

open source  
as a  
disruptive technology

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**2007 FREE AND OPEN SOURCE SOFTWARE  
FOR GEOSPATIAL (FOSS4G) CONFERENCE**  
VICTORIA CANADA  SEPTEMBER 24 TO 27, 2007

Last year, I had the pleasure of hosting a conference about open source GIS software in my home town.

And my favorite conference story, is from a couple guys who were having a beer in the pub shortly after getting to town, and the server asked them "what brings you to Victoria"? And they answered "we're here for a conference about open source".

“who would want  
to go to a  
conference about  
open sores?”

To which she replied,  
"open sores?  
who would want to go to a conference  
about open sores?"  
Which seems like  
a pretty fair question!



# open source

- itchy
- painful
- a source of infection

open source  
itchy,  
painful  
and a source of infection.

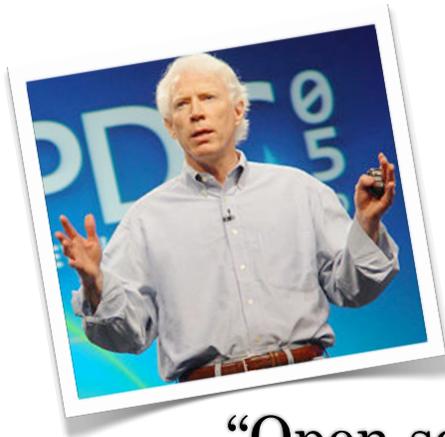
Actually,  
If you've been listening to  
Steve Balmer, the CEO of Microsoft  
over the past few years,  
you'll have heard him make  
at least the last of these claims.



Steve Ballmer  
CEO Microsoft

“Linux is a cancer that  
attaches itself in an  
intellectual property sense to  
everything it touches.”

He has said,  
"Linux is a cancer  
that attaches itself  
in an intellectual property sense  
to everything it touches"  
A cancer!  
Come on, Steve, don't soft-pedal it,  
tell us what you really think! :)



**Jim Allchin**  
**VP Microsoft**

“Open source is an intellectual-property destroyer... I can't imagine something that could be worse than this for the software business and the intellectual-property business...”

Or  
perhaps you heard  
the former head of the  
Microsoft operating system division,  
Jim Alchin,  
"Open source is  
an intellectual-property destroyer...  
I can't imagine something  
that could be worse than this  
for the software business  
and the intellectual-property business..."  
Ouch.



Normally, you only encounter this kind of overheated rhetoric in a war, or an election campaign. But something about open source really has Microsoft riled up.



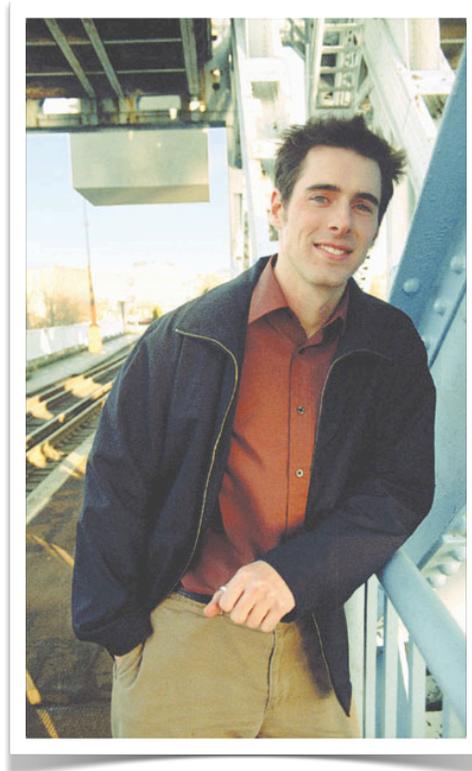
And what it is, is,  
they see something of  
themselves in the rise  
of open source.

Microsoft rode to prominence on the  
back of a disruptive technology,  
the PC, which tore down the previous  
mainframe and mini-computing edifices.  
And they fear that open source is  
a disruptive technology that might  
do them in, in turn.

anyhow...

Anyhow...

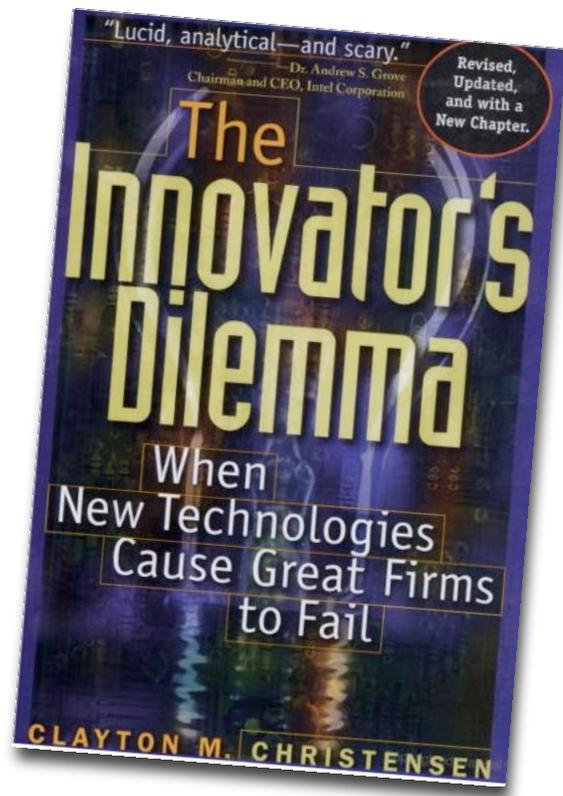
steve  
myhill-  
jones  
@  
latitude  
geographics



I came to this topic in a roundabout way.

About six months ago,

I had lunch with friend of mine,  
Steve Myhill Jones,  
who is an avid reader of business books.  
He runs the Latitude Geographic Group,  
which is in Victoria, where I live.



And over lunch he said  
"you have to read this great book,

the 'Innovators Dilemma',  
by Clayton Christensen  
I'll loan it to you!"



So I took it home,  
and put it on the back of my toilet,

and over the course of several, er,  
"study sessions" worked my way through it.

# innovator's dilemma

So,  
what is this "innovators dilemma"  
referred to in the title?

“blindly following the maxim  
that good managers  
should keep close to their customers  
can sometimes be a  
fatal mistake”

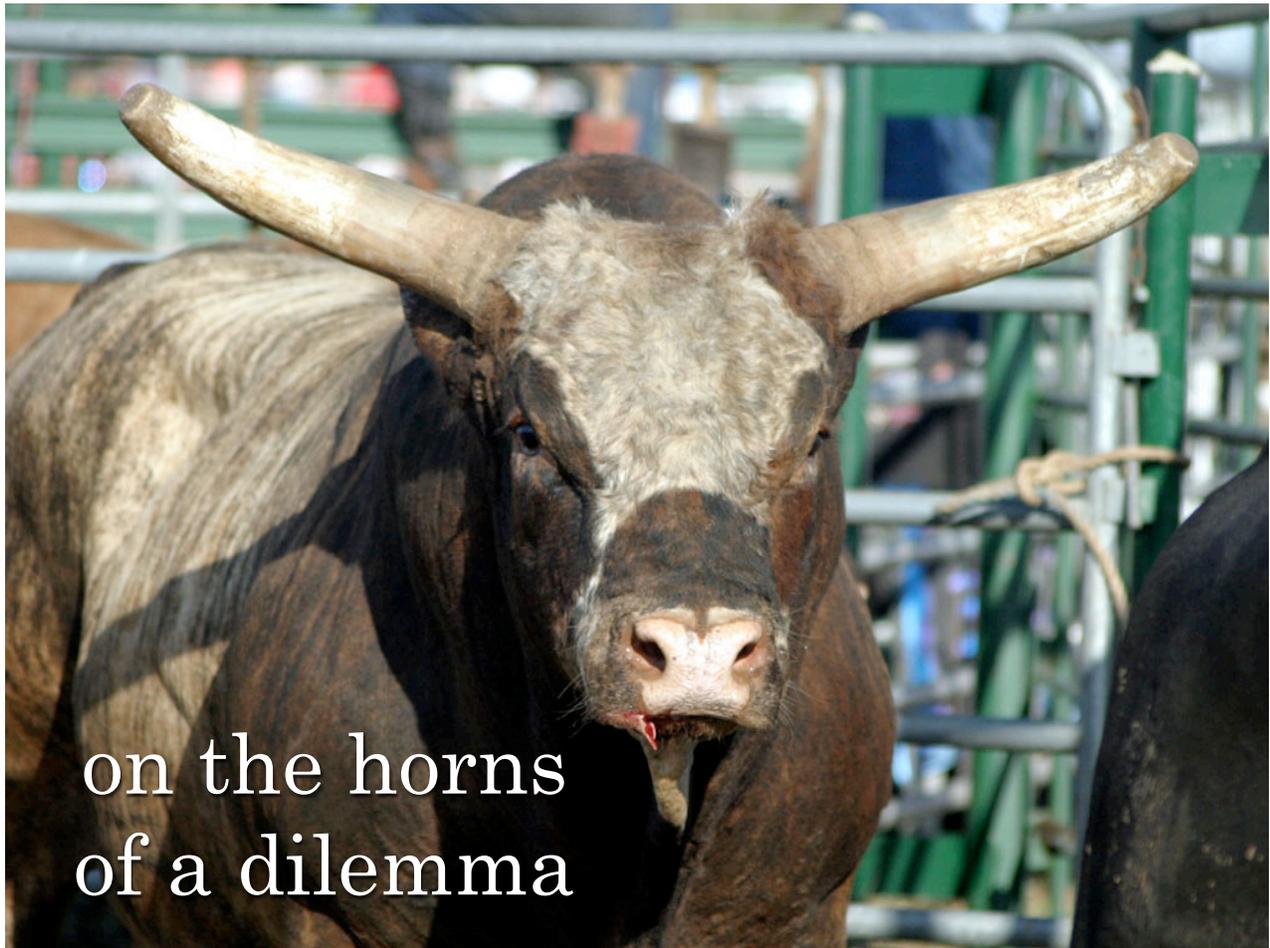
Christensen boils the "innovators dilemma"  
down to this warning to managers.

