A Very Rapid Introduction to Rapid Software Testing

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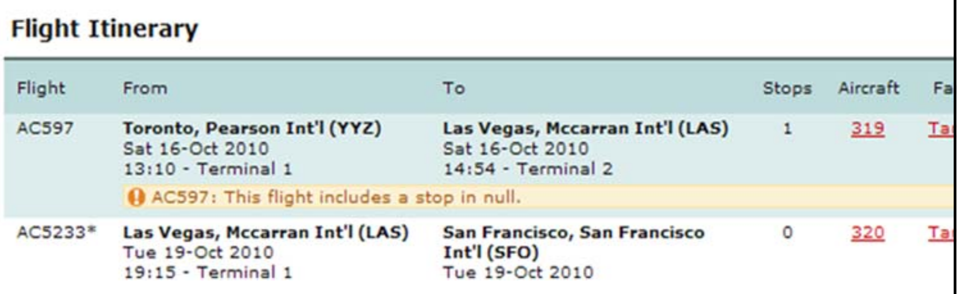
Updates

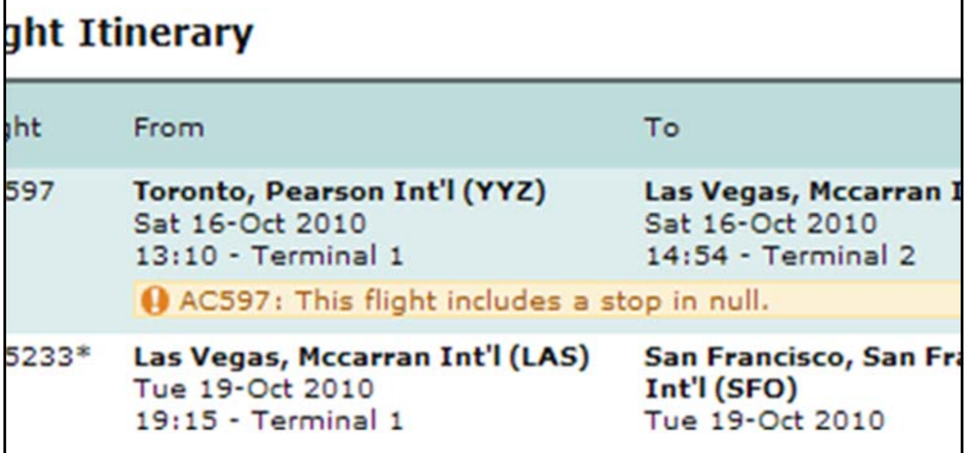
- This presentation is ALWAYS under construction
- Updated slides at http://www.developsense.com/past.html
- All material comes with lifetime free technical support



Flight Itinerary

Flight	From	To	Stops	Aircraft	Fa
AC597	**Toronto, Pearson Int'l (YYZ)** Sat 16-Oct 2010 13:10 - Terminal 1	**Las Vegas, Mccarran Int'l (LAS)** Sat 16-Oct 2010 14:54 - Terminal 2	1	319	Ta
	AC597: This flight includes a stop in null.				
AC5233*	**Las Vegas, Mccarran Int'l (LAS)** Tue 19-Oct 2010 19:15 - Terminal 1	**San Francisco, San Francisco Int'l (SFO)** Tue 19-Oct 2010	0	320	Ta

aircanada.com



ght Itinerary

ght	From	To
597	**Toronto, Pearson Int'l (YYZ)** Sat 16-Oct 2010 13:10 - Terminal 1	**Las Vegas, Mccarran I** Sat 16-Oct 2010 14:54 - Terminal 2
	AC597: This flight includes a stop in null.	
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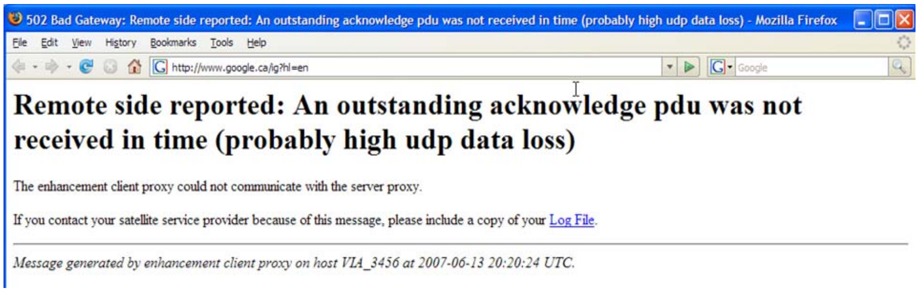


502 Bad Gateway: Remote side reported: An outstanding acknowledge pdu was not received in time (probably high udp data loss) - Mozilla Firefox

File Edit View History Bookmarks Tools Help
http://www.google.ca/ig?hl=en
Google

Remote side reported: An outstanding acknowledge pdu was not received in time (probably high udp data loss)

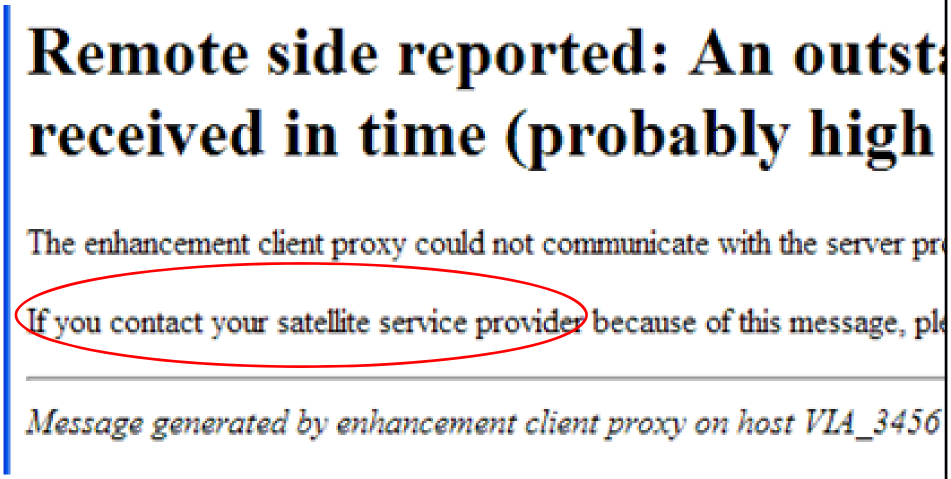
The enhancement client proxy could not communicate with the server proxy.

If you contact your satellite service provider because of this message, please include a copy of your Log File.

Message generated by enhancement client proxy on host VIA_3456 at 2007-06-13 20:20:24 UTC.

Error Message
Via Rail, between Montreal and Toronto, 2007

But I can’t contact my… oh, never mind.



Remote side reported: An outst
received in time (probably high

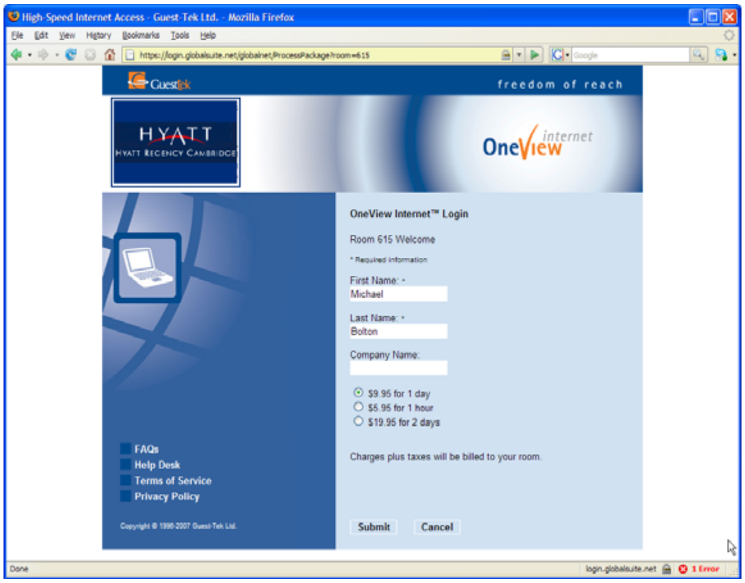
The enhancement client proxy could not communicate with the server pr

If you contact your satellite service provider because of this message, pl

Message generated by enhancement client proxy on host VIA_3456

Error Message
Via Rail, between Montreal and Toronto, 2007

With rooms at $195 a night, they CHARGE you?



High-Speed Internet Access - Guest-Tek Ltd. - Mozilla Firefox
File Edit View History Bookmarks Tools Help
https://login.globalsuite.net/globalnet/ProcessPackage?room=615
Google
GuestTek
freedom of reach
HYATT
HYATT REGENCY CAMBRIDGE
OneView internet
FAQs
Help Desk
Terms of Service
Privacy Policy
Copyright © 1996-2007 Guest-Tek Ltd.
Submit
Cancel
Done
login.globalsuite.net
1 Error

OneView Internet™ Login

Room 615 Welcome

* Required information

First Name: * Michael

Last Name: * Bolton

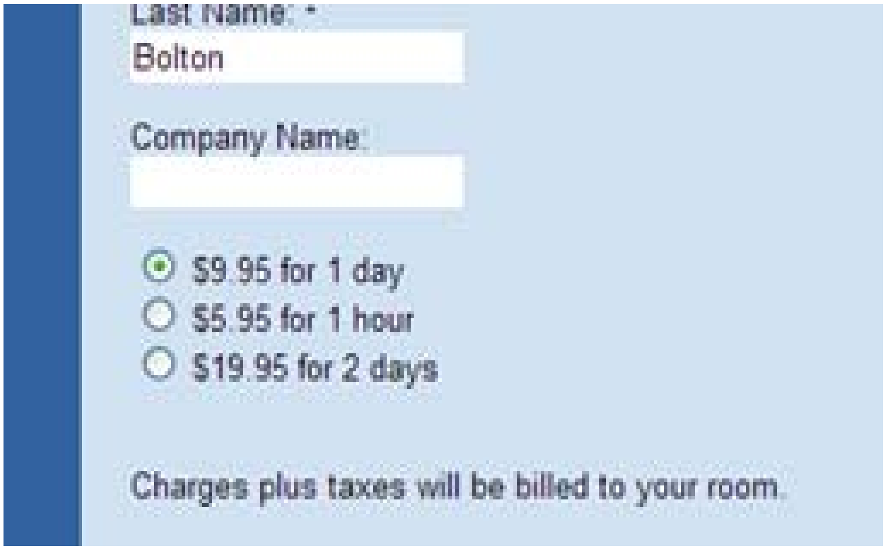
Company Name:

● $9.95 for 1 day
○ $5.95 for 1 hour
○ $19.95 for 2 days

Charges plus taxes will be billed to your room.

Hyatt Regency, Cambridge, USA, 2008

If you can't do math, it's a nickel extra.



Last Name: * Bolton

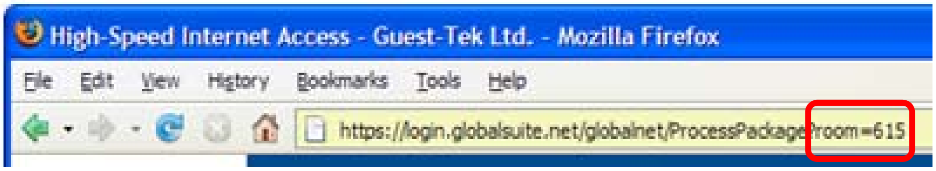
Company Name:

● $9.95 for 1 day
○ $5.95 for 1 hour
○ $19.95 for 2 days

Charges plus taxes will be billed to your room.

Hyatt Regency, Cambridge, USA, 2008

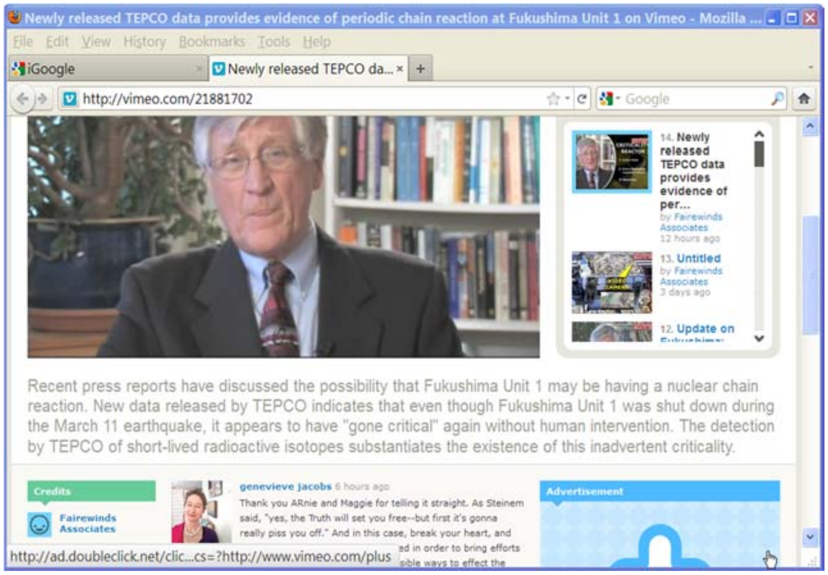
On the other hand, why not charge it to someone else's room?


High-Speed Internet Access - Guest-Tek Ltd. - Mozilla Firefox
File
Edit
View
History
Bookmarks
Tools
Help

https://login.globalsuite.net/globalnet/ProcessPackage?room=615

Hyatt Regency, Cambridge, USA, 2008

Why you shouldn't let an unsupervised algorithm choose your sponsored links (1).


Newly released TEPCO data provides evidence of periodic chain reaction at Fukushima Unit 1 on Vimeo - Mozilla ...
File
Edit
View
History
Bookmarks
Tools
Help
iGoogle
Newly released TEPCO da...
Google

http://vimeo.com/21881702

14. Newly released TEPCO data provides evidence of per...
by Fairewinds Associates
12 hours ago

13. Untitled
by Fairewinds Associates
3 days ago

12. Update on Fukushima:

Recent press reports have discussed the possibility that Fukushima Unit 1 may be having a nuclear chain reaction. New data released by TEPCO indicates that even though Fukushima Unit 1 was shut down during the March 11 earthquake, it appears to have "gone critical" again without human intervention. The detection by TEPCO of short-lived radioactive isotopes substantiates the existence of this inadvertent criticality.

Credits

Fairewinds Associates

genevieve jacobs 6 hours ago

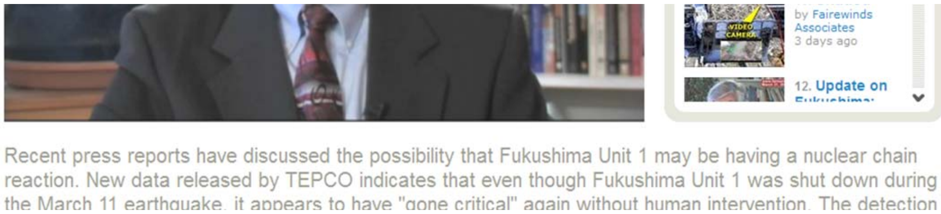
Thank you ARnie and Maggie for telling it straight. As Steinem said, "yes, the Truth will set you free--but first it's gonna really piss you off." And in this case, break your heart, and ed in order to bring efforts sible ways to effect the

Advertisement

http://ad.doubleclick.net/clic...cs=?http://www.vimeo.com/plus

Vimeo's Web Page
Spring 2010

Why you shouldn't let an unsupervised algorithm choose your sponsored links (2).


by Fairewinds Associates
3 days ago

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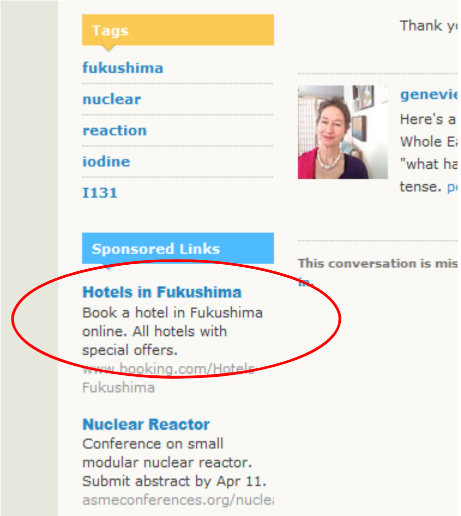
Vimeo's Web Page
Spring 2010

Why you shouldn't let an unsupervised algorithm choose your sponsored links (3).


