

# 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?

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- 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)

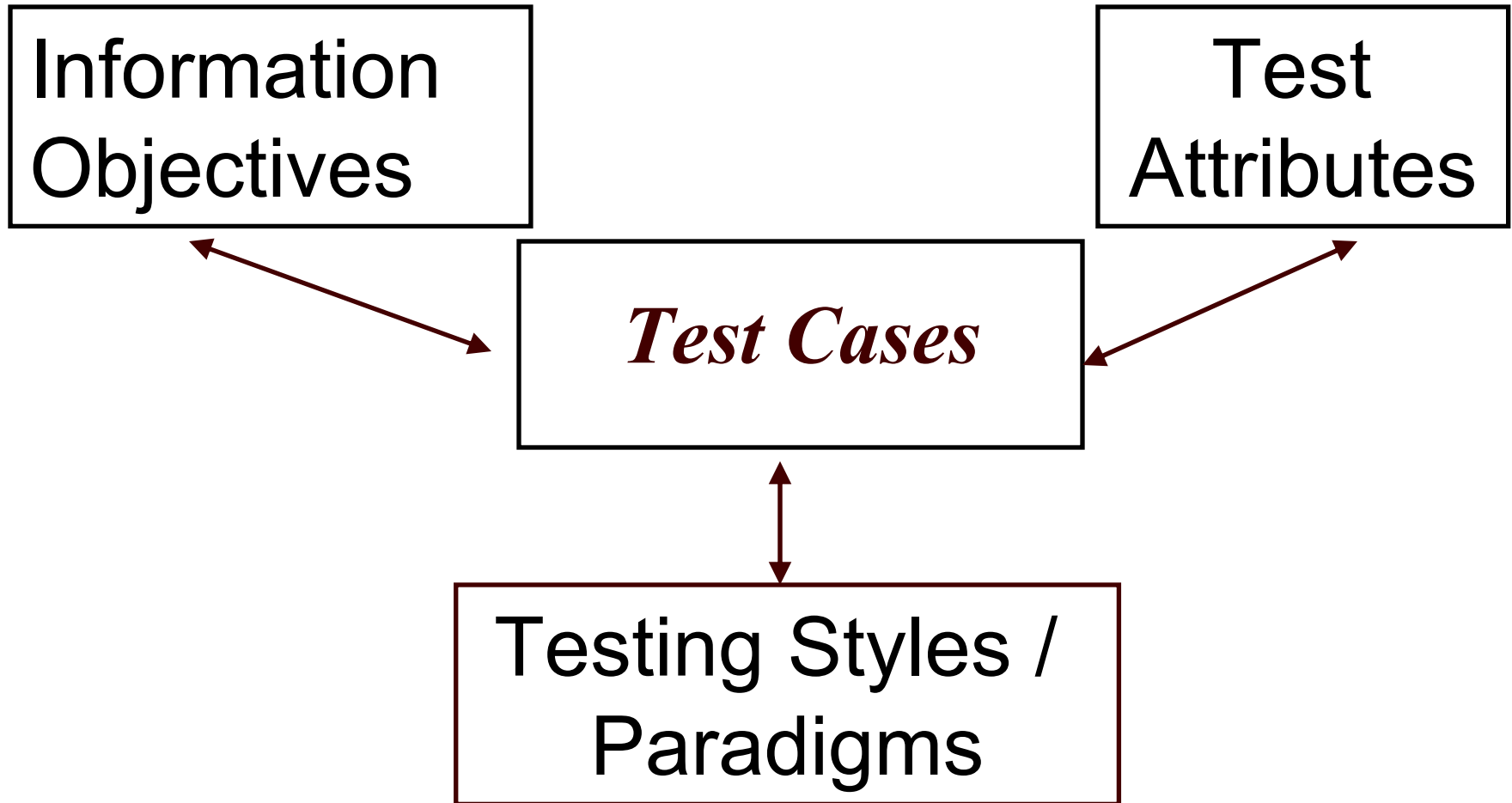
# Test Case

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- 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

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# Test Cases: Information Objectives

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- ❑ 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

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- 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

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- ❑ 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

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- 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.