Objectives

- Explain the importance of the testing process—and managing it—in both conventional and Agile development
- Reveal why mistaken common views of processes can impede test process effectiveness and efficiency
- Describe meaningfully measuring the testing process to maintain and improve testing value
Vendors/Consultants Often Say

“A test tool [or technique] is only as effective as the testing process in which it is used”

But….

Organizations Generally Don’t

Think very consciously about their Testing Process and especially about managing it

Distinguish managing the Testing Process from managing/conducting the testing itself

Is there a difference? What is it?
Agile Generally Integrates Testing

- Subsumed within development
- May think relatively little about managing the conduct of testing
- Even less likely to think about
  - The testing process, let alone
  - Managing the testing process

What Is a Process? Why Do We Care?
What Is a Process? Why Do We Care?

Common Definition:
A process is a set of steps or actions that should be taken to achieve a desired result

A Process is a set of steps/actions, beliefs, customs/practices, methods, skills, knowledge, and competencies that produce a result, whether or not they are recognized, intended, or even desirable

Knowing your process enables predicting your results

Your Testing Process

• Determines how you test, which in turn
• Determines how effective and efficient your testing is, which in turn
• Contributes greatly to how effective and efficient your development is

Managing the testing process is essential for delivering, maintaining, and improving testing and development value
**To Change Results, Change Process**

Presumed → Defined, documented often partial (Silo) → Different

PROCESS

Change action as is → belief should be (reqs) → Result

Real (unrecognized)

To see the need for and effects of changes, we need to measure at key process points from the beginning to the full end result.

**Typical Testing Experience**

Scheduled

- Coding
- Testing

Presumed

Actual

- Coding
- Testing

REAL

STOP

Done= Works Right!

Anyone can deliver by a deadline if it doesn’t matter what they deliver
“Managing the Test Process” Means

1. Defining how to appropriately determine
   a. What must be demonstrated to be confident it works
   b. How to demonstrate it
   c. How to capture, report, and address testing’s results
2. Making it the REAL Process that is actually used
3. Measuring each test project’s results and causes
4. Identifying variances from desired results
5. Re-evaluating and adjusting the defined process’ actions/beliefs/customs to improve practices, enhance strengths, and overcome weaknesses
6. Repeating 2-6

To Define a Desired Testing Process

- Identify key concepts the Testing Process should address
  - Possibly implicitly-recognized or even taken for granted
  - Concepts we want to be sure are explicit
  - Issues it needs to overcome
- Incorporate helpful relevant ideas and approaches from methodologies, maturity models, and standards
- Adapt other “good practices” as appropriate
**Some Key Concepts**

- Testing confirms, not assumes, the system:
  - Does what it’s supposed to do
  - Doesn’t do what it’s not supposed to do
- Testing mainly means comparing actual results to independently- (and preferably previously-) defined expected results
- It’s not impossible to test everything, only to know for sure that you have tested everything

*Is exploratory “finding out how it works” experimentation or testing?*

**Test Methodology**

- Types of tests you do, and when
  - Static reviews of requirements and designs
  - Dynamic test planning (large and medium risks)
  - Dynamic test design (small risks)
- How you do the tests—techniques and skills
  - Execution
  - Environments, data, tools
- How you manage the tests
  - Reports, metrics, learning
  - Evaluating/improving test adequacy and efficiency
Some Ways to Measure Your Software/Testing Process

- **Indirectly**, inferring from some other indicators, such as experts’ assessments and model-fitting, typically based on level of using certain practices as identified by surveys, questionnaires, internal people’s perceptions, and external observations.

- **Directly** based on the process’s actions/steps, often by accumulating measures across projects (but, must identify the full REAL process and appropriate key cause and effect measures and measurement points).

Most Common **Indirect Process Improvement Method**

- Informal, imprecise assessment
  - Gut feel
  - Particular problem
- Implement presumed good practices
  - Same informal, imprecise assessment
    - By the one choosing the practices
**Direct: Process Determines Projects, Projects Demonstrate Process**

- The way we really do things, our REAL Process, determines how we carry out project after project.
- Measure the REAL Process across projects
  - Results
  - Actions, beliefs, customs, and (including management and people) practices causing results
  - In full-project context

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**Measuring Results vs. Controlling Performance and Guiding Improvement**

- **Measuring Results**
  - Process output
    - Products and services
    - Capability and variation, quantity
    - Functionality
    - Quality (is it the same as lack of defects?)
    - Performance
- **Controlling Performance and Guiding Improvement**
  - Process causes
    - Steps/actions, beliefs, customs
    - Inputs resources and materials characteristics, quantities, costs, time
    - Methods
    - Skills, knowledge

Process Measures Improve Outputs’ Absolute Value and Variation

- Determine process capability—what/how much it can produce when stable (in statistical control)
- Identify normal variation due to common causes inherent in the process—outputs predictably will occur within this range (control chart shows upper/lower control limits = +3, -3 standard deviations from mean)—then adjustments are meaningful
- To stabilize, identify/remove other assignable (special) causes of variation

Must Appreciate Normal Variation to Reliably Improve Process Outputs

If we adjust our aim based on the first shot without knowing our actual pattern, what is likely to happen to our actual accuracy? What should the adjustment be?
In Fact, Main Cause of Failures…

Development process sets woefully inadequate budgets and schedules based on insufficient time and resource estimates and *destines projects to failure from start* in turn mainly due to inadequately-defined REAL business requirements—top level and detailed.

Does your process identify and measure such causes?

Coding Is Smallest Source of Errors

How thorough are developers’ test-first tests?
Coding Is Smallest Source of Errors

2/3 of errors in delivered code are in the design. Does essentially having no design increase, decrease, or just mask that?

Missed/incorrect/unclear business requirements are biggest source of design problems.
An Effective QA/Testing Process

- Detects defects in
  - Requirements and design
  - Code and other deliverables
  - Related project plans
- Early
  - When changes can be made easier and cheaper
  - Before creating work that would have to be redone
- Helps enable achievable budgets/schedules

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