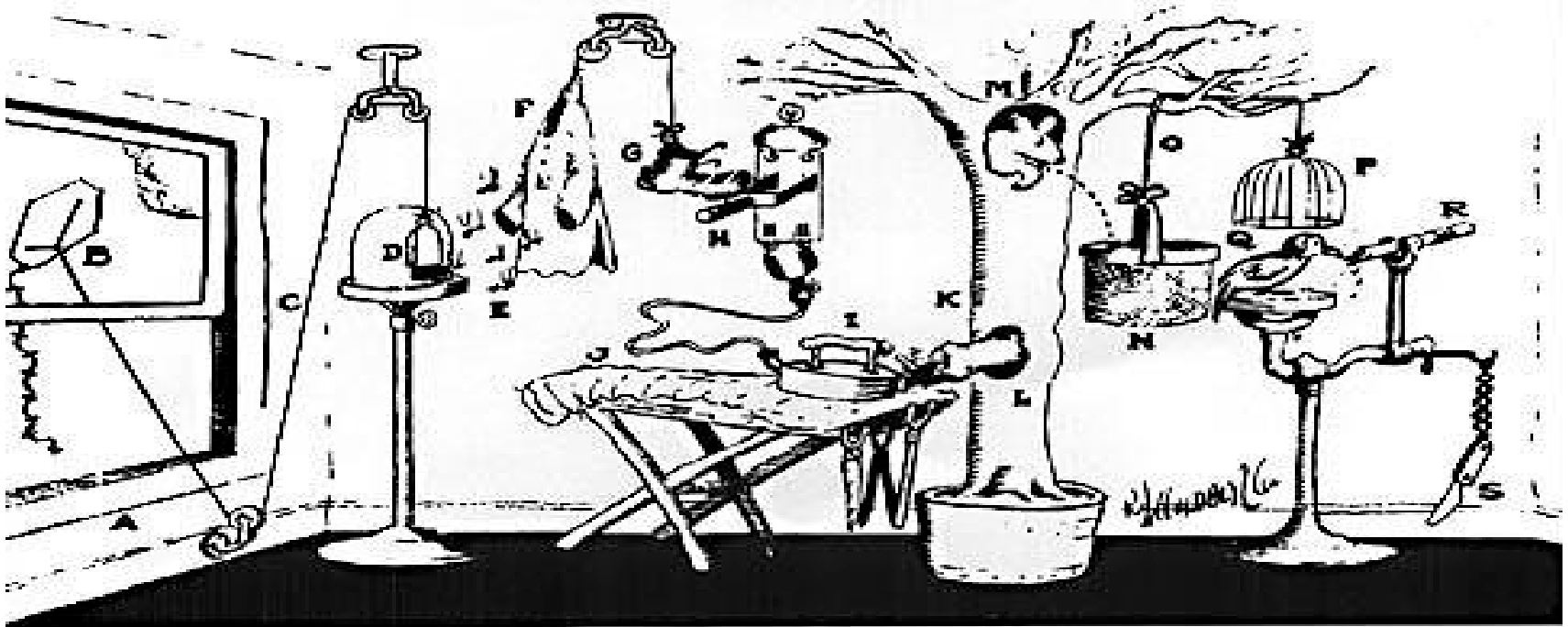


Improving the Testing Process

The Improving the Testing Process Framework



Pencil Sharpener RUBE GOLDBERG (tm) RGI 038

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Introduction

- ✦ There are various frameworks for evaluating testing processes
- ✦ The Improving the Testing Process framework is lifecycle-independent, value-focused, and requires no license for use
- ✦ In this presentation, we'll discuss how to use the framework to assess and improve your testing processes
- ✦ We'll look at some examples of assessment questions and metrics for some of the Improving the Testing Process



What is a Critical Testing Process?

- ❖ Process: A sequence of actions, observations, and decisions
- ❖ Testing: Assessing the quality of a system
- ❖ A test processes becomes critical when it is...
 - ❖ Repeated frequently → affects efficiency
 - ❖ Highly cooperative → affects team cohesion
 - ❖ Visible to peers and superiors → affects credibility
 - ❖ Linked to project success → affects effectiveness
- ❖ In other words, critical test processes directly and significantly affect the test team's ability to find bugs, build confidence, reduce risk, and provide valuable information and services



What Are the CTP Framework Processes?

1. Testing
2. Establishing context
3. Quality risk analysis
4. Test estimation
5. Test planning
6. Test team development
7. Test system development
8. Test release management
9. Test execution
10. Bug reporting
11. Results reporting
12. Change management



The Testing Process

What is it?

- ✦ Planning: figuring out what testing to do
- ✦ Preparing: building the tests and test team
- ✦ Performing: installing the system under test and testing it
- ✦ Perfecting: reporting findings and guiding the process

Why does it matter?

