

The Open Source Paradigm Shift

Tim O'Reilly

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Paradigm Shift

A change in world view that calls everything you know into question



The PC Paradigm Shift (Hardware)

- Commodity hardware with an open architecture – IBM beats Apple
- Low cost and a pure play commodity hardware business model beat proprietary add-ons – Dell beats IBM and Compaq
- Companies stuck in the old paradigm die off: Digital, Data General, Prime

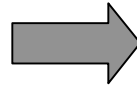


- Even open architectures have proprietary components – Intel Inside®

The PC Paradigm Shift (Software)

- Software decoupled from hardware
- Lock-in and competitive advantage move to software – Microsoft beats IBM

IBM



Microsoft®

Paradigm Failure at Work!

- How many of you use Linux?
- How many of you use Gnu/Linux?
- How many of you use Google?

- How many of you have seen this conversation?
 - Linux critic: “There are no user-friendly applications on Linux”
 - Linux advocate: Have you seen the latest release of Gnome and OpenOffice?

What's being missed here?

User Friendly Applications on GNU/Linux (or BSD)

Google™

amazon.com.

PayPal®

YAHOO! GetLocal Maps 

The Internet Application Platform

- Commodity Intel hardware
- The Internet protocol stack and utilities like BIND
- LAMP
 - **L**inux (or FreeBSD)
 - **A**pache
 - **M**ySQL
 - **P**HP (or Perl, or Python)
- Platform-agnostic client front ends

Another Paradigm Failure?

- These LAMP applications are being created by open source developers and run on an open source platform, but...
 - Source code is not distributed (and it wouldn't be useful to many developers if it were)
 - Licenses triggered by binary software distribution have no effect
 - The value in these applications is in their data and their customer interactions more than in their software
 - Most are fiercely proprietary



“I’m an inventor.
I became interested in
long term trends because
an invention has to make
sense in the world in
which it is finished, not
the world in which it is
started.”

-Ray Kurzweil

The Internet Paradigm Shift

- Commodity software with an open architecture
- Information applications decoupled from both hardware and software
- Competitive advantage and revenue opportunities move "up the stack" to services above the level of a single device.
- Lock in is based on data and customer relationships, not proprietary software
- Intel is still Inside, but so is Cisco, and eventually others -- there's plenty of room at the bottom as well as at the top

Beyond Licensing: the Three C's

The three deep trends:

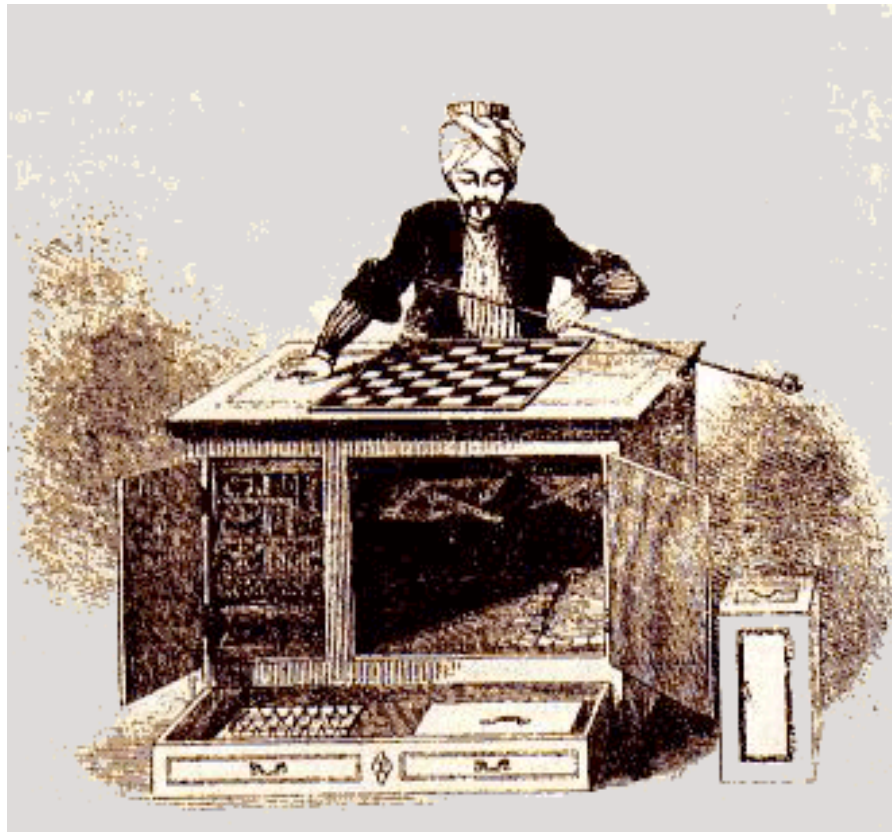
- **C**ommoditization of software
- User-**C**ustomizable systems and architectures
- Network-enabled **C**ollaboration

