Behavior Driven Development and Testing *of Qt and QML applications*

Qt Developer Days 2014

by Reginald Stadlbauer

About me

- Name: Reginald Stadlbauer
- Company: froglogic GmbH
- Position: co-founder and CEO
- Worked as Software Engineer at Trolltech and the KDE project

About froglogic

- HQ: Hamburg
- Founded: 2003
- US presence since 2008
- Product focus on Squish
  - Squish GUI Tester (Cross-Platform/Cross-Technology GUI Test Automation)
  - Squish Coco (C, C++ and C# Code Coverage)
- More than 3.000 customers world-wide

Overview

- What is BDD and TDD
- Automating a Behavior Driven Test
- Live Demo & Conclusion

What is BDD / BDT?

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"BDD is a second-generation, outside-in, pull-based, multiple-stakeholder, multiple-scale, high-automation, agile methodology. It describes a cycle of interactions with well-defined outputs, resulting in the delivery of working, tested software that matters." - Dan North

http://en.wikipedia.org/wiki/Behavior-driven_development

OR...

What is BDD / BDT?

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- Based on **Test Driven Development**
  - Write (failing) test
  - Implement feature until test passes
  - Unit-Test level granularity (inside-out)

- But
  - Focus on application's behavior and specification
  - Description in a human-readable DSL (e.g. Gherkin)
  - Less focus on implementation details

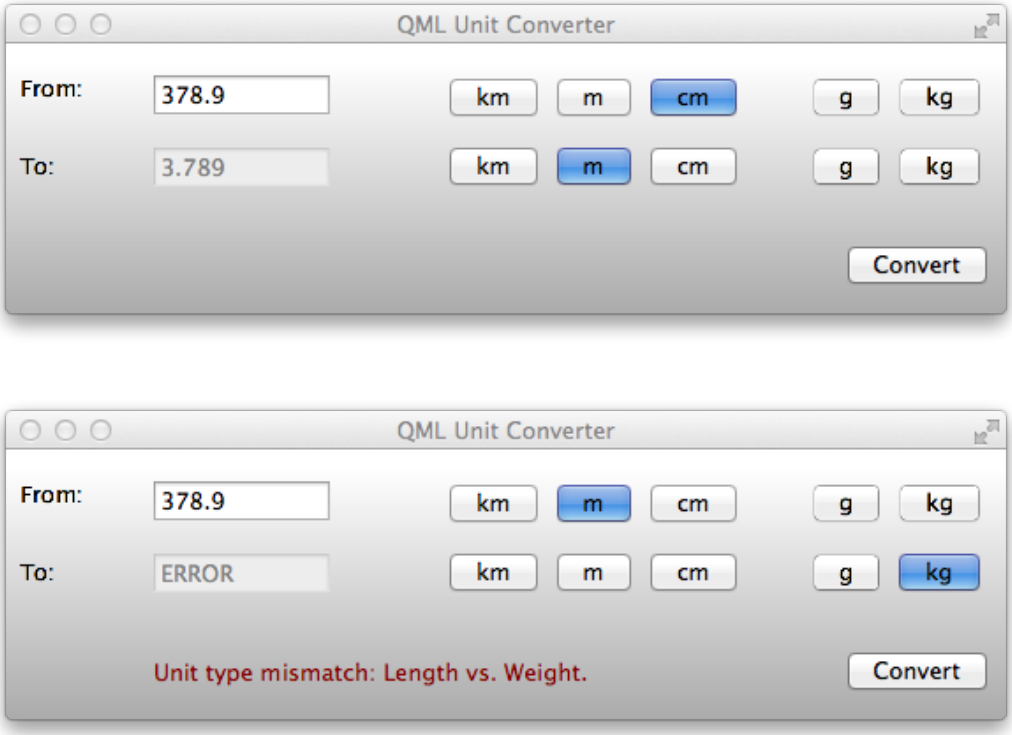
Versatile usage of Feature Files

- User story / feature specification
- Communicate with customer / users
- Documentation of acceptance test
- Sequence to walk through for manual tests
- Storyboard for automation of tests

Why BDD/BDT

- “Test first” development on a higher level
- Clearly separate test logic from implementation
- Allow non-programmers to define features & tests
- Have a common, single language two communicate