Tags

fukushima

nuclear

reaction

iodine

I131

Sponsored Links

Hotels in Fukushima
Book a hotel in Fukushima online. All hotels with special offers.
www.booking.com/Hotels-Fukushima

Nuclear Reactor
Conference on small modular nuclear reactor. Submit abstract by Apr 11.
asmeconferences.org/nucle

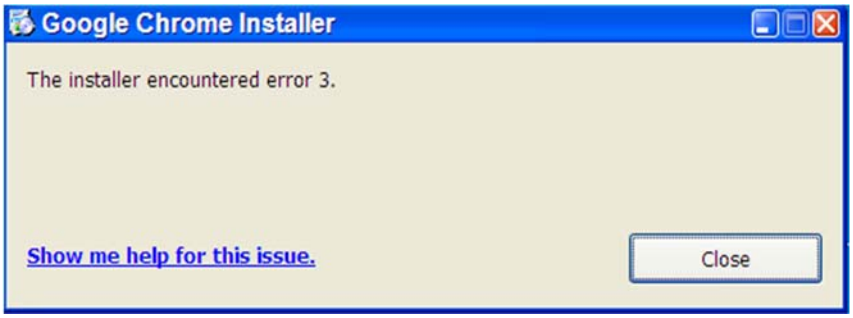
Thank y

genevie
Here's a
Whole E
"what ha
tense. p

This conversation is mis
in

Vimeo's Web Page
Spring 2010

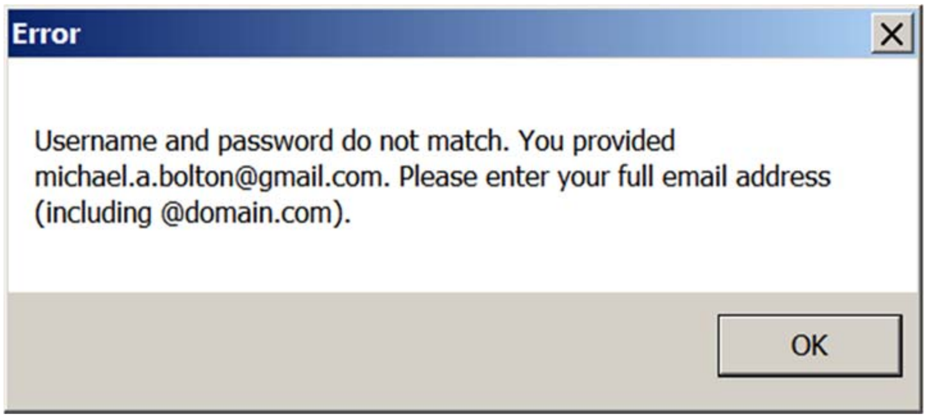
At least it wasn't 1 or 2.



The installer encountered error 3.

Google Chrome

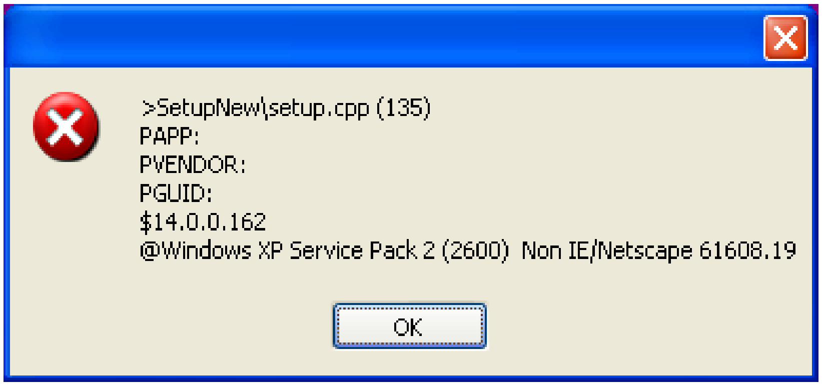
Should that be michael.a.bolton@gmail.com@domain.com?



Username and password do not match. You provided michael.a.bolton@gmail.com. Please enter your full email address (including @domain.com).

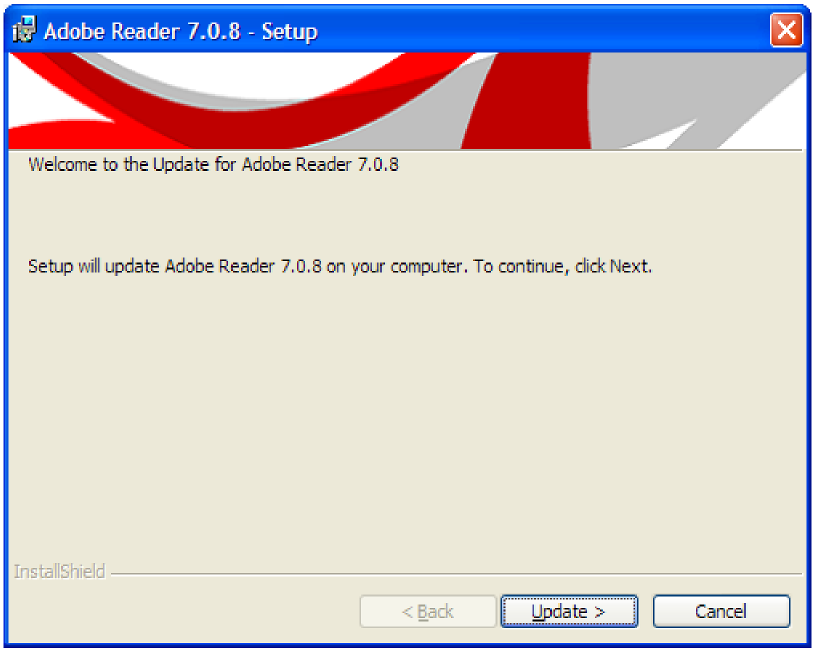
Google Calendar Update

OK, fine.



```
>SetupNew\setup.cpp (135)
PAPP:
PVENDOR:
PGUID:
$14.0.0.162
@Windows XP Service Pack 2 (2600)  Non IE/Netscape 61608.19
```

Don’t Know Who This Was

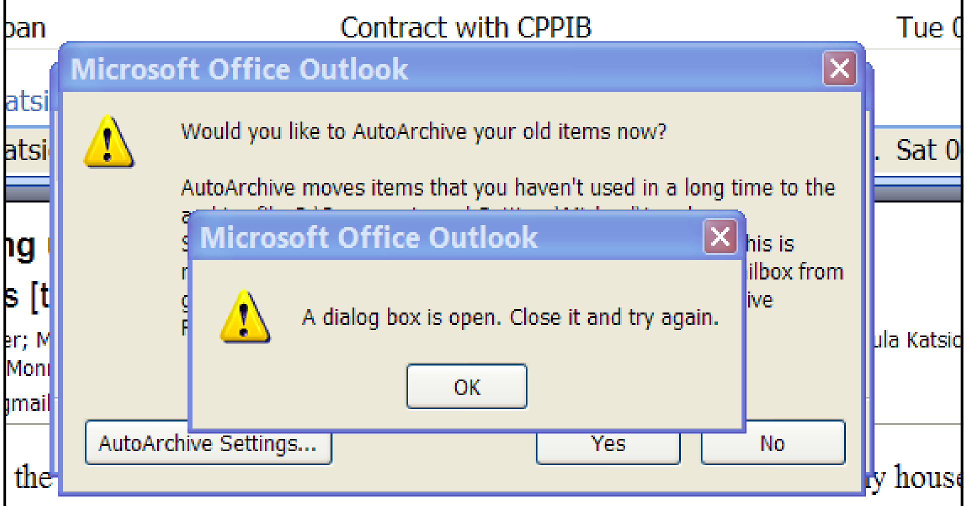


Adobe Reader 7.0.8 - Setup

Welcome to the Update for Adobe Reader 7.0.8

Setup will update Adobe Reader 7.0.8 on your computer. To continue, click Next.

Adobe Acrobat



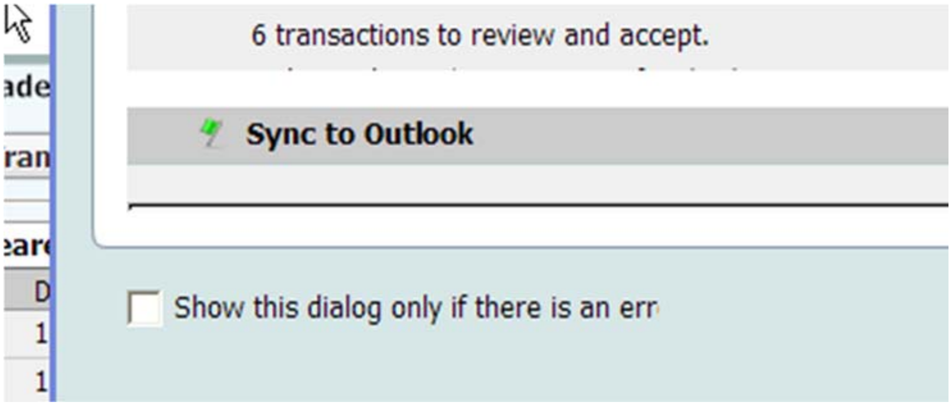
Would you like to AutoArchive your old items now?

AutoArchive moves items that you haven't used in a long time to the

A dialog box is open. Close it and try again.

Microsoft Outlook

I think there IS an err.

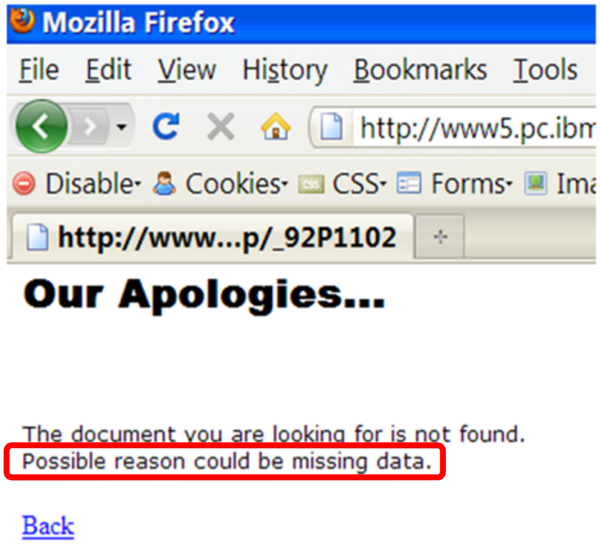


6 transactions to review and accept.

□ Show this dialog only if there is an err

Intuit Quicken

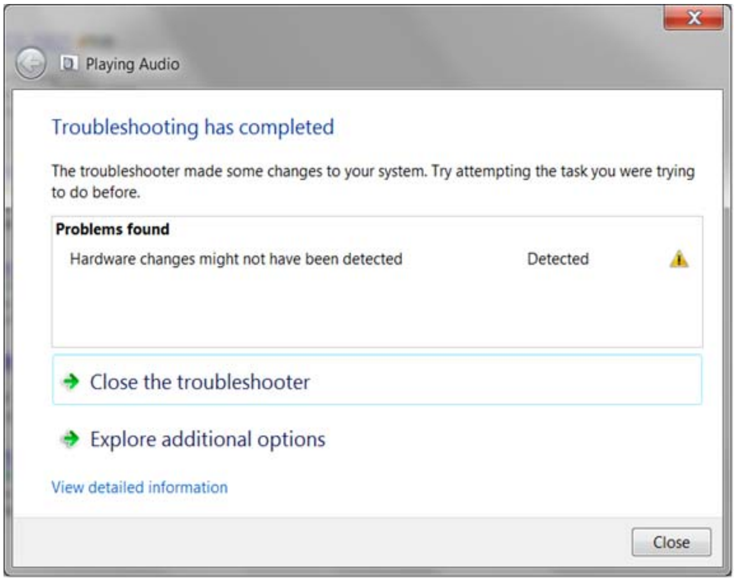
What was your first clue?


Mozilla Firefox
File Edit View History Bookmarks Tools
http://www5.pc.ibm
Disable· Cookies· CSS· Forms· Ima
http://www...p/_92P1102
Back

Our Apologies...

The document you are looking for is not found.
Possible reason could be missing data.

ibm.com



Troubleshooting has completed

The troubleshooter made some changes to your system. Try attempting the task you were trying to do before.

Problems found

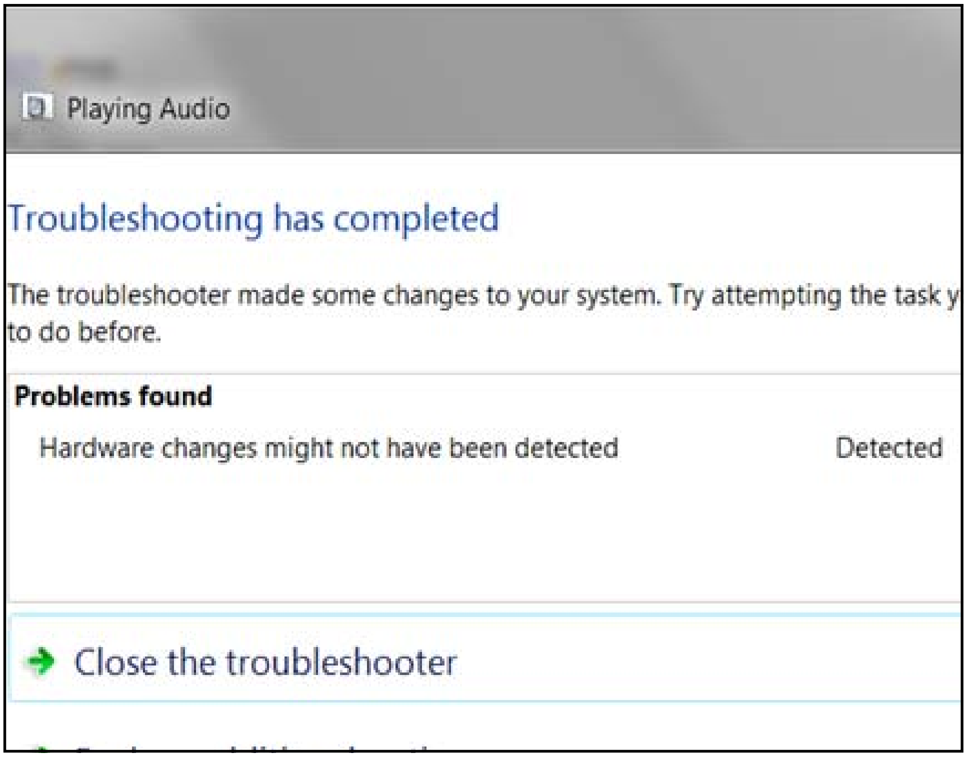
Hardware changes might not have been detected Detected ⚠

→ Close the troubleshooter

→ Explore additional options

View detailed information

Windows



Playing Audio

Troubleshooting has completed

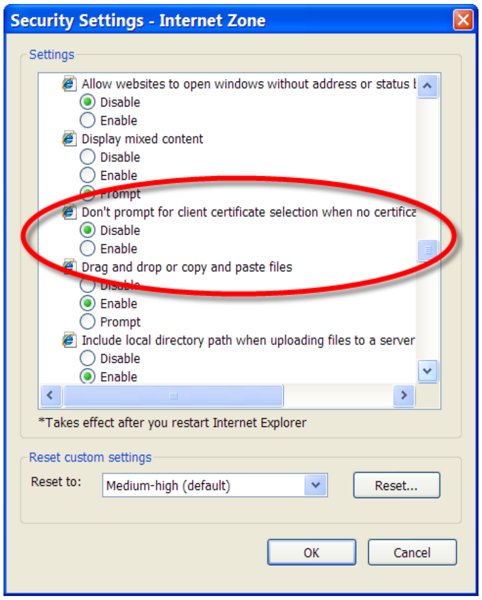
The troubleshooter made some changes to your system. Try attempting the task y to do before.

