the material in these slides is deliberately misleading, in both obvious and subtle ways

SD-MA

this slide deck may be unsuitable for developers familiar with fewer than three programming paradigms

narcissistic design

from complexity to job security

@stuarthalloway
stu@cognitect.com

praise for narcissistic design

.@stuarthalloway showed someone at work your ND talk. He switched it off after 2 mins, offended

@sofra

It's all about me.

@stuarthalloway

intentional obfuscation

```
#define _ -F<00||--F-OO--;
int F=00,OO=00;
main(){F_OO();printf("%1.3f\n",4.*-F/OO/OO);}F_OO()
{
            _-_-_-_
       _-_-_-_-_-_-_-_-_
    _-_-_-_-_-_-_-_-_-_-_-_
  _-_-_-_-_-_-_-_-_-_-_-_-_-_
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  _-_-_-_-_-_-_-_-_-_-_-_-_-_
    _-_-_-_-_-_-_-_-_-_-_-_
        _-_-_-_-_-_-_-_
            _-_-_-_
}
```

http://www.badprogramming.com/code/How-to-compute-the-length-of-an-array

established bad practice

```
<?
echo("<p>Search results for query: " .
    $_GET['query'] . ".</p>");
?>
```

http://www.sitepoint.com/good-and-bad-php-code/

embrace lang weirdness

```
try {
    m.invoke(parentObject, paramObj);
} catch (IllegalArgumentException e) {
    new CaseLibException(e);
} catch (IllegalAccessException e) {
    new CaseLibException(e);
} catch (InvocationTargetException e) {
    new CaseLibException(e);
}
```

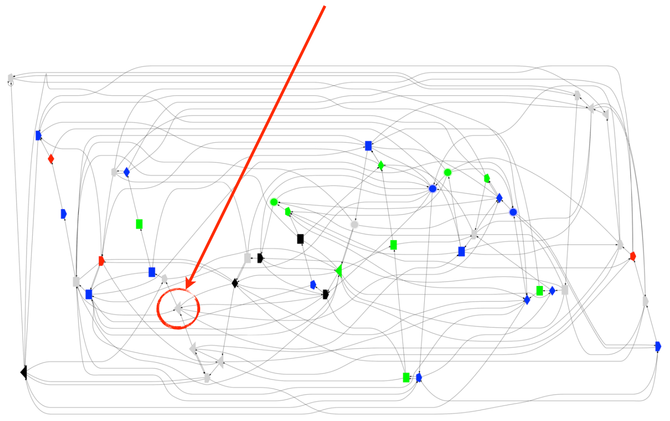
http://www.artima.com/forums/flat.jsp?forum=276&thread=190590

go overboard

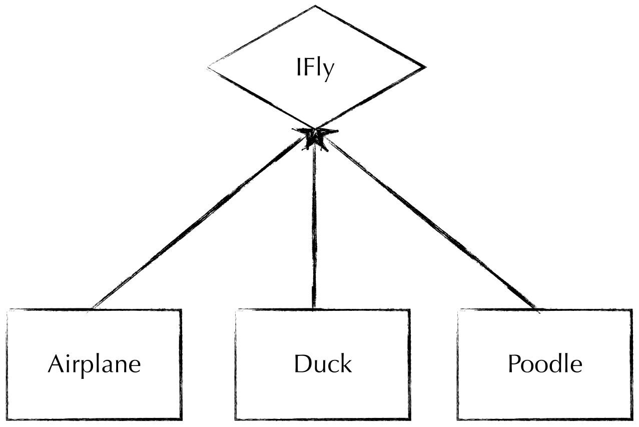
```
AbstractInterruptibleBatchPreparedStatementSetter

AbstractTransactionalDataSourceSpringContextTests

PreAuthenticatedGrantedAuthoritiesWebAuthenticationDetails
```

