TEST AUTOMATION DAY 2012
Kicking off the Future of Test Automation

Arie van Deursen
Delft University of Technology
Rotterdam WTC, 21 June 2012
The TU Delft
Software Engineering Research Group

Education
• Programming, software engineering
• MSc, BSc projects

Research
• Software architecture
• Software testing
• Repository mining
• Collaboration
• Services
• Model-driven engineering
• End-user programming
• A test case is an executable example of system behavior

• Each example can help in stakeholder communication

• Throughout the full development cycle
The Set of Examples is Incomplete

- Too much data
- Too many combinations
- Too many paths

- Properties of interest fundamentally undecidable
The Set of Examples needs to *Change*

- Software serves society
- Society is changing continually
- Successful software is easy to change
Test Automation

Automation of any step in the testing process

- Test execution
- Test case design
- Test case creation
- Test data generation
- Test output verification
- Test case management
- Test traceability
- Test adequacy analysis
Test Automation

**Benefits**
- Run tests faster
- Run more of them
- Run as often as you like
- Continuous integration
- Early bug detection
- More variation
- More reliable

**The Dark Side**
- Costly infrastructure
- Test case construction costs
- Fragile test cases
- Test suite maintenance
-Possibly false sense of safety
- Human out of the loop

Engineering tradeoffs to be made

*Requires skills and experience.*
Plugin / Junit Testing in Eclipse.

>> 1000s of tests
Test Automation: The Past

“Test automation has been around since DAY ONE of the computing industry.”

WHAT IS TEST AUTOMATION?

There seems to be a lot of confusion about this. Test automation is any use of tools to aid testing. Test automation has been around since DAY ONE of the computing industry. And never in that history has test automation been an “automatic way of doing what always should have been done.”
Test Automation: The Present

- State of the art: *Today!*
- State of the practice: *A bit behind.*

*Categories of Innovativeness*

- Innovators 2.5%
- Early Adopters 13.5%
- Early Majority 34%
- Late Majority 34%
- Laggards 16%

Test Automation: The Future
-- Two Research Examples --

• “Concolic testing”
  – Directed automated random testing

• Self-monitoring
  – Built-in self testing & testability interfaces
Discussions (1)

Die Wahrheit ist konkret

- Ask speakers for concrete experience!
- Offer your concrete experience to audience!
Discussions (2)

Elk nadeel
heb z’n voordeel

Johan Cruijff
## Plenary Program

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30</td>
<td>Kickoff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:55</td>
<td>Keynote 1</td>
<td>Scott Barber</td>
<td>Adding Value</td>
</tr>
<tr>
<td>10:35</td>
<td>Keynote 2</td>
<td>Walter Belgers</td>
<td>Security</td>
</tr>
<tr>
<td>11:10</td>
<td>Coffee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:45</td>
<td>Tracks 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:05</td>
<td>Lunch</td>
<td></td>
<td>(Tut. Scott Barber)</td>
</tr>
<tr>
<td>14:00</td>
<td>Keynote 3</td>
<td>Elfriede Dustin</td>
<td>Near Future</td>
</tr>
<tr>
<td>15:00</td>
<td>Tracks 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15:35</td>
<td>Tea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:10</td>
<td>Tracks 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:55</td>
<td>Closing Keynote</td>
<td></td>
<td>Dion Johnson Retrospective</td>
</tr>
<tr>
<td>17:35</td>
<td>Drinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18:30</td>
<td>Dinner</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>