"Blindly following the maxim  
that good managers  
should keep close to their customers  
can sometimes be a fatal mistake."

Hmmm, OK.

But,

Where's the dilemma?



A dilemma is a choice between two paths,

both equally unpleasant.

Hence the term  
"on the horns of a dilemma".

Pick a horn, any horn.



# lose to more responsive competitor

Horn #1: if you fail to pay attention to your customers current and future needs, you'll lose them to a competitor who does a better job of listening.

# lose to disruptive technology



Horn #2: if you  
\*do\* pay attention to your  
customers current and future needs,  
your organization will be  
vulnerable to destruction by a  
"disruptive technology"



Uh,

Wait a minute, says the manager,  
that second one doesn't sound so dangerous.  
What's a "disruptive technology"  
and why should I be afraid of it?

Fair question.



First of all,

this is not lightweight,  
class-room style "disruption",  
like Johnny used to make  
back in fourth grade.



This is full-on  
Klingon disruptor beam  
style disruption.

This is the kind of thing  
that rearranges every molecule  
in your body  
and leaves behind  
nothing but a pink mist.



The example of disruptive technology Christensen hangs much of his analysis on is the lowly hard-drive. He chooses hard-drives because the pace of change in the hard drive market has been so intense that several cycles of disruption have played out in just 30 years.

[ 1953 ]

random access  
method for  
accounting and  
control  
(RAMAC)



Hard drives have actually  
been around for a long time,  
they were invented in 1953 by IBM.

The "Random Access Method for  
Accounting and Control" (RAMAC)  
had 50 24" platters and could store ...  
wait for it ... 5MB.



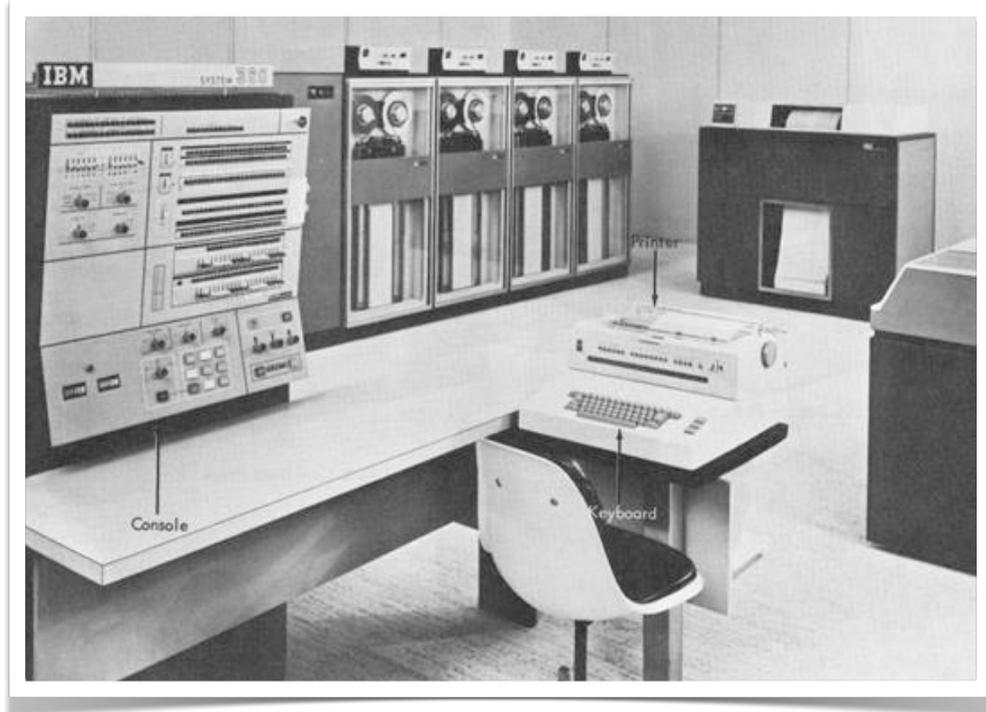
worst.  
iPod.  
ever.

Just enough to store an MP3,  
if the song isn't too long.

Of course, in 1953, there wasn't  
a computer powerful enough to decode  
the MP3 in real time, so moot point.

Anyhow...

# [ 1970 ] system360



The market for hard drives grew along with the market for computers, which at the time were mainframes, made by IBM and a handful of competitors.

CONTROL DATA  
COMPUTER SYSTEM

Memorex

TELEX

Century Data

AMPEX Corporation



EMM

Diablo

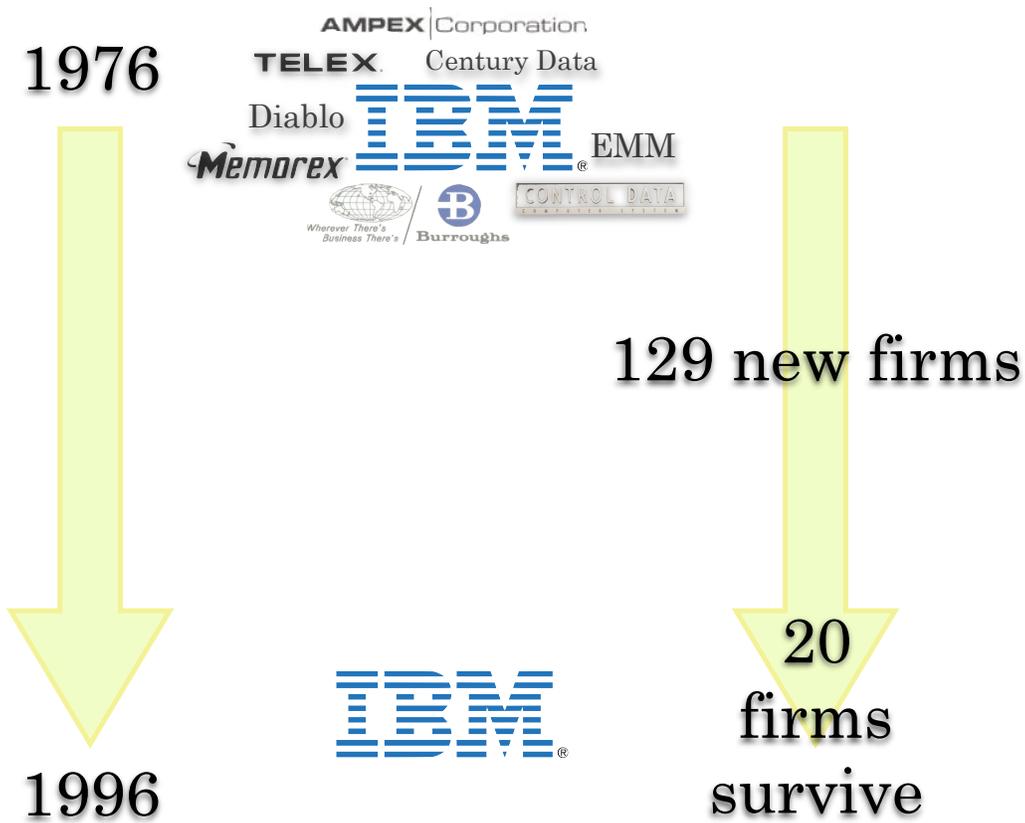
IBM®



IBM-2311 direct access  
storage facility

In the hard-drive space,  
"plug compatible" companies  
grew up who made drives  
that could be plugged into IBM computers,  
but sold for a much lower price  
than IBM storage systems.

They also began supplying drives  
compatible with other manufacturers,  
so that by 1976 there was a  
stand-alone hard-drive market  
that was selling about \$1B a year  
of mostly 14" drives, like this IBM unit.



There were 17 firms in the drive industry in 1976. By 1995, every one except IBM had gone out of business or been taken over.