Software as Commodity

- Linux on Intel gives 10x savings
- Apache means web serving is not a revenue opportunity
- MySQL threatens to do the same for databases
- Open source promotes competition and drives down margins
- Open Unix/Linux/Internet architecture makes "plug-compatible" software the norm
- Proprietary alternatives must become free (as in beer) to compete - usually bundled with added value components

Software Customization, or Why the 'P' Matters So Much

Von Kempelen's Mechanical Turk



Customizability at Work

- Commodity components provide platform and infrastructure, on which additional software is built for use in delivering services, not for sale
- Internet-era applications are updated daily, not yearly
- Interfaces are built with dynamic data, not just software - you might call this "infoware"
- Dynamic languages like Perl, PHP, Python are key to daily update: managing infoware interfaces and gluing together software components

Network-Enabled Collaboration

- Usenet: the real mother of open source
- The “Adhocracy” - like-minded developers can find each other and work in ever-shifting groups
- Software development teams can be distributed, even internationally
- Power shifts from companies to individuals
- Users help to build the application

What's more...

- Collaborative techniques are increasingly being applied to proprietary software

COLLABNET®

- With a large-enough development organization, OSS-like behavior emerges

Microsoft
ASP.net

Collaboration at the Data Layer

- Napster/Kazaa users build song swapping network as byproduct of their own self interest
- Google leverages millions of independent linkers via PageRank algorithm
- More people have "contributed" to Amazon than to Linux!

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by Rob Sobkoviak, Web Application GUI Designer/Dev...

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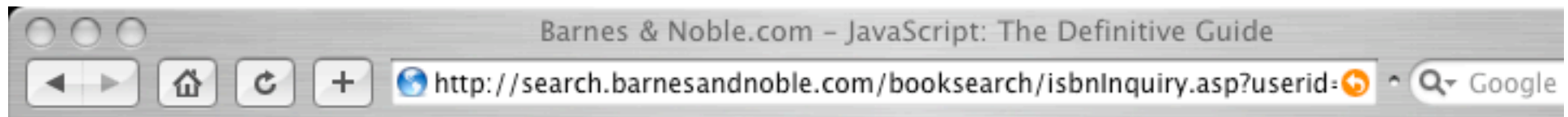


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and client-side JavaScript function, object, method, property, constructor, and event I
HTML authors can use this book to learn how to build dynamic web pages with JavaS
Experienced programmers can quickly find the information they need to start writing
programs. This book is an indispensable reference for all JavaScript programmers, r
experience level.

Synopsis

This fourth edition of the definitive reference to JavaScript, a scripting language that
embedded directly in web pages, covers the latest version of the language, JavaScrip
supported by Netscape 6 and Internet Explorer 6. The book also provides complete c
the W3C DOM standard (Level 1 and Level 2), while retaining material on the legacy
DOM for backward compatibility.

Customer Reviews

Number of Reviews: 18 **Average Rating:** ★★★★★

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Roger Dunn (rwdunn@orem.org), a GIS programmer, June 26, 2003, ★★★★★

What coverage!

