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Write Less Code!
Trends in Programming Style

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Today's Thesis

A. A large code base is hard to understand.

B. You are likely to introduce bugs in a hard-to-understand piece of code.

implication?

Large code bases are likely buggy.

Which Solution?

- Write Less Code?
- Write Code that can be Understood?

[hint: I tricked you to come today]

Defects per KLOC

- Industry Average: "about 15 - 50 errors per KLOC."
- Microsoft Applications: "about 10 - 20 defects per 1000 lines of code during in-house testing, and 0.5 defect per KLOC in released product (Moore 1992)."
- "Harlan Mills pioneered 'cleanroom development', a technique that has been able to achieve rates as low as 3 defects per 1000 lines of code during in-house testing and 0.1 defect per 1000 lines of code in released product" (Cobb and Mills 1990).

Check this

```
#!perl -pl
s!.!y$IVCXL426(-:$XLMCDIVX$dfor$$_.=5x$&*8%29628;$$$_=$_!egfor-4e3..y/iul-}/-$+ /%s''$';*_=eval
```

```
#!perl -pl
s!.!y$IVCXL426(-:$XLMCDIVX
$dfor$$_.=5x$&*8%29628;$$$_=
$_!egfor-4e3..y/iul-}/-$+ /
%s''$';*_=eval
```

perlmonks.org

And this...

```
(0/:l)(_+_)
```

http://www.google.com/search?q="(0/:l)(_%2B_)"

Which really means...

```
(0/:list)(_+_)
```


Which really means...

```
list./:(0)(_+_)
```

Which really means...

```
list.foldLeft(0)(_+_)
```


Which really means...

```
list.foldLeft(0)(x,y => x+y)
```


Which really means...

still convinced?

Writing fewer lines of code is not in itself a means to improve quality

... understandable code is

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REBOOT

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Write Code that can be Understood!
Trends in Programming Style

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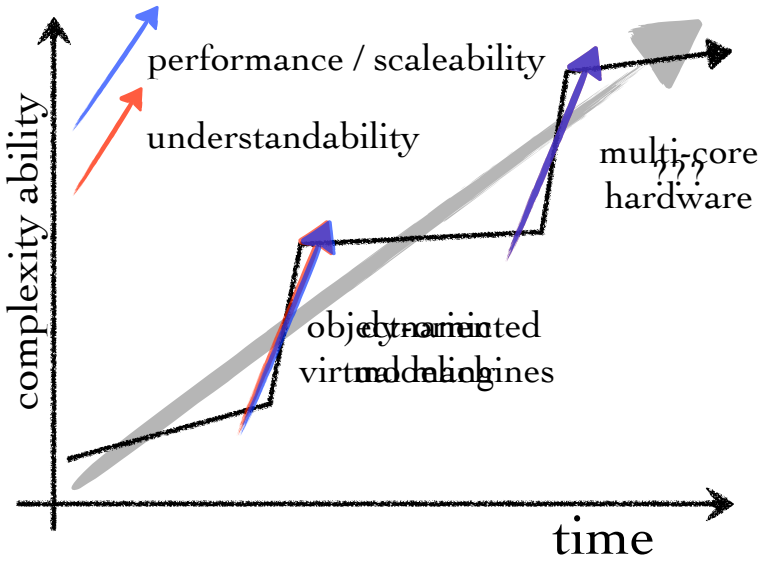
I'm no expert

I'm on a out to figure out how to

improve software quality

by means of

improving software understandability



Trends on Understandability

- Software Craftsmanship
- Clean Code [Bob Martin], Implementation Patterns [Kent Beck]
- Shared Code Ownership / Code Review
- Automated Build & Test
- Domain Specific Languages
- Domain Driven Design - DDD / Modeling

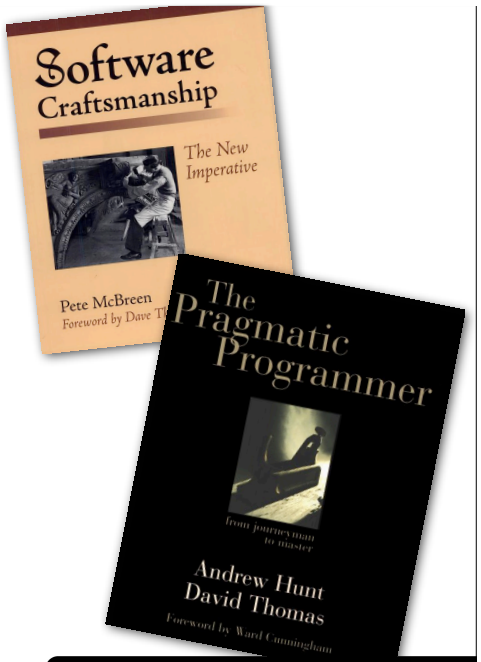
Meeting Richard Stallman

Software Craftmanship

- Being a "Software Professional"

  Apprentice ⇒
  Journeyman ⇒
  Master

- Taking responsibility, Learning-by-doing, long time customer relationships, ...



