Software Testing State-of-the-art & Industry-Academia Collaboration on Steroids

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Some software testing trends

“Big Data” for Software Testing:

**Test optimization**

Test case aging

Automating System and Acceptance Testing:

Visual GUI Testing

Combining Testing approaches:

Exploratory Testing

Unit vs System Testing
Finding patterns in test failures

<table>
<thead>
<tr>
<th>TEST START TIME</th>
<th>TEST CASE</th>
<th>SYSTEM VERSION</th>
<th>OUTCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-09-04 04:17:12</td>
<td>Login non existing user</td>
<td>1.32 - Build 3476</td>
<td>PASS</td>
</tr>
<tr>
<td>2013-09-04 04:17:12</td>
<td>Login existing user</td>
<td>1.32 - Build 3476</td>
<td>FAIL</td>
</tr>
</tbody>
</table>
Some trends

“Big Data” for Software Testing:
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**Test case aging**

Automating System and Acceptance Testing:
  Visual GUI Testing

Combining Testing approaches:
  Exploratory Testing
  Unit vs System Testing
Failure rate vs. Test case age

- Test case age: 1 year, 2 years, 3 years, 4 years
- Failure rate range: 0.00 to 1.00
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Automating System and Acceptance Testing:
  Visual GUI Testing

Combining Testing approaches:
  **Exploratory Testing**
  Unit vs System Testing
Simultaneous learning, test design and test execution
**Criticism:** NOT systematic & hard to automate (costly)

**New results:** ET is effective (32 eng & 97 students)

- Engineers knowledge & experience not critical
- Finds many faults (in total)
- Finds as “hard” faults as scripted testing
- Fewer “false positives”
- More efficient (takes less time) than scripted testing
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**Unit vs System Testing**
Unit or System Testing???

Apples and pears (must be balanced)

Research not clear but indications are:

Unit testing finds 12% of defects & 24% of “high severity” defects

Cost to fix found defects in unit-integration-system-field = 1-2-3-8

Reviews & inspections not as costly as thought to be

Unit testing has high maintenance costs

Cost to find and fix defects on average: 6,2h/def (system), 4,5h/def (integration) & 2,5h/def (unit)
Traditional Innovation Processes

- 10-20 years
- Consultants
  - 5-15 years and often less objective

Can we shorten this to 1 year and create a cycle?
Industry-Academia Collaboration

V1.0
Animosity & Blame

V2.0
Sadness & Dejection
Mild optimism for too long

V3.0
in 3-5 months cycles
<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Embedded</td>
<td>Mentored employee, Continuous</td>
</tr>
<tr>
<td>7</td>
<td>Collaboration</td>
<td>Employed by company</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Office at company</td>
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<tr>
<td>5</td>
<td></td>
<td>Recurrent visits</td>
</tr>
<tr>
<td>4</td>
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<td>Several visits</td>
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<tr>
<td>3</td>
<td>Exchange</td>
<td>Data collection</td>
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<tr>
<td>2</td>
<td>Visit</td>
<td>(One) Visit &amp; discussions</td>
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<tr>
<td>1</td>
<td></td>
<td>Presentation</td>
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<tr>
<td>0</td>
<td>Contact</td>
<td>Initial</td>
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</tbody>
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Questions?

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http://explanea.com
Taking it Online
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