I am an applications programmer who has had to turn into a web programmer for a s
project in my field. Before reading this book, I knew some HTML from my college day
overwhelmed by the project before me. I bought this book at a B&N store after debat
at least three other competitors. I am SO glad I bought this one! It has helped me ge
off the ground! I now feel comfortable with JavaScript and should be able to handle o
projects that come my way.

Also recommended: HTML: The Definitive Guide by Chuck Musciano & Bill Kennedy
Edition.

Business Model Thoughts for Commodity Software

- IBM WebSphere = Compaq
- ??? = Dell
- There are many possible "Intels Inside". Not just LAMP, but:
 - J2EE
 - .Net
- Platform = web services (digital identity, location, search)
- Aggregated and sold by subscription, not by the piece

Hidden Service Business Models in Open Source Software

- Not just “professional services,” but services delivered to end users
- UUnet, not RedHat - greatest open source business success to date
- BIND - a monopoly in disguise
- Sendmail and Apache - not software sales but email and web hosting
- Google, Paypal, Amazon et al - the next step on the path to a service-based software economy

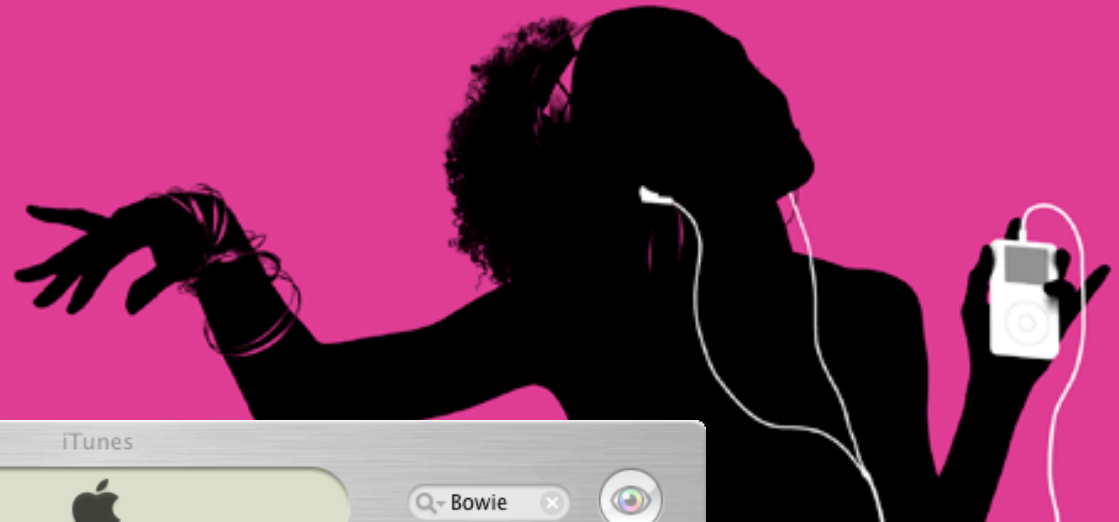
Reinventing the PC Desktop

"Useful software written above the level of the single device will command high margins for a long time to come.

"Stop looking over your shoulder and invent something!"

(<http://www.synthesist.net/writing/onleavingms.html>)

iPod.
10,000 songs
in your pocket.



iTunes

- Software above the level of a single device
- Database back end
- Web services-enabled (CDDB)
- Rich client front ends
- Mobile device support
- Rendezvous-enabled

- Not yet collaborative
- No "architecture of participation"

But it's uneven, even on Mac OS X...