Over the same 30 year period there was tremendous innovation and market upheaval, 129 new firms sprang up. But only 20 of them still survived at the end of the period.

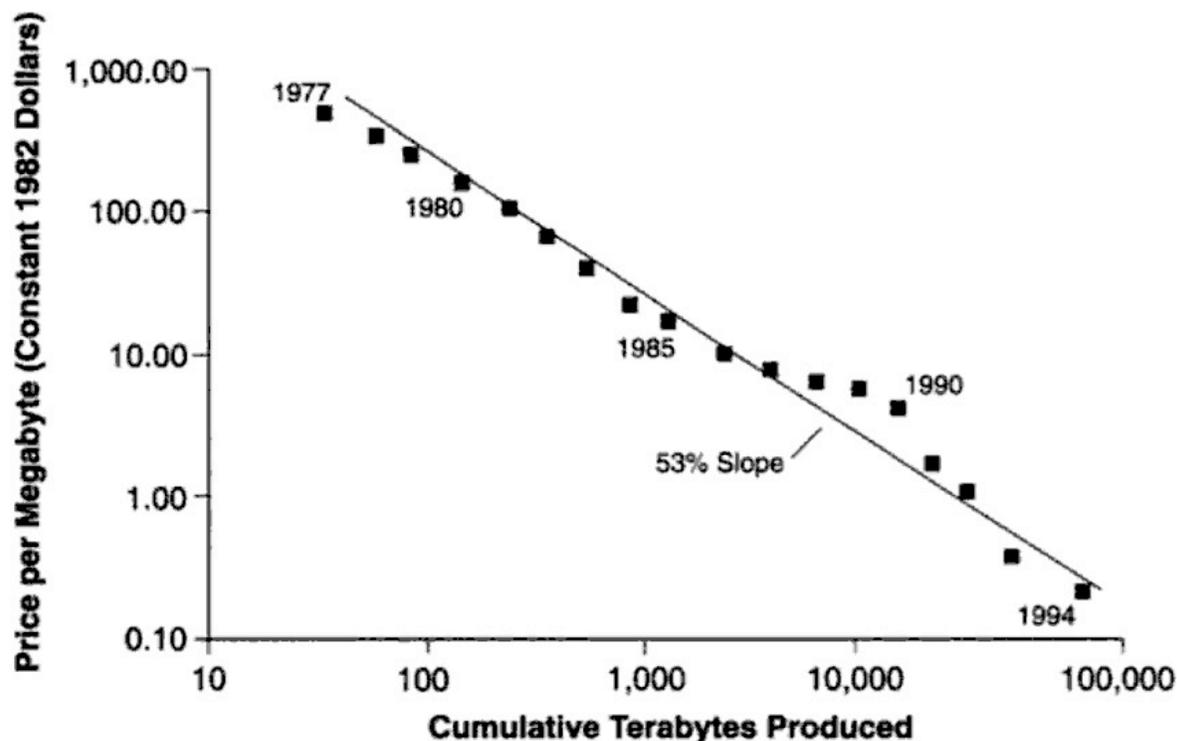
# what happened?

So, what happened?

We didn't stop using hard-drives  
between 1976 and 1995.  
In fact, the market grew  
from \$1B to \$18B.

Then,  
what killed off the 16 profitable firms,  
who owned the marketplace in 1976,  
with experience in manufacturing  
and selling storage devices.

Figure 1.3 Disk Drive Price Experience Curve



Source: Data are from various issues of *Disk/Trend Report*.

The quick and easy answer is "technological change", the drive industry has endured insane rates of change, in technology and volume of production. Price per megabyte has gone down 5% per quarter, for more than twenty years.

# sustaining

# disruptive

But just saying "technological change" is too broad brush. Christensen proposes two kinds of technological innovations,

"sustaining innovations" and "disruptive innovations".

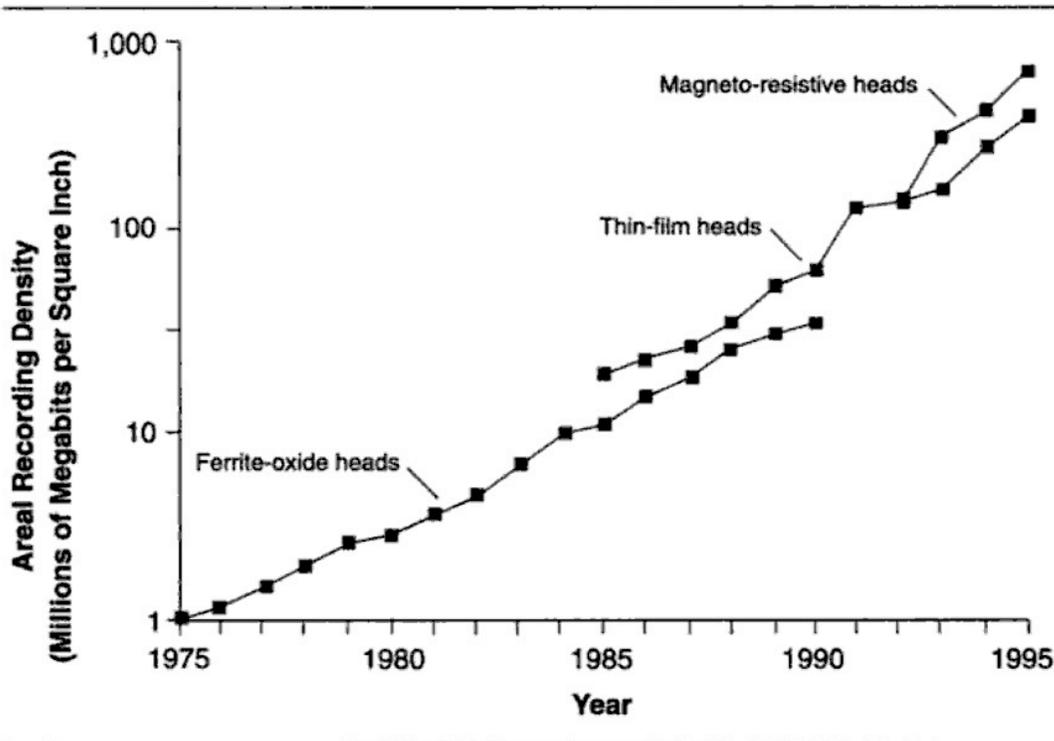
Sustaining innovations are "more of the same, only better". it's the kind of innovation that \*existing\* customers demand.

# boeing



For example,  
Boeing transitioned from  
open planes to pressurized planes  
to jet planes, to jumbo planes,  
to composite planes.  
Each of these changes was  
technologically difficult and  
very expensive,  
but each was needed by Boeing's  
existing customers.  
Boeing didn't go out of business,  
it navigated 50 years of massive  
technological change easily,  
building on existing engineering skills  
and sales channels over time.

Figure 1.4 Impact of New Read-Write Head Technologies in Sustaining the Trajectory of Improvement in Recording Density



Source: Data are from various issues of *Disk/Trend Report*.

The disk drive industry went through similar core technology changes between 1975 and 1995.

Each of these changes to ferrite-oxide, thin film, and magneto-resistive heads, required hundreds of millions of dollars in R&D, and re-tooling of product lines.

And in each of these changes, the established firms led the way.

Even though these changes were technologically huge, taking years to complete, they were "sustaining". They improved products in ways that made them more desirable to the existing customer base.

# disruptive

"Disruptive change" is different.

It does not address the needs of the existing customer base.

Disruptive change is what happened to the 14" drive makers who dominated the market in 1976.



14" hard drive

- Mainframe makers
- Mainframe users
- 300-350MB
- Expensive
- Very profitable

The 14" drive firms sold to customers who used or made mainframes. The mainframe customers required drives of about 300-400Mb. They had already invested millions and millions of dollars in their computers, and they could afford to pay top dollar for storage.

So the 14" firms had nice lists of customers willing to buy high margin products, who were all asking for more storage, faster storage, in the same basic form factor, Something the size of a washing machine. like this IBM 2311



8" hard drive  
(in this PDP-11)

- 20-40MB
- Minicomputer makers
- Minicomputer users
- Low-end computing
- Less expensive
- Less profitable

But, around 1978,  
a group of new companies sprang up,  
[Shugart, Micropolis, Priam, Quantum and others. ]  
making drives with 8" platters.  
The 8" drives introduced by  
these companies  
offered capacities of just 10Mb-40Mb.

Mainframe users did not want them,  
they had too little capacity.

However, the 8" drives were physically smaller,  
and they were cheaper,  
so they fit nicely with the  
emerging market for minicomputers,  
like the beloved PDP series  
from Digital Equipment Corporation.

# > digression



Digression...

The PDP-11 shows up in old stories of UNIX and free software quite often.