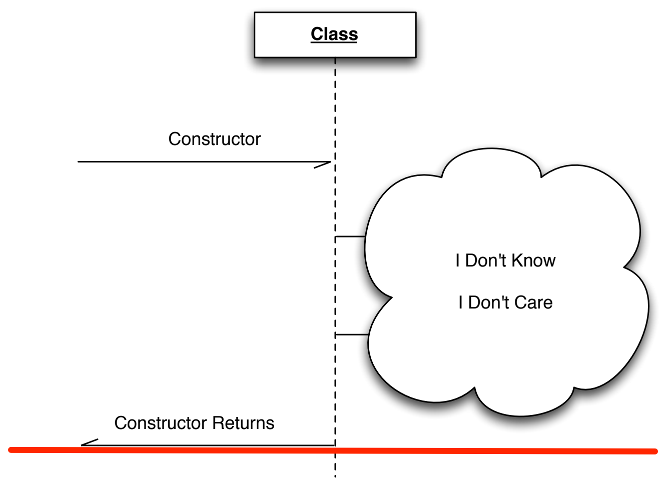
http://jacek-e.blogspot.hu/2011/07/longest-class-name-in-java.html

you are here



1. embrace setter methods

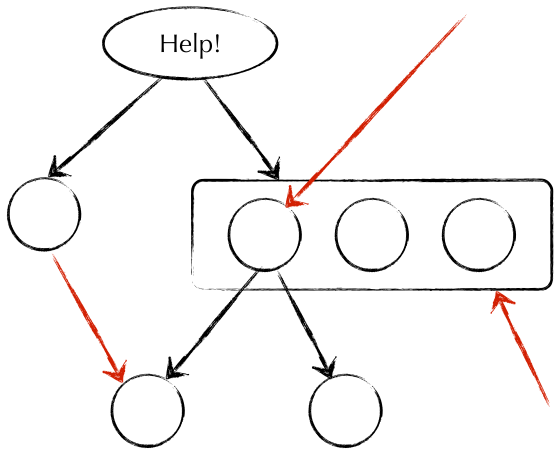




Setters undermine the two best parts of OO:

constructors and interfaces.

@stuarthalloway



2. prefer APIs over data

data forces decoupling

```xml
<?xml version="1.0" encoding="UTF-8" ?>
<testsuite errors="1" failures="1"
    hostname="mahmood-alis-macbook-pro.local"
    name="tests.ATest" tests="3" time="0.069"
    timestamp="2009-12-19T17:58:59">
  <testcase classname="tests.ATest" name="error" time="0.0060">
    <error type="java.lang.RuntimeException">
        java.lang.RuntimeException
        at tests.ATest.error(ATest.java:11)
    </error>
  </testcase>
  <testcase classname="tests.ATest" name="fail" time="0.0020">
    <failure type="junit.framework.AssertionFailedError">
      junit.framework.AssertionFailedError:
    </failure>
  </testcase>
  <testcase classname="tests.ATest" name="sucess" time="0.0" />
</testsuite>
```

https://github.com/notnoop/hudson-tools/blob/master/toJunitXML/sample-junit.xml

api coupling

temporality

language

mutability

semantics

esoteric features

tight coupling

```
import org.junit.runner.RunWith;
import org.junit.runners.Suite;

@RunWith(Suite.class)
@Suite.SuiteClasses({
  TestFeatureLogin.class,
  TestFeatureLogout.class,
  TestFeatureNavigate.class,
  TestFeatureUpdate.class
})

public class FeatureTestSuite {
  // the class remains empty,
  // used only as a holder
  // for the above annotations
}
```

Java required

language semantics

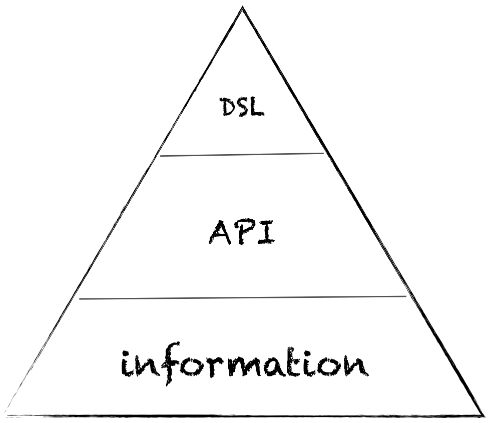
esoteric feature

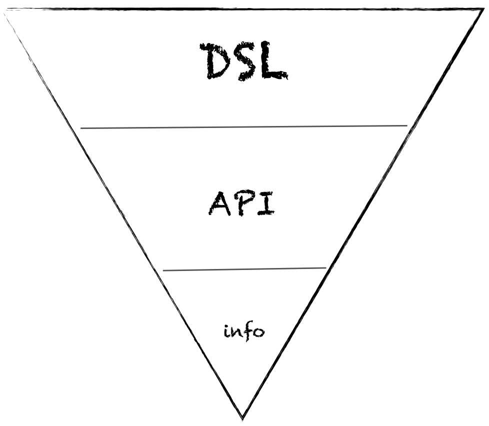
temporal semantics?