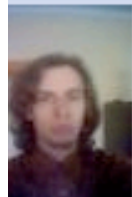
- No user-provided content in iTunes
- iPhoto now supports Rendezvous, but GarageBand doesn't...
- Data sharing protocols woefully limited - every application ought to be a source of web services
- iChat and Mail know about buddies, but iPhoto and iTunes don't
- We need a set of best practices -- "human interface guidelines" for network-generation applications!

new connections



[C.J. Collier](#) <cjcollier@colliertech.org> added you as a friend. Is **C.J.** your friend?

yes
 no



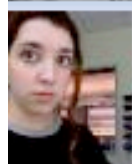
[Petras Kudasas](#) <moxliukas@delfi.lt> added you as a friend. Is **Petras** your friend?

yes
 no



[David Wheeler](#) <david@kineticcode.com> added you as a friend. Is **David** your friend?

yes
 no



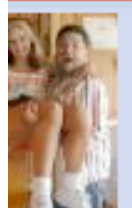
[Cameo Wood](#) <cameo@nsa.org> added you as a friend. Is **Cameo** your friend?

yes
 no



[Ian Macdonald](#) <ian@caliban.org> added you as a friend. Is **Ian** your friend?

yes
 no



[Bill Harp](#) <bill@stonehenge.com> added you as a friend. Is **Bill** your friend?

yes
 no



[Sean Bonner](#) <sean@sixsite.com> added you as a friend. Is **Sean** your friend?

yes
 no

my friends



[Marc](#) (294)



[Ross](#) (213)



[Randal](#) (185)

[view network](#)

my contacts



[perl](#) (715)



What

 **Tim O'Reilly**



my friend groups:

Digital Democracy	7 members	edit	remove
eurofoo	8 members	edit	remove
Foo	77 members	edit	remove

create a new friend group

name:

[create](#)

What Keeps Me Up at Night?

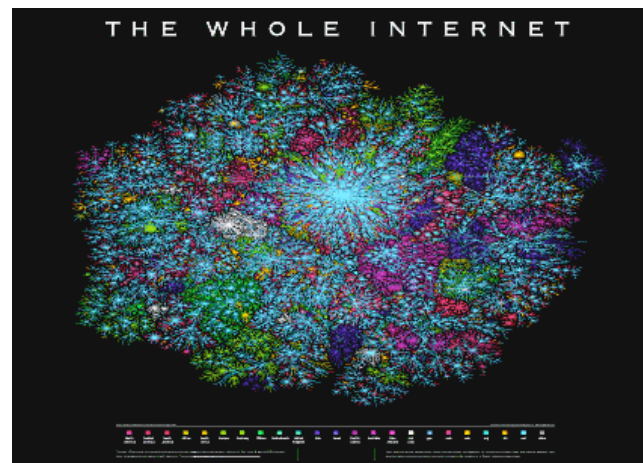
- Internet application providers have gained from open source, but haven't been trained to give back, and are ignored by OSS advocates
- Meanwhile, owning user data is the new source of lock-in
- What's more, a platform strategy beats an application strategy every time:
 - “Windows is just a bag of drivers.” (Marc Andreessen)
 - “It's just like GUI. Nobody owns it.” (Jim Allchin)

Two Types of Platform

- One Ring to Rule Them All



- Small Pieces Loosely Joined



Small Pieces Loosely Joined

- An architecture of participation means that your users help to extend your platform
- Low barriers to experimentation mean that the system is "hacker friendly" for maximum innovation
- Interoperability means that one component or service can be swapped out if a better one comes along
- "Lock-in" comes because others depend on the benefit from your services, not because you're completely in control