Problems found

Hardware changes might not have been detected   Detected

Close the troubleshooter

Go ahead; make sense of this.



Security Settings - Internet Zone

Settings

Allow websites to open windows without address or status l
- ● Disable
- ○ Enable

Display mixed content
- ○ Disable
- ○ Enable
- ● Prompt

Don't prompt for client certificate selection when no certifica
- ● Disable
- ○ Enable

Drag and drop or copy and paste files
- ○ Disable
- ● Enable
- ○ Prompt

Include local directory path when uploading files to a server
- ○ Disable
- ● Enable

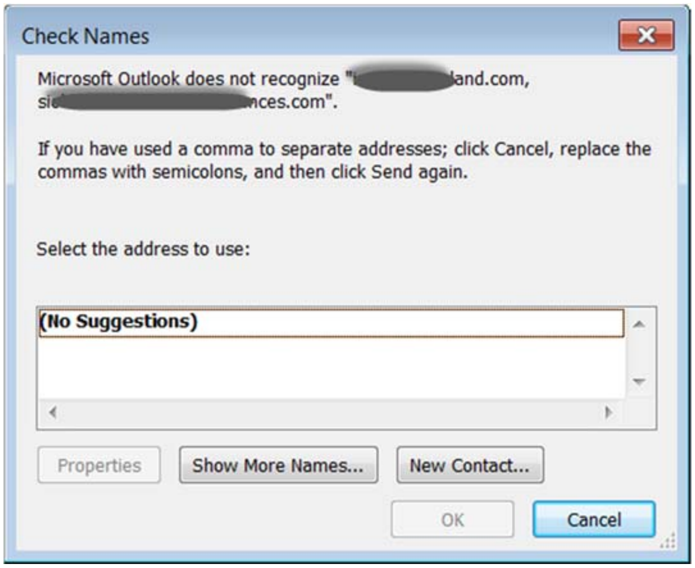
*Takes effect after you restart Internet Explorer

Reset custom settings

Reset to: Medium-high (default)

Windows

You're the computer. You do it.



Check Names

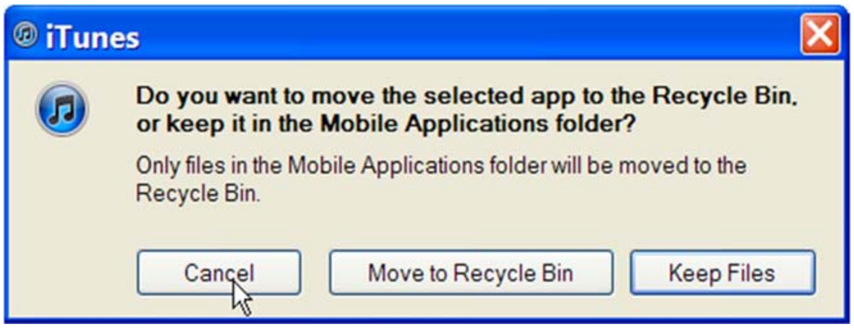
Microsoft Outlook does not recognize "[redacted]and.com, si[redacted]nces.com".

If you have used a comma to separate addresses; click Cancel, replace the commas with semicolons, and then click Send again.

Select the address to use:

(No Suggestions)

23



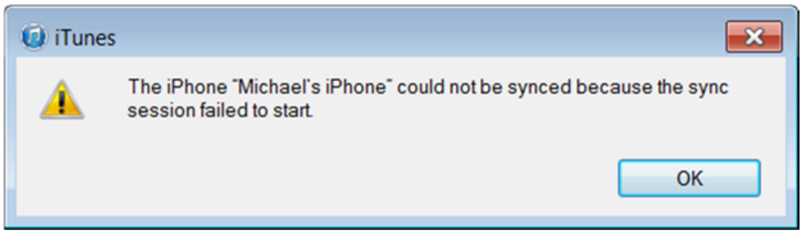
iTunes

Do you want to move the selected app to the Recycle Bin, or keep it in the Mobile Applications folder?

Only files in the Mobile Applications folder will be moved to the Recycle Bin.

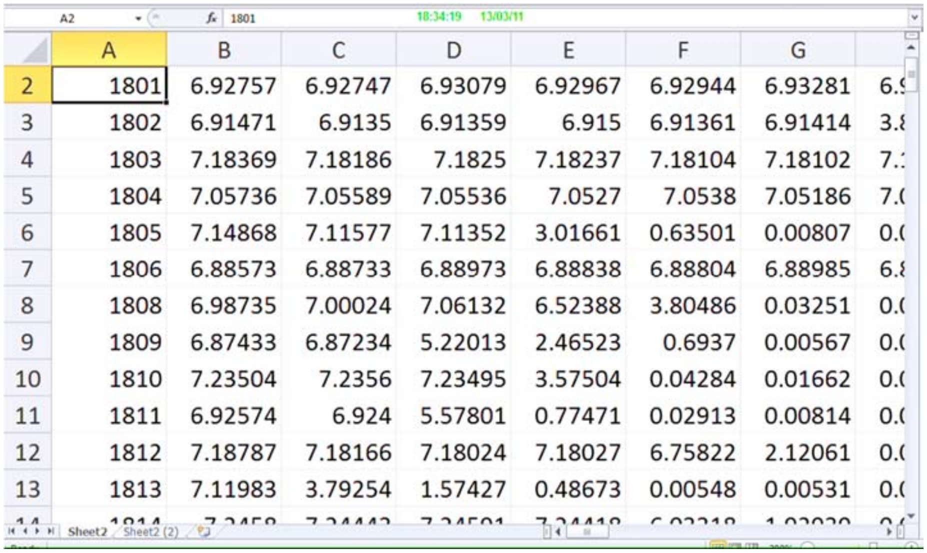
iTunes

This One's From Just This Morning



The iPhone "Michael's iPhone" could not be synced because the sync session failed to start.

Deeper Rapid Testing



	A	B	C	D	E	F	G	
2	1801	6.92757	6.92747	6.93079	6.92967	6.92944	6.93281	6.9
3	1802	6.91471	6.9135	6.91359	6.915	6.91361	6.91414	3.8
4	1803	7.18369	7.18186	7.1825	7.18237	7.18104	7.18102	7.1
5	1804	7.05736	7.05589	7.05536	7.0527	7.0538	7.05186	7.0
6	1805	7.14868	7.11577	7.11352	3.01661	0.63501	0.00807	0.0
7	1806	6.88573	6.88733	6.88973	6.88838	6.88804	6.88985	6.8
8	1808	6.98735	7.00024	7.06132	6.52388	3.80486	0.03251	0.0
9	1809	6.87433	6.87234	5.22013	2.46523	0.6937	0.00567	0.0
10	1810	7.23504	7.2356	7.23495	3.57504	0.04284	0.01662	0.0
11	1811	6.92574	6.924	5.57801	0.77471	0.02913	0.00814	0.0
12	1812	7.18787	7.18166	7.18024	7.18027	6.75822	2.12061	0.0
13	1813	7.11983	3.79254	1.57427	0.48673	0.00548	0.00531	0.0
14	1814	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A Computer Program

A set of instructions for a computer.

See the Association for Software Testing's
Black Box Software Testing Foundations course, Cem Kaner & James Bach

A House

A set of building materials, arranged in the "House" design pattern.

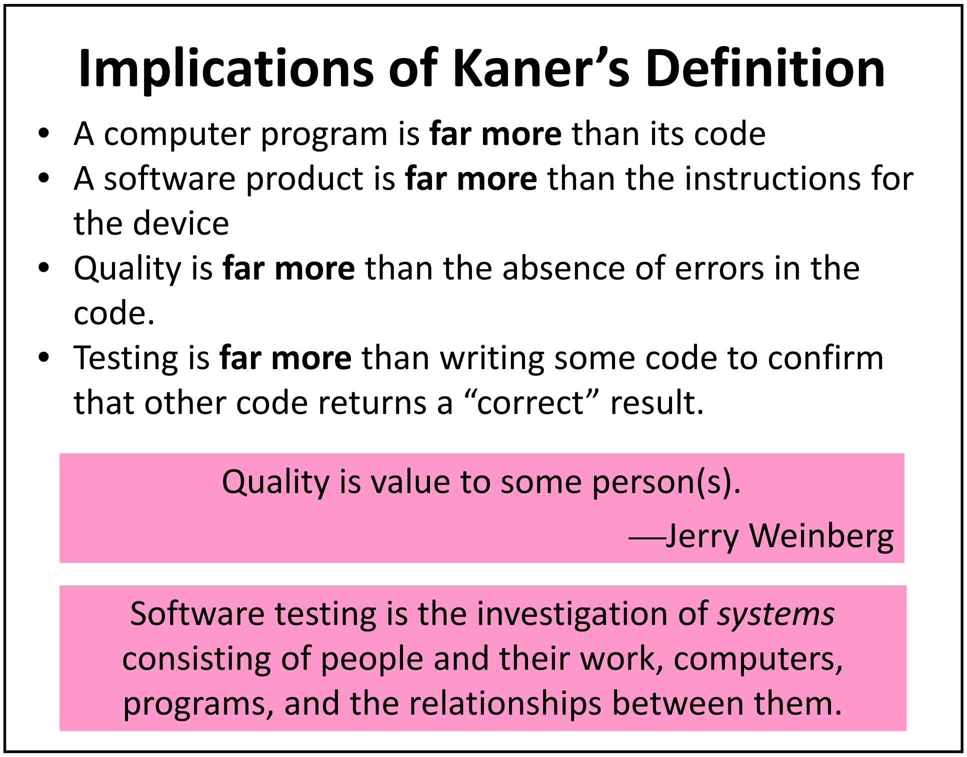
A House

Something for people to live in.

Kaner's Definition of a Computer Program

- A computer program is
- a *communication*
- among several people
- and computers
- separated over distance and time
- that contains instructions that can be run on a computer.

The purpose of a computer program is
to provide **value** to **people**.

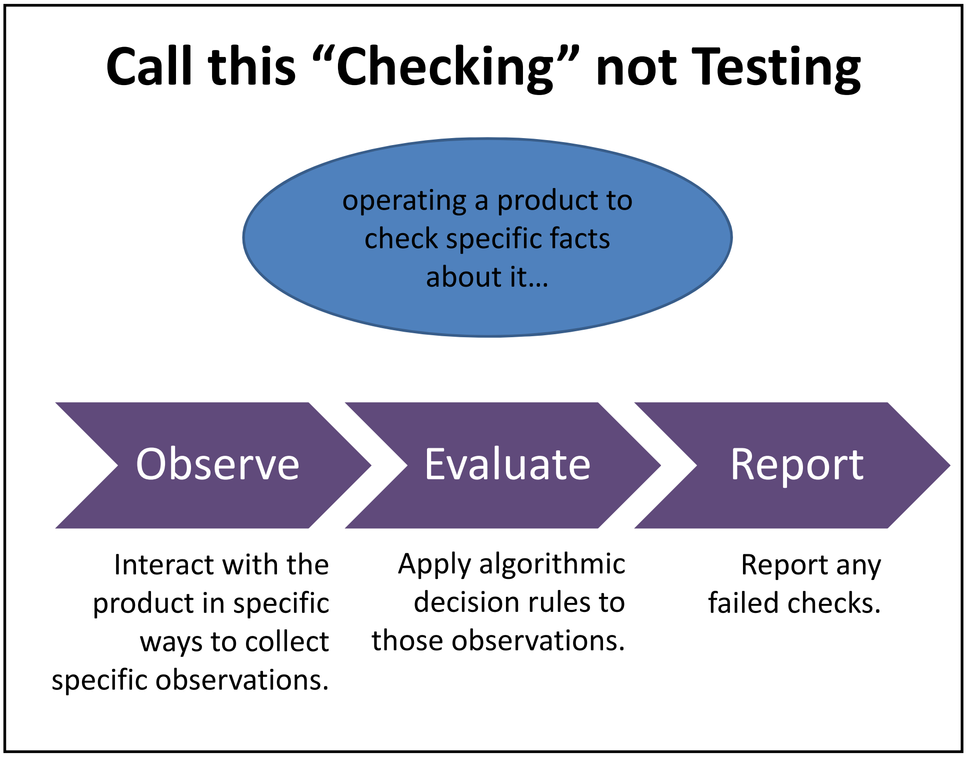


Implications of Kaner's Definition

- A computer program is **far more** than its code
- A software product is **far more** than the instructions for the device
- Quality is **far more** than the absence of errors in the code.
- Testing is **far more** than writing some code to confirm that other code returns a "correct" result.

> Quality is value to some person(s).
>
> —Jerry Weinberg

> Software testing is the investigation of *systems* consisting of people and their work, computers, programs, and the relationships between them.



Call this "Checking" not Testing

operating a product to check specific facts about it…

Observe — Interact with the product in specific ways to collect specific observations.

Evaluate — Apply algorithmic decision rules to those observations.

Report — Report any failed checks.

A Check Has Three Elements

1. An *observation* linked to…
2. A *decision rule* such that…
3. both observation and decision rule can be applied algorithmically.

