

[More] Reliable and Trustworthy Automated GUI Tests

Selenium Conference 2016

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24th June 2016



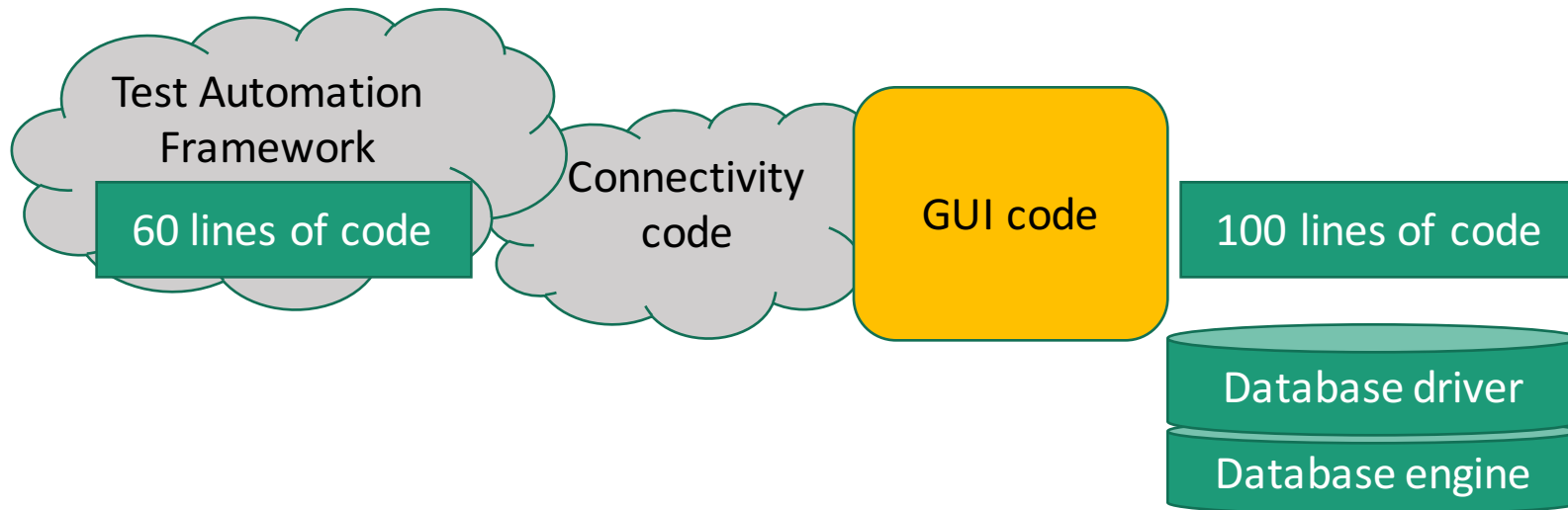
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How automated GUI tests work