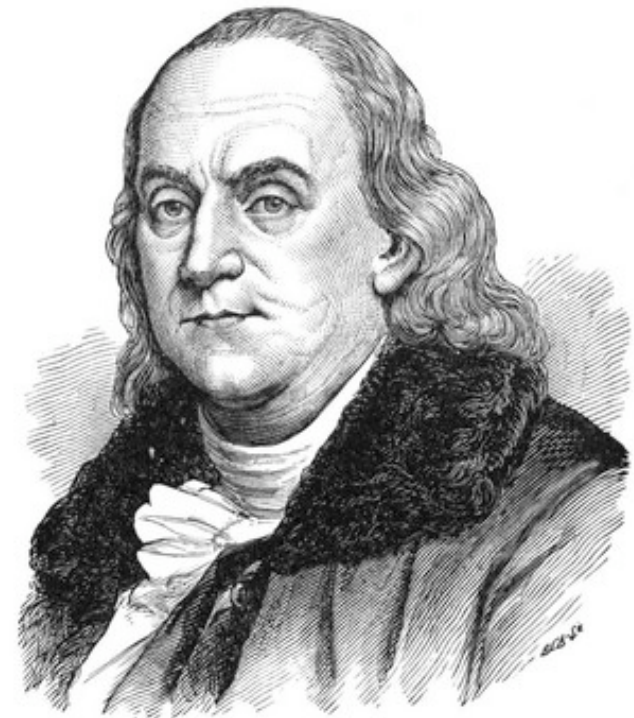
So What Do We Need to Do?

- Correctly characterize the OSS heritage
 - The native development methodology of the Internet
 - The Internet is OSS's greatest success to date
 - Interoperability and open data formats may be more important than source code availability

Adhere to Open Standards

“We must all hang together or we will assuredly all hang separately.”

—Ben Franklin



Reinvent the Opportunity for Surprise

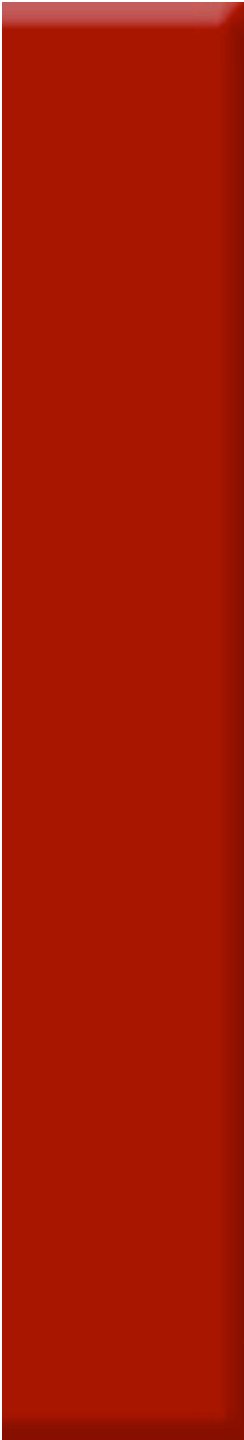
- New paradigms usually involve disruptive technologies
 - Poorly understood at first
 - Don't work as well as existing technologies
 - Don't have a clear business model
- Low barriers to entry spark innovation
 - Reusable components mean that you can build on the work of others

Watch the Alpha Geeks

- New technologies first exploited by hackers, then entrepreneurs, then platform players
- Two examples
 - Screen scraping predicts web services
 - Wireless community networks predict universal Wi-Fi



Rob Flickenger and his potato chip can antenna



"The future is here, it's just not evenly distributed yet."

-- William Gibson

Embrace the New Paradigm

- Use commodity software components to drive down prices for users
- Give customers increased opportunity for customization
 - Plug-replaceable standards-compliant components
 - Extensible architecture
 - Scripting support
- Look for hidden service business models
- Leverage collaborative development processes and participatory interfaces

Rethink Open Source in the Context of Web Services

- Google and Amazon APIs treat web applications and their data as programmable components
- Data re-usability may be more critical than source code availability
- Who owns the data?
- Open source represents a kind of "bill of rights" for software developers and users. What is the bill of rights for web services?

Questions?

- For more information

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Related Reading

- *The Structure of Scientific Revolutions*, by Thomas Kuhn
- *The Innovator's Dilemma*, by Clayton Christenson
- *The Cathedral and the Bazaar*, by Eric S. Raymond
- *Code and Other Laws of Cyberspace*, by Lawrence Lessig
- *The Cluetrain Manifesto*, by Chris Locke, Doc Searls, and David Weinberger
- *Small Pieces Loosely Joined*, by David Weinberger
- *Down and Out in the Magic Kingdom*, by Cory Doctorow