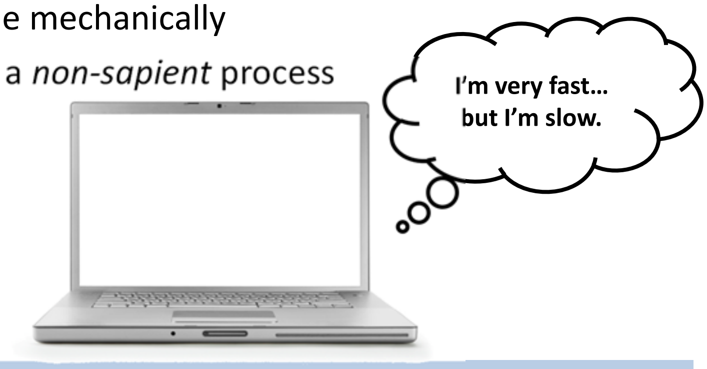
A ***check*** can be performed

by a machine
that *can't* think
(but that is quick and precise)

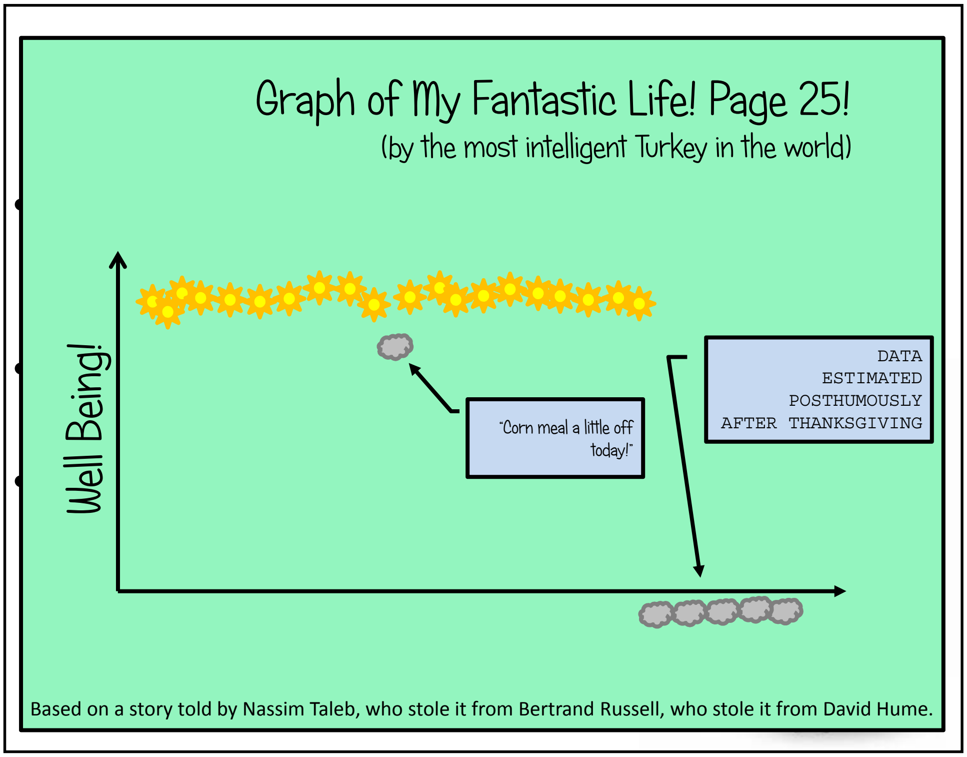
by a human who has been
instructed *not* to think
(and who is slow and variable)

Testing Is More Than *Checking*

- *Checking* is a process of confirming and verifying existing beliefs
  - Checking can (and we argue, largely should) be done mechanically
  - It is a *non-sapient* process



See http://www.developsense.com/2009/08/testing-vs-checking.html



Graph of My Fantastic Life! Page 25!

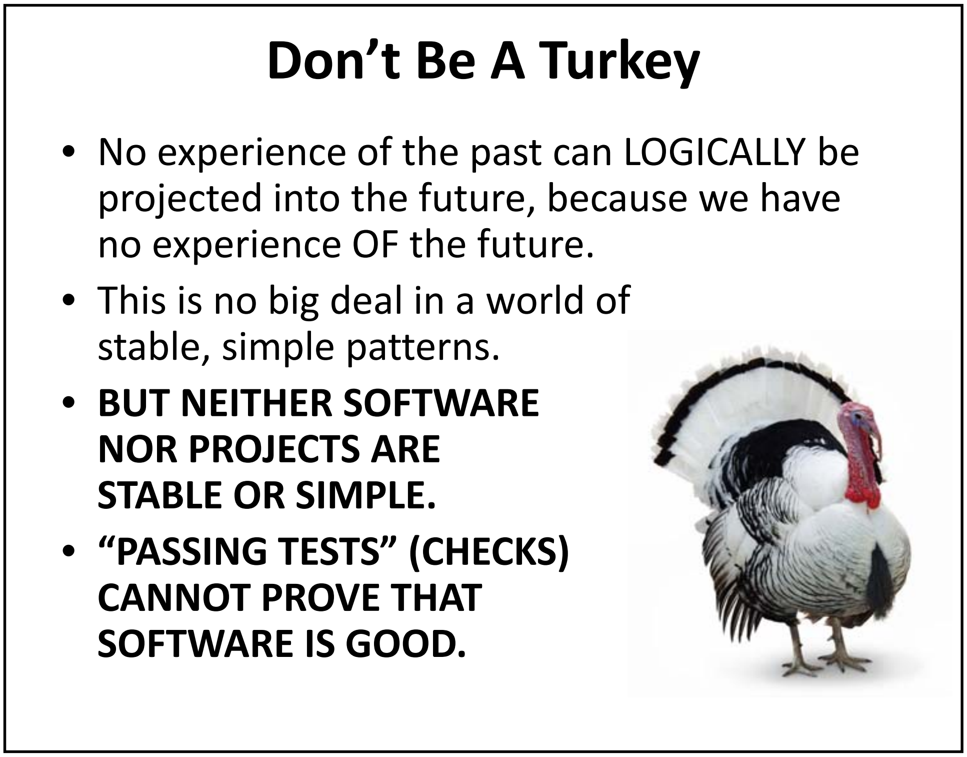
(by the most intelligent Turkey in the world)

Well Being!

"Corn meal a little off today!"

DATA
ESTIMATED
POSTHUMOUSLY
AFTER THANKSGIVING

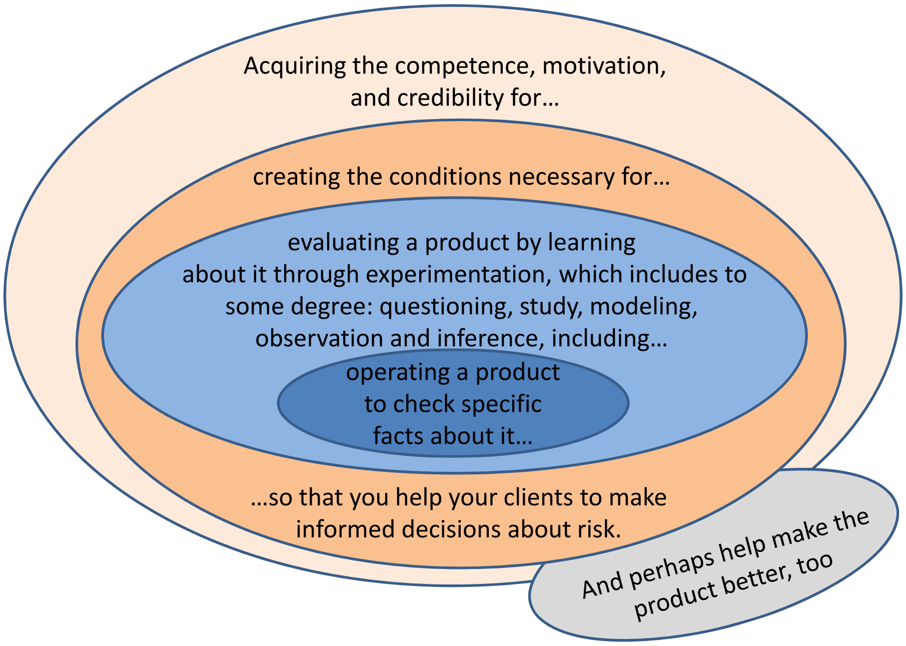
Based on a story told by Nassim Taleb, who stole it from Bertrand Russell, who stole it from David Hume.



Don’t Be A Turkey

- No experience of the past can LOGICALLY be projected into the future, because we have no experience OF the future.
- This is no big deal in a world of stable, simple patterns.
- **BUT NEITHER SOFTWARE NOR PROJECTS ARE STABLE OR SIMPLE.**
- **“PASSING TESTS” (CHECKS) CANNOT PROVE THAT SOFTWARE IS GOOD.**

Testing is…



Acquiring the competence, motivation, and credibility for…

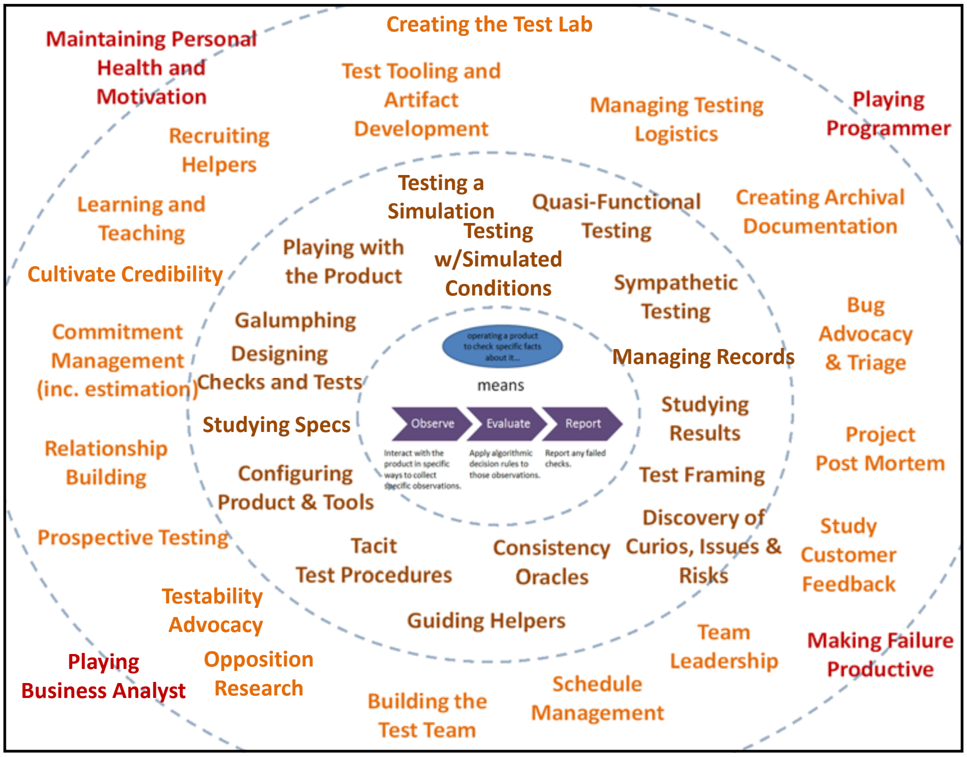
creating the conditions necessary for…

evaluating a product by learning about it through experimentation, which includes to some degree: questioning, study, modeling, observation and inference, including…

operating a product to check specific facts about it…

…so that you help your clients to make informed decisions about risk.

And perhaps help make the product better, too



Maintaining Personal Health and Motivation

Creating the Test Lab

Test Tooling and Artifact Development

Managing Testing Logistics

Playing Programmer

Recruiting Helpers

Learning and Teaching

Testing a Simulation

Quasi-Functional Testing

Creating Archival Documentation

Playing with the Product

Testing w/Simulated Conditions

Cultivate Credibility

Sympathetic Testing

Bug Advocacy & Triage

Galumphing

Commitment Management (inc. estimation)

Designing Checks and Tests

operating a product to check specific facts about it…

means

Observe — Interact with the product in specific ways to collect specific observations.

Evaluate — Apply algorithmic decision rules to those observations.

Report — Report any failed checks.

Managing Records

Studying Results

Studying Specs

Project Post Mortem

Relationship Building

Configuring Product & Tools

Test Framing

Prospective Testing

Discovery of Curios, Issues & Risks

Study Customer Feedback

Tacit Test Procedures

Consistency Oracles

Testability Advocacy

Guiding Helpers

Team Leadership

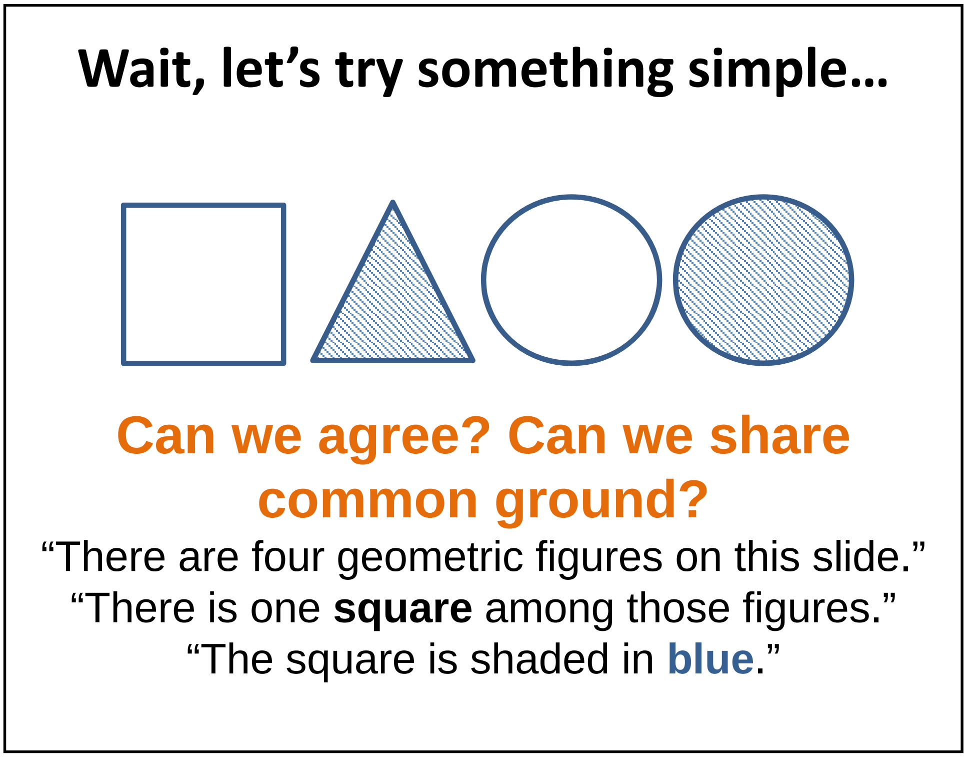
Making Failure Productive

Playing Business Analyst

Opposition Research

Building the Test Team

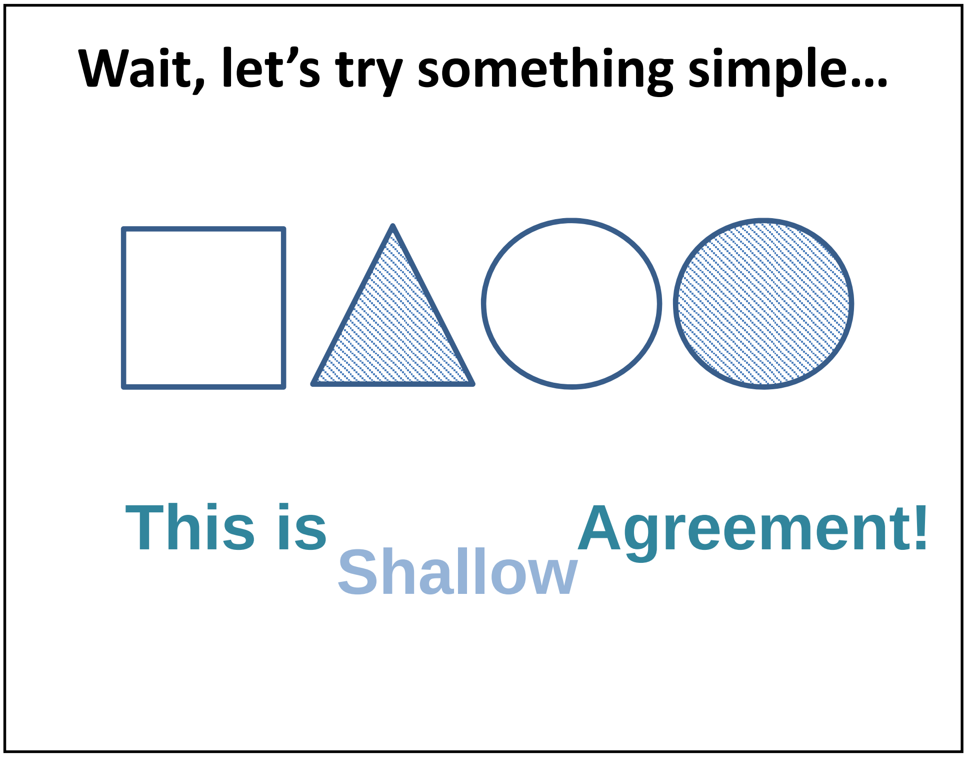
Schedule Management



Wait, let's try something simple…

Can we agree? Can we share common ground?

