Spot the Difference: How Front-end and UI Bugs are Hurting You, Your Team and Your Company

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March 2019

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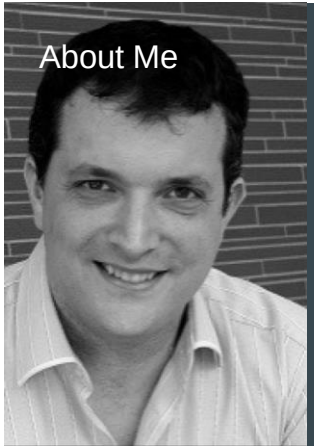

About Me

- Software Engineer at heart with over 20 years of experience.
- Currently Technical Solution Engineer @ Applitools
- Founder of the Canadian Software Testing Board
- My true passion is automation and being able to automate visual testing of web, app and desktop application makes my current position at Applitools a dream job

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What Are Functional Tests?

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So many kinds of tests...

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Tests, Tests, Glorious Tests!

- Unit
- Integration
- E2E
- Acceptance
- Visual
- Contract
- Browser
- Automation
- Functional
- And the list goes on…

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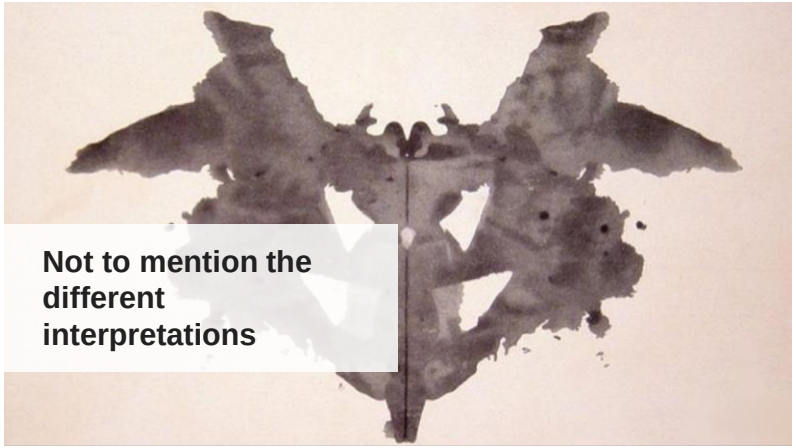

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Functional tests are
automation tests that automate the browser in order to test the functionality
of a web application*

* Or a mobile app

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Functional tests are
automation tests that automate the browser in order to *test the functionality*
of a web application*

* Or a mobile app

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Let’s write a Functional Test

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All Functional Tests are Stories

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All Functional Tests Look Like This

- Action
- Action
- **Validation**
- Action
- **Validation**
- Action
- Action
- Action
- Validation

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Problems with Actions

- Fragile Selectors
- Complex Code

- Solution: Page Objects

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Problems with Validations

- Fragile Selectors
- Complex Code
- Too much to validate
- Only positive check
  - We don't validate what we don't know about

- Solution: Page Objects, **partially**

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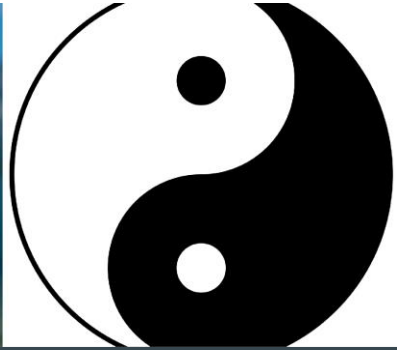

Actions are Focused
Validations ~~are~~ should be Wholistic

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Solving the Validation Problem

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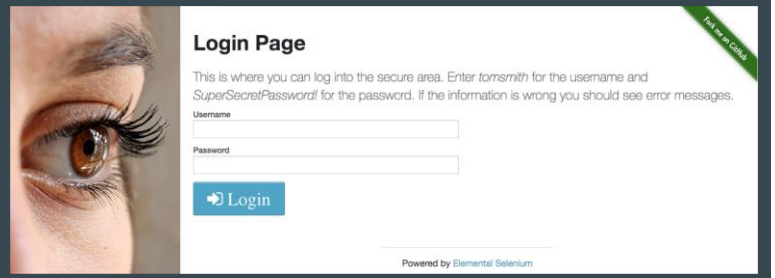
Visual Testing !



