Agile Testing Challenges

Successful Testing on Agile Projects

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Agile Testing Challenges

- Agile lifecycles are becoming common
- Every lifecycle affects testing
- What test strategies work well with Agile methodologies?
  - Risk-based testing
  - Automated testing, including functional regression testing
  - Reactive testing
  - Some test strategies work less well
- Even properly-chosen test strategies do not alleviate all the testing challenges of Agile projects
- Goals of this presentation
  - Understand the Agile testing challenges
  - Identify ways to deal with those challenges
- Let's look at these Agile challenges…

Volume and Speed of Change

- An Agile principle: welcome changing requirements, even late in development
  - Risk-based testing accommodates change
  - Careful automated testing can accommodate change, though GUI-based tests are often more sensitive
  - Lightweight reactive testing also accommodates change
- Testing challenges still arise from changes in the definition of the product and its correct behavior
  - Keep the test team informed of such changes
  - Account for differential impact of changes on testing
- Otherwise, changes can impose testing inefficiencies

Remaining Effective in Short Iterations

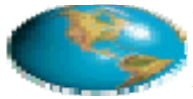
- Sequential lifecycles can provide test teams with a long period to develop and maintain their tests
- Some iterative lifecycle models allow substantial periods of time between each iteration
- Agile methodologies move faster
- The pace and brevity further squeeze the test team's ability to develop and maintain tests
- GUI test automation techniques can be particularly sensitive
- Risk-based testing strategies can help, because of the focus on the important areas
- Test teams in an Agile world can develop, maintain, and execute tests in risk priority order

Inconsistent or Inadequate Unit Testing

- Agile methodologies stress good, automated unit testing
- However, we often see two problems
  - Unit testing has limited bug-finding effectiveness, averaging 25 to 30%, while good system testing averages around 85%
  - Not all programmers do unit testing
- The short test execution periods on Agile sprints compound the damage from highly buggy code on system test
- So, good unit testing is essential

Increased Regression Risk

- In Agile lifecycles, code that worked in previous sprints gets churned by new features in each subsequent sprint, increasing the risk of regression
- Good unit testing can help but has limited bug-finding effectiveness
- Therefore, we need effective regression testing at the system test level
- Combine risk-based testing with maintainable automated regression testing at the system test level



Poor, Changing, and Missing Test Oracles

- Agile de-values documentation, so testers on Agile projects often receive insufficient test oracles
- Even with adequate test oracles, two Agile principles keep the challenge alive
  - Agile requires teams to embrace change
  - Agile advocates "conveying information [in] face-to-face conversation"
- Some project teams change the definition of correct behavior after tests execution starts, and sometimes change the definition of correct behavior in a meeting without involving the test team
- Test strategies cannot solve this; change management is required
- Test oracle problems impose test inefficiencies around 20 to 30 percent
- Test oracle problems reduce bug-finding effectiveness
- These situations frustrate the testers

A Shifting Test Basis

- Requirements-based testing strategies cannot handle bad requirements specifications, because they require these as a test oracle and a test basis
- The test basis also provides a means to measure coverage and report results
- Risk-based testing evades both problems, since quality risk items provide the test basis
- The level of risk determines the number of test cases and the priority of the test cases
- The test team can report in terms of quality risk mitigation

Many Meetings

- Agile focuses on working software not comprehensive documentation
- However, this can result in more meetings involving most leads and managers, reducing effectiveness and efficiency
- One manager said, "I'm surprised at the name *Agile*—it should be called *couch potato*. There are too many meetings. It's ironic that there are all these books explaining how simple it is."
- Excessive meetings can happen in any lifecycle
- Every organization, every project, and every lifecycle has to strike the right balance between documentation and meetings
- Further, embracing change should not mean analysis paralysis

Over-commitment and Sprint Durations

- Some Agile projects ritualize the rules, particularly sprint time deadlines
- For example, if a project follows four week sprints and continually over-commits, the test team gets squeezed on the last weekend of every sprint
- Fully resolving this challenge requires team and management maturity
- In the absence of a complete solution, risk-based testing helps the test team deal with over-commitment
  - Reduce the scope of testing based on risk
  - Slip low-risk tests into the next sprint

Blind Spots in the Sprint Silos: Organization

- Most RBCS clients adopting Agile methodologies have retained independent testing
- In some cases, this involves partitioning the test team across the various sprints and creating a dotted-line report to the sprint leader
- This creates some advantages, but also many disadvantages…

Sprint Silos Advantages (to the Sprint)

- Tester focuses entirely on sprint-related tasks
- Tester allocates and reallocates time based on (changing) sprint goals
- Sprint leader can re-direct tester without consulting the test manager
- The sprint leader can—and often will—call on the tester work overtime to hit sprint deadlines
- The test effort for the sprint does not vary once the number of testers is determined
- But the advantages have zero-sum-game elements…

Sprint Silos Disadvantages

- Tester loses independence
- Tester has reduced system-level perspective from broader contact
- Tester makes mistakes related to gaps and overlaps
- Test manager loses the ability to manage the workload of test resources, so morale suffers and turnover increases
- Reduced ability to grow a consistent, powerful, maintainable test system due to focus on the sprint's immediate needs
- These advantages and disadvantages are not inherent in Agile, but many typical Agile practices tend to accentuate them

Dealing with Sprint Silos

- Test manager (of truly independent team) introduces centripetal forces that bind the team together and makes its actions consistent, balancing the sprint-specific centrifugal forces
- Have a separate test sprint after the development sprint
- Test team remains engaged in development sprint to avoid exchanging one form of siloing for another

Gartner's Hype Cycle

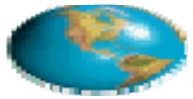
- Technology Trigger: Idea generates significant press and interest
- Peak of Inflated Expectations: Frenzy of publicity typically generates over-enthusiasm and unrealistic expectations
- Trough of Disillusionment: Failure to meet expectations makes technique unfashionable
- Slope of Enlightenment: Some businesses start to see benefits and practical application
- Plateau of Productivity: The benefits become widely demonstrated and accepted
- As 2010s decade arrives, Agile methodologies are in the peak of inflated expectations

Managing Agile Expectations

- Some test teams on Agile projects report to management that…
  - Quality is not higher or even lower
  - They are challenged by the issues in this presentation
  - They can't tolerate unlimited, unmanaged change
- This can create cognitive dissonance in the managers
  - Ultimately, these cognitive dissonance experiences will push these approaches along the Hype Cycle
  - In the short run, management might blame testing for the problems
- Testers and test managers must help their organizations understand and manage the challenges to manage expectations

Conclusions

- Good test strategies support the goals of Agile methodologies
  - Risk-based testing supports increased quality, increased productivity, and flexibility
  - Maintainable automated regression testing contains the regression risks associated with Agile methodologies
  - Reactive testing allows testers to explore areas that risk-based testing and automated regression testing might miss
- But good test strategies alone cannot fully resolve the Agile challenges
- The peak of inflated expectations requires the test team to carefully communicate Agile testing challenges
- In 2002 I wrote, "The onus is on us as professional testers to help develop a proper role for systematic but lightweight test processes and adapt the best practices of testing within the context of Agile methods. Hopefully, this will happen before the end of this decade."
- However, we still have work to do…



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Address:	RBCS, Inc. 31520 Beck Road Bulverde, TX 78163-3911 USA
Phone:	+1 (830) 438-4830
Fax:	+1 (830) 438-4831
E-mail:	info@rbcs-us.com
Web:	www.rbcs-us.com