"There are four geometric figures on this slide."
"There is one **square** among those figures."
"The square is shaded in **blue**."



Wait, let's try something simple…

This is Shallow Agreement!

What is the Point?

Any communication among humans…

(especially technical communication about complex systems)

…involves making reasonable, socially-situated assumptions about things not spoken...

(or else people will see you as a child, a robot, or a very unpleasant person)

…and that is a risk to be managed.

What is a "reasonable" assumption?

Tacit and Explicit Knowledge

EXPLICIT means it can be represented completely in the form of a string of bits: words, pictures, even actions can be explicit. (software is explicit)

TACIT means it is not manifested in a form that can be equated to a string of bits: it is unspoken, unwritten, unpictured.

- **Relational Tacit Knowledge** is tacit by convenience.
- **Somatic Tacit Knowledge** is tacit in your body.
- **Social Tacit Knowledge** is tacit in a community.

(see Collins, *Tacit and Explicit Knowledge*)

Examples of the Need for Tacit Knowledge

- You consider how users will **interact with and adjust** to a product.
- You consider what a specification and product was **intended to say or do**, not just what they literally say and do.
- You notice what the specification and product **strangely omits**.
- You focus on business risks even when **no one tells you** what they are.
- You notice changes in the product's behavior over time—none of which are failures in and of themselves—**you form conjectures** of why that happens, and you connect those conjectures with an evolving understanding of **plausible error and failure patterns**.
- You use tools, you notice when those tools **misbehave**, and you make **adjustments or workarounds** to get the job done.
- You report your test results based partly on **how you think your clients will react**. You **anticipate** their questions based on your insight about **how they will understand you.**

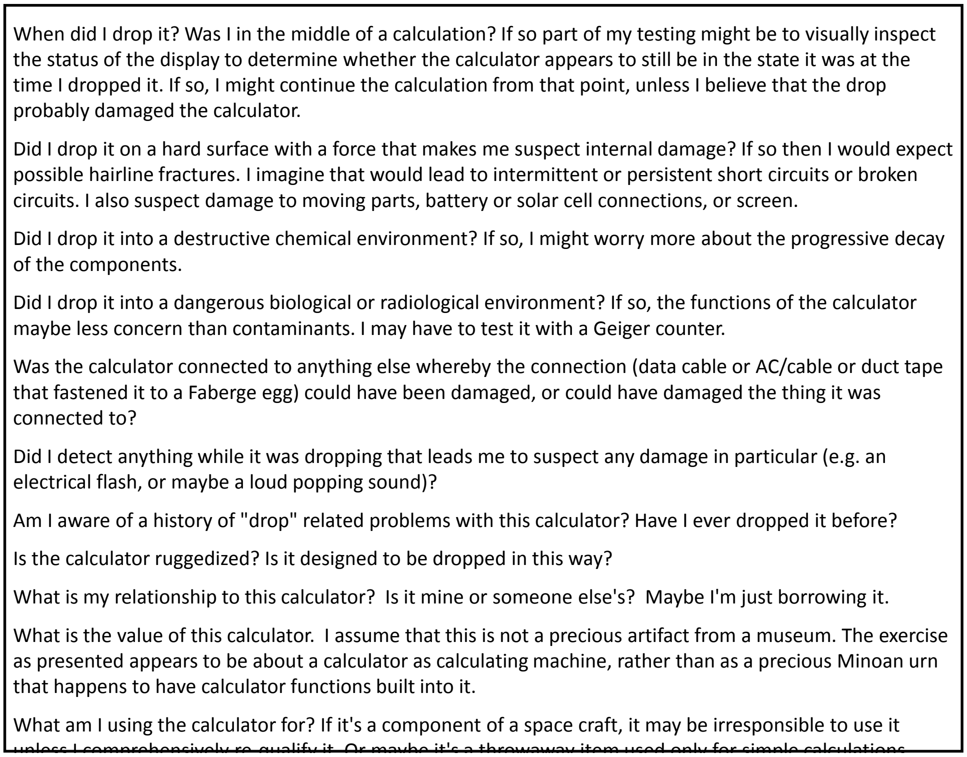
Exercise: Calculator Test

"You are carrying a calculator.

You **drop** it!

Perhaps it is **damaged**!

What might you do to test it?"



When did I drop it? Was I in the middle of a calculation? If so part of my testing might be to visually inspect the status of the display to determine whether the calculator appears to still be in the state it was at the time I dropped it. If so, I might continue the calculation from that point, unless I believe that the drop probably damaged the calculator.

Did I drop it on a hard surface with a force that makes me suspect internal damage? If so then I would expect possible hairline fractures. I imagine that would lead to intermittent or persistent short circuits or broken circuits. I also suspect damage to moving parts, battery or solar cell connections, or screen.

Did I drop it into a destructive chemical environment? If so, I might worry more about the progressive decay of the components.

Did I drop it into a dangerous biological or radiological environment? If so, the functions of the calculator maybe less concern than contaminants. I may have to test it with a Geiger counter.

Was the calculator connected to anything else whereby the connection (data cable or AC/cable or duct tape that fastened it to a Faberge egg) could have been damaged, or could have damaged the thing it was connected to?

Did I detect anything while it was dropping that leads me to suspect any damage in particular (e.g. an electrical flash, or maybe a loud popping sound)?

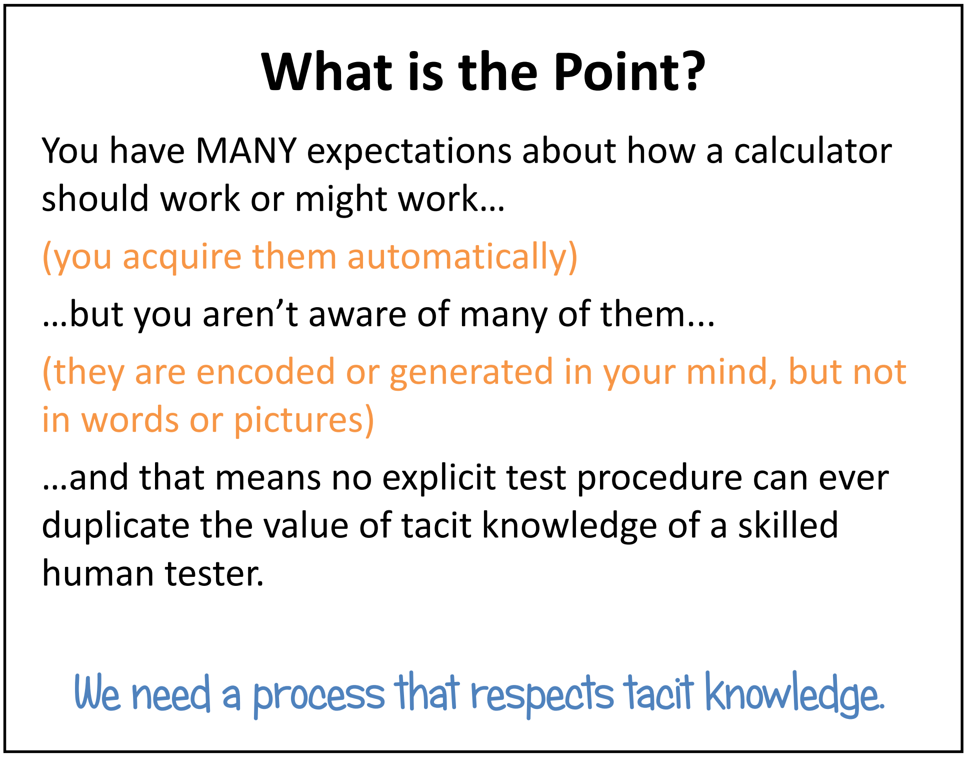
Am I aware of a history of "drop" related problems with this calculator? Have I ever dropped it before?

Is the calculator ruggedized? Is it designed to be dropped in this way?

What is my relationship to this calculator? Is it mine or someone else's? Maybe I'm just borrowing it.

What is the value of this calculator. I assume that this is not a precious artifact from a museum. The exercise as presented appears to be about a calculator as calculating machine, rather than as a precious Minoan urn that happens to have calculator functions built into it.

What am I using the calculator for? If it's a component of a space craft, it may be irresponsible to use it unless I comprehensively re-qualify it. Or maybe it's a throwaway item used only for simple calculations



What is the Point?

You have MANY expectations about how a calculator should work or might work…

(you acquire them automatically)

…but you aren't aware of many of them...

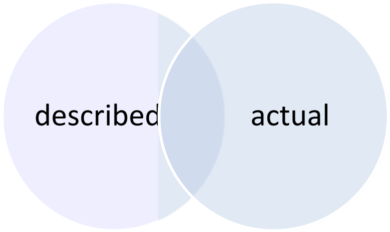
(they are encoded or generated in your mind, but not in words or pictures)

…and that means no explicit test procedure can ever duplicate the value of tacit knowledge of a skilled human tester.

We need a process that respects tacit knowledge.

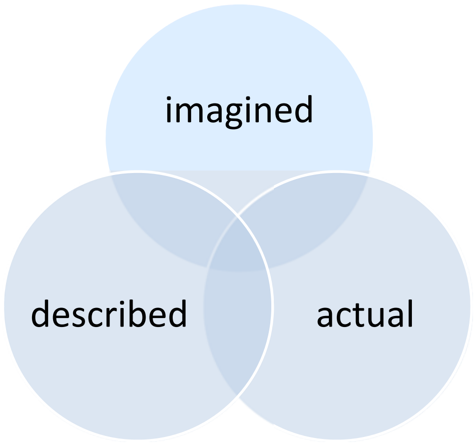
This is what people think testers do

"Compare the product to its specification"



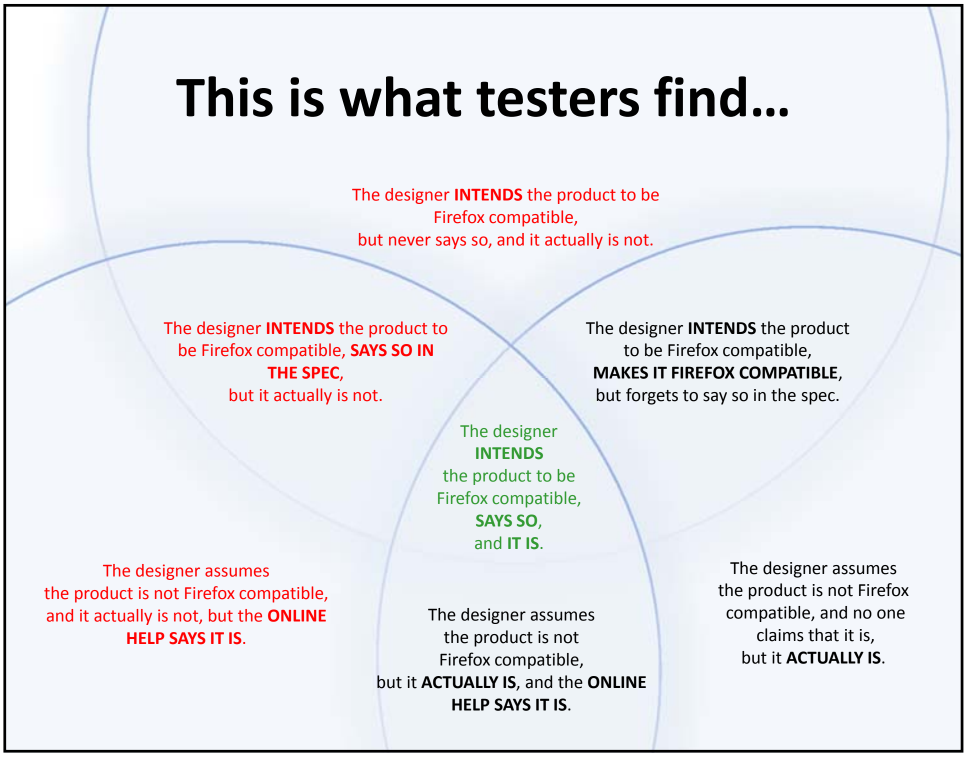
This is more like what testers really do

"Compare the idea of the product to a description of it"



"Compare the idea of the product to the actual product"

"Compare the actual product to a description of it"



This is what testers find…

The designer **INTENDS** the product to be Firefox compatible, but never says so, and it actually is not.

The designer **INTENDS** the product to be Firefox compatible, **SAYS SO IN THE SPEC**, but it actually is not.

The designer **INTENDS** the product to be Firefox compatible, **MAKES IT FIREFOX COMPATIBLE**, but forgets to say so in the spec.

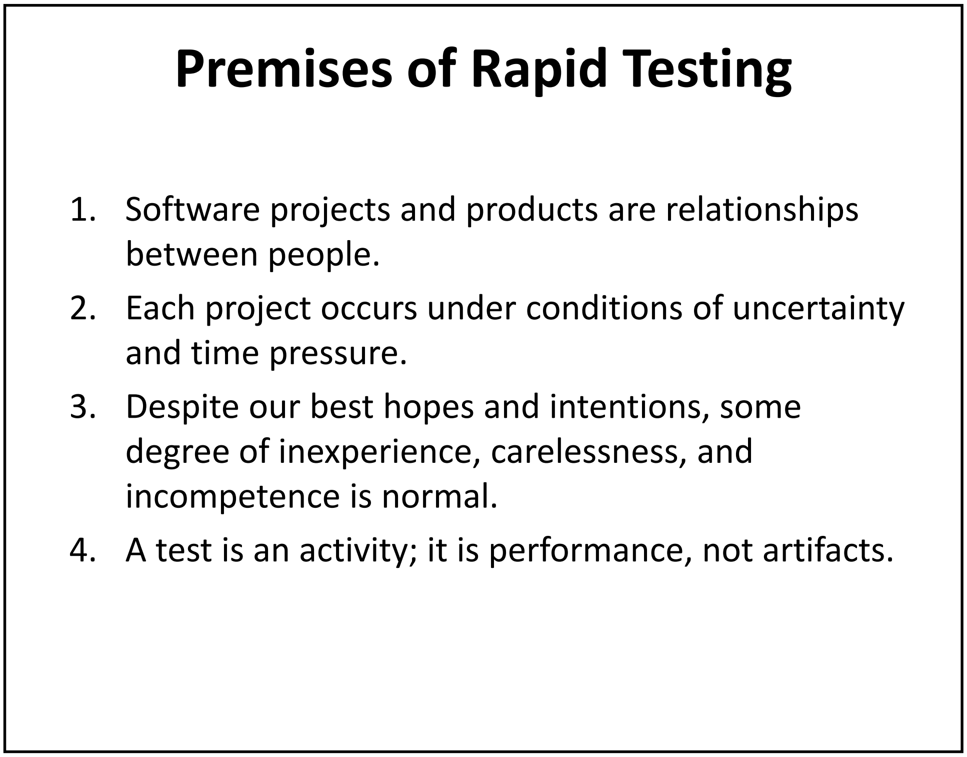
The designer **INTENDS** the product to be Firefox compatible, **SAYS SO**, and **IT IS**.

The designer assumes the product is not Firefox compatible, and it actually is not, but the **ONLINE HELP SAYS IT IS**.

