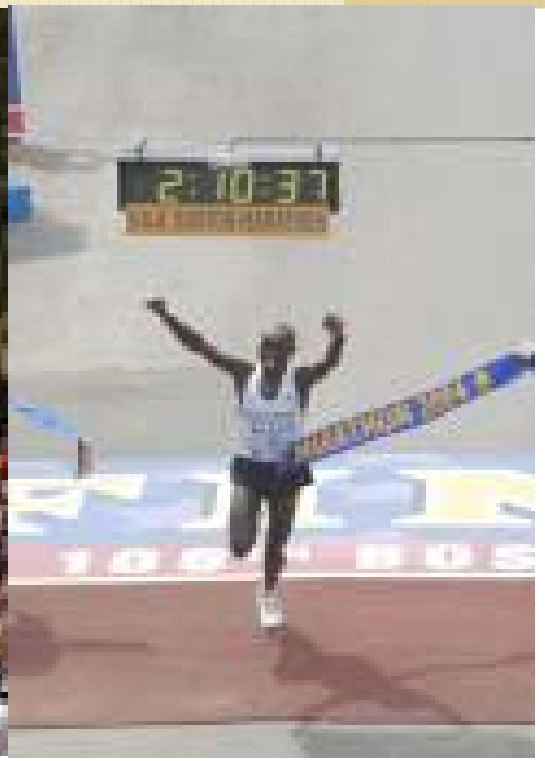
Five Testing Best Practices…

…And How These Practices Can Help You



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Top 5 Testing Best Practices

- A best practice is an approach to doing something that generally gives good results when applied *appropriately* and *thoughtfully*
- For testing, best practices include:
  - Use analytical risk-based testing strategies
  - Define realistic objectives for testing, with metrics
  - Institute continuous test process improvement based on lessons learned from previous projects
  - Have trained and certified test teams
  - Distribute testing work intelligently
- Let's look at each, with some examples…

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Analytical Risk-Based Testing

- Up-front analysis of quality risks
  - Identify risk items
  - Assess level of risk (e.g., likelihood and impact)
- Level of risk determines
  - Extent of test coverage
  - Order of test execution
  - Order of test triage (if necessary)

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Example: Quality Risk Analysis

Risk ID Number	Quality Risk Category	Specific Quality Risk	Likelihood	Impact	RPN	Extent of Testing	Other Action Needed	PRS/DDS Tracing	Total Items	Total Rated	Percent Rated
5.000	Serviceablity	Problems with deploying the system, updating the system, etc.							10	10	100%
5.001		Data Com r12 doesn't support service DB	2	3	6	Ext		PRS 2.1.3			
5.002		Internal product tracing capabilities insufficient to resolve new function code bugs	3	4	12	Ext		PRS 4.2			
5.003		Report Writer has installation or packaging errors	1	3	3	Ext		PRS 2.1.6			
5.004		GMI will not install	4	2	8	Ext		DDS Vantage 2.2.3.1			
5.005		Can not apply GMI fixes easily	3	3	9	Ext		DDS Vantage 3.2			
5.006		Out of box implementation does not work	5	1	5	Ext		PRS 4.2			
5.007		Migration from previous releases do not work	3	2	6	Ext		PRS 4.2			
5.008		SMP/E installation does not work	1	1	1	Ext		PRS 4.2			
5.009		Share Queues use or service does not work	4	2	8	Ext		DDS IMS 4.3			
5.010		Migration from previous release is error prone	5	3	15	Broad		PRS 4.2			

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Benefits of Risk-Based Testing

- Is methodical and robust in the face of many project challenges
- Tends to find bugs in priority order (i.e., "find the scary stuff first")
- Provides a basis for risk-driven estimation and planning
- Aligns stakeholder expectations on test coverage
- Provides a reasonable way to respond to changing project priorities and schedules

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Clear, Metrics-Based Testing Objectives

- Typical "external" test objectives
  - Find important defects
  - Build confidence in the system for release
  - Reduce quality risk to acceptable level
  - Provide critical information during project
- Other "internal" objectives support these goals (more in a moment)
- Organizations need a clear test policy that establishes objectives and metrics