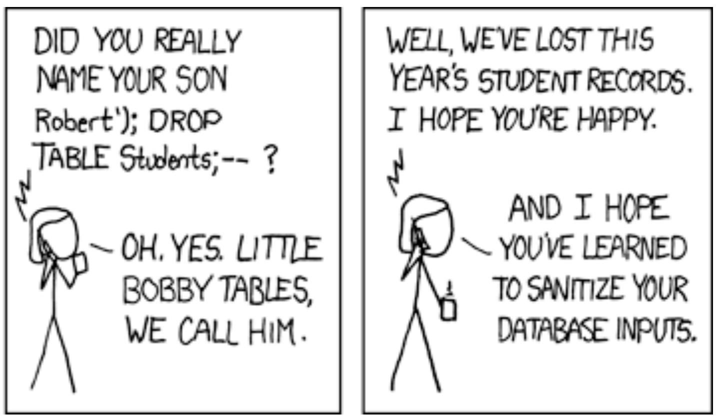
laugh? cry?

https://github.com/junit-team/junit/wiki/Aggregating-tests-in-suites

3. start with DSLs






DID YOU REALLY NAME YOUR SON Robert'); DROP TABLE Students;-- ?
OH, YES. LITTLE BOBBY TABLES, WE CALL HIM.
WELL, WE'VE LOST THIS YEAR'S STUDENT RECORDS. I HOPE YOU'RE HAPPY.
AND I HOPE YOU'VE LEARNED TO SANITIZE YOUR DATABASE INPUTS.

http://imgs.xkcd.com/comics/exploits_of_a_mom.png

JVM classfile

```
ClassFile {
  u4 magic;
  u2 minor_version;
  u2 major_version;
  u2 constant_pool_count;
  cp_info constant_pool[constant_pool_count-1];
  u2 access_flags;
  u2 this_class;
  u2 super_class;
  u2 interfaces_count;
  u2 interfaces[interfaces_count];
  u2 fields_count;
  field_info fields[fields_count];
  u2 methods_count;
  method_info methods[methods_count];
  u2 attributes_count;
  attribute_info attributes[attributes_count];
}
```

data!

often treated as a value

http://docs.oracle.com/javase/specs/jvms/se5.0/html/ClassFile.doc.html

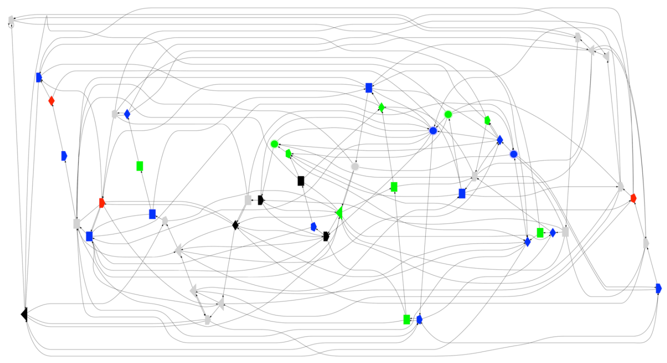
programming Java

```
// build generator for the new class
String tname = tclas.getName();
ClassPool pool = ClassPool.getDefault();
CtClass clas = pool.makeClass(cname);
clas.addInterface(pool.get("IAccess"));
CtClass target = pool.get(tname);

// add target object field to class
CtField field = new CtField(target, "m_target", clas);
clas.addField(field);

// add public default constructor method to class
CtConstructor cons = new CtConstructor(NO_ARGS, clas);
cons.setBody(";");
clas.addConstructor(cons);
```

http://www.ibm.com/developerworks/java/library/j-dyn0610/

4. always connect, never enqueue

ask no questions



tight coupling

presume objects that are available and close

never make a queue

if forced to queue, wrap object API

introduce conversational state

5. create abstractions for information

a few basic shapes

scalars

sequences

arrays

maps

sets

encapsulate!