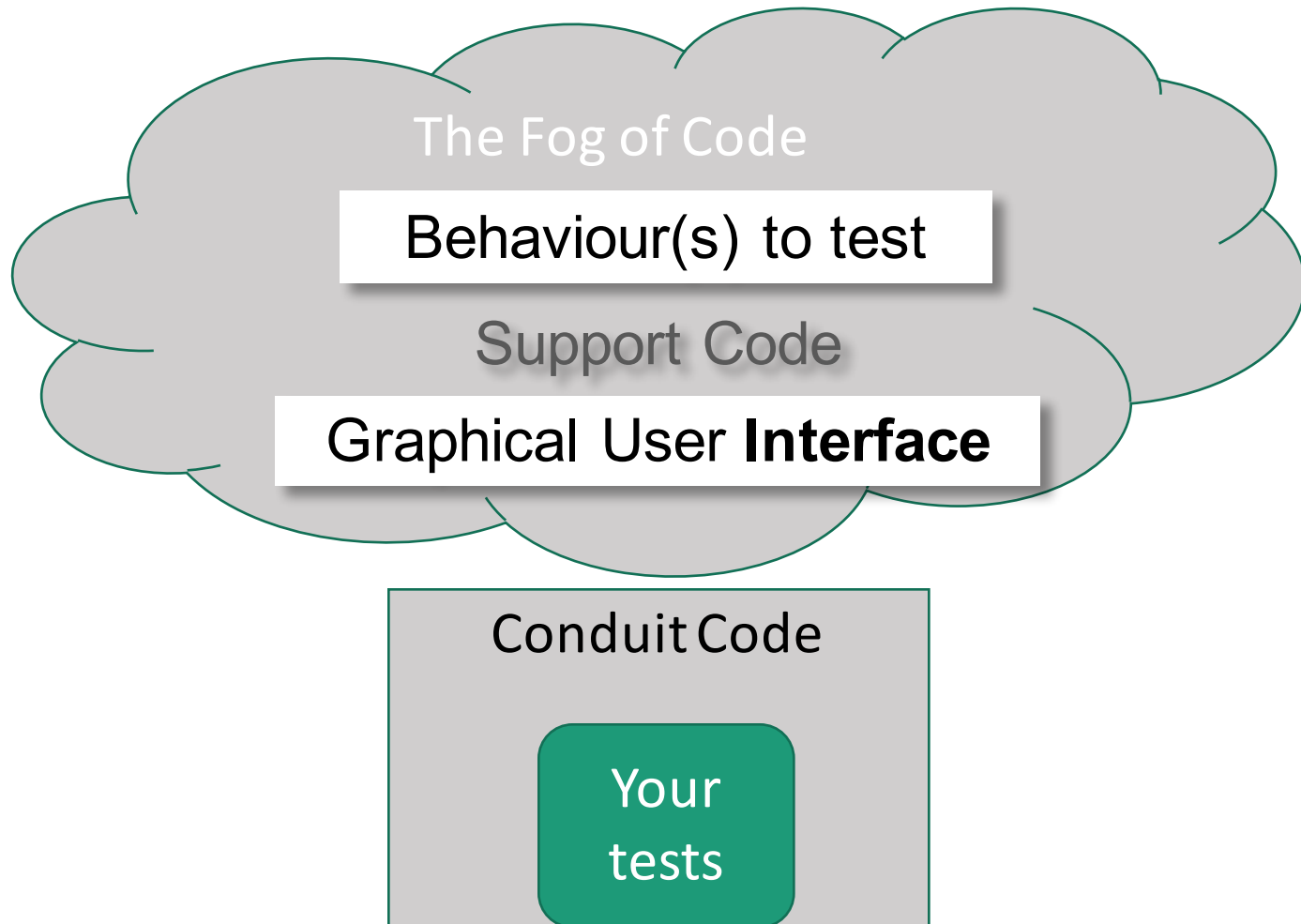
```
@FindBy(id = "userName") private WebElement userName;  
@FindBy(id = "password") private WebElement password;  
@FindBy(id = "submitButton") private WebElement submit;
```



Code snippet from:

<http://artoftesting.com/automationTesting/pageObjectModel.html>

Another perspective



What we think we're testing...



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What our automated test actually interacts with...



The image shows a horizontal search bar. On the left is a white text input field. To its right is a dropdown menu with the text "All Categories" and a small downward arrow icon. On the far right is a green button with the text "Search" in white.

