
**The Next
Really Big
THING**

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Paradigm Lost

We can't solve problems by using the same kind of thinking we used when we created them - Albert Einstein

We have quite some problems in **IT**:

Global Enterprise IT Spend = \$1.5T/year

18% of projects abandoned before production

55% "challenged" (late, broken, missing functions)

~ \$500B/year **wasted** due to "bad software"

<http://opensource.com/business/10/6/integral-innovation>

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~ **\$3.5T** anticipated value **not delivered**

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The Innovation Game

The payoff of innovation is simple:

$$(P_{\text{success}} * B_{\text{success}}) - (P_{\text{failure}} * C_{\text{failure}}) - C_{\text{implementation}}$$

Unfortunately, $P_{\text{failure}} \geq 73\%$, C_{failure} could be your job, and 50% of the time the expected outcome is worse not better. No rational incentive to innovate!?

<http://opensource.com/business/10/6/radically-simple-it-dr-david-upton>

Paradigms Regained?

In order to be commanded,
Nature must first be obeyed - Francis Bacon

"Classical" Economic Analogies

Law: free to everybody, but hire an expert to help (Cygnus Support charged \$300/hour)

Medicine: science is published and vetted; patients choose doctors and hospitals

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He set his mind to work on unknown arts,
thereby changing the laws of nature - Ovid

"Novel" Economic Analogies

Banking: except instead of paying interest only on your code, interest paid on sum total of all code deposited. Forking = move to new bank

Loyalty and Trust: organize business relationships around continuity of contractual relationships rather than simple prices (Commons, 1932 and Deming, 1982)

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*Whatever you do will be insignificant,
but it is very important that you do it* - Gandhi

Open Source Groundwork

1983: GNU Project founded

1985: GNU Manifesto

1987: GNU C and GNU C++ Compilers

1989: Cygnus Support founded

1991: Linus creates Linux

1994: Red Hat founded

1998: "Open Source" and OSCON

1999: Red Hat IPO

2000: Linux wins "Product of the Year" (4x)

2001: Linux 2.4 kernel released

2002: First long-term Enterprise Linux released

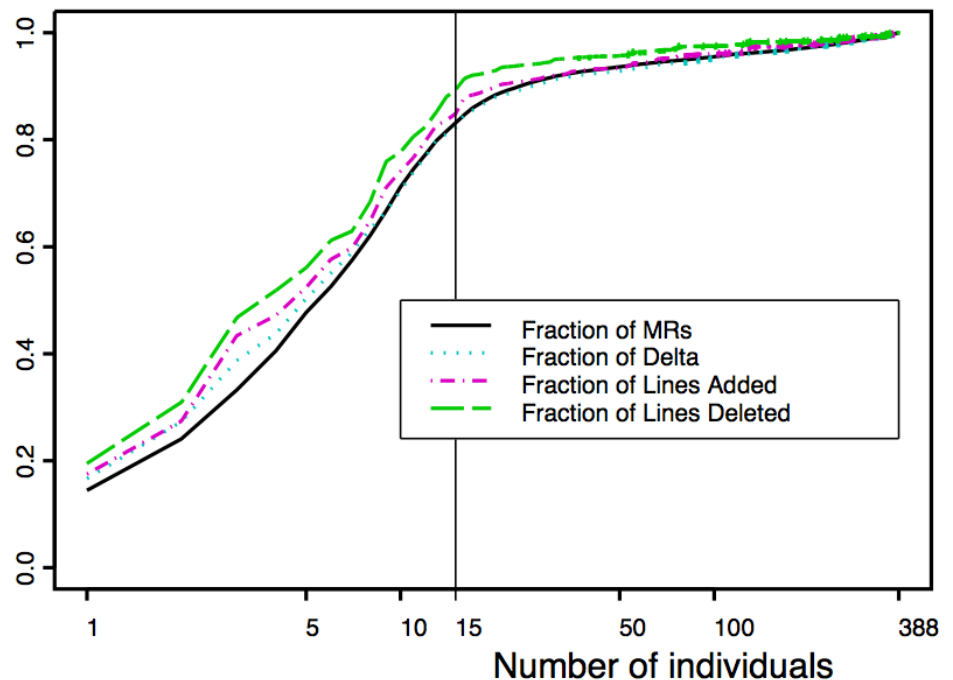
Open Source Game-Changers

Game Theory Predicts (Baldwin & Clark 2005):
Modularity + increased Option Value
+ (Involuntary) Altruism
= Architecture of Participation