The designer assumes the product is not Firefox compatible, but it **ACTUALLY IS**, and the **ONLINE HELP SAYS IT IS**.

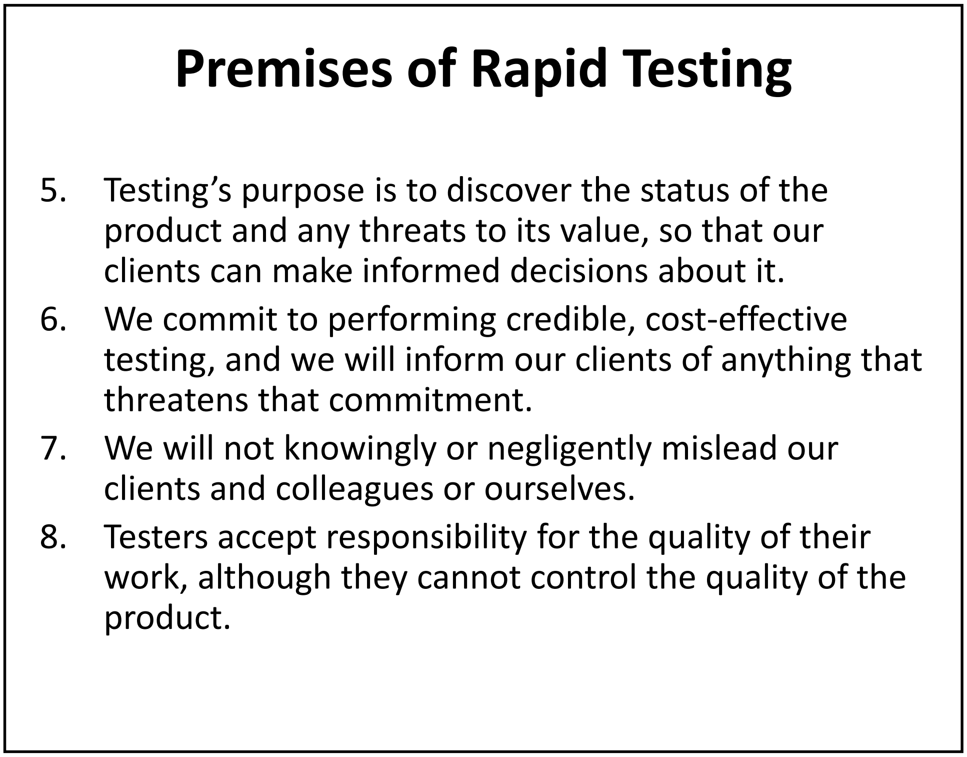
The designer assumes the product is not Firefox compatible, and no one claims that it is, but it **ACTUALLY IS**.

We Are Sensory Instruments For Our Clients



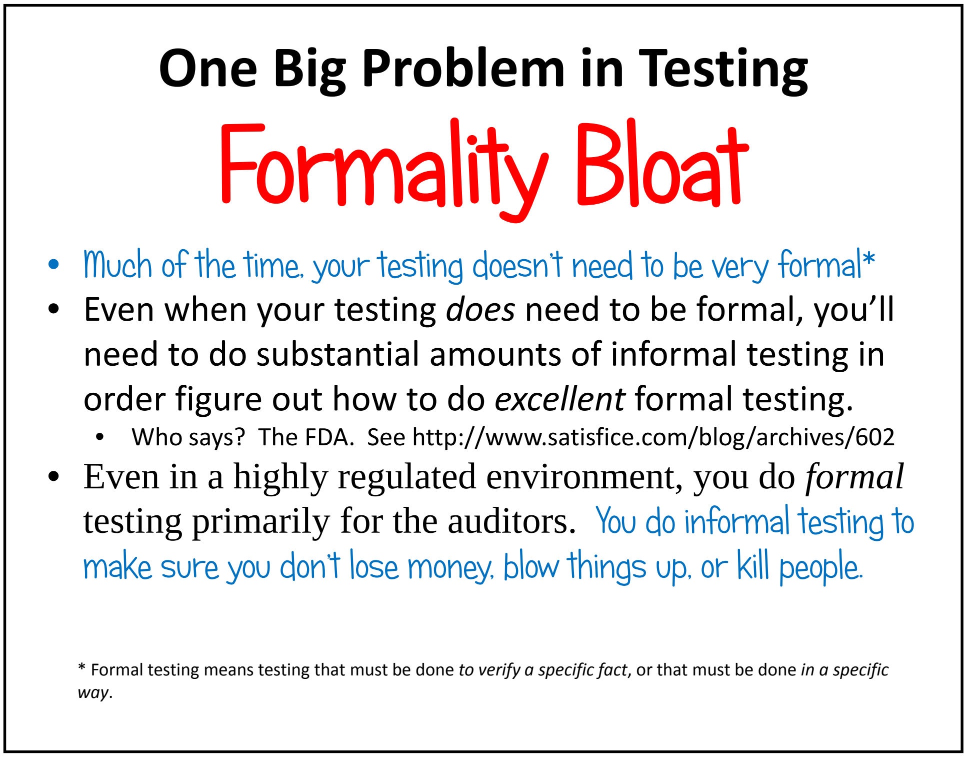
Premises of Rapid Testing

1. Software projects and products are relationships between people.
2. Each project occurs under conditions of uncertainty and time pressure.
3. Despite our best hopes and intentions, some degree of inexperience, carelessness, and incompetence is normal.
4. A test is an activity; it is performance, not artifacts.



Premises of Rapid Testing

5. Testing’s purpose is to discover the status of the product and any threats to its value, so that our clients can make informed decisions about it.
6. We commit to performing credible, cost-effective testing, and we will inform our clients of anything that threatens that commitment.
7. We will not knowingly or negligently mislead our clients and colleagues or ourselves.
8. Testers accept responsibility for the quality of their work, although they cannot control the quality of the product.

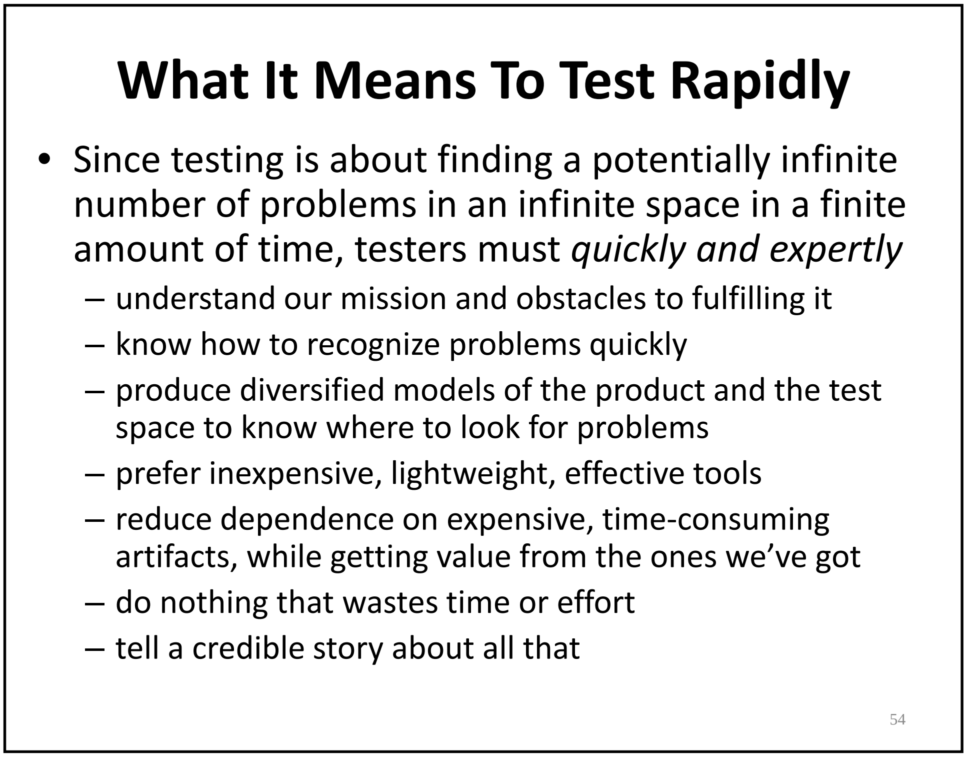


One Big Problem in Testing

Formality Bloat

- Much of the time, your testing doesn't need to be very formal*
- Even when your testing *does* need to be formal, you'll need to do substantial amounts of informal testing in order figure out how to do *excellent* formal testing.
  - Who says? The FDA. See http://www.satisfice.com/blog/archives/602
- Even in a highly regulated environment, you do *formal* testing primarily for the auditors. You do informal testing to make sure you don't lose money, blow things up, or kill people.

* Formal testing means testing that must be done *to verify a specific fact*, or that must be done *in a specific way*.



What It Means To Test Rapidly

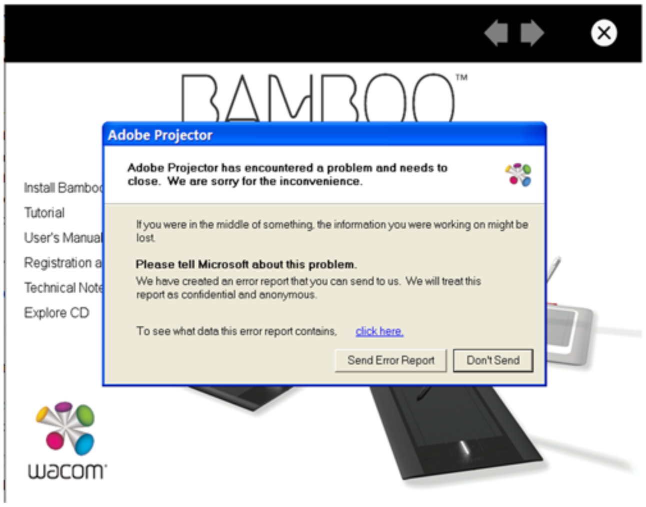
- Since testing is about finding a potentially infinite number of problems in an infinite space in a finite amount of time, testers must *quickly and expertly*
  – understand our mission and obstacles to fulfilling it
  – know how to recognize problems quickly
  – produce diversified models of the product and the test space to know where to look for problems
  – prefer inexpensive, lightweight, effective tools
  – reduce dependence on expensive, time-consuming artifacts, while getting value from the ones we've got
  – do nothing that wastes time or effort
  – tell a credible story about all that

How Do We Recognize Problems?

An oracle is…

a way to recognize a problem.

Familiar Problems



Adobe Projector

Adobe Projector has encountered a problem and needs to close. We are sorry for the inconvenience.

If you were in the middle of something, the information you were working on might be lost.

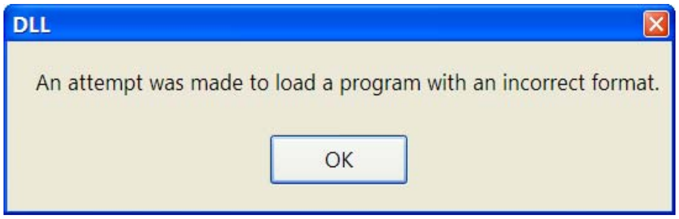
Please tell Microsoft about this problem.

We have created an error report that you can send to us. We will treat this report as confidential and anonymous.

To see what data this error report contains, click here.

If a product is consistent with problems we've seen before, we suspect that there might be a problem.

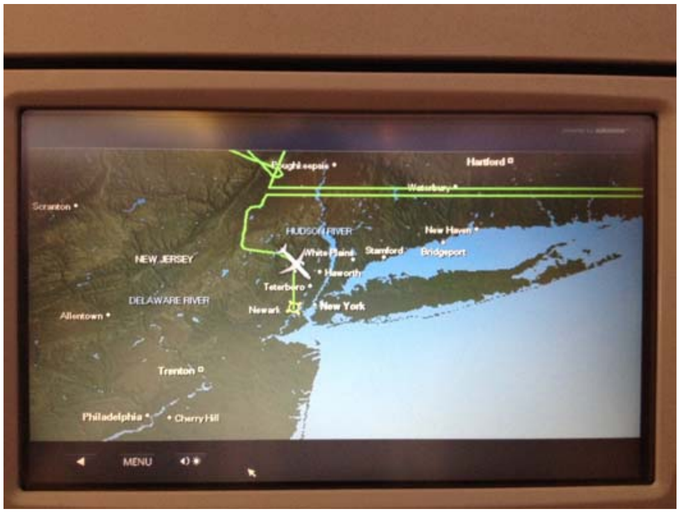
Explainability



An attempt was made to load a program with an incorrect format.

If a product is inconsistent with our ability to explain it, we suspect that there might be a problem.

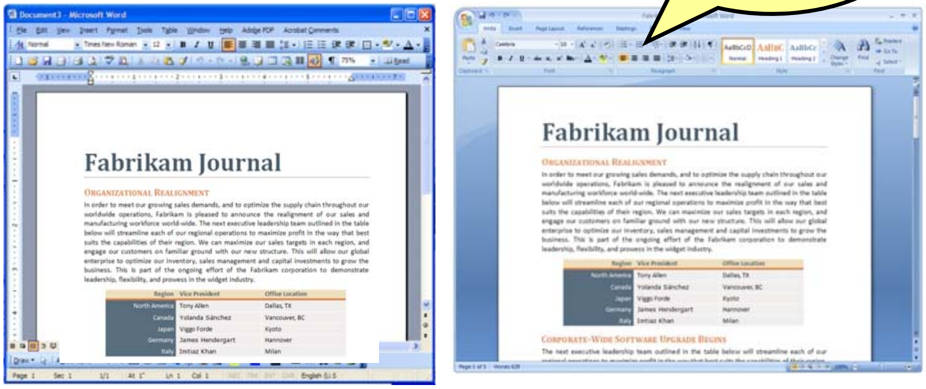
World



If a product is inconsistent with the way the world works, we suspect that there might be a problem.

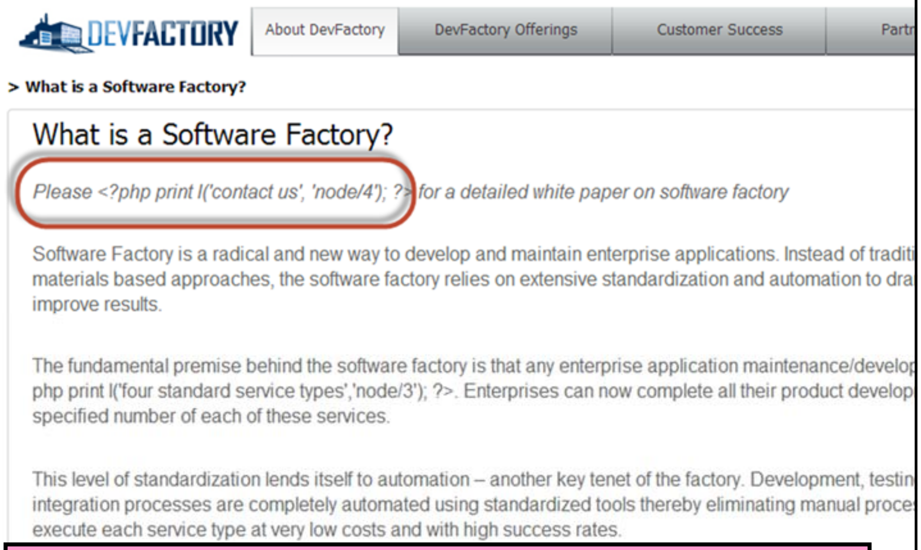
History

Hey, I **liked** the menu bar! How the #&@ do I print **now**?