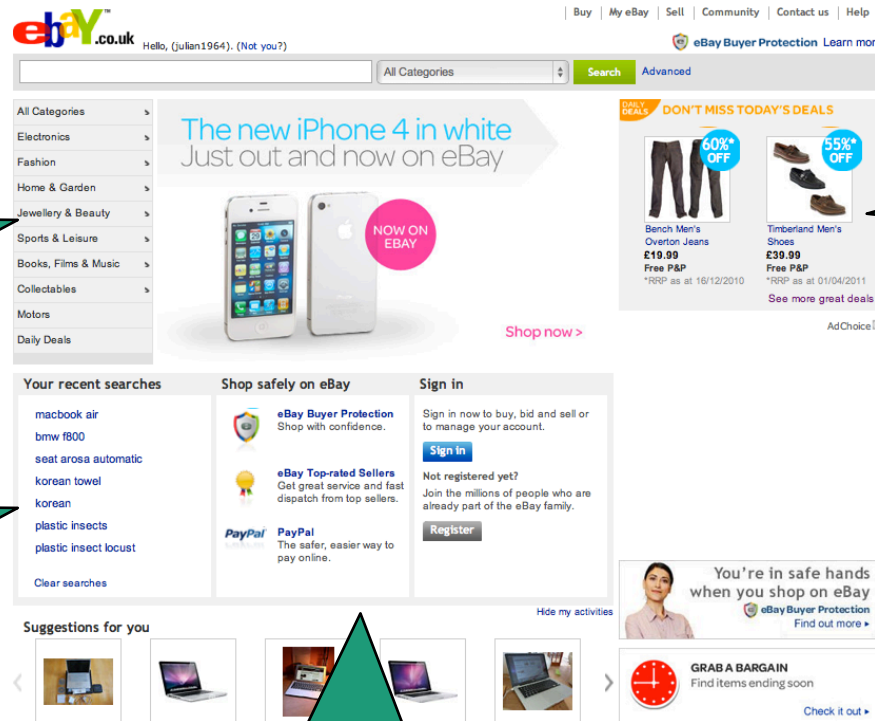


Enter text here



'click'

(Some of the) things our automated tests may miss...



Navigation

History

Promotions

Problem
JavaScript
CSS and
HTML

Layout,
Rendering &
Formatting

Expect change!

1. Triage tests on changes

- Keep?
- Modify?
- Delete?

2. Preventative Maintenance & Retirement

- Prune your code and codebase
- Accept tests have a 'useful life'... & then are best retired in your preferred source control database

Know yourself and your tools

- Discover weaknesses in your knowledge, understanding and practices
- Test what you will be using for testing
Test “inside the box”
- Calibration

Improve the Interfaces

Better object selection criteria

- Comparing the Maintainability of Selenium WebDriver Test Suites Employing Different Locators: A Case Study
- Andy Palmer's talk at this conference

Decide where you want the tests to be flexible, and when you want them to fail...

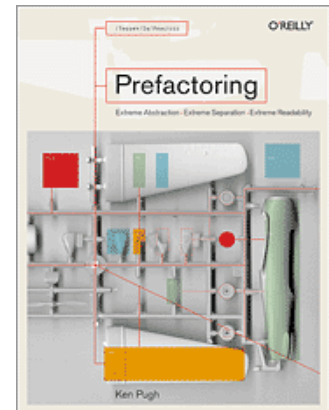
Improving your code

1. Design-in defensive code

- Trip-wires
- Pre-conditions
- Expectations

2. Design the Automation

- Design Patterns
- Consider the wisdom of others
- Pre-factoring (Ken Pugh)
- Brian Marick



Reliable Tests

- Internal Quality
- External Quality
- Quality in Use

Are you working too hard, on the wrong things?

We struggle to decide what to test, what to automate, & how much testing is enough, etc.

When Should a Test Be Automated?

1. The cost of automating a test is best measured by the number of manual tests it prevents you from running and the bugs it will therefore cause you to miss.
2. A test is designed for a particular purpose: to see if some aspects of one or more features work. When an automated test that's rerun finds bugs, you should expect it to find ones that seem to have nothing to do with the test's original purpose. Much of the value of an automated test lies in how well it can do that.

Brian Marick (1998)

<http://exampler.com/testing-com/writings/automate.pdf>

Beware of (over-)trusting test automation

- Automation as servant, not master, of our software delivery
 - Inaccurate results
 - “Beware of Automation Bias” by M.L. Cumming^[1]
- Automated tests and checks miss more than they find
- Make behavior easier to assess
 - Screenshots and contents of DOM to verify after tests ran
 - Automated video recordings

Beware the automation bias

“When presented with an automated solution 40% of pilots reasoned less or none at all”

Automation Bias in Intelligent Time Critical Decision Support Systems

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.2634&rep=rep1&type=pdf>

Further reading and research

Seven Steps to Test Automation Success by Bret Pettichord

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.471.9363&rep=rep1&type=pdf>

Architectures of Test Automation by Cem Kaner

<http://www.kaner.com/testarch.html>

Brian Marick

<http://exampler.com/testing-com/writings/automate.pdf>

“Beware of Automation Bias” by M.L. Cummings

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.91.2634&rep=rep1&type=pdf>

Questions now?

Questions later...

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