Implementation Patterns / Clean Code

- Simple, statement-level little rules for how to structure code.
- Gives you some vocabulary to talk about code quality at the detail level.

"Implementation Patterns"

If's are evil... ALLOW THEM WHEN

Condition can be expressed without **AND**, **OR**, operators

```
if (myContainer.hasItems()) {
   // ...
}
```


"Implementation Patterns"

If's are evil... ALLOW THEM WHEN

Condition is about a local field

```
if (this.isVisible) {
   // ...
}
```


"Implementation Patterns"

If's are evil... ALLOW THEM WHEN

Condition is is a non-float comparison, i.e.

```
if (myCertificates.count() < 3) {
   // ...
}
```

"Implementation Patterns"

If's are evil... BE CAUTIOUS

When there is more than one AND/OR operators, i.e.

```
if (isVisible && !isParent) {
   // ...
}
```


"Implementation Patterns"

If's are evil... BE CAUTIOUS

When there is negative logic

```
if (!isSenior) {
   // ...
}
```

positive statements are easier to understand

"Implementatin Patterns"

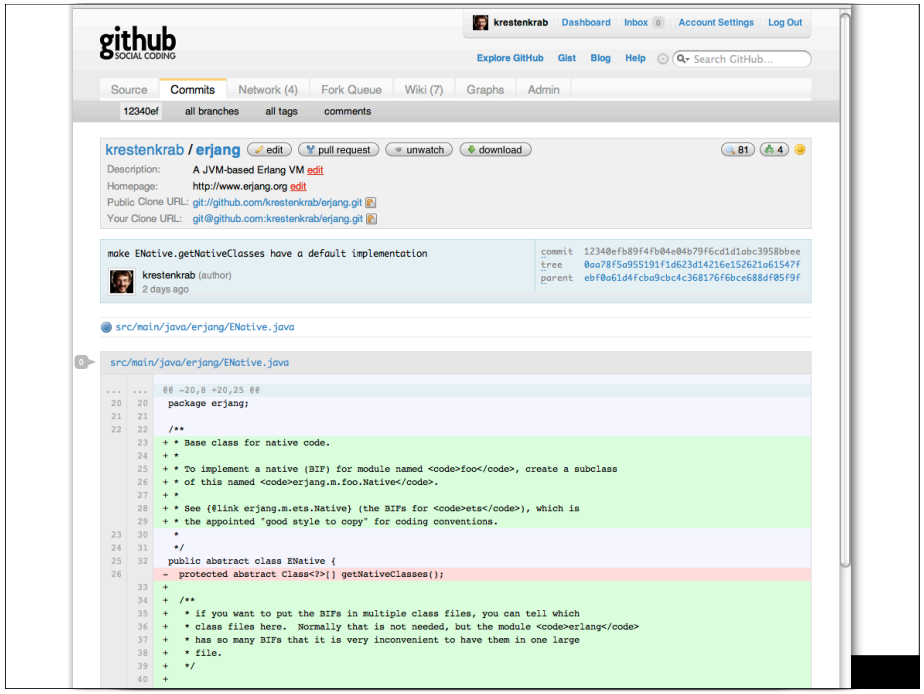
Good to read, because they give you an awareness of "what good code is".

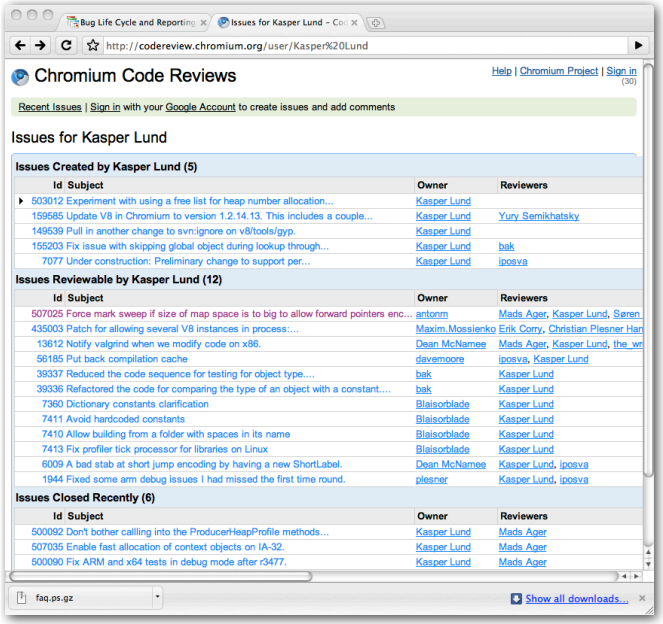
More than a "coding convention"

It's an invitation to have your own opinion!