setters / update-in-place covered in point 1

- tight coupling
- no model for time

use getters to block access to the basic shapes

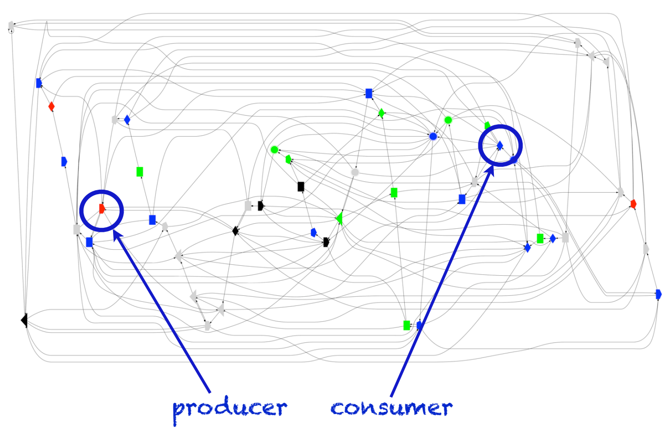
- codebase becomes an order of magnitude larger
- doesn't protect you from change

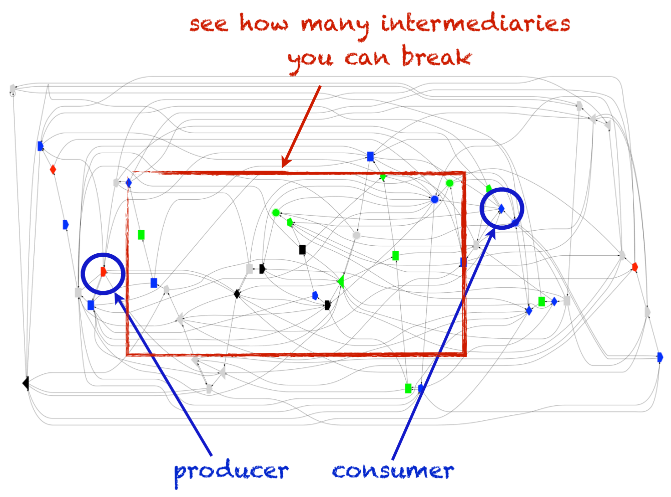
commercial break

#narcissisticdesign is the new clean code

@stuarthalloway

6. use static typing across subsystem boundaries





exceptional complexity

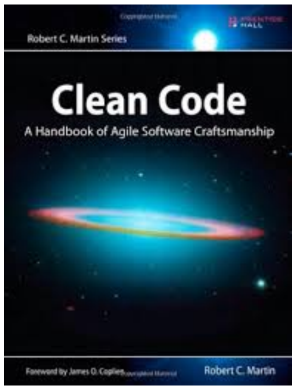
use checked exceptions

use lots of types

be very specific in what you throw and catch

let tests expand contracts

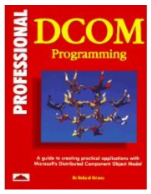
"Look for every boundary connection and write a test for it."

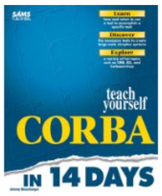


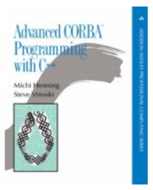
http://www.amazon.com/Clean-Code-Handbook-Software-Craftsmanship/dp/0132350882

