

Code Quality Assurance

Peter Kofler, 'Code Cop'

FH Technikum Wien, Dec. 2010



Peter Kofler

- Ph.D. (Appl. Math.)
- Professional Software Developer for 11 years
- Lead Developer at System One
- “fanatic about code quality”





Zero-Defect Mindset (MSF)

Steve McConnell

Code Complete

Deutsche Ausgabe der
Second Edition

Microsoft
PRESS



b-güte

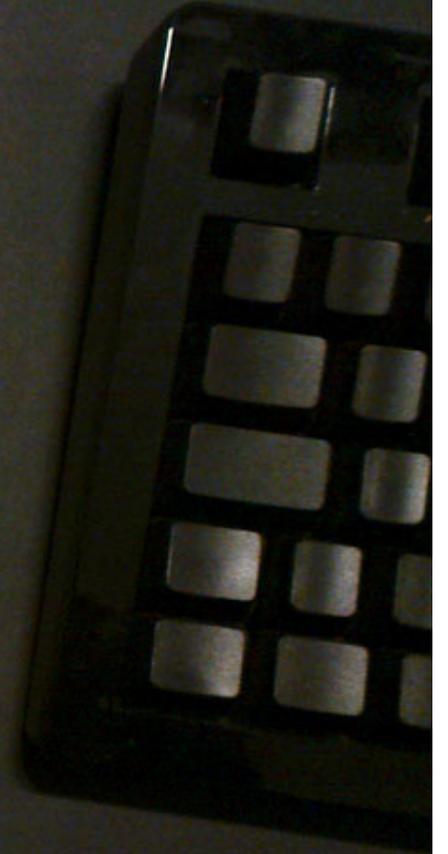
Andrew Hunt
David Thomas

Mit einem Vorwort von
Ward Cunningham

Der Pragmatische Programmierer

Übersetzt von Andreas Braig und Steffen Gemkow

HANSER



Robert C. Martin
("Uncle Bob")

Robert C. Martin Series

PRENTICE
HALL

Clean Code

A Handbook of Agile Software Craftsmanship

Foreword by James O. Coplien

Robert C. Martin



Software Craftsmanship

FANATIC ABOUT CODE QUALITY

Craftsmanship



Engineering



Craftsmanship
Over Crap

Mindset

The Prime Factors Kata

The Requirements.

- Write a class named “PrimeFactors” that has one static method: generate.
 - The generate method takes an integer argument and returns a List<Integer>.
 - That list contains the prime factors in numerical sequence.

<http://butunclebob.com/ArticleS.UncleBob.ThePrimeFactorsKata>

Demo

Keep the bar green to keep the code clean



Unit Testing

- test individual units
- isolate each part
- show that the individual parts are correct
- regression testing
- sort of living documentation
- executed within a framework

http://en.wikipedia.org/wiki/Unit_testing

xUnit Frameworks

- e.g.
- Smalltalk - SUnit
- Java - JUnit, TestNG
- .NET - NUnit, Typemock
- C++ - CppUTest
- Groovy, PHP, Python, Ruby, Scala, etc.