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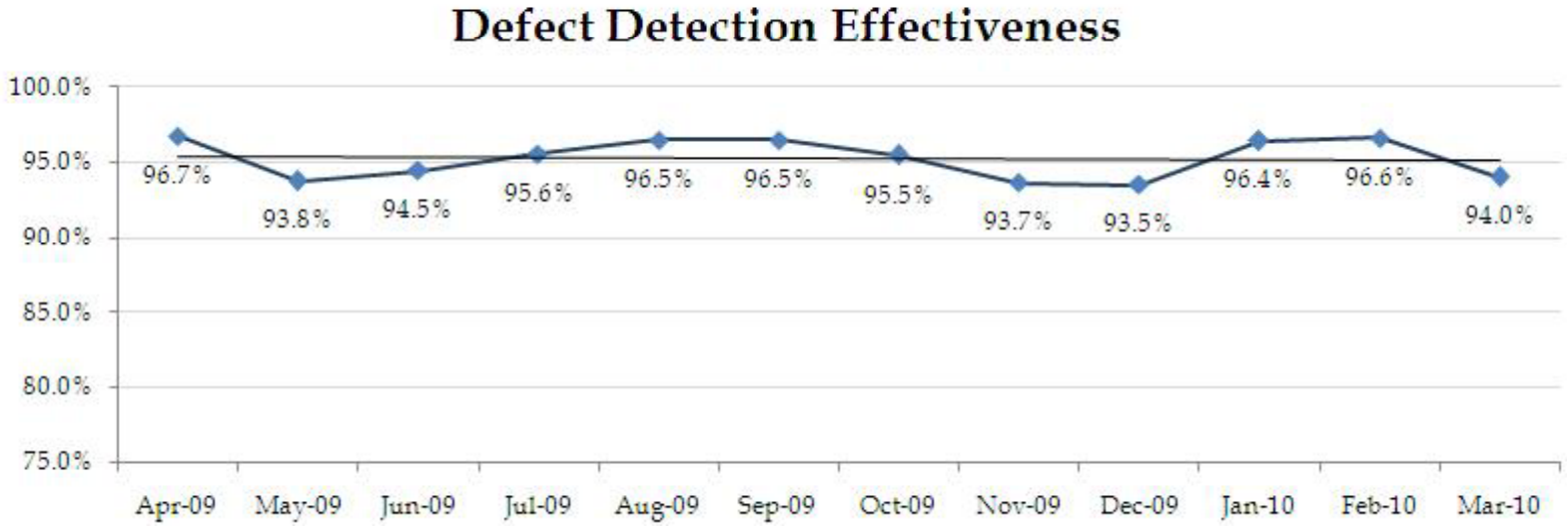
Example: Find Important Defects

- Objective: Find important defects
- Metric: Defect detection effectiveness (DDE)
- DDE = test defects/(test defects + customer defects)
- DDE of 90% is good; 95% is very good
- DDE for high-priority defects should exceed DDE for all defects



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Provide Information

- Objective: Provide critical information during project
- Metric: Stakeholder satisfaction with test results reporting
- Survey stakeholders on the following:
  - I understand the test results reports
  - The test results reports are based on data tempered with the proper amount of judgment and interpretation
  - The test results reports include the information I need to guide the project to success
- Identify and resolve problems leading to stakeholder dissatisfaction; e.g., improve the test dashboard to be risk-based and balanced