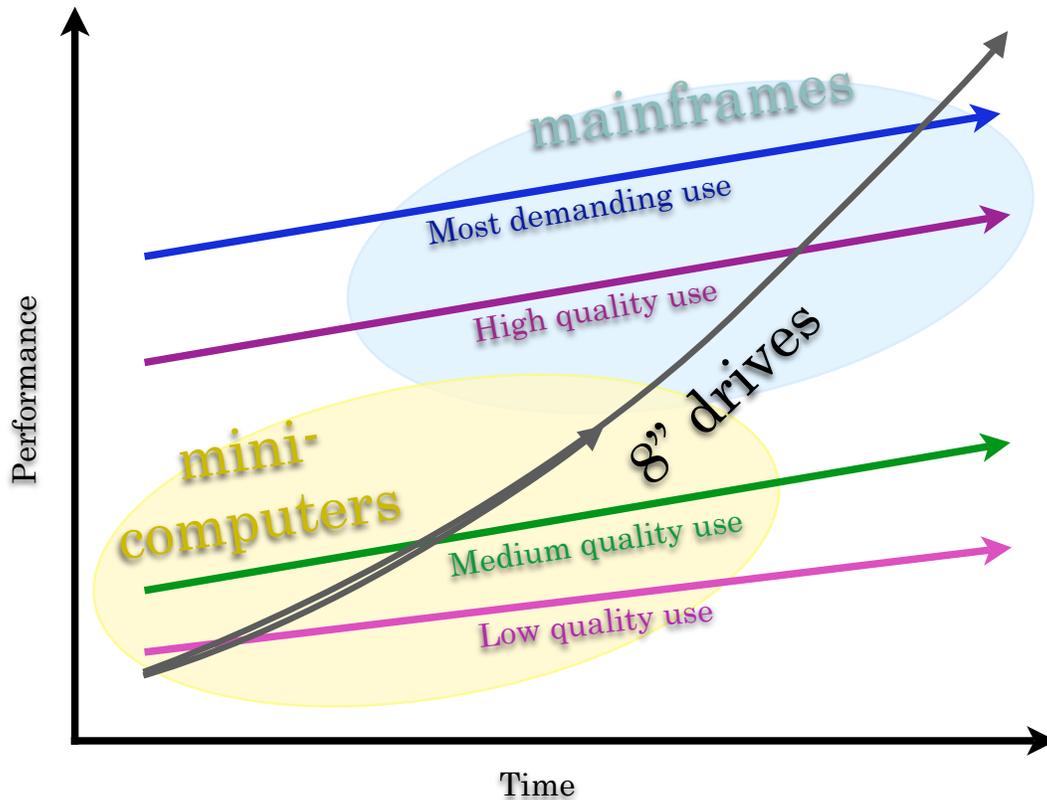
Ken Thompson developed the original UNIX as a Multics hack for the PDP.

Richard Stallman came up with the concept of free software while wrestling with a proprietary PDP-11 printer driver in the MIT computer lab.

Bill Joy built the first BSD Unix distribution on a PDP-11 at Berkeley, before he went on to Sun Microsystems to write SunOS (now open source Solaris).

anyhow...

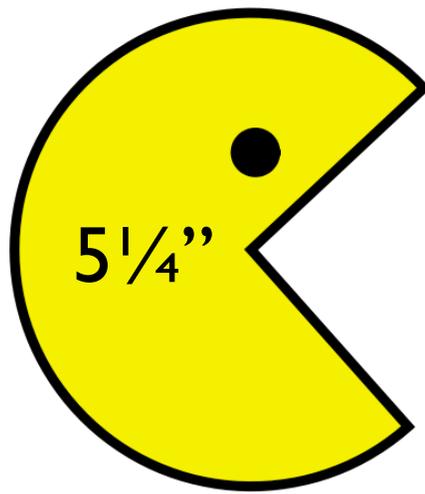
Anyhow...



The minicomputer market was small, and the cheaper components had lower profit margins, so the incumbent 14" drive makers had no interest in the market. They stayed up at the top of the market, where the volumes were large and the margins high.

At first.

But by the early 1980s, The 8" drives had increased their storage so much that they were useful for mainframes. They also had a larger unit volume, from selling to the rapidly growing minicomputer market, so the 8" makers had economies of scale that the old firms couldn't match when they introduced their own 8" models.



But here's the  
really strange thing...  
even with the knowledge of their  
own history,  
the 8" drive makers had the  
same thing happen to them  
a few years later.

minicomputer makers on

5¼" Drive:

“not enough capacity”

“not reliable enough”

The initial capacities 5.25" drives  
were 5-10Mb,  
too small for minicomputers.  
And data centers needed reliability.

Who would want  
these crappy 5.25" drives?



Cha ching!

pc makers on 5¼" Drive:  
“capacity is acceptable”  
“reliability is acceptable”  
and...  
“it fits on a desk”  
“it’s cheap”

The early PC market was small, but they didn't see the same drawbacks as the minicomputer makers and they valued two attributes of the 5.25" drive that the 8" drive lacked, small size and low price.



So, despite the lessons of their own history, only half of the 8" makers introduced 5.25" drives.

Of the top four 8" firms, only one survived as a top maker of 5.25" drives.

And then, it happened again with 3.5" drives, which found an initial market with portable computers.

And it's happening again with 1.5" drives, which have found an initial market in digital music players.



It also happened in computers.

Each computing generation was initially defined within a niche use, then expanded into general use.

Minicomputers were for scientists and engineers, then they were for everything.

PC's were for spreadsheets, then they were for everything.

Notepooks were for road warriors, then they were for everything.

Netbooks are for college students.  
iPhones are for hipster doofusses.  
How long until they become people's primary computing platform?

“

Because it can be a music and video player, Internet access device, e-mail and instant messaging platform, camera and many other things,



the iPhone gives cash-strapped consumers more for their money than do single-purpose products, and because it can be used on the go, it can help people make better use of their time.

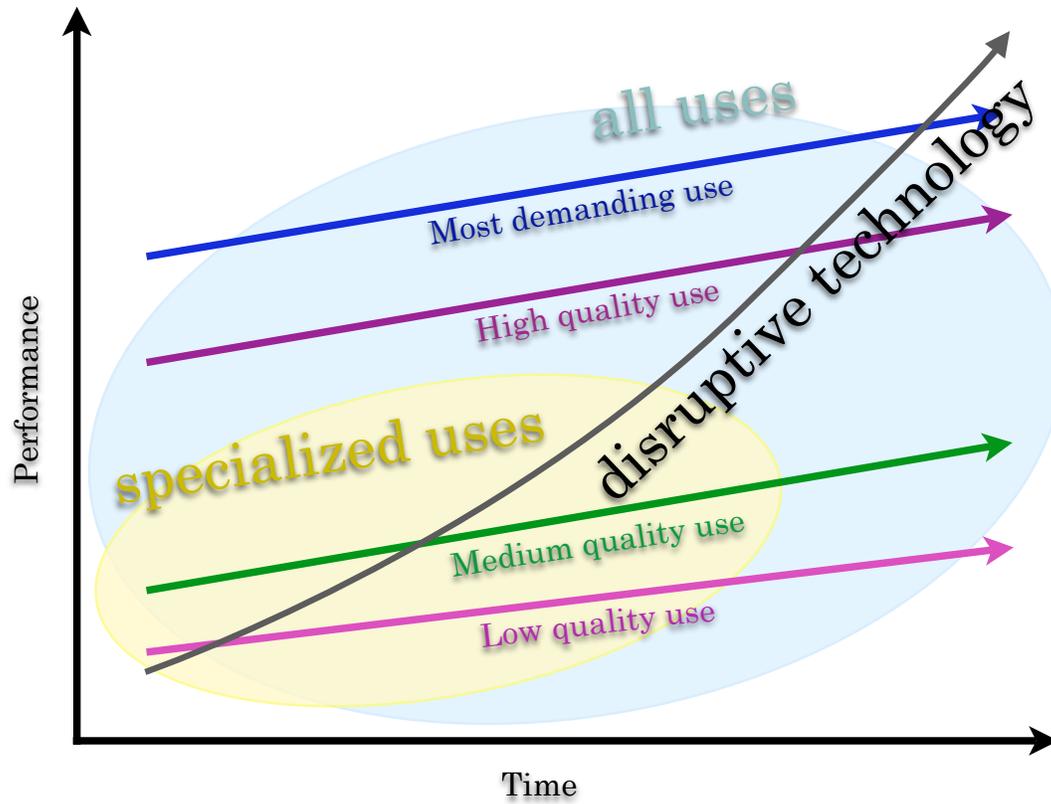
”

<http://www.itworld.com/personal-tech/57039/low-income-users-latch-iphone>

Not long, perhaps, here's a quote from IT World magazine, on the uptake of the iPhone amongst "low income" people:

"Because it can be a music and video player, Internet access device, e-mail and instant-messaging platform, camera and many other things, the iPhone gives cash-strapped consumers more for their money than do single-purpose products, And because it can be used on the go, it can help people make better use of their time."

Is the iPhone a disruptive technology? May be...



Each disruptive transition brings a host of new companies into the market, and unseats many of the incumbents, as the disruptive technology moves

out of its niche and into general use.



So,  
What is wrong with these  
established companies?  
Why can't they protect their  
old market  
\*and\* enter into a new one?

