no-ship decisions
- ❑ Minimize technical support costs
- ❑ Assess conformance to specification
- ❑ Conform to regulations
- ❑ Minimize safety-related lawsuit risk
- ❑ Find safe scenarios for use of the product
- ❑ Assess quality
- ❑ Verify correctness of the product
- ❑ Assure quality

Test Cases: Test Attributes

- For These Objectives:
 - Find bugs that will be considered relevant
 - Get these bugs fixed
- Attributes: One test is better than another if it is:
 - More powerful
 - More likely to yield significant (more motivating, more persuasive) results
 - More credible
 - Representative of events more likely to be encountered by the user
 - Easier to evaluate.
 - More useful for troubleshooting
 - More informative
 - More Appropriately complex
 - More likely to help the tester or the programmer develop insight into some aspect of the product, the customer, or the environment



Test Cases: Testing Styles / Paradigms

- ❑ Function testing
- ❑ Domain testing
- ❑ Specification-based testing
- ❑ Risk-based testing
- ❑ Stress testing
- ❑ Regression testing
- ❑ User testing
- ❑ Scenario testing
- ❑ State-model based testing
- ❑ High volume automated testing
- ❑ Exploratory testing

Concluding Notes

- There's no simple formula or prescription for generating “good” test cases. The space of interesting tests is too complex for this.
- There are tests that are *good for your purposes*, for bringing forth the type of information that you're seeking.
- Given a purpose, we can evaluate tests as better or worse along *several dimensions*, in terms of how they advance that purpose.
- *Test types differ along the dimensions.*
- Many test groups stick with a few types of tests. To achieve the broad range of value from our tests, we have to use a broad range of techniques, consciously selected to help us achieve our information goals.