Living on the Bleeding Edge In The Financial Industry

Using Clojure, AMQP, Chef, Cucumber and JRuby in the Financial Industry

Philadelphia ETE, April 2010

Algorithmics, Inc.

Risk Management

Collateral Management

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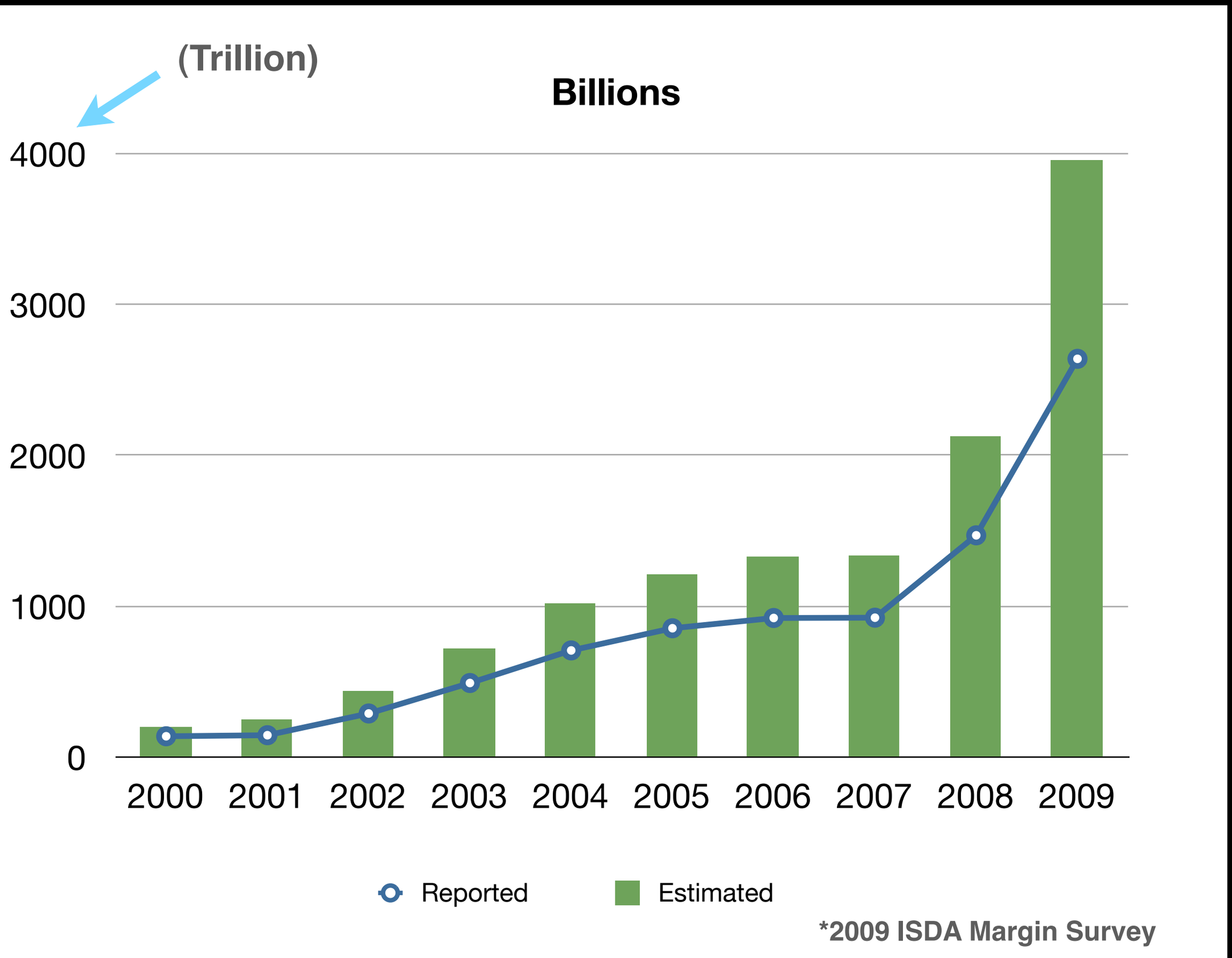
Ok, WTF is Collateral Management?