http://en.wikipedia.org/wiki/List_of_unit_testing_frameworks



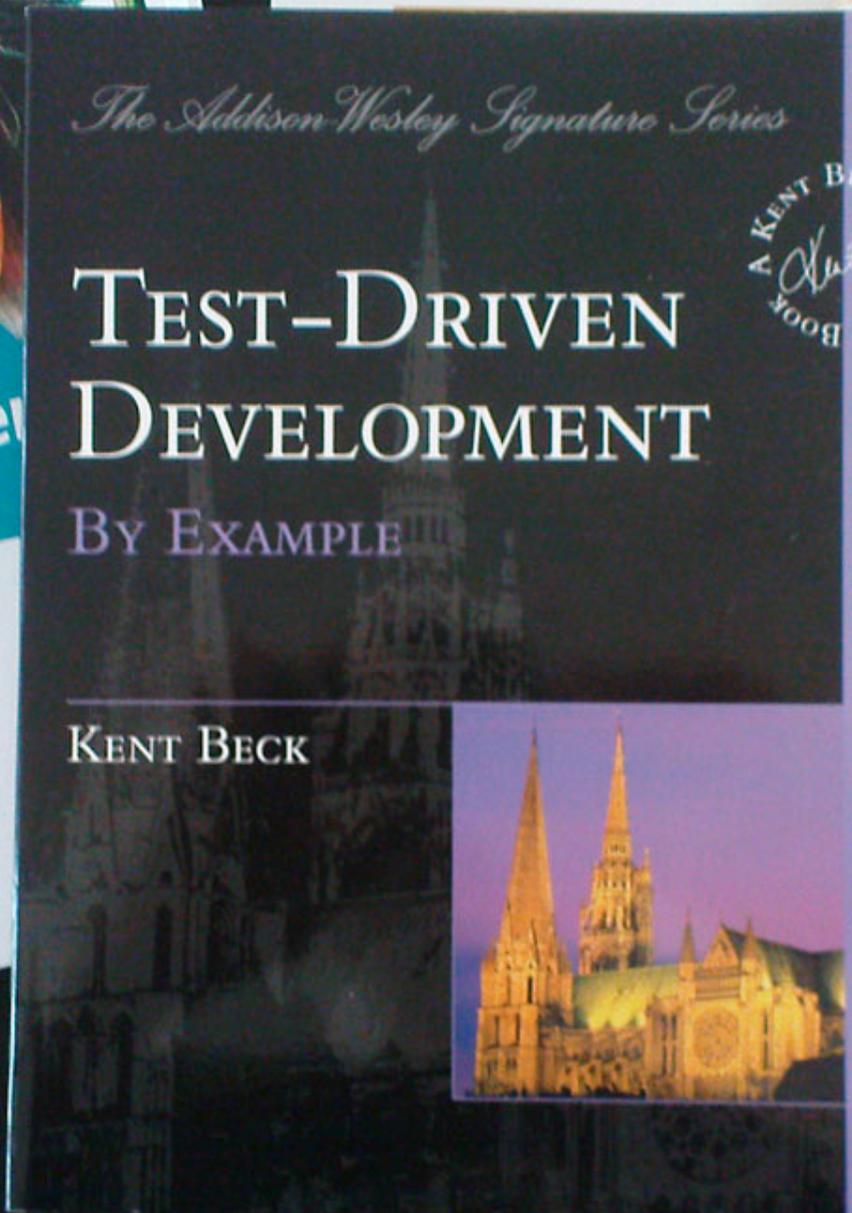
TESTING
I FIND YOUR LACK OF TESTS DISTURBING.

Test-Driven Development

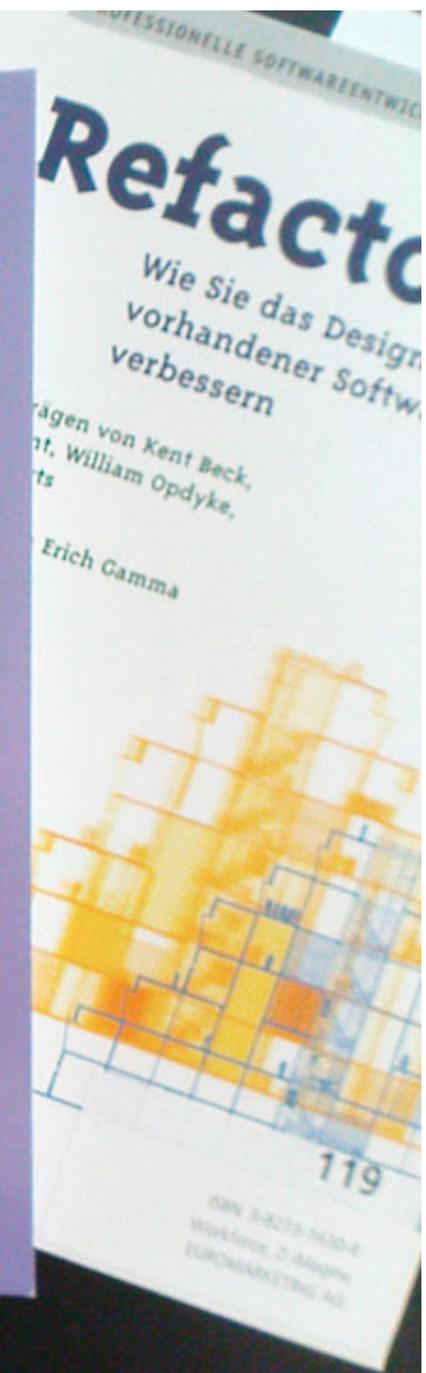
- add a test
- run all tests and see if the new one fails
- write some code
- run all tests and see them succeed
- refactor code
- „Red Green Refactor“

http://en.wikipedia.org/wiki/Test_Driven_Development

A minute ago all
their code worked



A KENT BECK SIGNATURE BOOK



Testing is
a mindset

You

have to want it



Code Coverage

comprehensiveness of tests

Beware!

comprehensiveness \neq quality!