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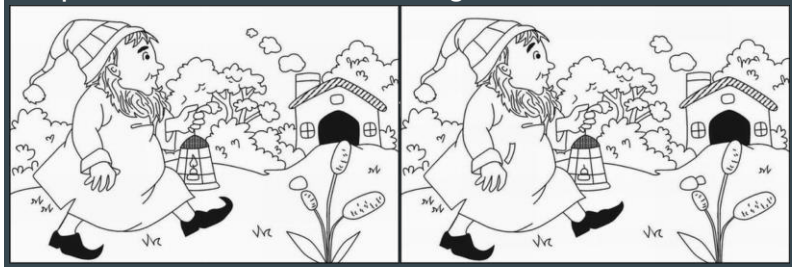
Spot The Difference Challenge



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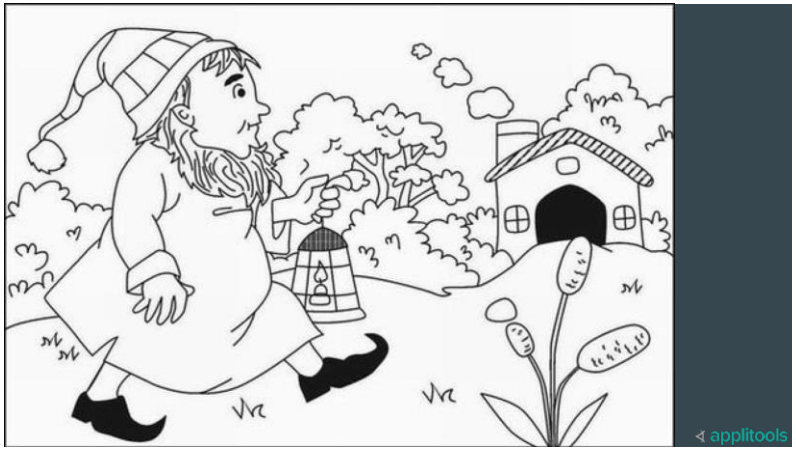

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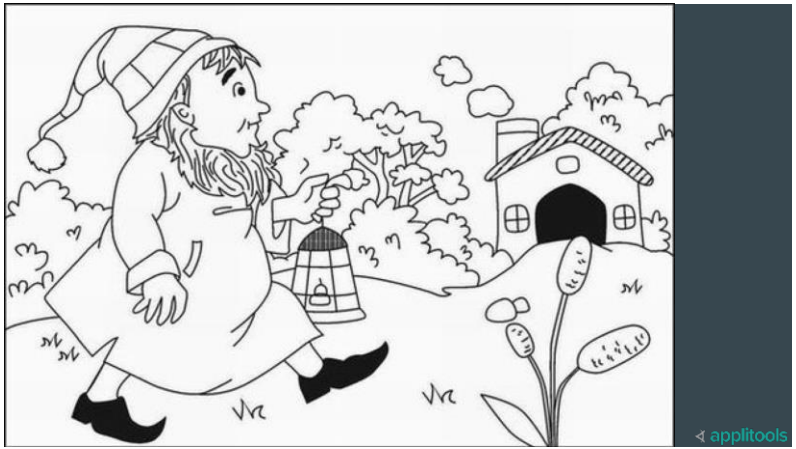

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State of Test Automation

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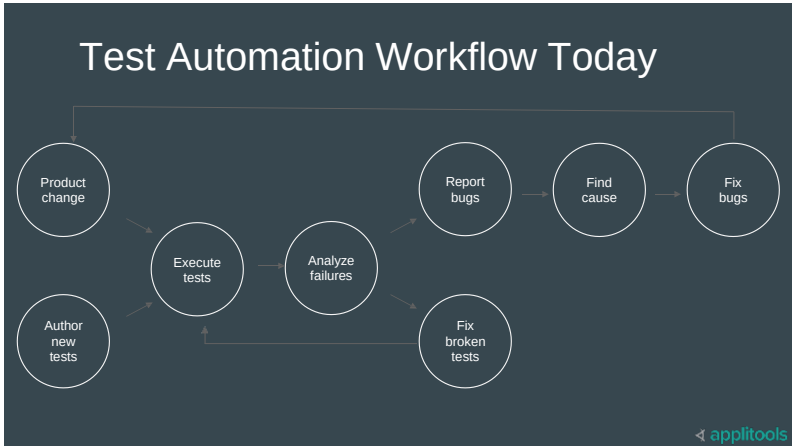
Test Automation Workflow Today
Product change
Author new tests
Execute tests
Analyze failures
Report bugs
Fix broken tests
Find cause
Fix bugs
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Applications Are Getting More Complex
Microservices
OS Types
Browser Versions
Devices & Screen Types
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Delivery Cycles Are Getting Faster