- ✦ Reduces costs by finding important bugs
- ✦ Provides useful information about less important bugs
- ✦ Reduces risk by identifying what works and what doesn't
- ✦ Gives management essential information



Testing Process Assessment Questions

- ⊕ Does testing provide valuable, economical testing services to clearly identified stakeholders?
- ⊕ Does testing pervade the project in time and teams?
- ⊕ Is testing effective, efficient, understood, organized, and optimizing?
- ⊕ Does testing apply appropriate levels of formality?
- ⊕ Does testing have a clearly-articulated test strategy, is the strategy appropriate, and is the strategy properly executed?
- ⊕ Does the test operation comply with all appropriate or required standards and regulations?



Testing Process Assessment Metrics

- ❖ Defect detection effectiveness

$$\text{DDE} = \frac{\text{test defects}}{\text{test defects} + \text{production defects}}$$

- ❖ Defect detection efficiency

Use cost of quality to calculate relative costs of bugs in test versus production

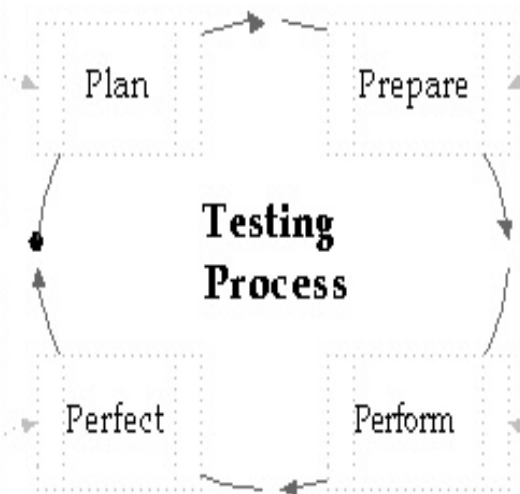
- ❖ Note: I'm using the words "bug" and "defect" interchangeably



Testing and Constituent Processes

Understand the testing effort

- Discover the context of testing
- Analyze the quality risks
- Estimate the testing
- Plan the testing



Assemble the people and tests

- Build the test team
- Design and implement a test system

Guide adaptation and improvement

- Report any bugs
- Report test results
- Manage changes

Do the testing and gather the results

- Obtain a test release
- Run and track the tests

To optimize the overall testing process—to provide the best possible, most valuable, most timely testing information and services—optimize each constituent testing process



Quality Risk Analysis

What is it?

- ✦ Discussing potential problems with stakeholders
- ✦ Prioritizing the levels of risk based on likelihood and impact of potential problem
- ✦ Applying PRAM or other risk analysis processes
- ✦ Documenting findings

Why does it matter?

- ✦ Identifies the key risks to system quality
- ✦ Aligns testing with the key risks to system quality
- ✦ Builds quality and test stakeholder consensus around what is to be tested (and how much) and what is not to be tested (and why)



QRA Assessment Questions

- ⊕ Are requirements provided to testing in a timely fashion?
- ⊕ Are the requirements provided to testing sufficiently detailed?
- ⊕ Is the quality risk analysis process carried out in a timely fashion?
- ⊕ Are the right stakeholders involved in quality risk analysis?
- ⊕ Does the quality risk analysis process employ the proper level of formality?
- ⊕ Are the risk assessment levels normally distributed?



QRA Assessment Metrics

- ❖ Risk coverage (if strategy is risk based)
Risk Coverage = Number of Covered Risk Elements / Number of Identified Risk Elements
- ❖ Requirements coverage (if strategy is reqs based)
Requirement Coverage = Number of Covered Requirements Elements / Number of Requirements Elements



Bug Reporting

What is it?

- ✦ Describing a specific way in which the system doesn't work properly
- ✦ Giving key information
 - ❑ To developers
 - ❑ To managers
 - ❑ To other testers
 - ❑ To technical support
- ✦ A hand-off from the test team to the project team

Why does it matter?

- ✦ Creates an opportunity to improve system (and save money)
- ✦ Delivers (part of) the value of testing to the project team
- ✦ Builds tester credibility with programmers



Bug Reporting Assessment Questions

- ⊕ Has the test team identified all audiences for bug reports?
- ⊕ Do the bug reports effectively communicate useful information to all audiences?
- ⊕ Does each bug report describe one symptom?
- ⊕ Is there a clear delineation between debugging and testing?
- ⊕ Are irreproducible failures handled appropriately?
- ⊕ Are all reports clearly related to bugs?
- ⊕ Is the bug tracking system usable by all participants and stakeholders?



Bug Reporting Assessment Metrics

- ❖ Survey report audiences (on Likert scale) on these questions

The bug reports are well-written

The bug reports include the information I need

- ❖ Rejected bug reports

Rejected Bug Reports = Number of Rejected Bug Reports / Number of Bug Reports

- ❖ Reopened (failed confirmation test) bug reports

Reopened Bug Reports = Number of Reopened Bug Reports / Number of Reopened Reports



Conclusions

- ❖ The critical testing processes framework allows thorough assessment
 - ❖ Participant and stakeholder opinions measured through questions
 - ❖ Opinions corroborated with facts via metrics
- ❖ The framework measures test activities throughout the lifecycle
- ❖ Based on the findings of the assessment, value-focused improvements can be implemented



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