Testing is More Than Checking

Michael Bolton
DevelopSense
http://www.developsense.com
@michaelbolton
Special acknowledgements to Cem Kaner, James Bach, and Jerry Weinberg

I’m Michael Bolton

Not the singer. Not the guy in Office Space. No relation.
The Comforting Link
Between Cause and Effect

Screw you, buddy; we’re better.
Disappearing Aircraft?

Flight Itinerary

<table>
<thead>
<tr>
<th>Flight</th>
<th>From</th>
<th>To</th>
<th>Stops</th>
<th>Aircraft</th>
<th>Fare Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC597</td>
<td>Toronto, Pearson Int'l (YYZ)</td>
<td>Las Vegas, Mccarran Int'l (LAS)</td>
<td>1</td>
<td>318</td>
<td>Tango Plus W</td>
</tr>
<tr>
<td>AC5233*</td>
<td>Las Vegas, Mccarran Int'l (LAS)</td>
<td>San Francisco, San Francisco Int'l (SFO)</td>
<td>0</td>
<td>220</td>
<td>Tango Plus L</td>
</tr>
<tr>
<td>Tue 19-Oct 2010 19:15 - Terminal 1</td>
<td>Tue 19-Oct 2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* AC597: This flight includes a stop in null.

aircanada.com
Why yes, we’ll sell you Internet access.

But if you can’t do math, it’s five cents extra.

Hyatt Regency, 2008
Google Doesn’t Recognize Gmail?

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
What was your first clue?

IBM

Our Apologies...

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

Back
The Key Questions of Testing

Is there a problem here?

Are we okay with this?
Call this “Checking” not Testing

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.

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...

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

Tools Can Do FAR More Than Checking

• Test generation (data and script generators)
• System configuration (setup; rapid changes)
• Test execution (harnesses and test scripts)
• Logging (action capture, video capture)
• Probes (identifying internal states)
• Monitoring (coverage analysis, profiling)
• Visualization (blink testing, highlighting)
• Test management (but keep tools lightweight)
• and yes, oracles (automated checking)
BUT Testing CANNOT Be Encoded

“Test Cases Are Not Testing: Toward a Culture of Test Performance”
James Bach & Aaron Hodder

What Is Testing?

• Excellent testing is not merely a branch of computer science
  – testing includes computer science, mathematics, technical domains
  – BUT… focus only on programs and functions, and you leave out questions of value and other relationships that include people
• To me, excellent testing is more like anthropology—interdisciplinary, systems-focused, investigative, storytelling

Biology  Archaeology  Language  Culture
Why Testing Cannot BeEncoded
Harry Collins on Software Testing

“Computers and their software are two things. As collections of interacting cogs they must be ‘checked’ to make sure there are no missing teeth and the wheels spin together nicely. Machines are also ‘social prostheses’, fitting into social life where a human once fitted. It is a characteristic of medical prostheses, like replacement hearts, that they do not do exactly the same job as the thing they replace; the surrounding body compensates.

Why Testing Cannot BeEncoded
Harry Collins on Software Testing

“Contemporary computers cannot do just the same thing as humans because they do not fit into society as humans do, so the surrounding society must compensate for the way the computer fails to reproduce what it replaces. This means that a complex judgment is needed to test whether software fits well enough for the surrounding humans to happily ‘repair’ the differences between humans and machines. This is much more than a matter of deciding whether the cogs spin right.”

Abstract, “Machines as Social Prostheses”, EuroSTAR 2013
Driving is partly technical, but it’s also highly social.

Dear Google...
I’ve just been to China.

Good luck with your car thing.
Love, Michael
Plus what happens when the Google Car meets the Microsoft Car?

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.