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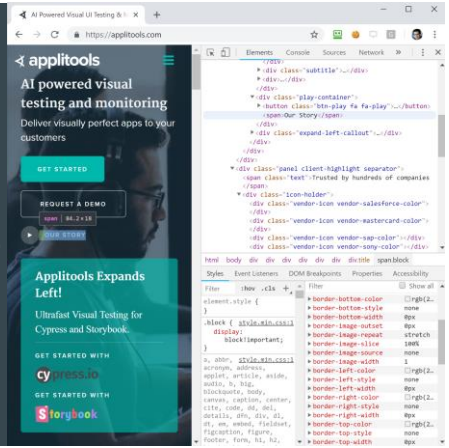
Every Page.
Every Application.
Hundreds Lines of Code.
Changing Constantly.



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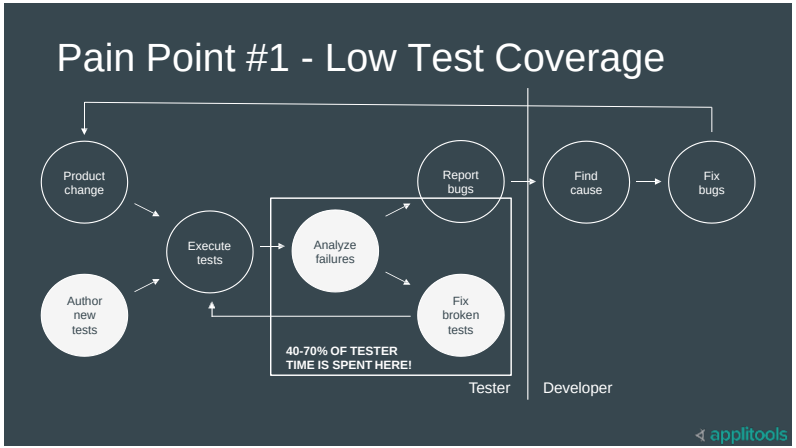
Pain Point #1 - Low Test Coverage
Product change
Author new tests
Execute tests
Analyze failures
Report bugs
Fix broken tests
Find cause
Fix bugs
40-70% OF TESTER TIME IS SPENT HERE!
Tester
Developer
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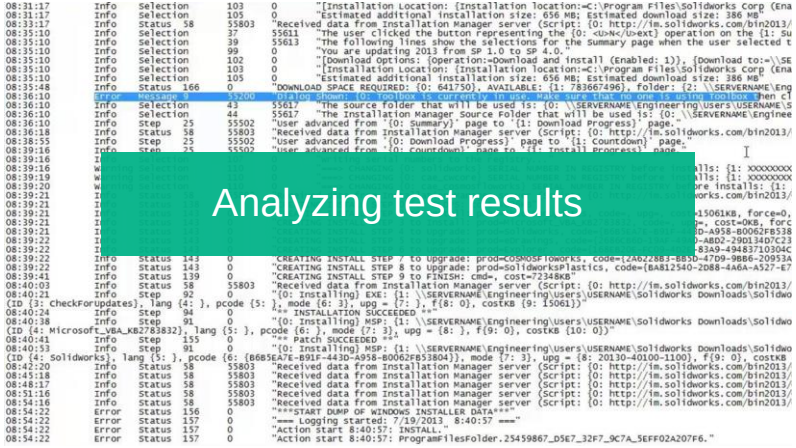
Analyzing test results