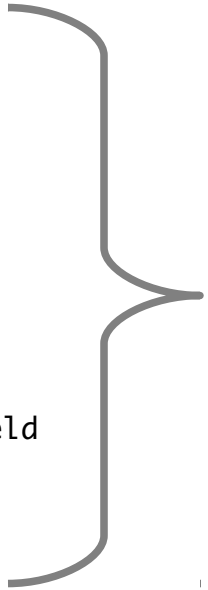
What is BDD / BDT – Unit Conversion



What is BDD / BDT – Unit Conversion

```
Feature: Valid conversion

    Scenario: Convert meter in centimeter
        Given the Unit Converter is running
        When I enter 378.9
        And choose to convert from "m"
        And choose to convert to "cm"
        And click Convert
        Then 37890 should be displayed in the result field
```

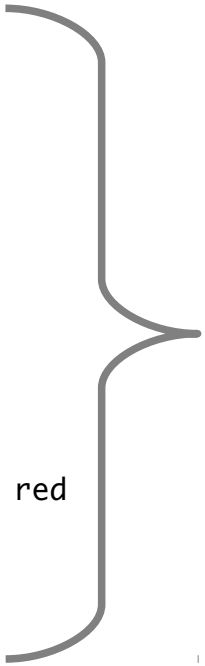


Feature File
(Gherkin)

What is BDD / BDT – Unit Conversion

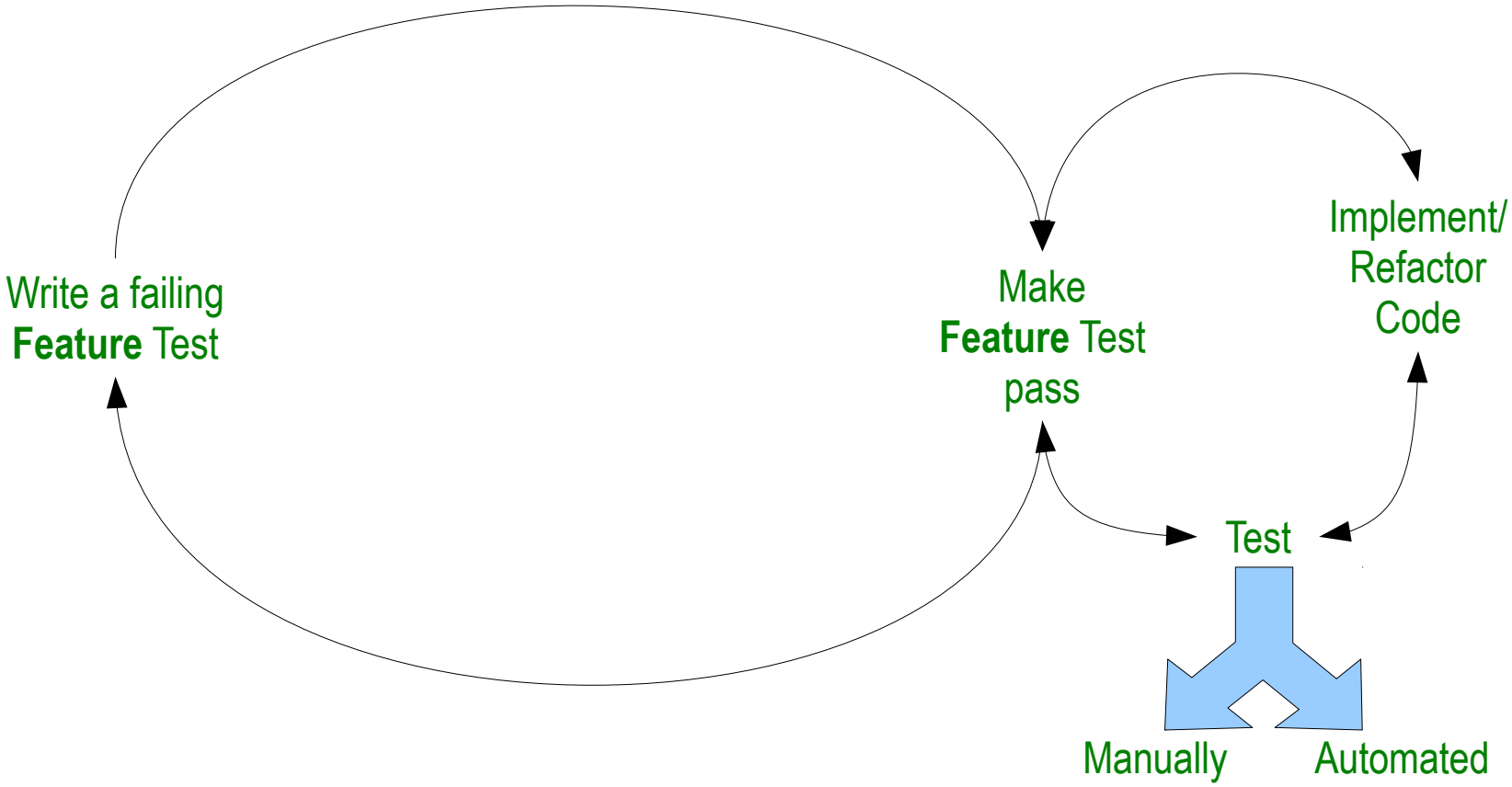
```
Feature: Invalid conversion

    Scenario: Mix units
        Given the Unit Converter is running
        When I enter 378.9
        And choose to convert from "m"
        And choose to convert to "kg"
        And click Convert
        Then ERROR should be displayed in the result field
        And "Unit type mismatch: Length vs. Weight." should be displayed in red
```



