

## Problem Reporting EuroSTAR 2014

### Let's Talk about Bugs and Issues

- A **bug** is *any problem with the product that might threaten its value*
  - informally, a bug is something that bugs somebody who matters
- An **issue** is *any problem that threatens the value of the testing, the project, or the business*
  - informally, an issue is any problem in the product or project that makes testing harder or slower

### A Mnemonic for Problem Reporting: PEOPLE WORKing

- A **P**roblem that you've observed.
- An **E**xample to illustrate the problem
- An **O**racle
- **P**olite
- **L**iterate
- **E**xtrapolation
- A **W**orkaround

## Problem Reporting EuroSTAR 2014

### Problem

- **“a difference between what is perceived and what is desired.”**
  - Dewey, J., *How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process*, 1933
- **“an undesirable situation that is significant to and maybe solvable by some agent, though probably with some difficulty.”**
  - G.F Smith, “Towards a Heuristic Theory of Problem Structuring”, quoted in Weick, Karl E. *Sensemaking in Organizations*. Sage Publications, Inc, 1995

### Problem Summary

- Think of the summary as a headline
  - a thumbnail description
  - an attention-getter
  - a conversation starter
  - a call to action
- The summary should be able to direct the appropriate amount of attention to the problem

# Problem Reporting

## EuroSTAR 2014

### Example

- include steps, data, circumstances, or platform information (only) if needed
- don't fill out a template with absolutely everything if a one-line description works in your culture, or for this bug
- What is the fastest, least effortful way to report this problem that still completely addresses what people need to know in order to get to it
- That's a lot of factors! But NOT thinking about them costs money and time, in the end.
- Notice ways in which your reporting system might be
  - adding unnecessary work
  - failing to do helpful work for youboth as a reporter and as a reader.

### Oracle

- an oracle is “a fallible way to recognize a problem when it happens during testing”
- typically linked to a *risk* or to a *quality criterion* that is threatened

Historically, oracles have been described as media (tools, comparable products, or references) that give “the right answer”. There are serious logical problems with this, since no oracle can show that a program is working correctly, nor can an oracle show that a product is problem-free. As Dijkstra put it, testing can show the presence of problems, but cannot prove their absence.

The workaround is to invert the logic: Oracles make it possible to recognize, describe, or articulate our belief that *there is a problem*, but they cannot show that *there is no problem*.

# Problem Reporting

## EuroSTAR 2014

### Feelings

#### *Heuristic Triggers For Oracles*

- An emotional reaction is a trigger to attention and learning
- Without emotion, we don't reason well
  - See Damasio, *The Feeling of What Happens*
- When you find yourself mildly concerned about something, someone else could be *very* concerned about it
- Observe emotions to help overcome your biases and to evaluate significance

An emotion is a signal; consider looking into it

### What Might Feelings Tell Us?

Impatience	⇒ a threat to performance?	
Frustration	⇒ a threat to capability?	
Fear	⇒ a threat to security?	
Surprise	⇒ a threat to reliability?	
Confusion	⇒ a threat to usability? to testability?	
Annoyance	⇒ a threat to charisma?	
Boredom	⇒ an insignificant test?	
Tiredness	⇒ time for a break?	
Anxiety	⇒ a need for a particular skill?	
Curiosity	⇒ a pointer to useful investigation?	

# Problem Reporting

## EuroSTAR 2014

### General Examples of Oracles

*things that suggest “problem” or “no problem”*

- A person whose opinion matters.
- An opinion held by a person who matters.
- A disagreement among people who matter.
- A reference document with useful information.
- A known good example output.
- A known bad example output.
- A process or tool by which the output is checked.
- A process or tool that helps a tester identify patterns.
- A feeling like confusion or annoyance.
- *A desirable consistency between related things.*

People

Mechanisms

Feelings

Principles

9

### Consistency (“this agrees with that”)

*an important theme in oracle principles*

- **Familiarity:** The system *is not consistent* with the pattern of any familiar problem.
- **Explainability:** The system *is consistent* with our ability to describe it clearly.
- **World:** The system *is consistent* with things that we recognize in the world.
- **History:** The present version of the system *is consistent* with past versions of it.
- **Image:** The system *is consistent* with an image that the organization wants to project.
- **Comparable Products:** The system *is consistent* with comparable systems.
- **Claims:** The system *is consistent* with what important people say it’s supposed to be.
- **Users’ Expectations:** The system *is consistent* with what users want.
- **Product:** Each element of the system *is consistent* with comparable elements in the same system.
- **Purpose:** The system *is consistent* with its purposes, both explicit and implicit.
- **Standards and Statutes:** The system *is consistent* with applicable laws, or relevant implicit or explicit standards.