Reduces Credit Risks for
Unsecured Financial Transactions

Credit Risk == Debtor Fails to Pay

Unsecured Financial Transactions are
OTC (over the counter)


(Trillion)
Billions
4000
3000
2000
1000
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Reported
Estimated
*2009 ISDA Margin Survey

Talk about the product here

- Today
  - Manual Processing
  - Email, Phone, Fax
- Tomorrow
  - Secure Messaging
  - Formalized Workflow
  - Standards based Protocol

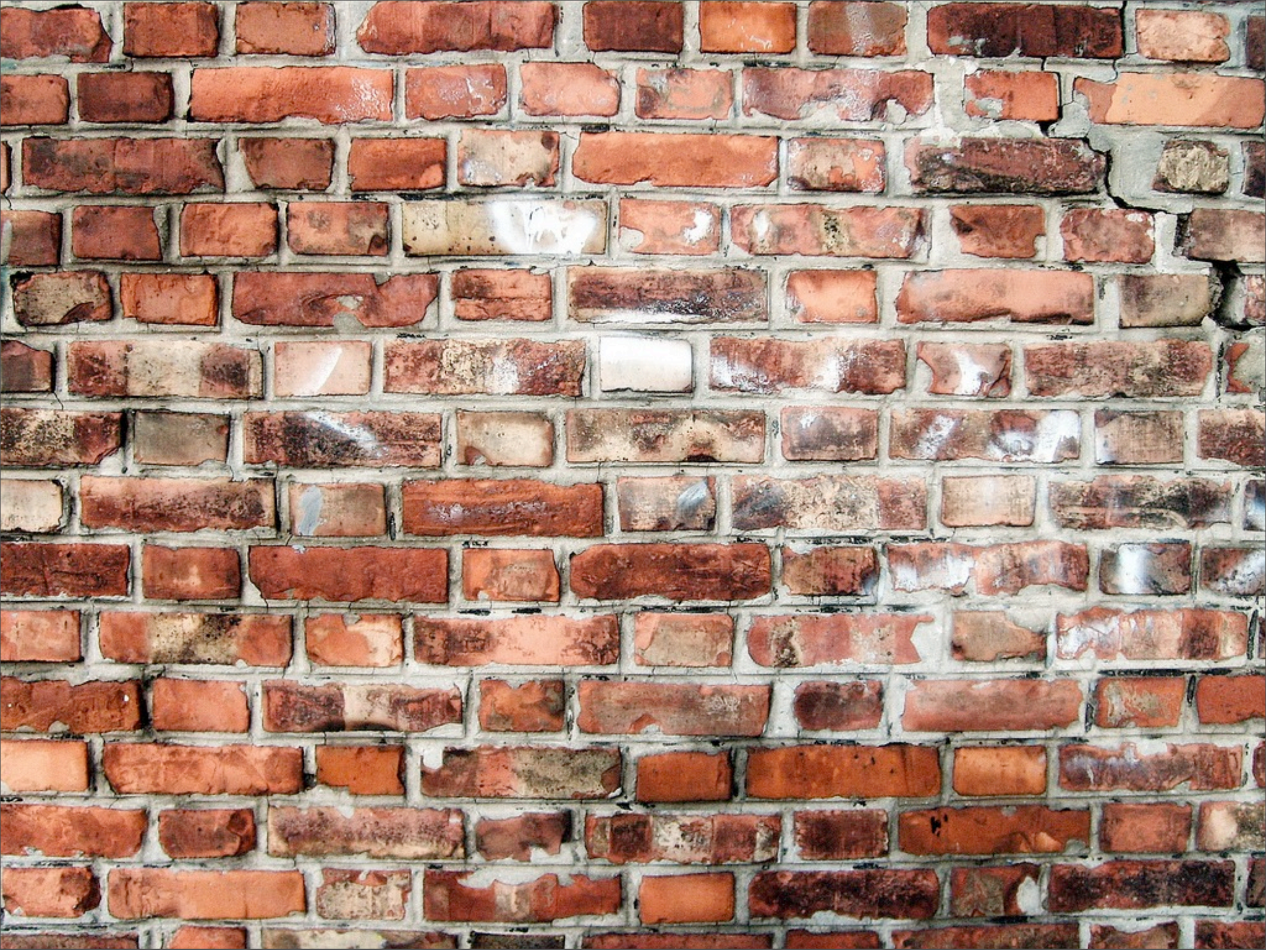
Overview

- What do we all want?
  - What Challenges Did we face
- How did we do/get it?
- What did we do?
  - What challenges did we face
- What has it done for us?

What do we Want?

- Best People
- Best Technologies
- To Create: new code, not legacy
- Interesting Problems
- Best Processes

Monday, March 8, 2010



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Challenges

- Financial Industry: Conservative
- Management: Conservative, Skeptical
