

Strategies of Testing, Not Schools

A Powerful Way to Effective, Efficient Testing

If you outnumber the enemy ten to one, surround them.

If you outnumber them five to one, attack them.

If you outnumber them two to one, divide them.

If you are equal, then find an advantageous battle.

If you are fewer, defend against them.

If you are much weaker, evade them.



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What's Wrong with the Schools?

- “Seven principles” okay, but also common sense for the most part
- However, a tree should be judged by its fruit:
 - No one claims membership in other schools
 - The concept started the schism in software testing
 - The only papers on schools are by CDTs (and are unremittingly negative about other schools)
 - The most prescriptive pronouncements emanate from CDTs (just follow them on Twitter)
 - Builds a Tower of Babel by re-naming established terms (e.g., “checking” vs. “verification”)
 - Often used as an excuse to be exceptionally rude
 - Has been used to establish an orthodoxy
- To quote Bret Pettichord, schools “can be used to dismiss ideas you don’t agree with,” which is usually what I see



Strategies: a Better Way to Think

- ❖ Strategy: “a careful plan or method for achieving a particular goal, usually over a long period of time”
- ❖ Schools: “a group of persons who hold a common doctrine or follow the same teacher”
- ❖ When you choose to belong to a school, you are bound to its doctrines/teachers
- ❖ When you choose strategies, you do so to serve your needs and those of your stakeholders



Test Strategies

- A test strategy is a general, project-independent pattern for how testing is done
- The various test strategies discussed here are in use by test teams around the world
- Some work sometimes, some don't work sometimes, but all *have* worked in some situations
- What do you need to know about test strategies, how to select them, and how to blend them for success?
- Let's see...



Analytical Test Strategies

- ❖ Includes two of the most common strategies
 - ❑ Requirements-based testing
 - ❑ Risk-based testing
- ❖ Analyze the test basis to identify the test conditions



Analytical: Key Characteristics

- ✚ Benefits: Alignment with test basis, measurability of testing, defect prevention, and transparency of test coverage
- ✚ Factors for success: Document-focused strategies require the document(s), while stakeholder-focused strategies require input from the stakeholders
- ⚡ Risks: For document-focused strategies, unmanaged changes, absent, or low-quality documents, while, for stakeholder-focused strategies, the inability to engage the stakeholders
- ⚡ Stakeholders are involved, and the analysis occurs before the software is delivered for testing



Model-based Test Strategies

- ❖ Include:
 - ❑ Operational profiling for reliability and performance
 - ❑ Models such UML for functional aspects
- ❖ Develop a model of the environment, the inputs, and system's behavior, typically from study of actual or anticipated situations



Model-based: Key Characteristics

- ➊ Benefits: Testing consistent with real-world usage
- ➋ Factors for success: An accurate model of real-world usage and available tools
- ➌ Risks: Insufficient data, statistical inaccuracies, improper selection of tools, and a focus on positive paths
- ➍ Model-based strategies involve the key test stakeholders in validation of the model and its construction



Methodical Test Strategies

- ❖ Use standard set of test conditions
- ❖ These predetermined test conditions can include:
 - ❑ A quality standard
 - ❑ A checklist
 - ❑ Logical test conditions
- ❖ The test conditions don't vary across iterations or releases



Methodical: Key Characteristics

- ❖ Benefits: Consistent testing of defined attributes
- ❖ Factors for success: Adequate, current test conditions, and stable test object
- ❖ Risks: An insufficient or outdated test basis
- ❖ Methodical strategies involve key test stakeholders only in initial definition test conditions



Process-compliant Test Strategies

- ❖ Follow a set of processes defined by others
- ❖ Processes typically address:
 - ❑ Documentation
 - ❑ Proper test basis and test oracle
 - ❑ Organization of the test team



Process-compliant: Key Characteristics

- Benefits: Leveraging skills and experience of standard creators (e.g., IEEE Standards or Agile approaches)
- Factors for success: The selected process must align with existing test problems
- Risks: Improper understanding of process, improper implementation of process, and misapplication of process
- Stakeholder involvement depends on the process (e.g., Agile requires daily engagement)



Reactive Test Strategies

- ❖ Test approach evolves rapidly
- ❖ Tests derive from practical experience rather than formal models
- ❖ Test team designs and implements tests once test item is received
- ❖ React to the system under test
- ❖ Pre-existing structure (e.g., fault attacks) can be used



Reactive: Key Characteristics

- Benefits: Finds different defects, low cost per defect found, continuous re-focusing of testing, robust given incomplete test basis
- Factors for success: Skilled and experienced testers with deep understanding of the application and technologies
- Risks: Insufficient skill, lack of knowledge of system and/or subject, limited demonstrable coverage, poorly defined test oracle
- Frequently used in combination with formalized strategies to measure coverage and leverage knowledge



Consultative Test Strategies

- ❖ Rely on the input of one or more key stakeholders
- ❖ External stakeholders determine test conditions to cover
- ❖ Stakeholders have complete control over conditions



Consultative: Key Characteristics

- ✚ Benefits: Consulted stakeholders can receive their desired coverage
- ⌚ Factors for success: Consulted stakeholders need an accurate concept of what should be tested, how much, and in what order
- ⌚ Risks: Conflicting priorities between stakeholders, incorrect definition of the test conditions, no means for self-checking the direction, wrong set of stakeholders
- ⌚ Consultative strategies are often used in concert with other strategies to reduce risk of testing gaps
- ⌚ Consultative strategies are also used by outsource testing service providers



Regression-averse Test Strategies

- ❖ Manage the risk of regression through testing
- ❖ Extensive automation is common
- ❖ Automation can occur at one or more levels
- ❖ For iterative lifecycles, regression risk is higher, so ongoing regression risk management is very important



Regressive-averse: Key Characteristics

- ⊕ Benefits: Minimize risk of regression in key areas while supporting quick releases of new versions
- ⊕ Factors for success: Successful, efficient, maintainable automation at the unit, integration, system, and/or system integration levels
- ⊕ Risks: Insufficient or unavailable tools, unautomatable tests, insufficient skills, poorly tested new features, changing scope
- ⊕ Stakeholders want features to continue to work
- ⊕ Test automation crucial for Agile projects
- ⊕ Ideally, developers design for testability and participate in automation architecture and scripts



Blending Strategies

- ❖ Do you have to pick a single strategy?
- ❖ NO!
- ❖ Disparate strategies complement each other
- ❖ Each strategy's benefits can balance other strategies' risks
- ❖ Select a smart set of strategies and blend them for optimum success



Conclusions

- The concept of “test schools” simply binds the tester to a single test strategy
- Abandoning this failed paradigm frees testers to evaluate other test strategies which are in common use
- All have their strengths and weaknesses, so you must understand your needs to select a strategy
- Wrong choices in strategy are a frequent cause of test team failure
- Stakeholders should be involved in the strategy
- Blend strategies for optimum success



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