Document3 - Microsoft Word
File Edit View Insert Format Tools Table Window Help Adobe PDF Acrobat Comments
Fabrikam Journal
Organizational Realignment
Fabrikam Journal
Organizational Realignment
Corporate-Wide Software Upgrade Begins

If a product is inconsistent with previous versions of itself, we suspect that there might be a problem.

Image



> What is a Software Factory?

What is a Software Factory?

Please <?php print l('contact us', 'node/4'); ?> for a detailed white paper on software factory

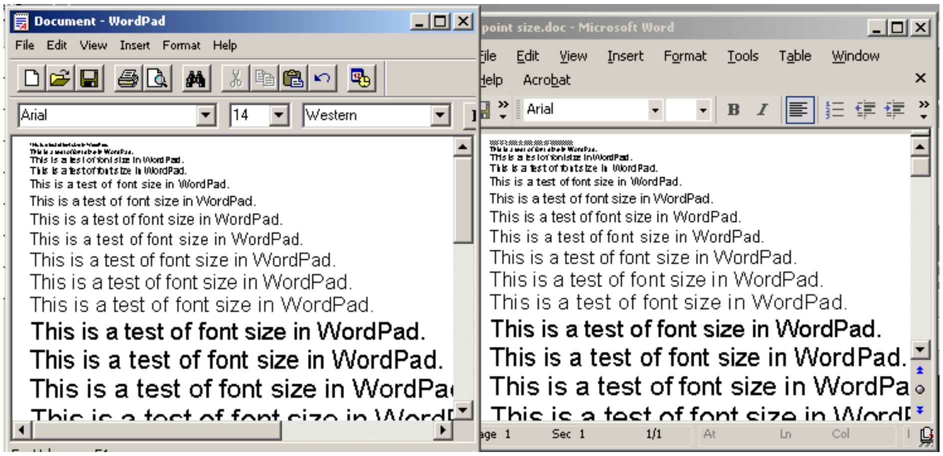
Software Factory is a radical and new way to develop and maintain enterprise applications. Instead of traditi materials based approaches, the software factory relies on extensive standardization and automation to dra improve results.

The fundamental premise behind the software factory is that any enterprise application maintenance/develop php print l('four standard service types','node/3'); ?>. Enterprises can now complete all their product develop specified number of each of these services.

This level of standardization lends itself to automation – another key tenet of the factory. Development, testin integration processes are completely automated using standardized tools thereby eliminating manual proce execute each service type at very low costs and with high success rates.

If a product is inconsistent with an image that the organization wants to project, we suspect a problem.

Comparable Products


Document - WordPad
File Edit View Insert Format Help
Arial
14
Western
point size.doc - Microsoft Word
File Edit View Insert Format Tools Table Window
Help Acrobat
Arial
Page 1 Sec 1 1/1 At Ln Col

This is a test of font size in WordPad.
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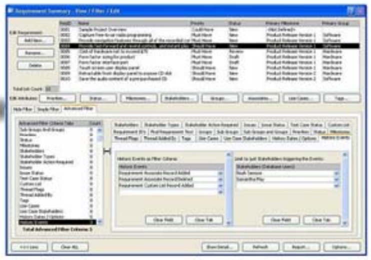
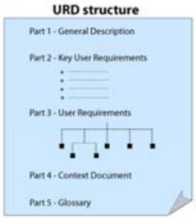
WordPad Word

When a product seems inconsistent with a comparable product or algorithm, we suspect that there might be a problem.

Claims

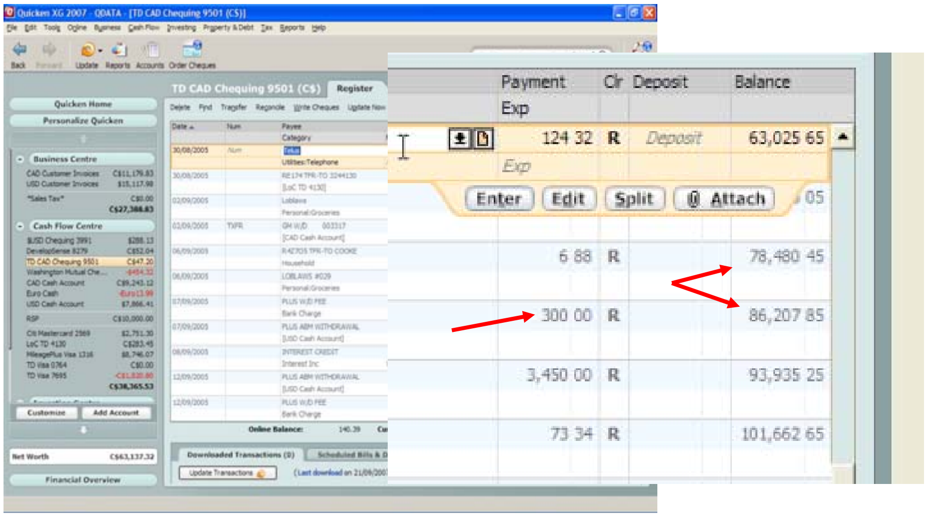


New! Supports Mac OS/X!


URD structure
Part 1 - General Description
Part 2 - Key User Requirements
Part 3 - User Requirements
Part 4 - Context Document
Part 5 - Glossary

When a product is inconsistent with claims that important people make about it, we suspect a problem.

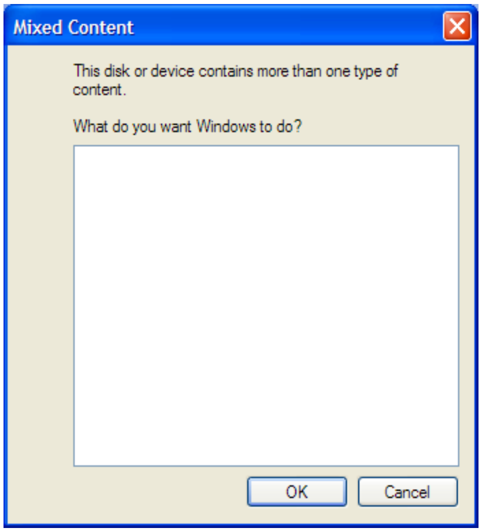
User Expectations


Quicken XG 2007 - QDATA - [TD CAD Chequing 9501 (C$)]
TD CAD Chequing 9501 (C$)
Register
Enter
Edit
Split
Attach

Payment Exp	Clr	Deposit	Balance
124 32 Exp	R	Deposit	63,025 65
6 88	R		78,480 45
300 00	R		86,207 85
3,450 00	R		93,935 25
73 34	R		101,662 65

When a product is inconsistent with expectations that a reasonable user might have, we suspect a problem.

Purpose

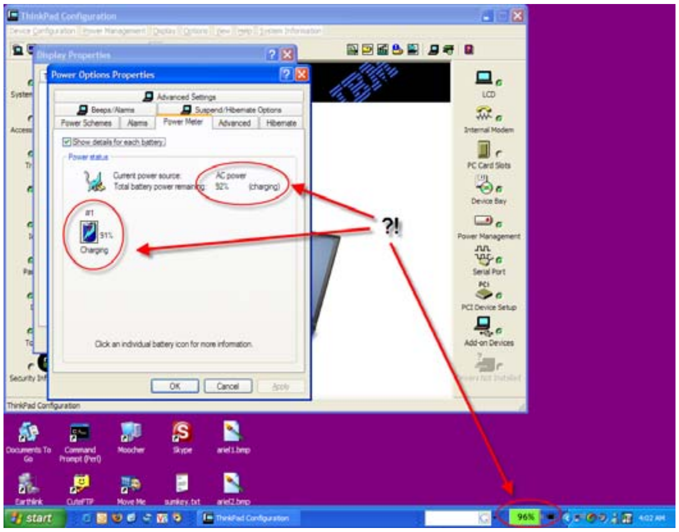


This disk or device contains more than one type of content.

What do you want Windows to do?

When a product is inconsistent with its designers' explicit or implicit purposes, we suspect a problem.

Product

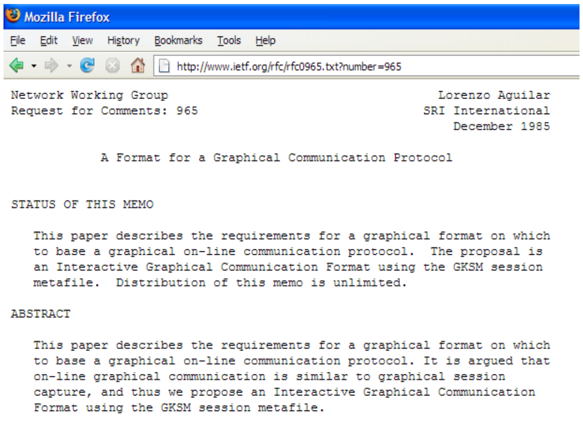


Current power source: AC power
Total battery power remaining: 92% (charging)

Click an individual battery icon for more information.

When a product is inconsistent internally—as when it contradicts itself—we suspect a problem.

Statutes and Standards


Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.ietf.org/rfc/rfc0965.txt?number=965

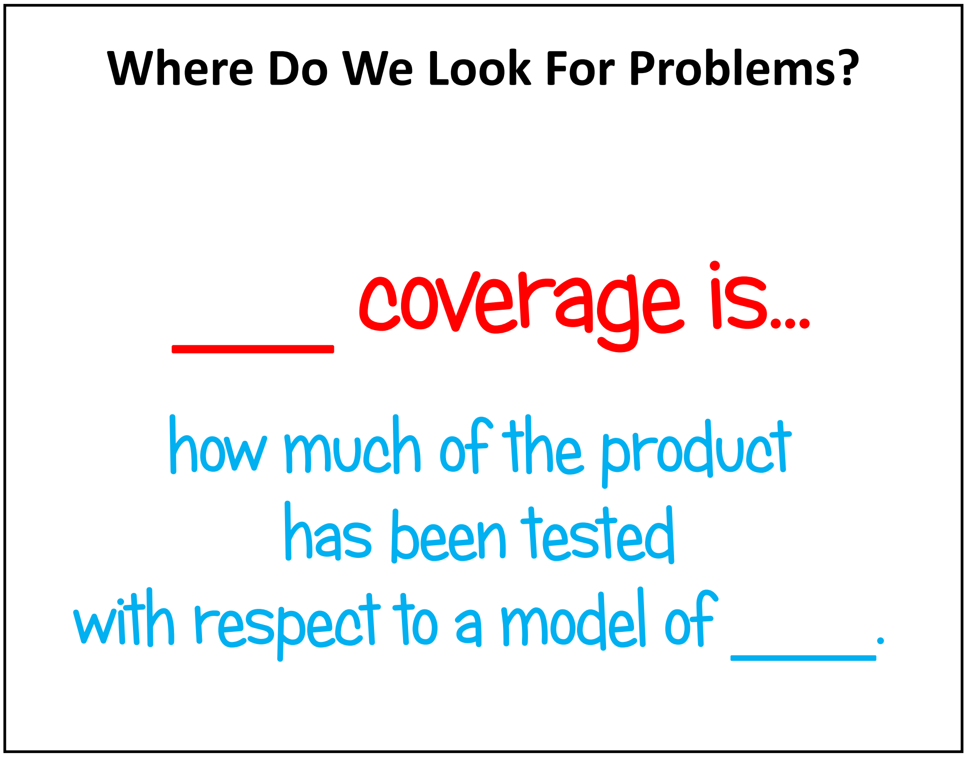
```
Network Working Group                                    Lorenzo Aguilar
Request for Comments: 965                             SRI International
                                                           December 1985

            A Format for a Graphical Communication Protocol


STATUS OF THIS MEMO

   This paper describes the requirements for a graphical format on which
   to base a graphical on-line communication protocol.  The proposal is
   an Interactive Graphical Communication Format using the GKSM session
   metafile.  Distribution of this memo is unlimited.

ABSTRACT

   This paper describes the requirements for a graphical format on which
   to base a graphical on-line communication protocol. It is argued that
   on-line graphical communication is similar to graphical session
   capture, and thus we propose an Interactive Graphical Communication
   Format using the GKSM session metafile.
```

When a product is inconsistent with laws or widely accepted or relevant standards, we suspect a problem.

Where Do We Look For Problems?

Coverage is...

how much of the
product has been tested.



Where Do We Look For Problems?

____ coverage is...

how much of the product
has been tested
with respect to a model of _____.

Models

- **A model is an idea, activity, or object…**

  such as an *idea in your mind*, a *diagram*, a *list of words*, a *spreadsheet*, a *person*, a *toy*, an *equation*, a *demonstration*, or a *program*

- **…that heuristically represents (literally, re-presents) another idea, activity, or object…**

  such as something complex that you need to work with or study

- **…whereby understanding something about the model may help you to understand or manipulate the thing that it represents.**

  - A *map* is a model that helps to navigate across a terrain.
  - *2+2=4* is a model for adding two apples to a basket that already has two apples.
  - *Atmospheric models* help predict where hurricanes will go.
  - A *fashion model* helps understand how clothing would look on actual humans.
  - *Your beliefs about what you test are a model of what you test.*

There are as many kinds of test coverage as there are ways to model the system.

Structure

Business Risk

Time

Technical Risk

Functions

Platform

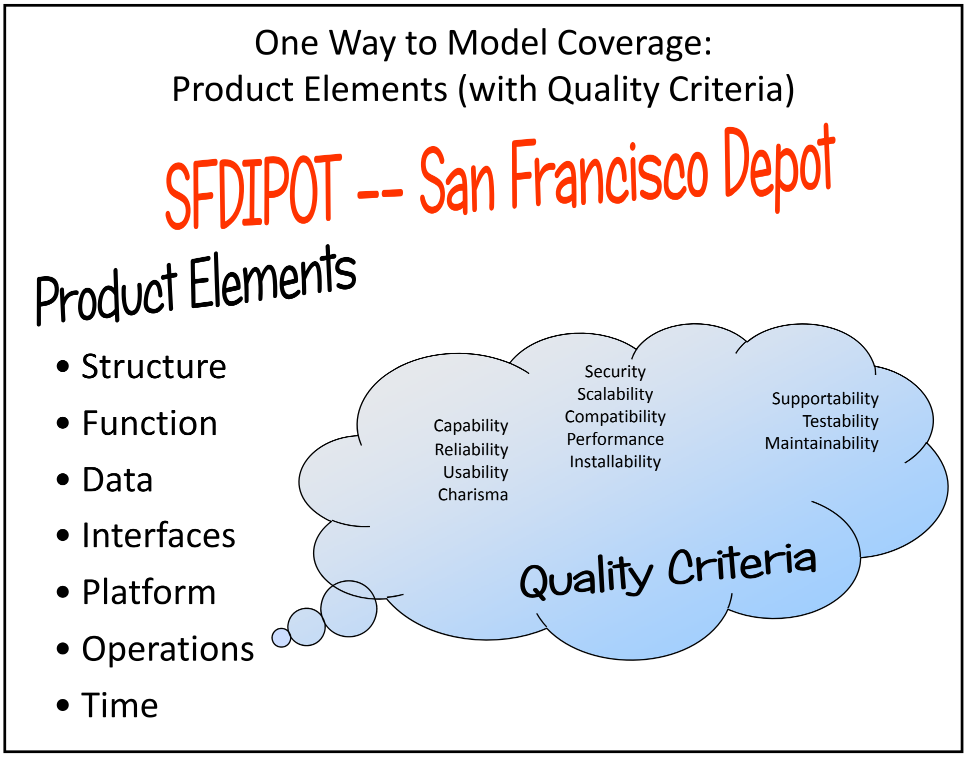
Operations

Interfaces

Data

And each could be covered…

Intentionally OR Incidentally



One Way to Model Coverage: Product Elements (with Quality Criteria)