- Programmers: Skeptical
- Technology Choices: Clojure, Ruby, AMQP
- Gasp: Where do we go for support?

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How we did it: People

- Product Visionaries Sold Higher Ups on Idea
- Time To Market Critical

- Aaron Built a Prototype *very* Rapidly
  - All by His Lonesome
  - Demonstrated Value of Technologies

Project Given Green Light June 2009

How we did it: People

- Aaron Invested in Philly Lambda
- Networked with Members
- Organized, Brought in Speakers
- Bought Lots of Pizza

First Two Developer Hires July 2009

How we did it: Support

- LShift: unlike many open source techs, a company sits behind RabbitMQ
- We knew RabbitMQ was great, it was built on Erlang
- Erlang devs don't grow on trees in Philly
- Contracted with LShift to extend and accelerate product roadmap

What did we do?

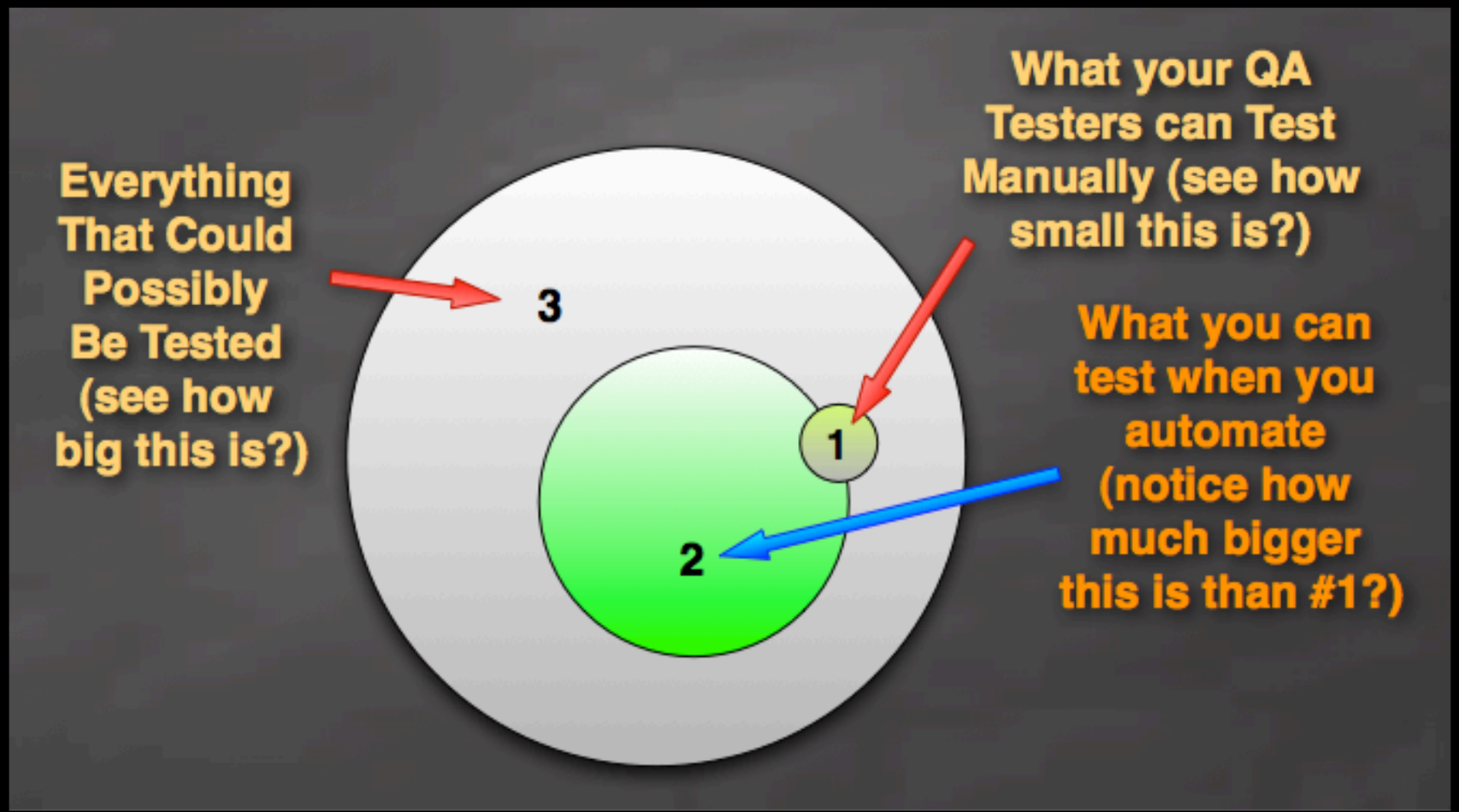
- Small Team
- Agile Methodologies
- Pair Programming
- Continuous Improvement
- Automation