Some Code Coverage Tools

- Java - EMMA, Cobertura, Clover
- .NET - NCover, PartCover
- C++ - Covtool, gcov
- Ruby - rcov
- commercial products

Demo

Demo



works on
my
machine

Daily Builds
Nightly Builds

Continuous Integration

Continuous Integration

- Maintain a code repository
- Automate the build
- Make the build self-testing
- Everyone commits every day
- Every commit should be built
- Keep the build fast
- Everyone can see the results of the build

http://en.wikipedia.org/wiki/Continuous_integration

Immediate Feedback
and
Early Warning

YOU BROKE THE BUILD!

This is Agnes and she's none too pleased with you, Bub. You broke the build. You should have known that you were making breaking changes, but you checked them in anyway.



If you start using continuous integration, Agnes won't have to come back.

www.YouBrokeTheBuild.com

Some CI Servers

- Java - CruiseControl, Hudson
- .NET - CruiseControl.NET, Hudson
- C++ - Hudson (Shell/Make)
- Ruby - CruiseControl.rb
- commercial products - TeamCity, ALA

The Addison-Wesley

CON
DEL

RELIABLE S
TEST, AND

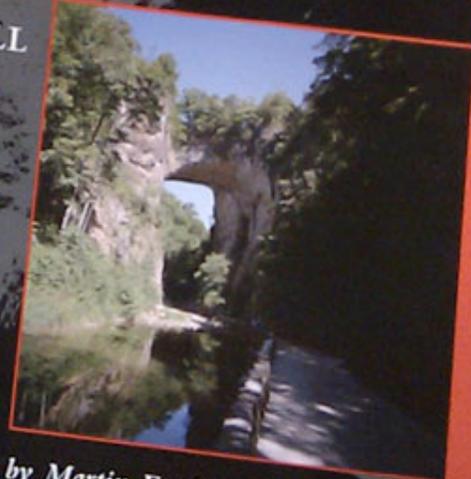
JEZ H
DAVI

The Addison-Wesley Signature Series

CONTINUOUS INTEGRATION

IMPROVING SOFTWARE QUALITY
AND REDUCING RISK

PAUL M. DUVAL
WITH
STEVE MATYAS
ANDREW GLOVER



Forewords by Martin Fowler and Paul Julius



Good Enough?

Demo



Check What?

- Lexical analysis
 - naming, coding conventions, design idioms
- Flow/path analysis
 - null-pointer, dead code (conditional)
- Dependency analysis
 - architectural/design flaws
- Verification
 - mathematical proof of correctness