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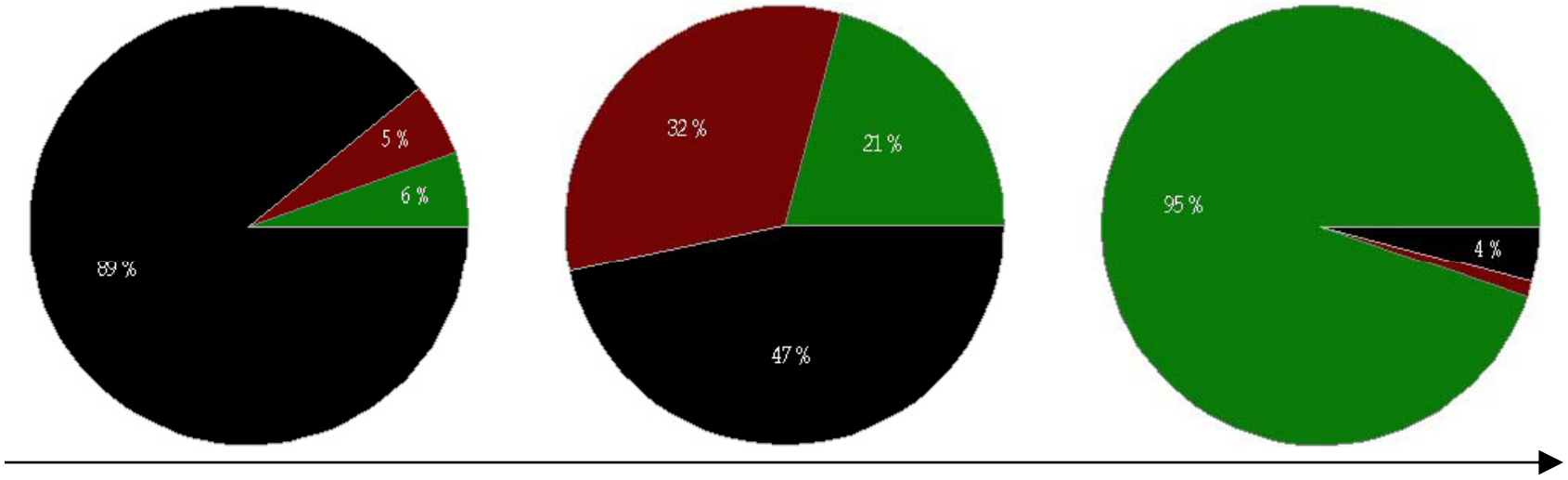
Executive Risk-Based Reporting



Region in green represents risks for which all tests were run and passed and no must-fix bugs were found.

Region in red represents risks for which at least one tested has failed and at least one must-fix bug is known.

Region in black represents other risks, which have no known must-fix bugs but still have tests pending to run.

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Benefits of Clear Objectives

- Provides a clear definition of success for test process and team
- Gives guidance on areas of process improvement required
- Establishes uniform and realistic expectations across test stakeholders

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Continuous Test Process Improvement

- Set goals for improvement of external and internal test objectives
- Put plans in place to achieve these improvements
  - Standard TQM techniques like Pareto analysis, five-whys, Ishikawa diagrams
  - Identify non-test challenges to test process improvement as well
- Measure progress towards goals and course-correct

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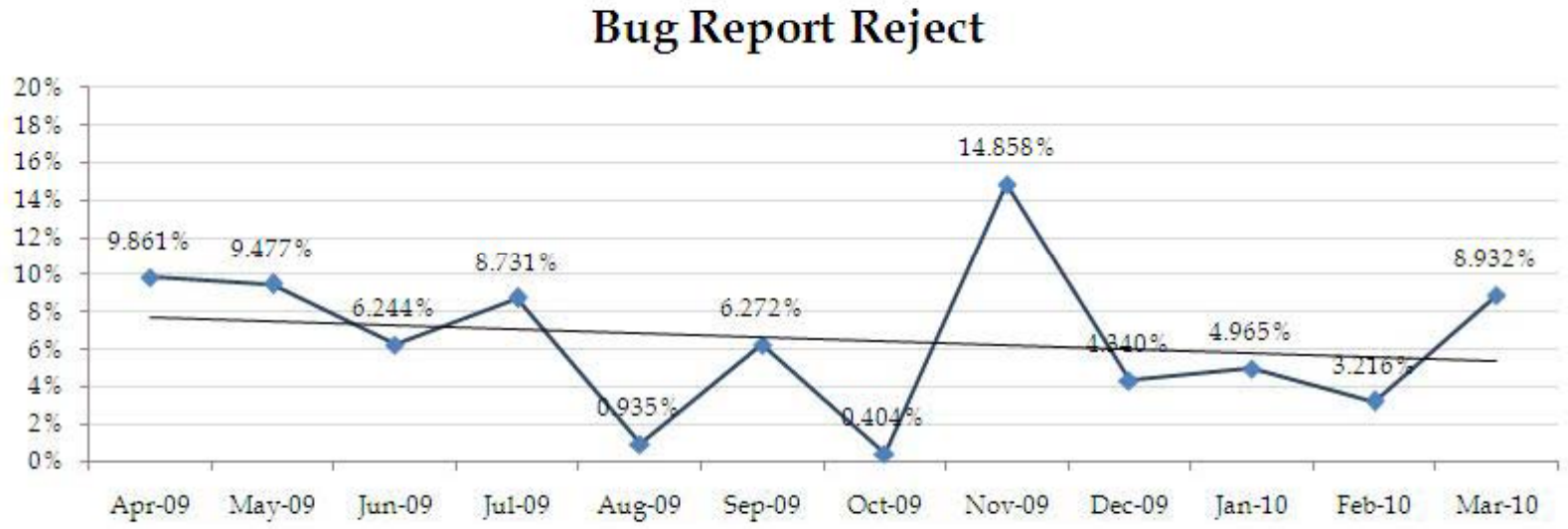
Example: Bug Reject Rate

