The dark side of test automation
Why test automation leads to worse testing.
And what you can do about it.

Jan Jaap Cannegieter

Agenda

Oh yes, and we are going to talk about test automation

Special thanks to:
Barry Geerdink
Martijn van Werven
René van Veldhuijzen
Ruud van Berkum
A story about the introduction of technology
The introduction of technology leads to a decrease of craftmanship

Based on

The degeneration effect

- Automation complacency
  - False sense of certainty
  - Over-estimation of the capabilities of a machine
  - Professionals get separated from the real work
- Automation bias
  - Follow blindly the information the machine gives
  - Trust the machine completely
  - Disable own judgment

Based on
### The dark side of test automation PNSQC 2018

#### View Results in Table

<table>
<thead>
<tr>
<th>Sample #</th>
<th>Start Time</th>
<th>Thread Group</th>
<th>Label</th>
<th>Status</th>
<th>/time</th>
<th>Delta</th>
<th>Result</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23:40:51.56</td>
<td>TestGroupA</td>
<td>1</td>
<td>Passed</td>
<td>60s</td>
<td>0</td>
<td>Passed</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>23:40:51.56</td>
<td>TestGroupB</td>
<td>2</td>
<td>Failed</td>
<td>90s</td>
<td>0</td>
<td>Failed</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>23:40:51.56</td>
<td>TestGroupC</td>
<td>3</td>
<td>Passed</td>
<td>30s</td>
<td>0</td>
<td>Passed</td>
<td></td>
</tr>
</tbody>
</table>

#### View Results in Tree

- TestGroupA
  - TestCase1
    - SubCase1
    - SubCase2
  - TestCase2
    - SubCase1
    - SubCase2

---

**Welcome, Please Sign In**

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“… over the long run it <automation> may diminish our existing skills or prevent us from acquiring new ones.”
Top 5 misconceptions of test automation

- 100% test automation
- You can/want to automate only a part of your test cases

What can you automate?

Infinite amount of tests

<table>
<thead>
<tr>
<th>Valuable tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests that you want to do more than once</td>
</tr>
<tr>
<td>Tests that you want to do once</td>
</tr>
</tbody>
</table>

Tests you can automate

Tests you want to automate

Tests you have automated

Based on ‘Implication of emphasis on automation in CI’ - Martin Jansson
http://thetesteye.com/blog/2017/03/implication-of-emphasis-on-automation-in-ci/
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Top 5 misconceptions of test automation

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  - You can test more, more often, more complete, faster and other things with TA

Test automation and costs

<table>
<thead>
<tr>
<th>Manual</th>
<th>Automated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional testing</td>
<td></td>
</tr>
<tr>
<td>Analysis of the outcome</td>
<td></td>
</tr>
<tr>
<td>Regression test</td>
<td></td>
</tr>
<tr>
<td>Non-functional testing</td>
<td></td>
</tr>
</tbody>
</table>
You will test more
You will test more often
You will test faster
You will test other things

But probably it will not be cheaper

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- Test automation makes testing easier
  - Test automation is extreme complex
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```java
package testform.TestForm;

import static org.junit.Assert.assertEquals;
import org.junit.Test;
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.chrome.ChromeDriver;