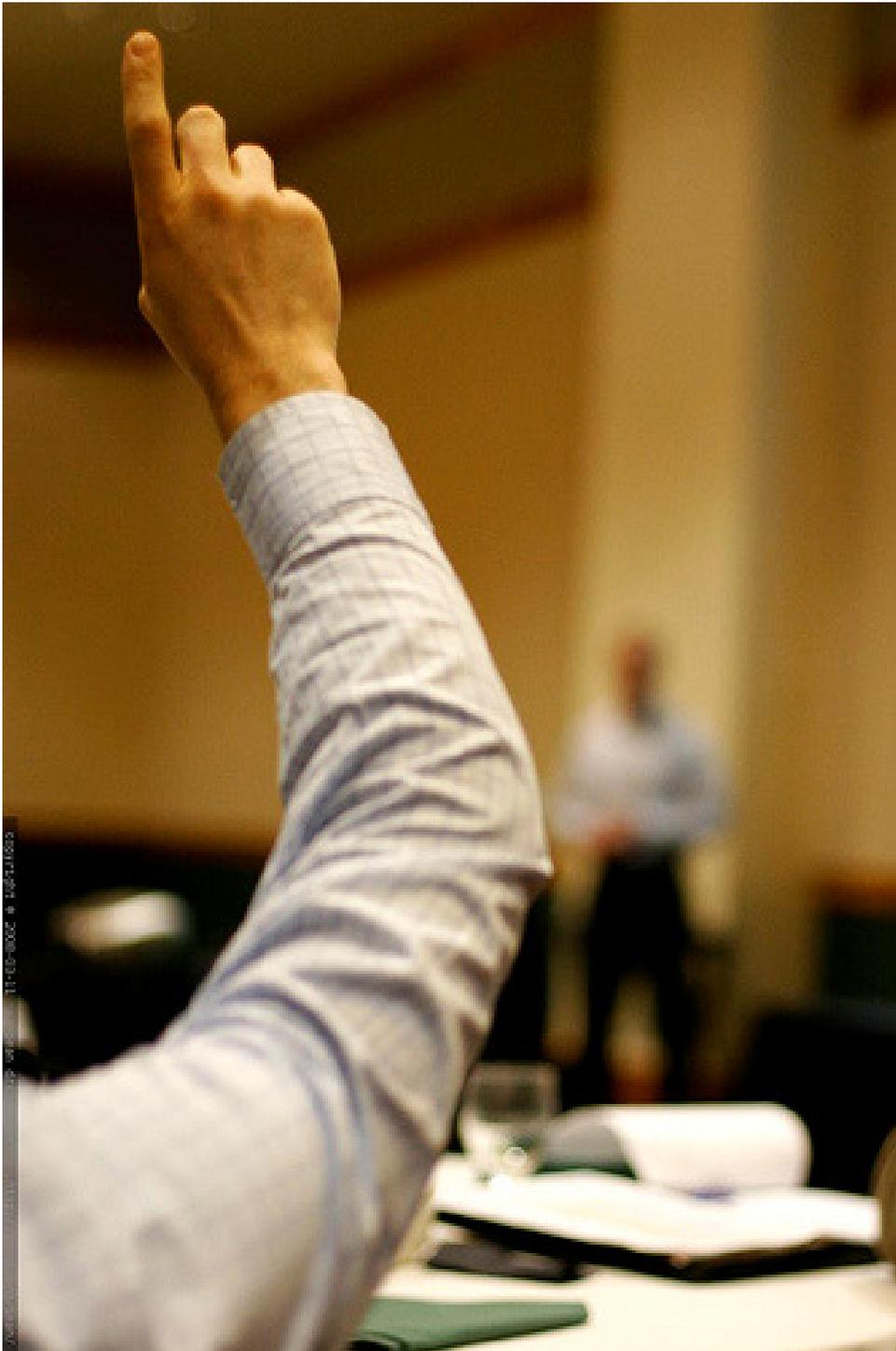
Some Static Analysis Tools

- Java - Checkstyle, Findbugs, PMD
- .NET - FxCop, (ReSharper, NDepend)
- C++ - (Sp)Lint
- Ruby - Roodi, Dust, Flog, Saikuro
- commercial products

Good Enough?

FANATIC ABOUT CODE QUALITY

Thank You



www.code-cop.org

Links #1

Mindset

- <http://codebetter.com/blogs/darrell.norton/archive/2003/12/03/4222.aspx> (Zero-Defect Mindset)
- http://www.sqnz.org.nz/documents/ShipHappens/Software%20Quality%20Group%20Presentation_frame.htm (Zero-Defect Mindset)
- http://en.wikipedia.org/wiki/Fixing_Broken_Windows
- <http://pragprog.com/the-pragmatic-programmer>
- http://en.wikipedia.org/wiki/Robert_Cecil_Martin
- <http://www.clean-code-developer.de/>
- http://en.wikipedia.org/wiki/Software_craftsmanship

Kata

- <http://butunclebob.com/ArticleS.UncleBob.ThePrimeFactorsKata>
- [http://en.wikipedia.org/wiki/Kata_\(programming\)](http://en.wikipedia.org/wiki/Kata_(programming))

Links #2

Test

- http://en.wikipedia.org/wiki/Unit_testing
- <http://en.wikipedia.org/wiki/XUnit>
- http://en.wikipedia.org/wiki/List_of_unit_testing_frameworks
- http://en.wikipedia.org/wiki/Test_Driven_Development

Code Coverage

- http://en.wikipedia.org/wiki/Code_coverage
- <http://www.ibm.com/developerworks/java/library/j-cq01316/>

Continuous Integration

- <http://hudson-ci.org/>
- <http://www.codinghorror.com/blog/archives/000818.html>
- <http://www.stevemccconnell.com/ieeesoftware/bp04.htm>

Links #3

Continuous Integration

- <http://www.joelonsoftware.com/articles/fog0000000023.html>
- http://en.wikipedia.org/wiki/Continuous_integration

Static Code Analysis

- http://en.wikipedia.org/wiki/Static_code_analysis
- http://en.wikipedia.org/wiki/List_of_tools_for_static_code_analysis

CC Images

- spray face: <http://www.flickr.com/photos/iangallagher/4115047191/>
- broken egg: <http://www.flickr.com/photos/nickwheeleroz/2475011402/>
- broken windows: <http://www.flickr.com/photos/sketchglass/4281424410/>
- shoe maker: <http://www.flickr.com/photos/tbatty/1450209613/>
- shoe factory: <http://www.flickr.com/photos/94693506@N00/4643248587/>
- red-green: <http://www.flickr.com/photos/30830597@N08/3630649274/>
- Darth Vader: <http://rubystammtisch.at/>
- covered car: <http://www.flickr.com/photos/paulk/3166328163/>
- works: <http://www.codinghorror.com/blog/archives/000818.html>
- Agnes: <http://www.youbrokethebuild.com/>
- microscope: <http://www.flickr.com/photos/gonzales2010/8632116/>
- questions: <http://www.flickr.com/photos/seandreilinger/2326448445/>