Sharing Code

- We have a lot to learn from open source projects> Distributed Collaboration
  - In the late 80's the GNU project developed the style of cooperation that is main stream today.
- XP/practices for "pairing" when writing production code.





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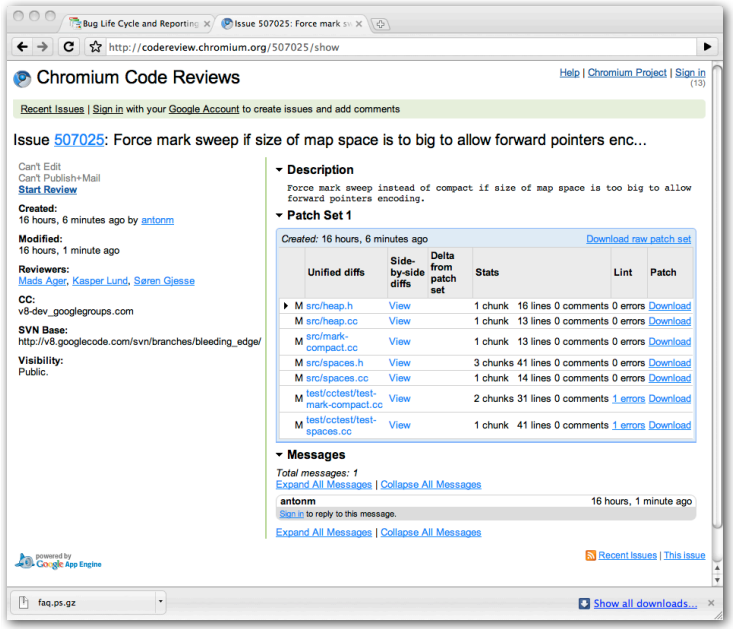

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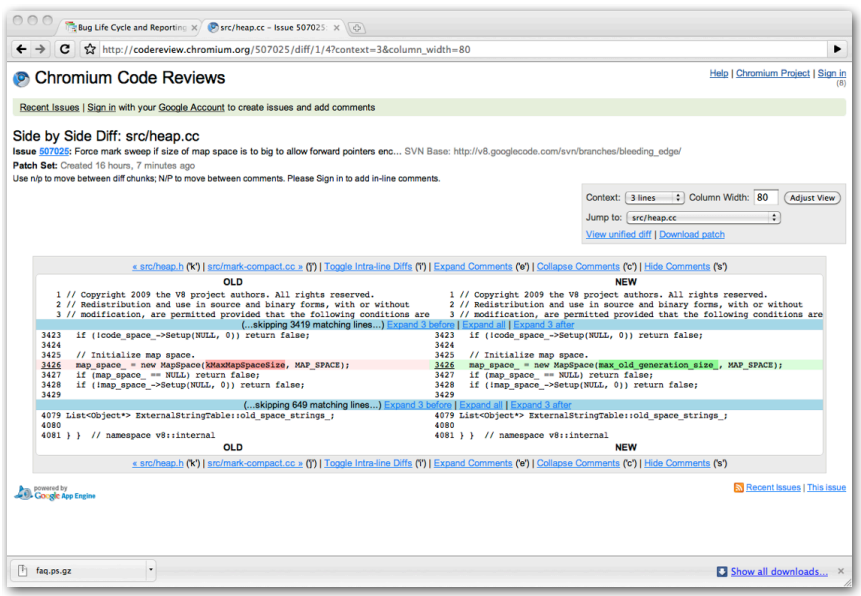

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Using Version Control

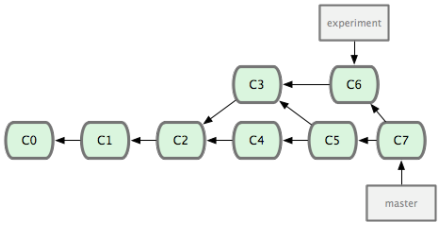
- First we used file-oriented version control
- Then repository-oriented CVS, SVN, ...
- The new kids in town:
  GIT, Mercurial & Darcs

GIT [github] **& Mercurial** [google code]

No central repository

Edit history is a DAG of deltas

Each revision identified by strong hash of all edits included.

