

Test Strategies Around the World

Winning the War on Bugs Through Strategy



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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

- ❖ Benefits: Testing consistent with real-world usage
- ❖ Factors for success: An accurate model of real-world usage and available tools
- ❖ Risks: Insufficient data, statistical inaccuracies, improper selection of tools, and a focus on positive paths
- ❖ 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- ❖ Risks: An insufficient or outdated test basis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



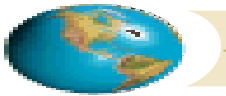
Process-compliant Test Strategies

- ❖ 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

- ❖ Many test strategies 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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