public class TestForm {
    @Test
    public void test() {
        WebDriver driver = new ChromeDriver();
        driver.get("file:///C:/web2form/form.htm");
        driver.findElement(By.id("firstname")).sendKeys("Jan Jaap");
        driver.findElement(By.id("lastname")).sendKeys("Canneregister");
        driver.findElement(By.id("email")).sendKeys("jj.canneregister@querist.nl");
        driver.findElement(By.id("password")).sendKeys("jancjaapactualpassword");
        driver.findElement(By.id("Register")).click();
        assertEquals("Your password must be at least 256 characters long", driver.findElement(By.id("password-error")).getText());
        driver.quit();
    }
}
```
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Seen at PNSQC 2019 – day 1

Developing a test automation program step by step – Joel Gerbino. PNSQC October 14, 2019

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- With TA you can find a lot of defects
  - Maybe most of the defects are not regression defects
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Effort versus defects found

Money spent on automation of regression test

Money spent on testing new features

Defects due to regression

Defects in new features

Just a consideration...

Issues do to bad communication, bad collaboration, stubbornness of the team members, the wrong Product Owner

Issues that can be solved by TA
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- Automation = tooling
  - It starts with why

What I see happening a lot in practice

How
- Buy a tool
- Automate your regression test

What
- Regression testing
- Performance testing
- Test data management
- Security testing
- Multi device / multi browser testing

Why
- Less repetitive work
- Enable continuous delivery
- Shorten time to market
- Increase coverage
- (Save money)
“Start with why” - approach …

**Why**
- Clear and realistic goals
- Make sure you are ready for TA

**What**
- Regression testing
- Performance testing
- Test data management
- Security testing
- Multi device / multi browser testing

**How**
- Tool selection
- Tool implementation
- Use of tools
- Based on

... and iterate!

Implementing TA is not a project
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Should you use test automation?

YES YOU SHOULD
The alternative for the dark side...

... is taking all aspects in consideration...
...is about testing...
... and is a socio technical system.
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Conditions to avoid the dark side

- UI/API/Backend
- Testability
- Tool
- Test goals
- Coverage test set
- Connection manual testing
- Expectations
- Education/skills
- Support

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SQUERIST Test Automation Readiness Scan

Software testing  Business Process Transformation  Security testing
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Trail question

What is Phil Lew's secret home wifi password?

1. testing123 because he is a testing geek
2. Sharine1999 because it is his first daughters' name and year of birth
3. Fj%r637&dS because he takes security seriously
4. Welcome01 because it is the default password of his wifi router, and he doesn't know how to change it
Technical aspects

1. Is there a separate test environment available for automated testing?
2. Is test data available for executing automated tests?
3. Is the test object itself stable?
4. Are there clear requirements for testability and are they communicated with development?
   1. Are the technical id's stable?
   2. Is the backend accessible?
   3. Does the system give a signal when windows are loaded?
Organizational aspects

1. Are clear and realistic goals set for the implementation of test automation?
   1. Are the goals of the different stakeholders in line with each other?
   3. Does everyone involved agree that test automation is important?
2. Is there enough budget and capacity available?
3. Is there enough knowledge available for …
   1. …the tools used?
   2. …test automation in general?
   3. …test automation frameworks?
4. Are the tasks and responsibilities concerning the operation of test automation clear (automating tests, maintaining the test set, maintaining the test data, execute test runs, judge the results, process findings, et cetera)?
Testing aspects

1. Is the scope clear? (for example regression test, performance test, security test etc.)
2. Is there a professional set of test cases available for automation?
   1. Is it clear which risk will be covered and which risks won’t be covered with the automated test set?
   2. Are the automated test cases prioritized?
   3. Are test design techniques used to make the automated test set?
3. Is the coverage of the test set determined and maintained?
   1. Is it clear which coverage technique is used?
   2. Is there a difference between goal coverage and real coverage.
4. Is test automation part of the DoD?
The alternative for the dark side...

... is taking all aspects in consideration...
... is about testing...
... and is a socio technical system.

‘Don’t forget why you test in the first place’
Test Automation Day 2017

Test strategy
Test goals
Tests
Manual
Automated
Rapid testing
Continuous testing

Stephen Janaway -
http:\\stephenjanaway.co.uk/stephenjanaway/
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Management  Developer

Tester  Test automation engineer
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Contribution per role

- **Management**
  - Set realistic goals
  - TA policy
  - Facilitate

- **Developer**
  - Testability
  - Accessibility
  - Programming skills

- **Tester**
  - Test design techniques
  - Coverage test set
  - Maintenance test set

- **TA engineer**
  - TA-framework
  - Use and operations tools
  - Utilization tooling

BUILD BRIDGES, NOT WALLS
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Management

Developer

Tester

Test automation engineer

Individuals and interaction over Technical possibilities
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Seen at PNSQC 2019

Re-tuning Automation
“Test automation makes humans more efficient, not less essential”

The QA/QE Role – Supporting DevOps the smart way – Melissa Tondi. PNSQC October 14, 2019

What to do to avoid the dark side

Software testing | Business Process Transformation | Security testing
To avoid the dark side: my advices

- Keep investing in the craftsmanship of testing
- Be realistic to your stakeholders: you can’t automate everything and you can’t find all defects with test automation
- Be realistic about the goals of test automation (test more, test more often, test faster, test other things) but don’t expect test automation to make testing easier or cheaper
- Test automation is more than buying and installing a tool, different people (inside and outside the team) should be involved and contribute to it.
- Take all aspects into consideration: technical, organizational and testing aspects
- Don’t forget why you test in the first place: automation should make testing better
- Test automation is about a socio-technical system: it is mostly about people

The only way to improve is to experiment and evaluate