What did we do: Small Team

- Focus on Automation
  - Frequent Releases
    - Chef for Provisioning
    - Cucumber for Acceptance Tests
    - Lots of Other Small Automations
      - A Mindset, Core Value of Team

Focus On Automation: QA

Reduced QA Resource Needs Initially (zero)
Suite Provided Regression Testing: Reduced Errors
Sped Up Development

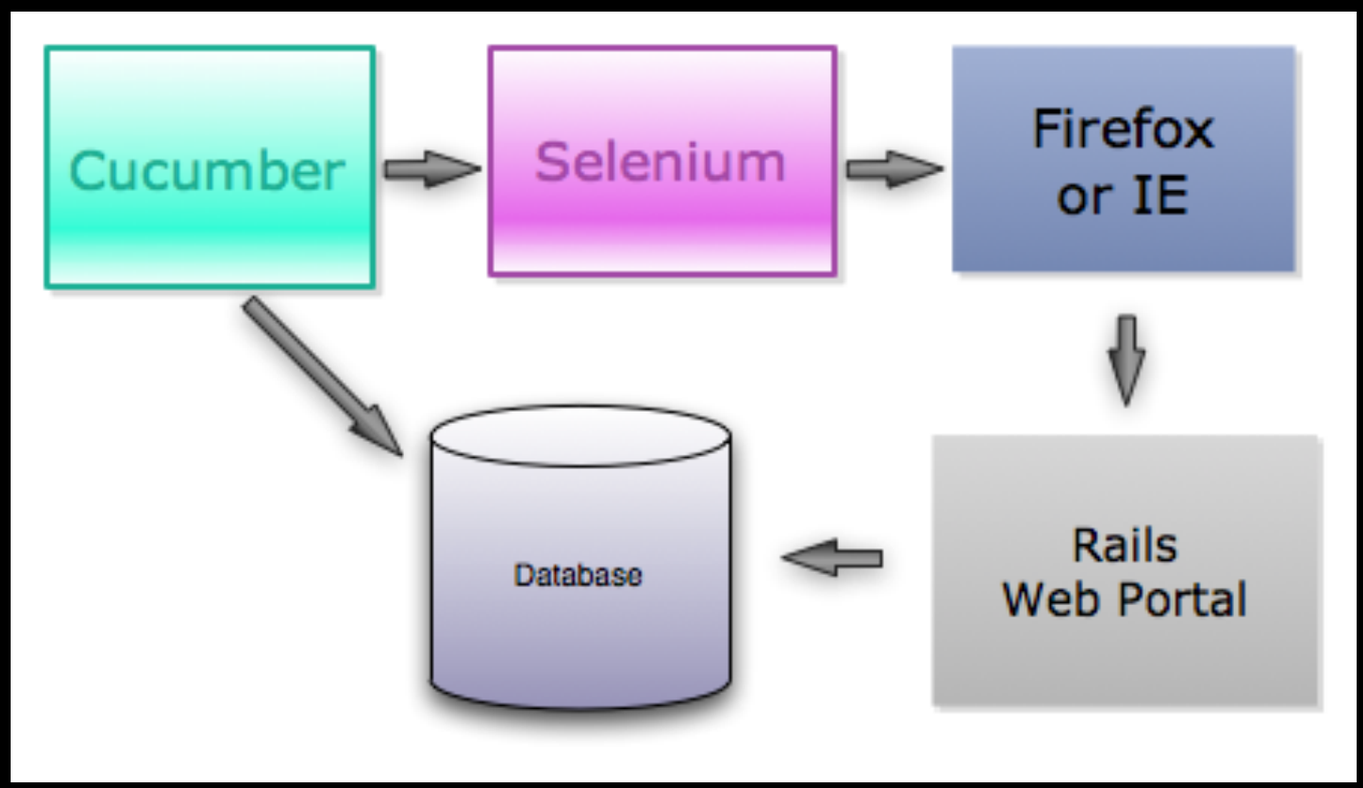


Focus On Testing: TDD

Core Value: Test Driven Development

Tools:

- Cucumber: Front End Integration Testing
- Rspec: Behavior Driven Unit Testing



Testing: BDD With Cucumber

Default

```
1  Feature: Send Margin Calls
2    In order to request money
3    As an analyst
4    I want to be able to send a margin call demand request
5
6    Background:
7      Given I reset the data
8      And I am logged in as "guest"
9      And I am on the margin calls page
10     And I am on the "Unsent" tab
11
12   Scenario: Login and see margin call
13     Then "Guestbank vs Algobank" should be visible
14     And "Send Calls" should be visible
15
16   Scenario: Send Margin Call Demand with status
17     When I check the checkbox to the left of "Guestbank vs Algobank"
18     And I click "Send Calls"
19     Then "No records found" should be visible
20     When I go to the "Awaiting Demand Response" tab
21     Then "Guestbank vs Algobank" should be visible
22     And "sent" should be visible
23
                                                    1,1           Top
