

Code Quality Assurance

Peter Kofler, 'Code Cop'

FH Technikum Wien, Dec. 2011

562

564



VAL DISERC

Peter Kofler

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



The opinions expressed here are my own and do not necessarily represent those of current or past employers.





Zero-Defect Mindset (MSF)

Steve McConnell

Code Complete

Deutsche Ausgabe der
Second Edition

Microsoft
Press



GEORGE
Inc
Oliver

SHL
epc
yeah
kash

MS
LROK
N

GEORGE
*

Boy Scout Rule

b-ygite

Andrew Hunt
David Thomas

Mit einem Vorwort von
Ward Cunningham

Der Pragmatische Programmierer

Übersetzt von Andreas Braig und Steffen Gemkow

HANSER



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

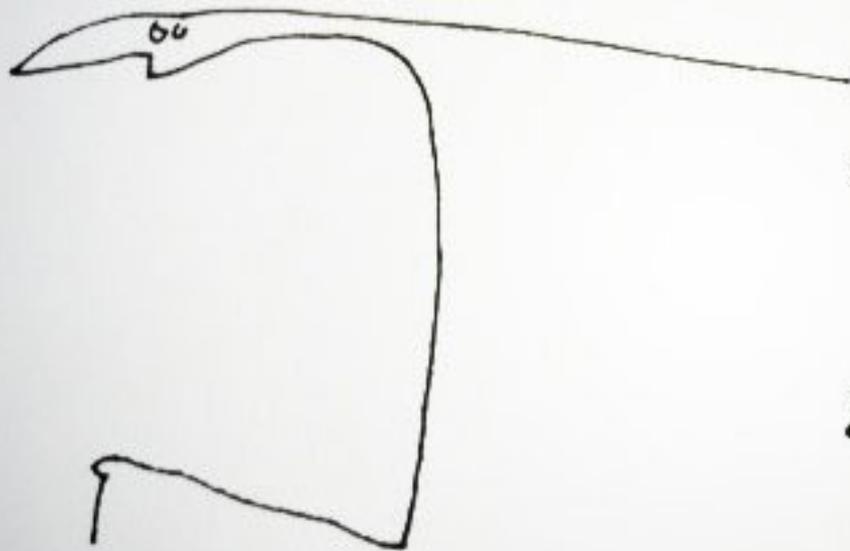
Craftsmanship



Engineering



Craftsmanship Over Crap



suddenly
"passion"
became
a buzzword!

Mindset
and
Passion

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



Global Day of CodeRetreat (3.12.2011)

<http://coderetreat.coachcamp.org/>

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“

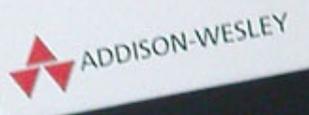
http://en.wikipedia.org/wiki/Test_Driven_Development

A minute ago all
their code worked

PROGRA
Erich Gamma
Richard Helm
Ralph Johnson
John Vlissides

Entwurfsmuster

Elemente wiederverwendbarer
objektorientierter Software

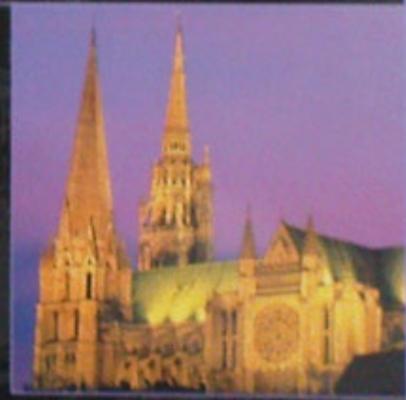


The Addison-Wesley Signature Series

TEST-DRIVEN DEVELOPMENT

BY EXAMPLE

KENT BECK



Refacto

Wie Sie das Design
vorhandener Softw
verbessern

trägen von Kent Beck,
nt, William Opdyke,
ts

Erich Gamma



119

ISBN 3-8273-1030-4
Workshop 2
EUROMARKETING AG

TDD → BDD

Testing is
a mindset

You

have to want it

٢٦٤٦٨٩/٥٥

مكتبة الإيمان

محمد بن كعب

مبهور
الشيعة

الجمعية الشرعية للتقوية

الرياضيات

التاريخ

الزياء



Code Coverage

comprehensiveness of tests

Beware!

comprehensiveness \neq quality!

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

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

Many, Many Tools

Good Enough?
(Probably Not)

Lessons Learned

(!) Boy Scout Rule

(!) Do TDD/BDD

(!) Use the Tools

(Coverage, CI, Static Analysis)

Thank You



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www.code-cop.org

@codecopkofler

Links #1

Mindset

- <http://codebetter.com/blogs/darrell.norton/archive/2003/12/03/4222.aspx>
- http://www.sqnz.org.nz/documents/ShipHappens/Software%20Quality%20Group%20Presentation_frame.htm (Zero-Defect Mindset)
- <http://pragprog.com/the-pragmatic-programmer>
- http://en.wikipedia.org/wiki/Fixing_Broken_Windows
- http://programmer.97things.oreilly.com/wiki/index.php/The_Boy_Scout_Rule

Software Craftsmanship

- http://en.wikipedia.org/wiki/Software_craftsmanship
- http://en.wikipedia.org/wiki/Robert_Cecil_Martin
- <http://vikashazrati.wordpress.com/2009/11/18/dissecting-software-craftsmanship/>
- <http://clean-code-developer.de/>

Links #2

Kata

- [http://en.wikipedia.org/wiki/Kata_\(programming\)](http://en.wikipedia.org/wiki/Kata_(programming))
- <http://butunclebob.com/ArticleS.UncleBob.ThePrimeFactorsKata>
- <http://hg.code-cop.org/primefactors/> (Kata Source Code)

Unit Test

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

TDD

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

BDD

- http://en.wikipedia.org/wiki/Behavior_Driven_Development

Links #3

Code Coverage

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

Continuous Integration

- http://en.wikipedia.org/wiki/Continuous_integration
- <http://www.codinghorror.com/blog/archives/000818.html>
- <http://www.stevemcconnell.com/ieeesoftware/bp04.htm>
- <http://www.joelonsoftware.com/articles/fog0000000023.html>
- <http://jenkins-ci.org/>

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/>
- Judge Dredd: <http://www.flickr.com/photos/eldave/6169431454/>
- 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/>
- factory: <http://www.flickr.com/photos/94693506@No0/4643248587/>
- passion: <http://gapingvoid.com/2011/03/29/suddenly-passion/>
- red-green: <http://www.flickr.com/photos/30830597@No8/3630649274/>
- 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/>