	25%	50%	100%	150%	200%
1	0	0	0	2	3
5	0	5	15	25	30
10	0	20	40	60	80
15	0	45	75	120	150
20	20	60	120	180	220
25	25	75	175	250	300

Positive Feedback Loops

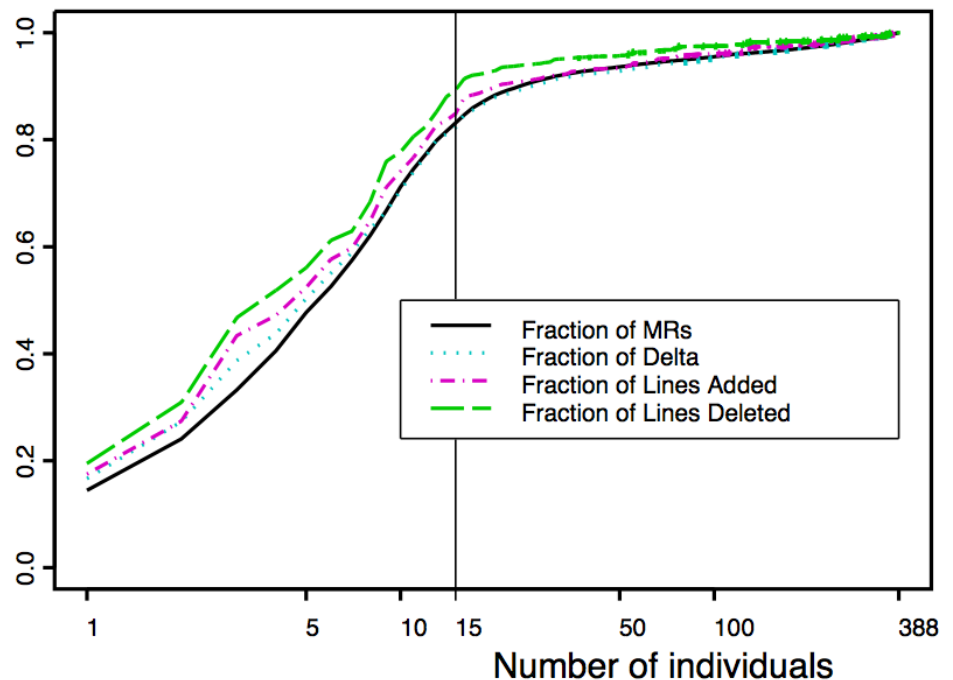
Ever-increasing participation
+ Ever-increasing functionality
+ Ever-increasing quality
+ Ever-decreasing cycle-time
= Ever-increasing utility



Positive Feedback Loops

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User-driven innovation
creates whole new ruleset
for mgmt, investment,
culture, and customers



Open Source Successes

2003: 8 of top 10 investment banks run Linux

2004: Red Hat #1 in Vendor Value survey

2005: 95% of Top 500 supercomputers run Linux

2006: 50x-200x lower defect rate than prop sw

2007: #1 in Value

(Japan, World 4x)