Feature File
(Gherkin)

What is BDD / BDT – The Process



Automating a Behavior Driven Test

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- Requirements
  - BDT framework
  - testing framework (unit, GUI, ...)
  - Glue between both

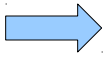
BDT Framework – Generate Skeletons

- Parse feature files
- Generate step definition skeletons (functions and annotations) in preferred language

Test.feature

```
Feature: Valid conversion

    Scenario: Convert meter in centimeter
        Given the Unit Converter is running
        When I enter 378.9
        ....
```



Test.py

```
@Step("Given the Unit Converter is running")
def step(context):
    test.warning("Implement me")

@Step("When I enter 378.9")
def step(context):
    test.warning("Implement me")
```

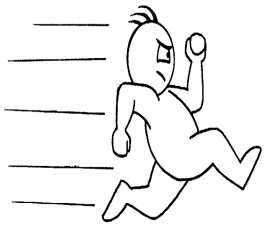
BDT Framework – Run Feature Files

- Parse feature files
- Execute feature files by mapping to steps to step definitions (functions)
- Reporting

Test.py

```
@Step("Given the Unit Converter is running")
def step(context):
    [...]

@Step("When I enter 378.9")
def step(context):
    [...]
```



Test.feature

```
Feature: Valid conversion

    Scenario: Convert meter in centimeter
        Given the Unit Converter is running
        When I enter 378.9
        ....
```

Testing framework

- Support the specific programming language
- Support the specific UI technology of AUT
- Scripting support / integration options
- Tooling for convenient test creation, maintenance and debugging

Test.py

```
@Step("Given the Unit Converter is running")
def step(context):
    startApplication("UnitConverter")

@Step("When I enter 378.9")
def step(context):
    click("FromField")
    typeText("378.9")
```

Integrating BDT and test frameworks

- Need to “talk the same language”
- Reporting
- Debugging

BDT Frameworks

- Cucumber
- JBehave
- Behave
- SpecFlow
- RSpec
- Lettuce
- Squish GUI Tester
- ...

Unit Testing Frameworks

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- QtTestLib
- Qt Quick Test
- CppUnit
- GoogleTest
- xUnit
- NUnit
- JUnit
- ...

GUI Testing Frameworks

- Squish GUI Tester
- HP QTP
- Rational Functional Tester
- Selenium
- ...

Live Demos

- QML Unit Converter
  - Non-GUI test (backend)
  - GUI test (frontend)

Q & A

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Questions? Visit our booth or email sales@froglogic.com

Free and supported trial of Squish at http://www.froglogic.com/evaluate

About Squish GUI Tester

- Cross-Platform / Cross-GUI-Technology Test Automation
  - Windows, Linux, Mac OS X, Unix, RTOSes, Mobile
  - Java (Swing/AWT, SWT/RCP, JavaFx), Qt/QML/QtQuick, Web, MFC, WinForms, WPF, iOS, Cocoa, Carbon, Android, Tk, Flex, …
- Object-based GUI object identification
- Record & replay
- Powerful scripting (JavaScript, Python, Ruby, Tcl, Perl)
- Eclipse-based IDE
- **Built-in BDD framework and support**

- Batch-testing via command-line tools
- Remote/distributed testing architecture
- Integrations: Microsoft ALM, HP QC/ALM, Rational RQM, Seapine TCM, SpiraTest, MKS, XStudio, Jenkins, Hudson, TeamCity, Bamboo, Robot Framework, JUnit, Maven, …