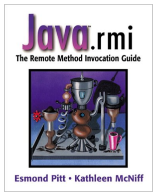
7. put language semantics on the wire

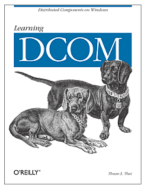
type systems on the wire








Java.rmi
The Remote Method Invocation Guide
Esmond Pitt • Kathleen McNiff

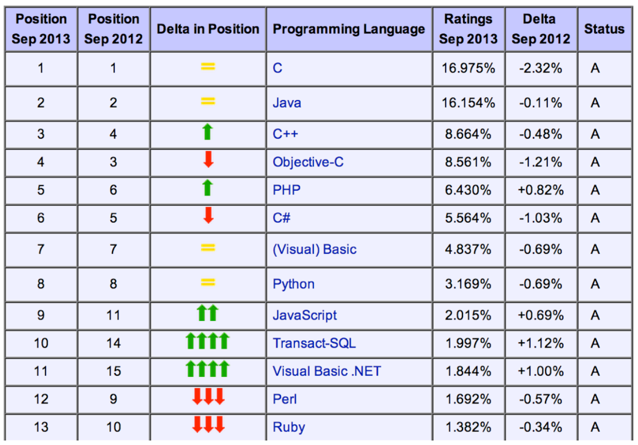


You know what is web scale?
The web.

Oh, and it is dynamically typed.

@stuarthalloway

programming languages



Position Sep 2013	Position Sep 2012	Delta in Position	Programming Language	Ratings Sep 2013	Delta Sep 2012	Status
1	1	=	C	16.975%	-2.32%	A
2	2	=	Java	16.154%	-0.11%	A
3	4	⬆	C++	8.664%	-0.48%	A
4	3	⬇	Objective-C	8.561%	-1.21%	A
5	6	⬆	PHP	6.430%	+0.82%	A
6	5	⬇	C#	5.564%	-1.03%	A
7	7	=	(Visual) Basic	4.837%	-0.69%	A
8	8	=	Python	3.169%	-0.69%	A
9	11	⬆⬆	JavaScript	2.015%	+0.69%	A
10	14	⬆⬆⬆⬆	Transact-SQL	1.997%	+1.12%	A
11	15	⬆⬆⬆⬆	Visual Basic .NET	1.844%	+1.00%	A
12	9	⬇⬇⬇	Perl	1.692%	-0.57%	A
13	10	⬇⬇⬇	Ruby	1.382%	-0.34%	A

data languages

avro	java
bson	json
csv	kryo
edn	protobuf
fressian	thrift
hessian	yaml
	xml

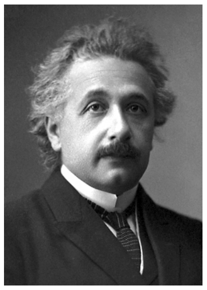
keep it complex

keep the focus on programming languages

let programming languages drive serialization

JSON

```
{"name":"Albert Einstein",
 "dob":"Wed Mar 14 01:00:00 CET 1979",
 "interests":["thermodynamics","relativity"]}
```

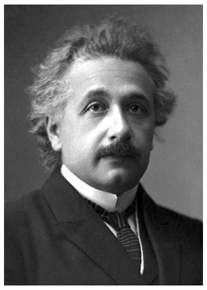


http://en.wikipedia.org/wiki/Albert_Einstein

JSON

```
{"name":"Albert Einstein",
 "dob":"Wed Mar 14 01:00:00 CET 1979",
 "interests":["thermodynamics","relativity"]}
```

"Everything should be made as simple as possible, but no simpler."



http://en.wikiquote.org/wiki/Albert_Einstein

Put JSON into APIs so its impoverished semantics become everybody's problem.

@stuarthalloway

8. write lots of unit tests

example-based tests (EBT)

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

EBT

setup

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

EBT

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

inputs

EBT

execution

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

EBT

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

output

EBT

```ruby
describe Bowling, "#score" do
  it "returns 0 for all gutter game" do
    bowling = Bowling.new
    20.times { bowling.hit(0) }
    bowling.score.should eq(0)
  end
end
```

validation

decouple	benefits
model	improve design generate load
inputs	increase comprehensiveness by running longer
execution	test different layers with same code only part that must change with your app
outputs	expert analysis persist for future study
validation	test generic *properties* run against prod data
all	*functional programming* *feedback loops in test development*

abuse those unit tests

keep testing complected!

handcraft *a lot* of different inputs

forget about documentation, code review

always be coding

keep polishing that English-like DSL

Use static typing and unit testing as an expensive way to catch easy bugs.