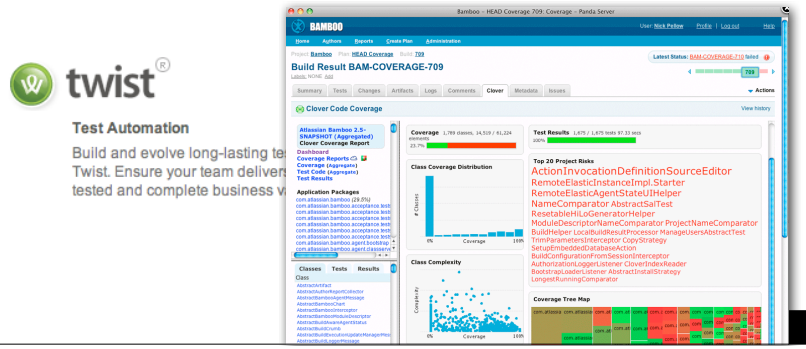


Automated Build

- Atlassian, Australian maker of developer tools, measures project performance by timing
  - **Compile-run cycle [short]**
  - **Checkout-build-deploy [from scratch]**
- Imagine what this does to make a codebase accessible to a new developer joining the project.

Continuous Integration

- Upon every "commit" to the source code repository, run automated build and test.

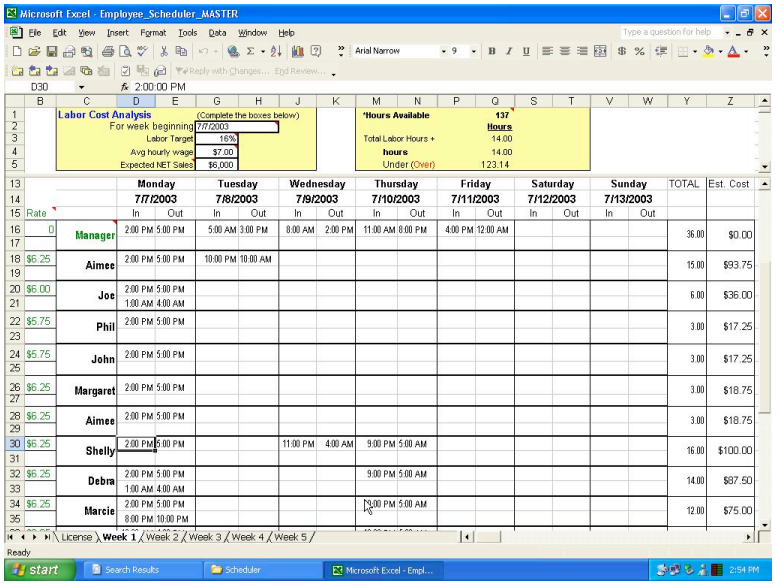


Continuous Delivery

- Deploy to production upon Commit
- The Developer's responsibility
- Bugs are much cheaper to fix right away
  - Suitable for online systems;
  - Need infrastructure to automatically track issues
  - Jez Humble's new book.

Domain Err

- The worst kind of "bug" is if your program does not do what the customer wants!
- Ideal: Make your program, such that the customer can read it; or even better: so he can write it.
  - End-user programming
  - Domain Specific Languages
  - Domain Driven Design
  - Short development cycles ⇒ feedback



resolver systems ltd

End-User Participation

- Domain Specific Languages
  - User's typically write business-logic or test cases in specialized languages
- Intentional "Domain Workbench"
  - Excel on steroids, still being proven

Technical "Domain Specific Languages"

- **Rails** is a domain specific language for the "domain" of creating database backed web applications.
- **FIT** is a test framework, that allows end-users to write tests/specifications in a tabular format in Excel or Microsoft Word.
- In dynamic languages (Ruby, Smalltalk, Javascript, Groovy, **Ioke**, ...) it is quite easy to create your own.

Expert "Domain Specific Languages"

- **ERP** systems (SAP, Maconomy, Navision) typically embody a language specifically for "application programming".
- **Trifork Athene** uses a DSL for doctors to describe procedures for determining diseases.
- There needs to be a good number of usages, before a DSL makes sense. One use case is seldom enough.

DSLs: create your own

- Internal DSLs
  - Use the language you already use (Java, C#, Ruby) to express things more concisely
- External DSLs
  - Write a parser/graphical editor specifically for your domain.

DDD

- Focus on understanding the customer's domain.
- Design [code] guide lines for how to make this successful.
- OOA&D popularized by an american.