Can't they do two things at once?  
No. Not well.



# “held captive by their customers”

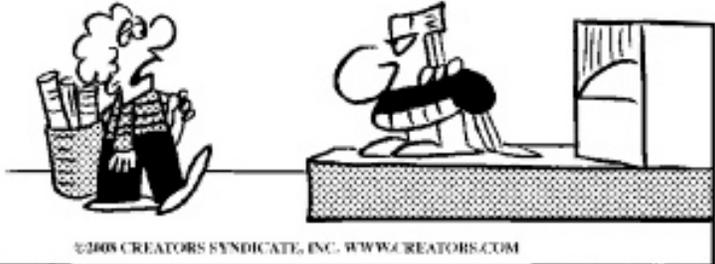
First of all,  
the incumbent companies are  
"held captive by their customers".  
"The customer is  
always right" is a great  
business maxim, but it does

limit the options of managers  
planning for the future.

what is your bidding, sire?

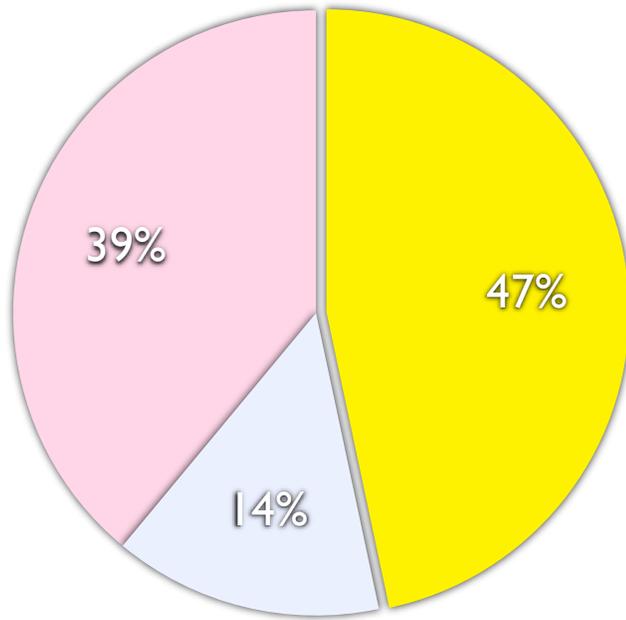
faster!

more storage!



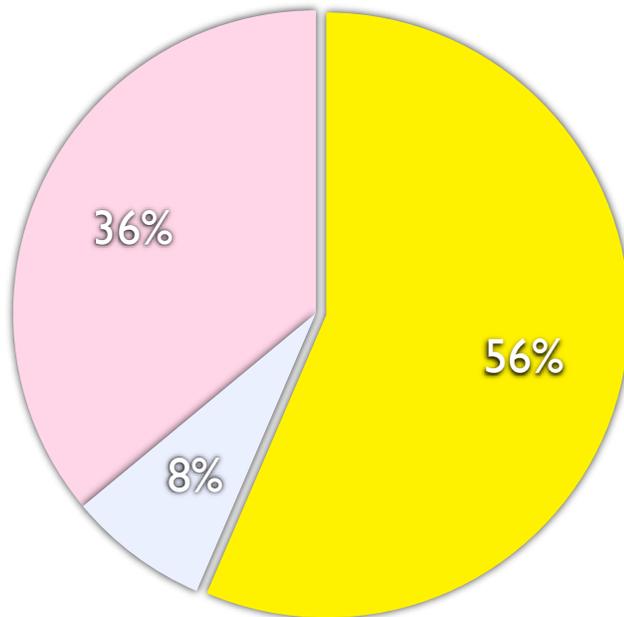
©2008 CREATORS SYNDICATE, INC. WWW.CREATORS.COM

● Me   ● Competitor #2   ● Competitor #1



Also, financially,  
expanding your share of a  
large market makes  
more sense than

● Me   ● Competitor #2   ● Competitor #1



scrapping for a share of a

tiny market.

So, the need to maintain market share, and follow the signals provided by the existing market, means that customers dictate what technologies "make sense" to pursue.

# rational resource allocation

Second,  
Well managed companies make  
good decisions about resource allocation.

What projects should I put my  
dollars and  
engineering effort into?

Sustaining Research	Disruptive Research
Known market	Unknown market
Well-defined goal	Poorly-defined goal
Improve profitability in short term	Lower profitability in short term

Sustaining technologies have a known market, an existing customer base, they are well defined, because the customers are providing requirements, and they will immediately be sellable, to a large pool of high-margin customers.

Disruptive technologies are the opposite, they have an unknown market, which means poorly defined requirements, and low profitability in the short term.



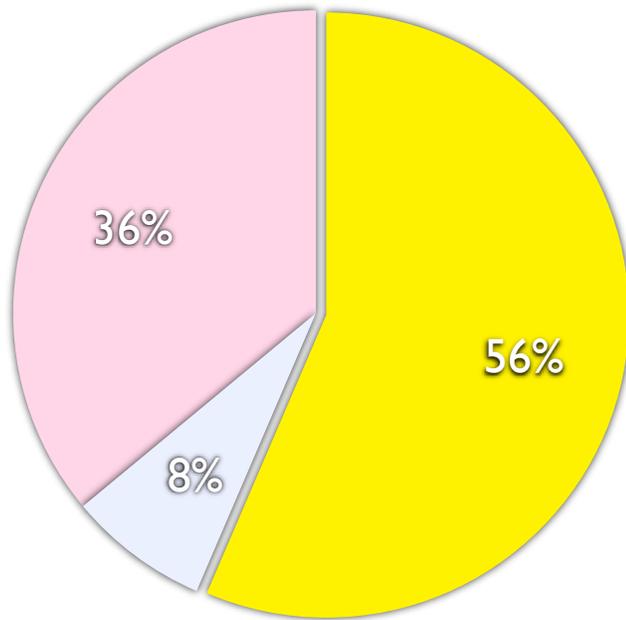
But, but,  
in the long term, the

disruptive technology could put you  
out of business!

So these established organizations  
should be focussing on  
disruptive threats! Right?

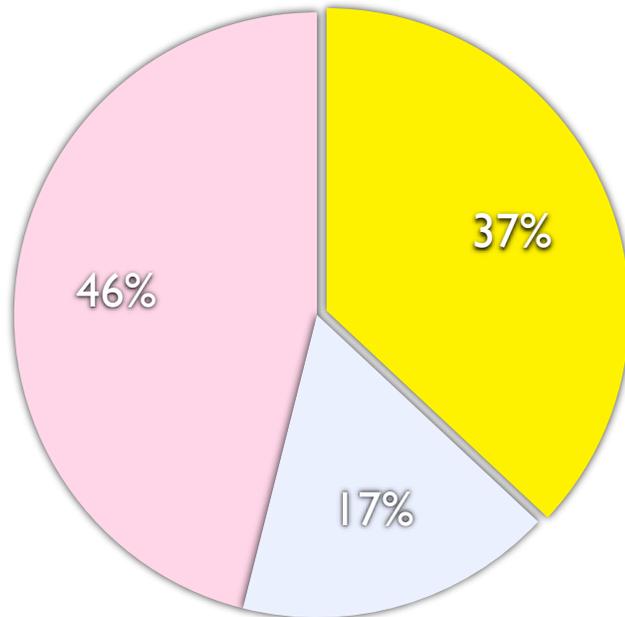
No,  
wrong.

● Me   ● Competitor #2   ● Competitor #1



An established organization that is focussed on a low margin emerging market will be ignoring and

● Me   ● Competitor #2   ● Competitor #1



losing market share in a high margin established market. That can make the difference between profit and loss,



success and failure.

# breakfast

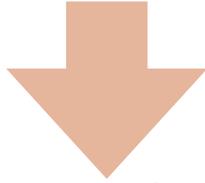


The ability to concentrate on small, potentially disruptive markets, is a matter of scale...

Small organizations can afford to focus their resources on small markets, and can survive on the thin margins available in emerging technology.

Big organizations have to operate at a scale sufficient to meet their daily revenue needs.

your size



your customers



your direction

Operating at large scale  
provides efficiency,  
but  
at the expense of flexibility.

Your size dictates  
who your customers are,  
and who your customers are  
dictates your corporate direction.

# disruptive technologies

- start crappy and get better
- enter new markets and then move into existing markets
- are not profitable enough to sustain existing enterprises (at first)

So, to recap,

disruptive technologies  
start crappy and get better,

they don't enter existing markets,  
they gain a foothold in a  
new market that  
doesn't mind their crappyness and  
likes some of their  
other attributes, and

they are not  
initially profitable  
enough to sustain  
existing enterprises,  
this leads to  
new small enterprises springing up,  
that eventually  
supplant the existing enterprises,



So, is open source a disruptive technology?

Should

these guys be worried?

We don't \*really\* know yet,  
but we  
can evaluate the character  
of open source  
in the marketplace.