```

What did we do: Small Team

- Pair Programming
  - Skill Transfer Happens Quickly
  - Bus Factor == Team Size
  - Lost one of our best members in Feb: OMM*

* OMM: Oh! My!....meh.

What did we do?

- Web Portal for the low end of the market
- Ruby on Rails (JRuby), jQuery, YUI
- Lots of Plugins, Gems, Libraries
- Cucumber for automated testing

What did we do?

- Clojure for the ‘router’
  - Concurrency is fantastically easy
  - FP, Immutability by default => reduction of bugs caused by common errors
  - JVM: It’s the libraries(!)
  - Live Image: easier introspection into running system (and sometimes modifications)

Challenges

- Acceptance of the stack
- Finding Developers
- Learning These Technologies
- Integration

What has it done for us?

- Automated Testing and why it is win
- Automated Provisioning and why it is win
- Functional Programming and the reduction of errors
- Tiny components and ability to quickly adapt to changes in the product

NOT LOC Metrics Again!

- Widely Believed that LOC/Dev is Roughly Constant
- Two Devs of Equal Skill/Experience, the one using a higher level language will be more productive
- See also: Mythical Man Month

NOT LOC Metrics Again!

- sloccount
- For the first 9mo of the project:
  - 24kloc, 687loc per dev per month
  - 5.81 developer years
  - Our People & Process put us roughly 45% ahead of that estimate

Conclusion

- We Came
- We Learned
- We Conquered
- We ‘re hiring