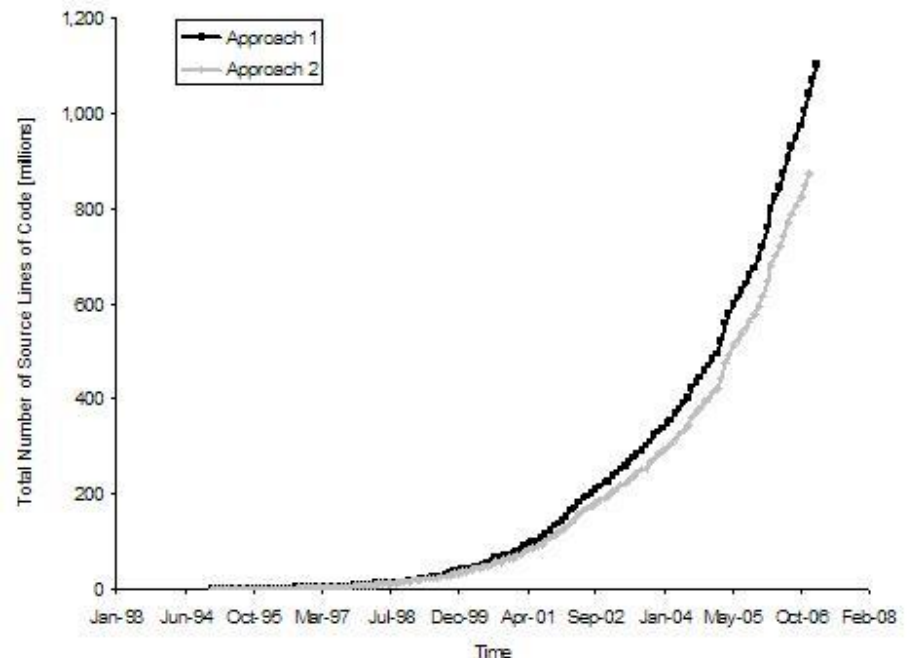
2008: Obama 1st

"Open Source President"

2009: RHT joins S&P 500

2010: Quality >> Cost

2011-2012: RHT \$1B rev



But what about the Cloud?

Hypothesis 1: Macroeconomics of cloud makes the microeconomics of open source insignificant and therefore irrelevant

Hypothesis 2: Open Source and the architecture of participation functions like the nanotechnology of Cloud Computing, and therefore crucial to all innovation going forward

Hypothesis 1: OSS insignificant

The argument is that the game is fixed, and that only the players and the tokens change

Cloud platform replaces OS

Cloud apps replace traditional apps

Cloud protocols and modules replace software APIs and libraries

If true, prepare for the Blue Cloud of Death

Hypothesis 2: New game

Q: Who is going to be the next Microsoft?

A: Who cares?!

Open source changes the rules in the cloud:

Architecture of participation

+ unrestricted replication & innovation

+ operational modularity

= REAL Cloud Computing

Game-theory Game Changers

Old school open source evolved conventionally

- Developers create new features / fix bugs

- Maintainers merge fixes and features

- Zero-like cost of replication makes distribution cheap

- Forks were expensive and frowned upon

- Operating platforms were expensive (one per box)

Meritocracy worked, but overly centralized

- Thin-skinned developers need not apply

Game-theory Game Changers

New school open source evolves radically

Distribution still cheap, but git makes forking "free"

Virtualization means unconstrained platform choice

Applications become momentary sync points

Modularity extends beyond software and data

Polyinstantiated meritocracy dramatically improves incentives for user-innovators

Better for would-be entrepreneurs

Better for would-be intrapreneurs

Evolutionary Game Theory

Evolutionary game theory (EGT) studies behavior of *populations* of agents repeatedly engaging in strategic interactions. Behavior changes in populations are driven either by natural selection via differences in birth and death rates, or by the application of myopic decision rules by individual agents.

git & cloud computing shift economic analysis of OSS to EGT

Population Dynamics of the Cloud

Applications are composed of, and represent, populations

Studying economics of Cloud Computing without understanding its underlying software development model is like studying the evolution of a species without understanding anything about its DNA

Cloud Winners & Losers

Up to the starting line...

financial capital (& willingness to invest)

knowledge capital (& willingness to educate)

user-innovator population

internet quality / capacity

enabled business value

trust capital

Thoughts from Kerala

Environmental Contingencies, Organizational Transformation and their Impact on Failure
(Inman 1995)

How can travel industry change to protect the resources that are its lifeblood for the future?
Is eco-tourism possible, or a myth?

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See the change

Write the change

Do the change

Be the change