# open source

- is very cheap  
(\$0)
- is infinitely replicable  
(cost of N units =  $N * \$0 = \$0$ )
- is highly re-purposeable  
(take the bits you like, change the bits you don't)

It has three properties  
that really  
differentiate it from  
proprietary software in the  
marketplace:

it's very cheap  
(\$0)

it's infinitely replicable  
(cost for N units = \$0)

it's high re-purposable  
(take the bits you like,  
change the bits you don't)

# existing vendors

- sell software for \$N  
(\$0 looks like bad price)
- are used to high margins  
(Microsoft corporate profit = 25%)

The incumbent vendors don't want any part of open source, because the margins are terrible, and they are structured to operate on very high software sales margins. For example,

# profit

Microsoft Office + Windows	\$28 BILLION
Everything Else Microsoft Does	-\$3 BILLION
Total Corporate Profit	\$25 BILLION

[http://www.microsoft.com/msft/reports/ar08/10k\\_fr\\_dis.html](http://www.microsoft.com/msft/reports/ar08/10k_fr_dis.html)

The Microsoft Office and  
Windows divisions earned \$25B in 2008.

The whole of Microsoft  
earned \$22B.

So, all the other things  
Microsoft does  
(MSN, Search, Ads,  
SQL Server, Visual Studio,  
XBox, Mice, Keyboards)  
lost \$3B.

# existing customers

- have long feature lists
- do not like the cost of change

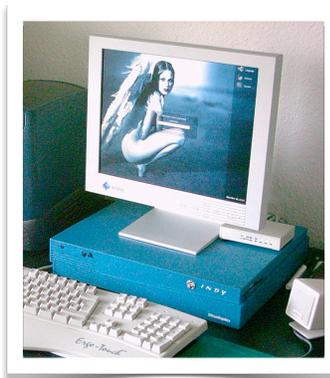
The incumbent customers generally don't want any part of open source either, because the feature list is usually shorter, and because of organizational inertia.

Change is expensive.

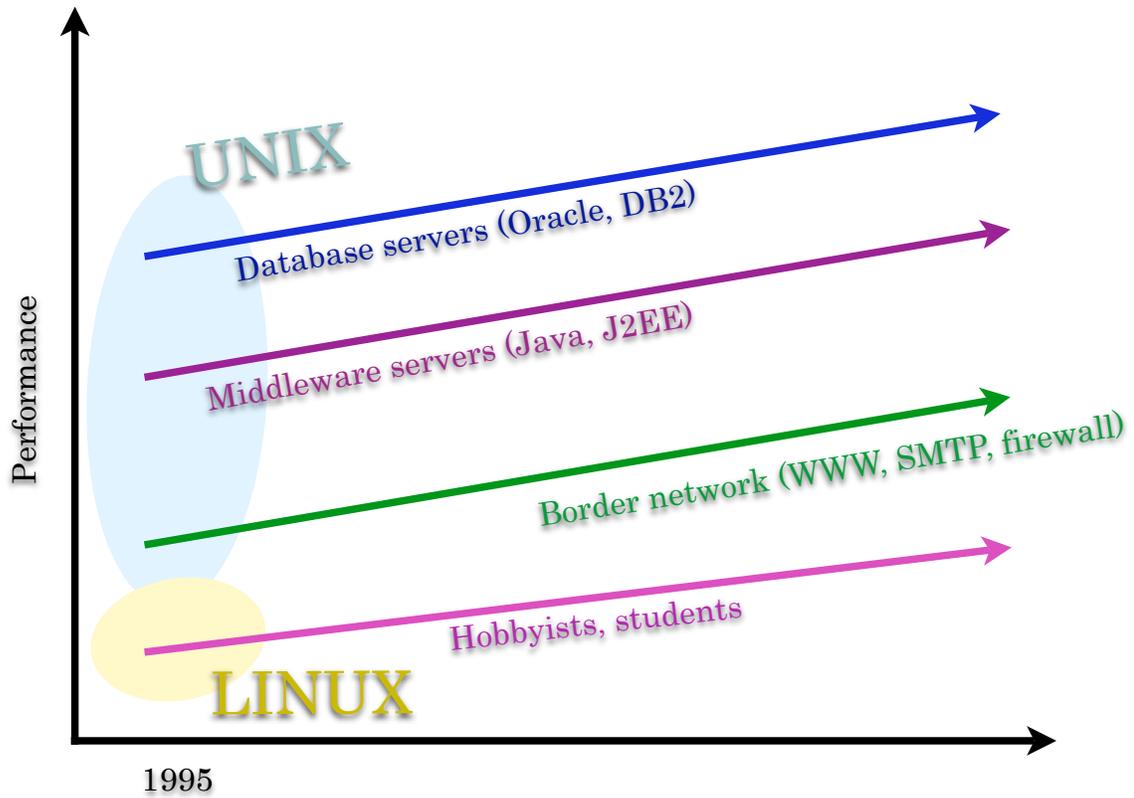


But  
history is a funny thing.

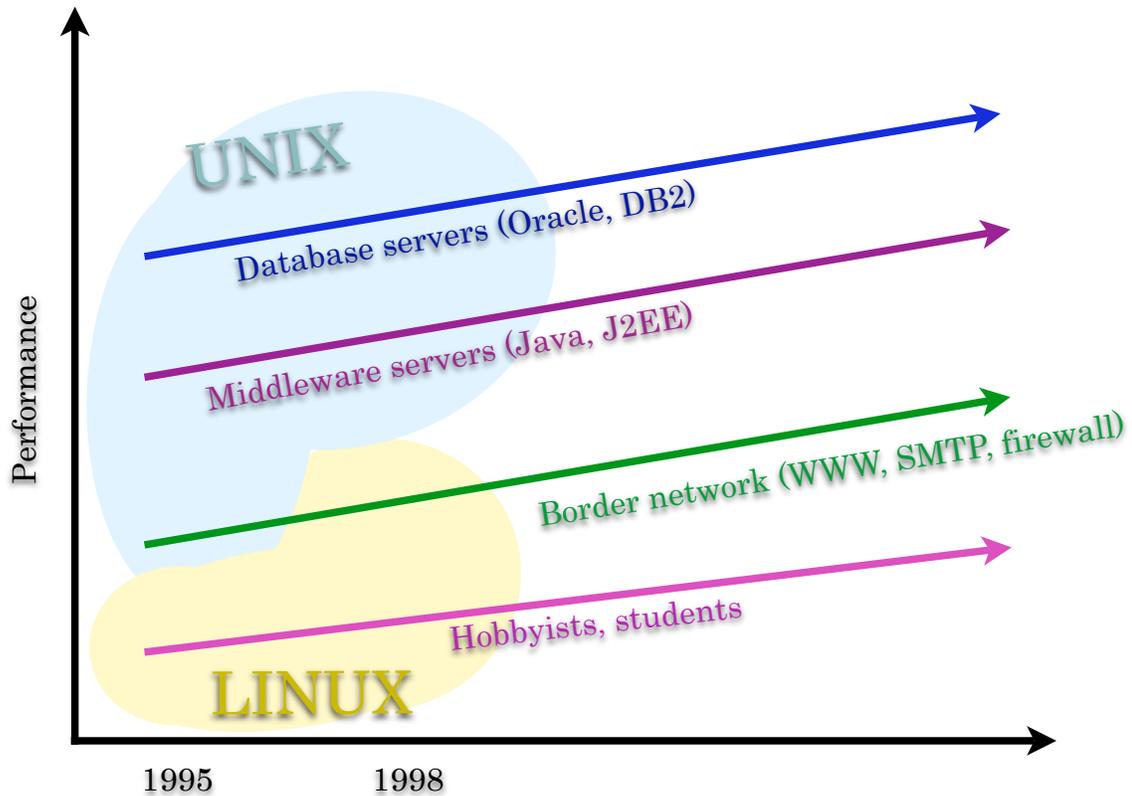
Sometimes,  
things can change and  
quite quickly.  
In fact,  
we have already seen  
one marketplace flip to open source,  
over about 10 years,  
and that's UNIX servers.



In 1995,  
UNIX servers were made by  
Sun, HP, DEC, SGI, IBM.  
They used expensive  
RISC chips and SCSI disks.  
They ran proprietary versions of UNIX,  
like Solaris, HP/UX, OSF, IRIX, AIX.