@stuarthalloway

9. update information in place

the laws

memory is expensive

storage is expensive

machines are precious

resources are dedicated

mutable

characteristic	mutable structure
sharing	difficult
distribution	difficult
concurrent access	difficult
access pattern	eager
caching	difficult
examples	Java and .NET collections relational databases NoSQL databases

mutable vs. persistent

characteristic	mutable	persistent
sharing	difficult	trivial
distribution	difficult	easy
concurrent access	difficult	trivial
access pattern	eager	eager or lazy
caching	difficult	easy
examples	Java, .NET collections relational databases NoSQL databases	Clojure, F# collections Datomic database

uses for mutability

model the substrate on which programs run

specific algorithms

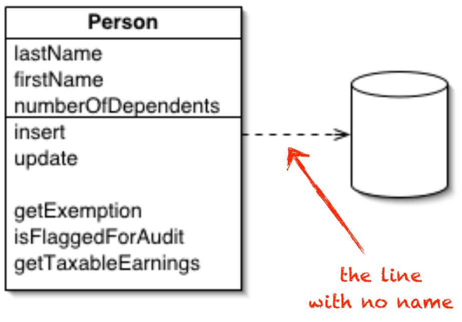
time model

Eventual consistency is the fast path to complexity.

@stuarthalloway

10. leverage context

active record



http://www.martinfowler.com/eaaCatalog/activeRecord.html

ruby on rails

```
class Song < ActiveRecord::Base
  # Uses an integer of seconds to
  # hold the length of the song

  def length=(minutes)
    write_attribute(:length, minutes.to_i * 60)
  end

  def length
    read_attribute(:length) / 60
  end
end
```

table name: contextual

db connection: contextual

http://api.rubyonrails.org/classes/ActiveRecord/Base.html

now I need to talk to *two* databases

no problem!

```
class OldUser < ActiveRecord::Base
  establish_connection :adapter  => "postgresql",
                       :database => "legacy_users",
                       :username => "whatever",
                       :password => "something"
  set_table_name "u_users" # Whatever you require
  belongs_to :company,
             :class_name => "OldCompany",
             :foreign_key => "fk_company_id"
end
```

http://stackoverflow.com/questions/3609482/activerecord-talk-to-two-databases

but...

Having upgraded to ActiveRecord 3.1.0 I'm seeing that it fails with an `ActiveRecord::ConnectionNotEstablished` exception

(setup problem)

http://stackoverflow.com/questions/7390623/activerecord-3-1-0-multiple-databases

and...

```
desc "Migrate the database through scripts in db/migrate."
namespace :db do
  task :migrate do
    Rake::Task["db:migrate_db1"].invoke
    Rake::Task["db:migrate_db2"].invoke
  end

  task :migrate_db1 do
    ActiveRecord::Base.establish_connection DB1_CONF
    ActiveRecord::Migrator.migrate("db/migrate/db1/")
  end

  task :migrate_db2 do
    ActiveRecord::Base.establish_connection DB2_CONF
    ActiveRecord::Migrator.migrate("db/migrate/db2/")
  end
end
```

there is an API!

migrations change?
build tool usage changes?

except...

Jérémy Mortelette · 9 months ago

Hi, I just tried this but I get some errors (in rails 3.2.9) : the globals variable aren't accessible.

I recommend to move the configuration from application to an initializer.

(more setup problems)

http://stackoverflow.com/questions/7390623/activerecord-3-1-0-multiple-databases

but be careful!

Gustav Jérémy Mortelette · 7 months ago

Jeremy is absolutely right in that you need to use an abstract model ... hunh?

If you don't do this then every model that calls "establish_connection" will create a new connection pool instead of using the cached connection.

(bleeds into connection pool setup)

http://stackoverflow.com/questions/7390623/activerecord-3-1-0-multiple-databases

Look what we made when devs were stakeholders:

build tools and ORM

@stuarthalloway

	ORMs	build tools
setters	lots	lots
API > data	lots	lots
DSL > API	lots	lots
always connect	lots	some
info abstractions	lots	some
static typing	some	?
lang on wire	some	some
lots of unit tests	?	?
update in place	lots	some
leverage context	lots	lots

thanks!