*Consistency heuristics rely on the quality of your models of the product and its context.*

10

# Problem Reporting

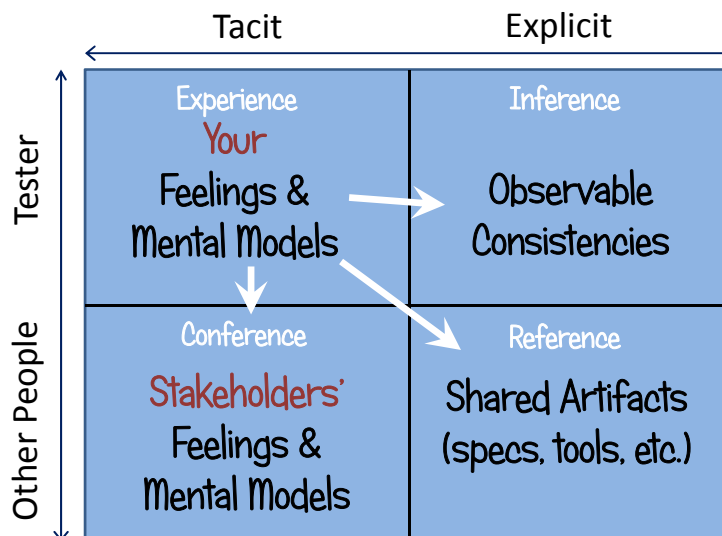
## EuroSTAR 2014

### All Oracles Are Heuristic

- We often do not have oracles that establish a definite correct or incorrect result, in advance. Oracles may reveal themselves to us on the fly, or later.  
**That's why we use abductive inference.**
- No single oracle can tell us whether a program (or a feature) is working correctly at all times and in all circumstances.  
**That's why we use a variety of oracles.**
- Any program that looks like it's working, to you, may in fact be failing in some way that happens to fool all of your oracles. **That's why we proceed with humility and critical thinking.**
- We never know when a test is finished.  
**That's why we try to maintain uncertainty when everyone else on the project is sure.**
- You (the tester) can't know the deep truth about any result.  
**That's why we report whatever seems likely to be a bug.**

11

### Oracles from the Inside Out



## Problem Reporting EuroSTAR 2014

### Oracle Cost and Value

- Some oracles are more *authoritative*
  - but less predictable
- Some oracles are more *consistent*
  - but maybe not up to date
- Some oracles are more *immediate*
  - but less reliable
- Some oracles are more *precise*
  - but less accurate
- Some oracles are more *accurate*
  - but less precise
- Some oracles are more *available*
  - but less authoritative
- Some oracles are *easier to interpret*
  - but more narrowly focused

### Oracles are Not Perfect And Testers are Not Judges

- You don't need to know FOR SURE if something is a bug; it's not your job to DECIDE if something is a bug.
- You do need to form a justified belief that it MIGHT be a threat to product value in the opinion of someone who matters.
- And you must be able to say why you think so; you must be able to cite good oracles... **or else you will lose credibility.**

MIP'ing VS. Black Flagging

14

## Problem Reporting EuroSTAR 2014

### Polite

- nobody really likes
  - bad news
  - pointlessly critical language
  - writing that is hard to understand
  - waiting missing information that was reasonably and foreseeably necessary
  - searching through unnecessarily large volumes of text to find a salient fact

### Literate

- A problem report is a story about an interaction between person and product
- A problem is not an *attribute*; it's a *relationship*
- You may have to
  - identify characters (a product and at least one person)
  - build empathy for the person (the person must matter)
  - portray the relationship (the problem must matter too)
  - develop a plot (a threat to value)



## Problem Reporting EuroSTAR 2014

### Extrapolation

- Inspired by Kaner's RIMGEA...
- Maximize
  - how could this be the biggest, baddest bug it could possibly be?
- Generalize
  - where else might the bug manifest *in the code*?
- Externalize
  - where else might the bug manifest *in the world*?
  - to whom else might the bug be important?

### Workaround

- maybe there is one that reduces the severity or significance of the problem
- management has to decide on whether to fix this bug or not; provide information to help them make that decision

Showstopper (n.) Something that makes more sense to fix than to ship.

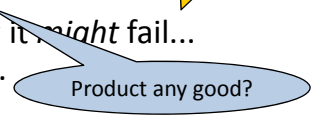
# Problem Reporting

## EuroSTAR 2014

**To test is to compose, edit, narrate, and justify  
THREE stories.**

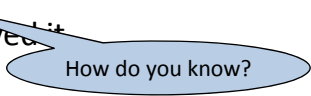
**A story about the status of the PRODUCT...**

...about what it does, how it failed, and how it *might* fail...  
...in ways that matter to your various clients.



**A story about HOW YOU TESTED it...**

...how you configured, operated and observed it...  
...how you recognized problems...  
...about what you have and haven't tested yet...  
...and what you won't test *at all* (unless the client objects)...



**A story about how GOOD that testing was...**

...the risks and costs of (not) testing...  
...what made testing harder or slower...  
...how testable (or not) the product is...  
...what you need and what you recommend.