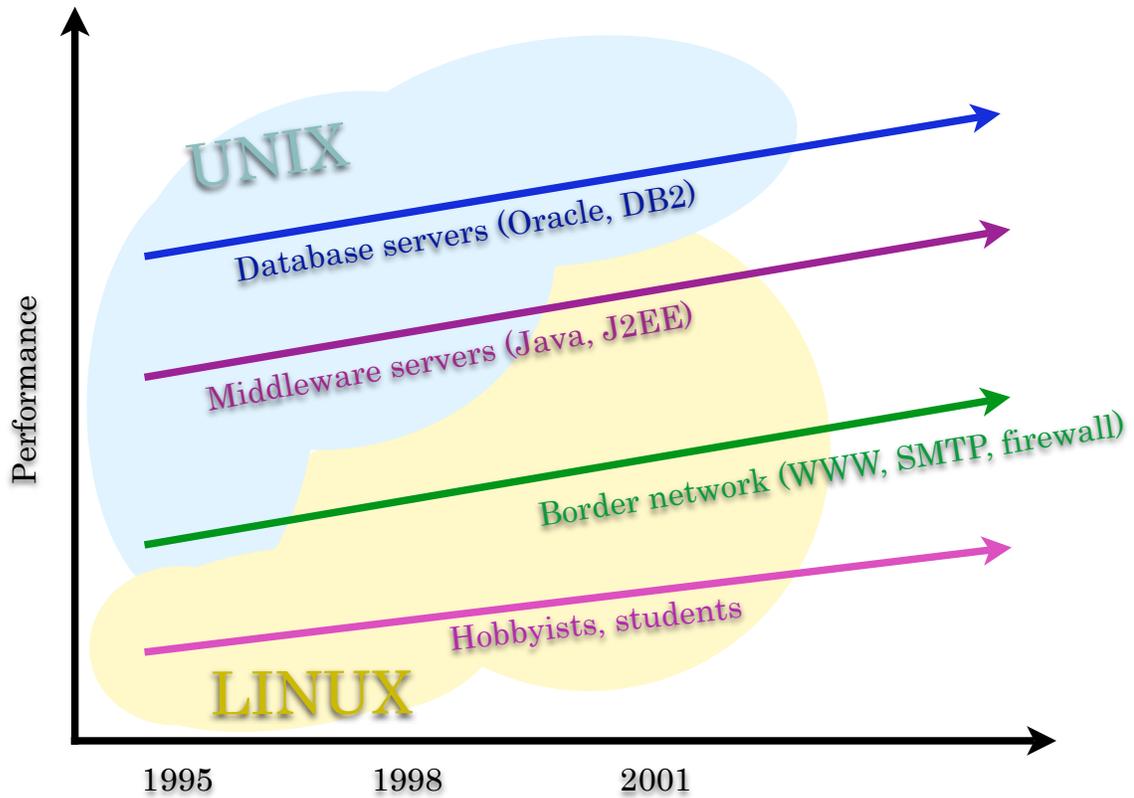
They could handle big tasks, like running databases and data processing (and GIS workstation software!) and could run network services, like web servers and mail servers. Linux was used by hobbyists and people (like me) learning to use UNIX at home.



But, over time,

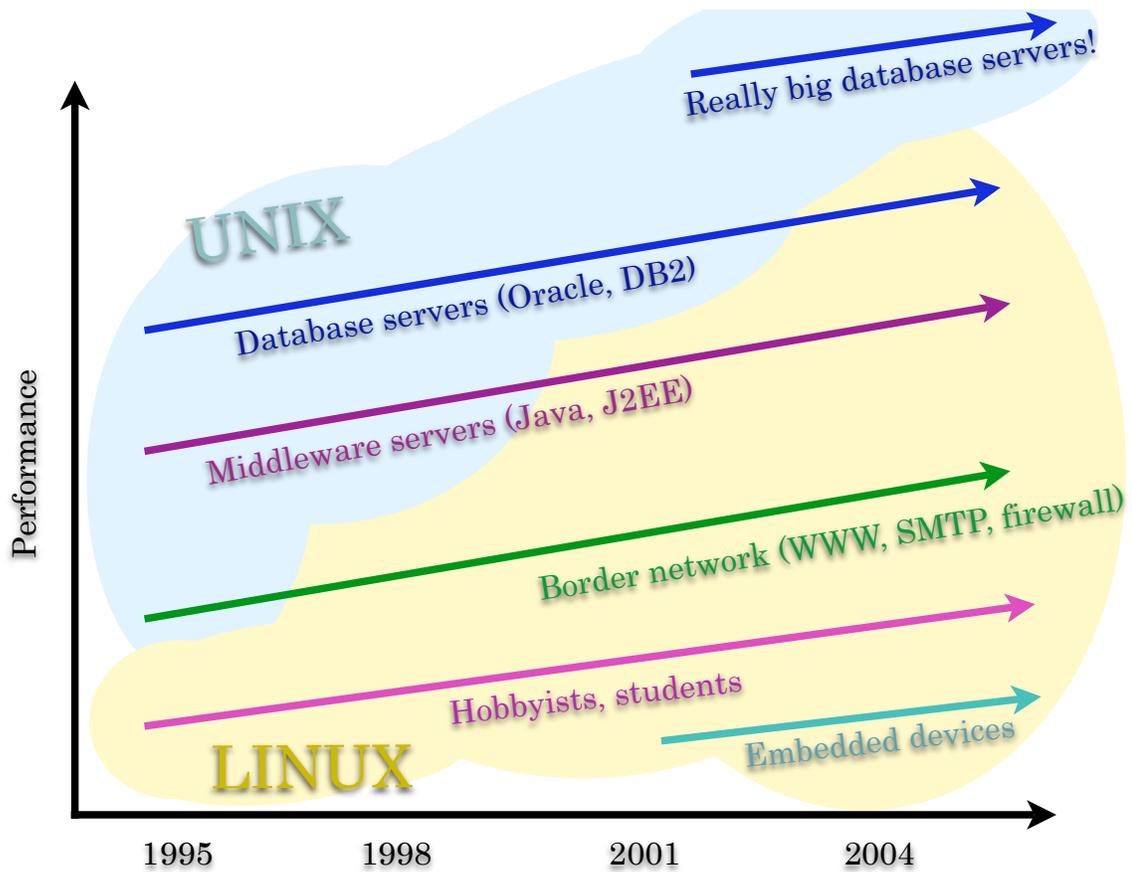
Linux got good enough to run web services and mail services. Internet service providers started to use it for their infrastructure.

The incumbent vendors could not lower their prices enough to compete for the ISP business. (Which was high volume, but low margin: ISPs were cheap.) But they still had lots of business selling to Fortune 500 clients who wouldn't touch Linux.



Linux got better,  
the proprietary UNIXes got better.

New Linux companies added things like  
support and training  
to the Linux value chain,  
and the  
quality difference between the two got  
smaller.



And then  
Oracle ported their database to Linux.

Now Fortune 500 companies could migrate  
to Linux without being forced  
to change their database  
at the same time.

Many did.

And

the proprietary UNIXes retrenched  
up-market yet again,  
to the realm of very expensive  
multi-way servers.



- “unix on x86 is a toy”
- “try Solaris x/86 if you want unix on x86”
- “we’re open sourcing java!”
- “we’re open sourcing everything!!”
- “we’ve bought MySQL!!!”
- “help, help!!!!”

Here's how Sun Microsystems reacted to the encroachment of Linux.

First they tried to laugh it off.

Then they tried to staunch the bleeding by putting a direct competitor to Linux in the field, but they couldn't compete on price, and they never provided the same level of engineering support as Solaris on Sparc got. Why? Because Solaris on Sparc had lots of high margin customers... rationally resources were better spent there, than on the x86 line.

Finally, Sun tried to coopt the open source spirit in Java.

Then, in their whole software line.

Then they started thrashing about.

And here we are now.



Despite seeing the Linux/x86 train coming, Sun has been driven upmarket to the point

where its remaining high margin business is selling servers like these, ultra-parallel, huge memory monsters for high-end databases.



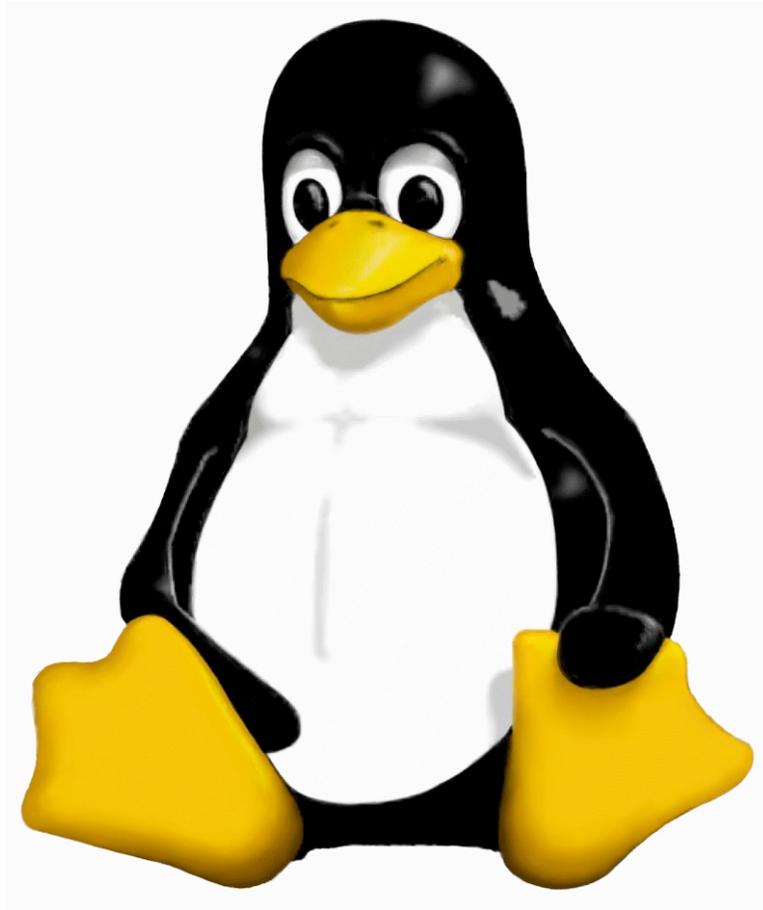
And what happened to the other UNIX server makers?