SFDIPOT -- San Francisco Depot

Product Elements

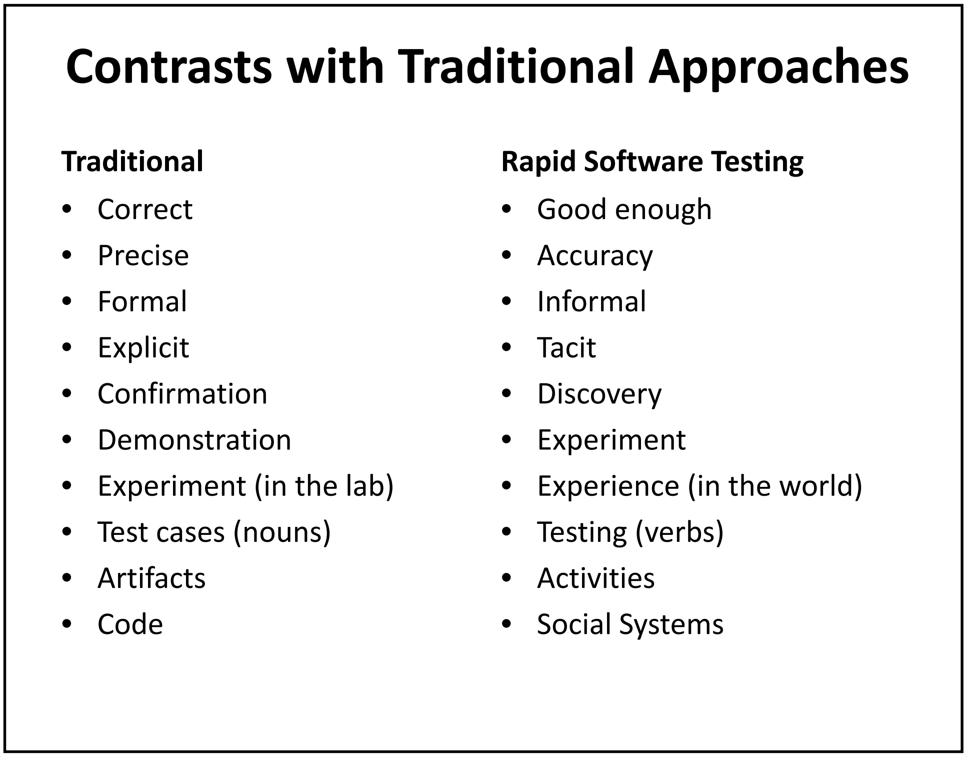
- Structure
- Function
- Data
- Interfaces
- Platform
- Operations
- Time

Capability
Reliability
Usability
Charisma

Security
Scalability
Compatibility
Performance
Installability

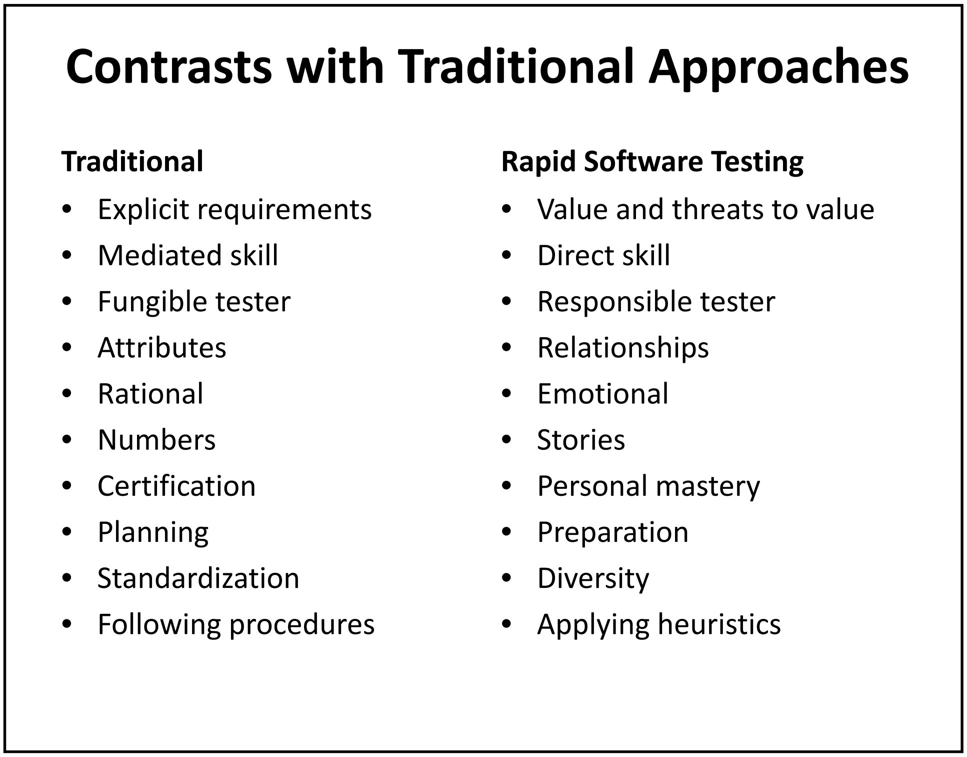
Supportability
Testability
Maintainability

Quality Criteria



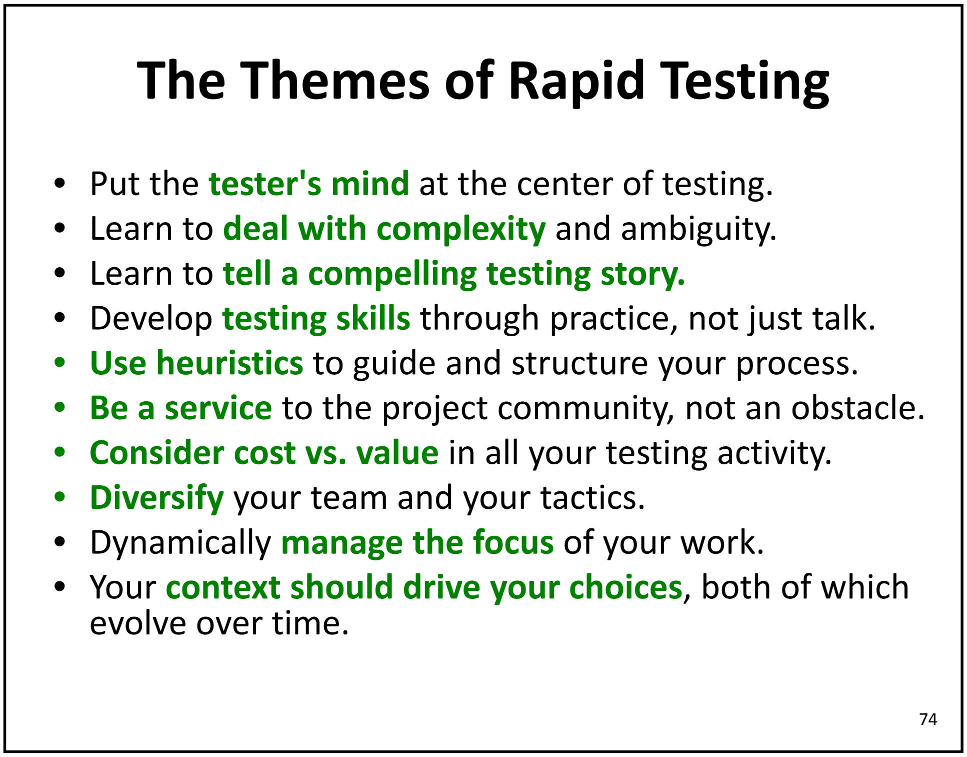
Contrasts with Traditional Approaches

Traditional	Rapid Software Testing
Correct	Good enough
Precise	Accuracy
Formal	Informal
Explicit	Tacit
Confirmation	Discovery
Demonstration	Experiment
Experiment (in the lab)	Experience (in the world)
Test cases (nouns)	Testing (verbs)
Artifacts	Activities
Code	Social Systems



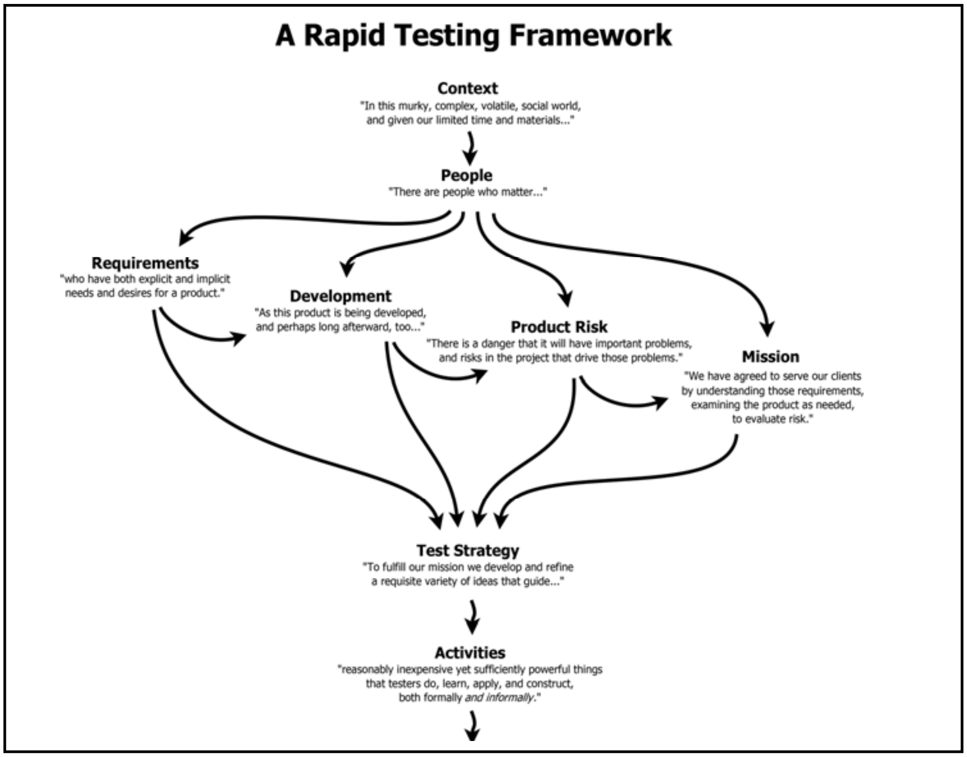
Contrasts with Traditional Approaches

Traditional	**Rapid Software Testing**
• Explicit requirements	• Value and threats to value
• Mediated skill	• Direct skill
• Fungible tester	• Responsible tester
• Attributes	• Relationships
• Rational	• Emotional
• Numbers	• Stories
• Certification	• Personal mastery
• Planning	• Preparation
• Standardization	• Diversity
• Following procedures	• Applying heuristics



The Themes of Rapid Testing

- Put the **tester's mind** at the center of testing.
- Learn to **deal with complexity** and ambiguity.
- Learn to **tell a compelling testing story.**
- Develop **testing skills** through practice, not just talk.
- **Use heuristics** to guide and structure your process.
- **Be a service** to the project community, not an obstacle.
- **Consider cost vs. value** in all your testing activity.
- **Diversify** your team and your tactics.
- Dynamically **manage the focus** of your work.
- Your **context should drive your choices**, both of which evolve over time.



A Rapid Testing Framework

Context
"In this murky, complex, volatile, social world, and given our limited time and materials..."

People
"There are people who matter..."

Requirements
"who have both explicit and implicit needs and desires for a product."

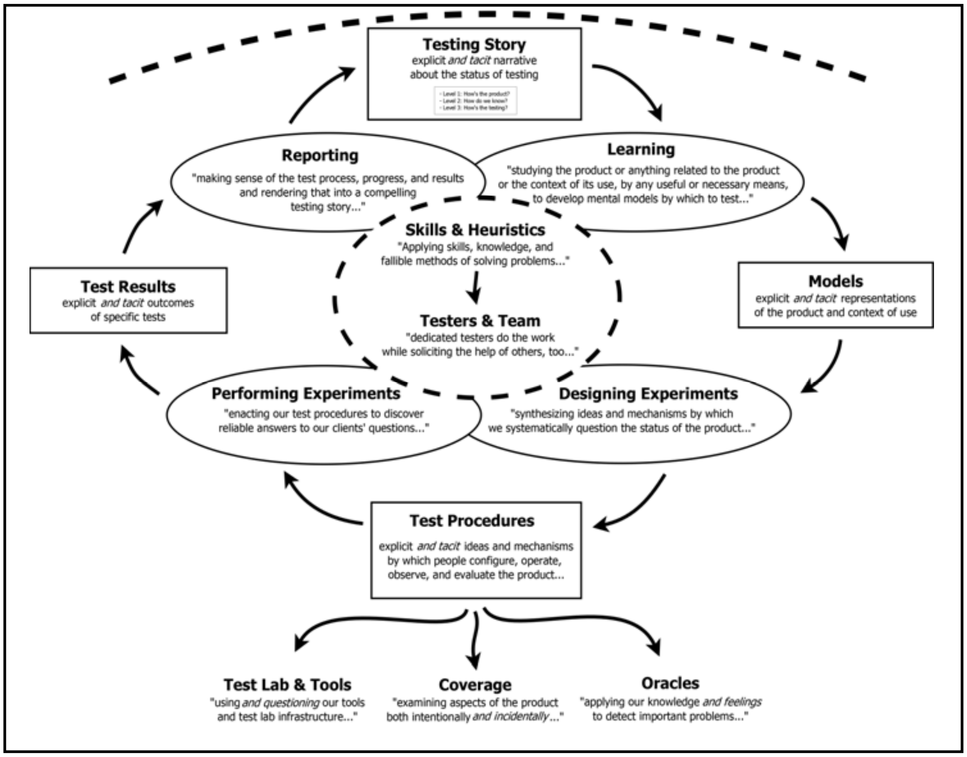
Development
"As this product is being developed, and perhaps long afterward, too..."

Product Risk
"There is a danger that it will have important problems, and risks in the project that drive those problems."

Mission
"We have agreed to serve our clients by understanding those requirements, examining the product as needed, to evaluate risk."

Test Strategy
"To fulfill our mission we develop and refine a requisite variety of ideas that guide..."

Activities
"reasonably inexpensive yet sufficiently powerful things that testers do, learn, apply, and construct, both formally *and informally*."



Testing Story
explicit *and tacit* narrative about the status of testing

- Level 1: How's the product?
- Level 2: How do we know?
- Level 3: How's the testing?

Learning
"studying the product or anything related to the product or the context of its use, by any useful or necessary means, to develop mental models by which to test..."

Models
explicit *and tacit* representations of the product and context of use

Designing Experiments
"synthesizing ideas and mechanisms by which we systematically question the status of the product..."

Test Procedures
explicit *and tacit* ideas and mechanisms by which people configure, operate, observe, and evaluate the product...

Performing Experiments
"enacting our test procedures to discover reliable answers to our clients' questions..."

Test Results
explicit *and tacit* outcomes of specific tests

Reporting
"making sense of the test process, progress, and results and rendering that into a compelling testing story..."

Skills & Heuristics
"Applying skills, knowledge, and fallible methods of solving problems..."

Testers & Team
"dedicated testers do the work while soliciting the help of others, too..."

Test Lab & Tools
"using *and questioning* our tools and test lab infrastructure..."

Coverage
"examining aspects of the product both intentionally *and incidentally*..."

Oracles
"applying our knowledge *and feelings* to detect important problems..."