- Use: Evaluates the quality of the bug reporting process
- Data needed: Total number of bug reports filed and the total number rejected



Benefits of Test Process Improvement

- Increases effectiveness and efficiency of test activities
- Aligns testing with organizational priorities and with other project processes
- Improves both real and perceived value of testing to the organization

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Trained and Certified Test Teams

- Testing is a specialty skill area requiring training
- Certification can establish the minimum and expected skills needed for test positions
- Introduction of ISTQB certification program is raising the standard for tester skills uniformly around the world

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Example: Certification and Efficiency

- A client recently reported that one test team trimmed their regression test set from 800 test cases to 300 (with no increase in risk) by applying concepts from our Test Engineering Foundation course
- They now require all their testers to be ISTQB Foundation certified
- They have a career path for Advanced Test Analysts and for Advanced Test Managers

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Benefits of Certification

- Certified tester has increased job skills, ability, and confidence
- Manager of certified test team has more effective and efficient test team
- Project team using certified testers has more efficient testing, focused on important project goals
- Organization using certified testers has greater overall achievement of test objectives
- Software industry benefits from removal of incompetent/unskilled testers from practice of testing
- Test profession benefits from improved standard of testing for all

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Intelligently Distributed Testing

- Understand lifecycle implications
- Select appropriate test partner
- Take testing beyond CMMi
- Plan and execute test logistics
- Plan for and manage the risks
- Be there
- Adapt to the cultures
- Maintain focus during test execution

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Example: Test Maturity of CMMi

Critical Testing Process	CMMi	Critical Testing Process	CMMi
Testing (plan, prepare, perform, perfect)	*2 3 4 5*	Test system design and implementation	*3*
Context-tailored testing	*3*	Test releases	*2 3*
Quality risk analysis	*3* **4**	Test execution	*3*
Test estimation	*2 3* **4**	Bug reporting	*3 4* **5**
Test planning	*2 3*	Test results reporting	*3* **4**
Test team staff, skills	*3 5*	Change management	*2 3 4* **5**

Italic numbers indicate CMMi level that *introduce some elements* of that test process' maturity. **Bold numbers** indicate CMMi level in which you can **assume proper handling** of the test process.

Bottom line: CMMi can help companies establish a foundation for quality, but does not guarantee thorough testing.

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Benefits of Distributed Testing

- Use of lower-priced labor can reduce overall test costs
- By collocating testing with development, communication time is improved
- Can use testers with specialized skills or test labs with specialized facilities or tools to run particular tests
- Localization tests (language and operational) are easier to handle in many cases

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Now What?

- Evaluate which of the five best practices you are practicing, and ask how you can do better
- Evaluate which of the five best practices you are not practicing, and ask how you can put them into action
- Consider an assessment of your test operation to measure current capability, opportunities to improve
- Set a long-term plan for yourself and your team
- Follow through on the plan

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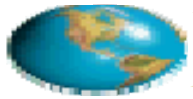

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