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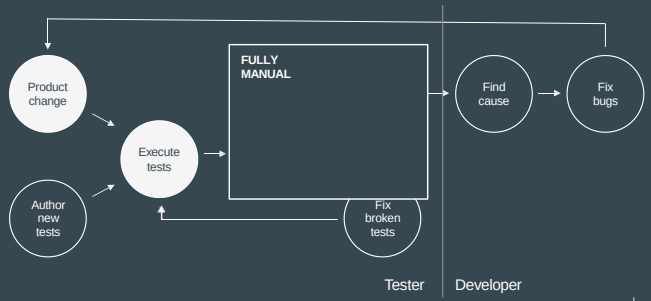
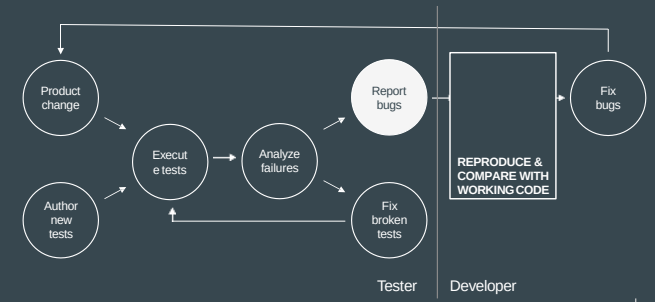
Is It Really Worth Automating?

- Every assertion increases the maintenance overhead
- Even if you manage to achieve 100% functional coverage, *it does not provide visual coverage*
- We only catch expected bugs (e.g. what we assert)
- So...**manual testing remains a vital technique**

Pain Point #2 - Slow QA Feedback



Pain Point #3 - Slow Dev Feedback



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Testing Is Seen as a Bottleneck

According to a recent survey conducted by CA

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Testing is seen as a Bottleneck

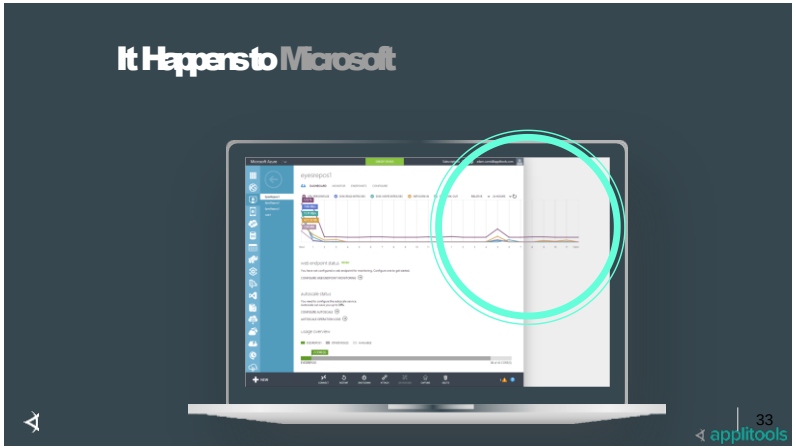
Testing is vital...

- Protect quality
- Represent the end user
- Critical to business success

But success for teams is challenging.

- Visual and functional bugs escape routinely
- Hard to keep up with R&D pace and complexity
- No obvious solution in sight
- Team morale can suffer

It Happens to Amazon


It Happens to Microsoft
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It Happens to UPS
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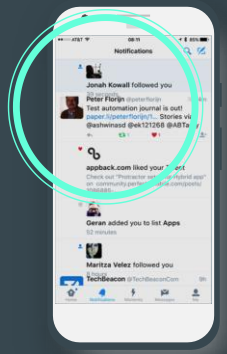
It happens to
Twitter



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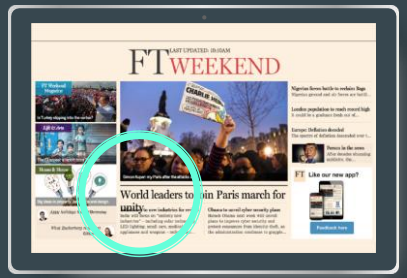
It Happens to Financial Times



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What Are Visual Tests?

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Replace Humans with Image Diffing ?

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Solutions to problems with validations

- Fragile Selectors
  - **No more selectors**
- Complex Code
  - **Same code for all validations**
- Too much to validate
  - **We validate wholisticlly**
- Only positive check
  - **We validate things we didn't even think of validating**

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Problems with Naive Image Diffing

- Small anti-aliasing differences
  - Mac vs. Linux vs. Windows
  - Different GPUs
- Date/time problems
  - regions that *are* different from run to run
- Full screen vs. Viewport
- Comparing is a pain
- "Accepting" a new baseline is a pain

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Cloud-Based Solutions

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Cloud-based solution

- Visual diffing algorithms see like a human sees
  - Ignoring the small differences
  - AI-level algorithms are now evolved and keep getting better
- Screenshot management tools are available, enabling you to
  - See the diffs
  - Approve new baselines
  - Open bugs on diffs that are bugs

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Let’s Run the Demo

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Thank You

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