@stuarthalloway

https://github.com/stuarthalloway/presentations/wiki.

http://www.linkedin.com/pub/stu-halloway/0/110/543/

mailto:stu@cognitect.com

additional examples

functions are too simple

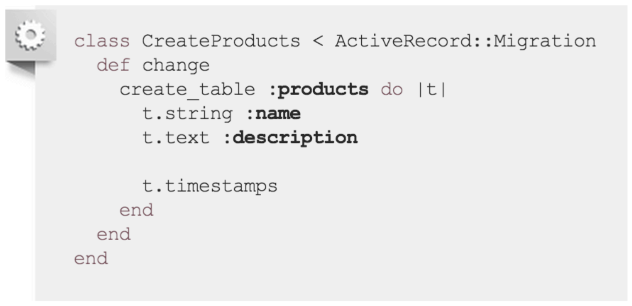
make classes matter

make inheritance matter

drag in build tools

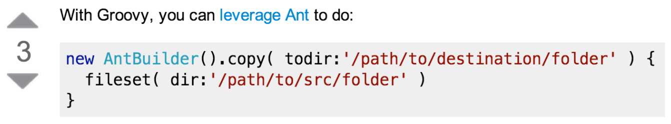
add convenience libraries on top of build tools

require an IDE!



```
class CreateProducts < ActiveRecord::Migration
  def change
    create_table :products do |t|
      t.string :name
      t.text :description

      t.timestamps
    end
  end
end
```

http://guides.rubyonrails.org/migrations.html


3

With Groovy, you can leverage Ant to do:

```
new AntBuilder().copy( todir:'/path/to/destination/folder' ) {
  fileset( dir:'/path/to/src/folder' )
}
```

http://stackoverflow.com/questions/6214703/copy-entire-directory-contents-to-another-directory

Does any know why, during widgetset compilation, a folder is generated [...] ***The folder takes up 20 Mbytes***, which causes my war file to double in size...

Kind regards,
Jan De Beule

Vaadin **Plug-in for Eclipse** was designed to delete them automatically after widgetset compilation step, but it **no longer works** due to difference introduced in GWT 2.x. At least until corrected Plug-in is made available by Vaadin team.

Not a big deal anyway :smug:

https://vaadin.com/forum#!/thread/476763

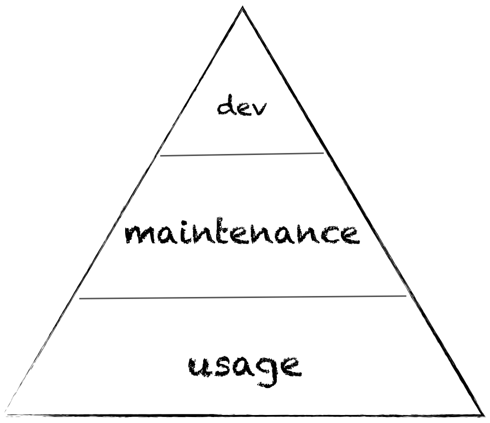
never eliminate complexity

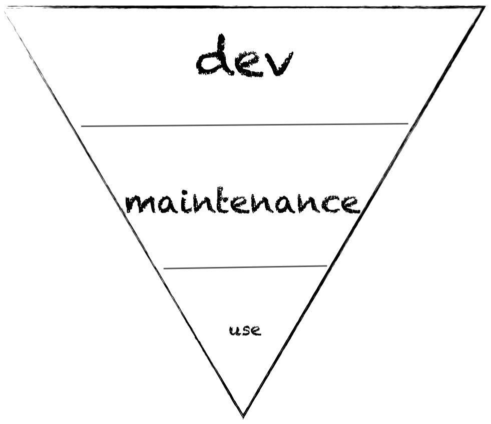
automate around it

Manage by pull request, because code is the first and best unit of discussion.

@stuarthalloway

http://oldblog.antirez.com/post/pull-requests-are-not-conversations.html





integrating narcissism and agile practice

Individuals and interactions over processes and tools
Working software over ***comprehensive*** documentation
Customer collaboration over contract negotiation
Responding to change over following a ***plan***

http://agilemanifesto.org/