Compaq bought DEC and killed the Alpha chip and OSF, they were then bought by HP in turn.

SGI left the UNIX business early on, as PC workstations gained enough power to do 3D visualizations.

IBM and Sun have both retreated to the high end. HP also retreated, and is now selling HP/UX with Intel Itanium servers that nobody seems to want.

Some went out of business, some shrunk their market, all of them basically ceded their relevance to this



800lb gorilla.  
Er, penguin.

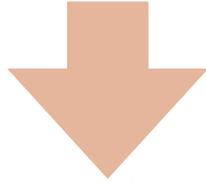
OK fine, so  
open source has taken  
over UNIX servers,



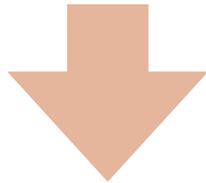
What about desktop Linux?

Like  
nuclear fusion  
and  
universal health care,  
the "Linux desktop" has been  
"just a few years away"  
for the last 10 years,  
ironically, the same  
years in which Linux  
has eaten and fully  
digested the UNIX server market.

no niche



no corporate support



slow growth

Why so little success?

First there has been no uncontested market niche to carve out a lead.

Which means there has been no place where a large capital investment in Linux desktop technology can land,

Which means the pace of development has been slow.

(As an aside, if Linux were proprietary, the pace of development in a low investment environment wouldn't have been slow, it would have been zero.

The "unkillable", "upstoppable" nature of open source makes it that much more threatening to existing vendors.)

# linux (open source)

- is very cheap
- is infinitely replicable
- is highly re-purposeable

So,  
what would a Linux desktop  
niche look like?

It would be a place  
where the Linux desktop  
is relevant to a  
wide base of users.

It would play to the open source  
strengths, of  
cheapness,  
replicability and  
customizability.



- slow processor
- small memory
- \$200 price point

- **Windows**

- fast processor
- large memory
- \$20-50 OEM price

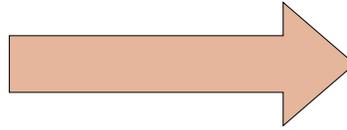
- **Linux**

- slow processor
- slow memory
- \$0 price

The niche may have arrived, with introduction of the netbook computer, and the resurgence of Apple as a viable competitor in the notebook and desktop computer market.

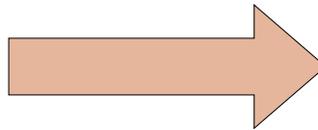
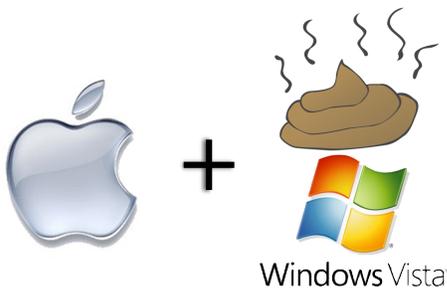
Netbooks retail for only a couple hundred dollars,

They have technical specifications that play to Linux's strengths. Most importantly, the margins on selling operating systems for netbooks might just be low enough that Microsoft won't enter the market.



strategic

- IE
- MSN
- XBox



defensive

- protect windows

Microsoft has traditionally treated Windows as a cash cow, directing profits from the operating system monopoly into strategic investments aimed at fending off disruptive change.

The return of Apple, and the failure of Vista has put Microsoft on the defensive in their core business for the first time in 15 years.

The fact that early models of netbooks shipped with Linux operating systems, that they were generally described as "good enough", and readily accepted by the student target market could be bad news for Microsoft.

# iPhone



- proprietary
- premium priced
- superior product

# Android



- open
- mass-market priced
- adequate product

Ironically, Apple may find a similar dynamic at work in the smart phone business.

I assume everyone knows about the iPhone already.

Google Android is not a phone, it's a phone operating system. Google developed it, then open sourced it. Phone makers will supply their own hardware, and customize Android to supply the software interface for their hardware.

The iPhone OS is a superior product, but with a price premium and a closed development process -- what apple wants, apple gets.

The Android OS is not as good as the iPhone, but it's "good enough", and it will be ubiquitous and free to any phone manufacturer.

So, who would you bet on?



Bear in mind,

the last time a superior  
Apple product met an adequate but  
more open solution  
in the marketplace,

the result wasn't pretty.

anyhow...

# “When will there be an open source replacement for ArcMap?”

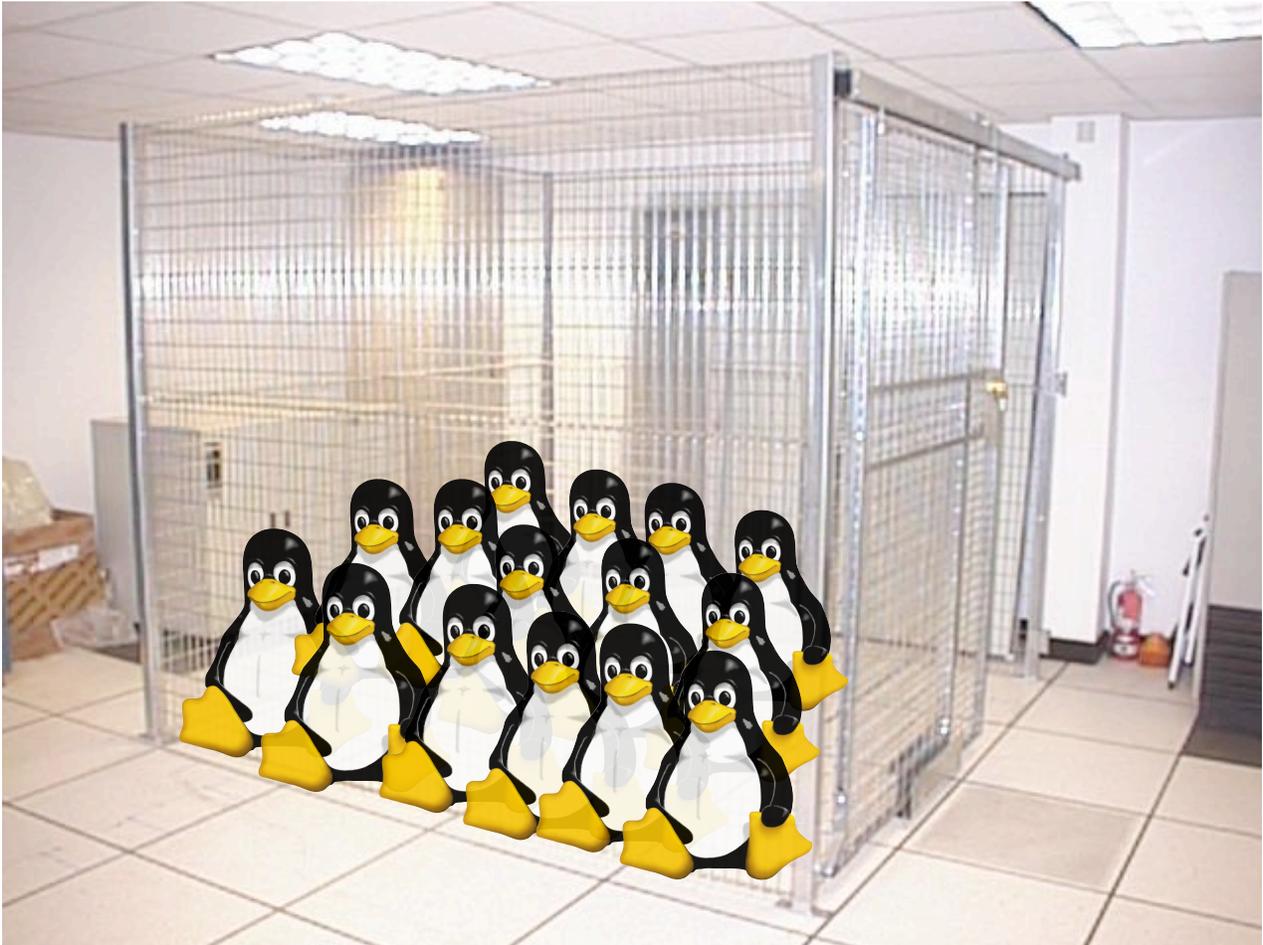
So,

let's address an incredibly  
common question I get when  
talking about  
open source to  
geospatial audiences:

"When will there be an  
open source replacement for  
ArcMap?"

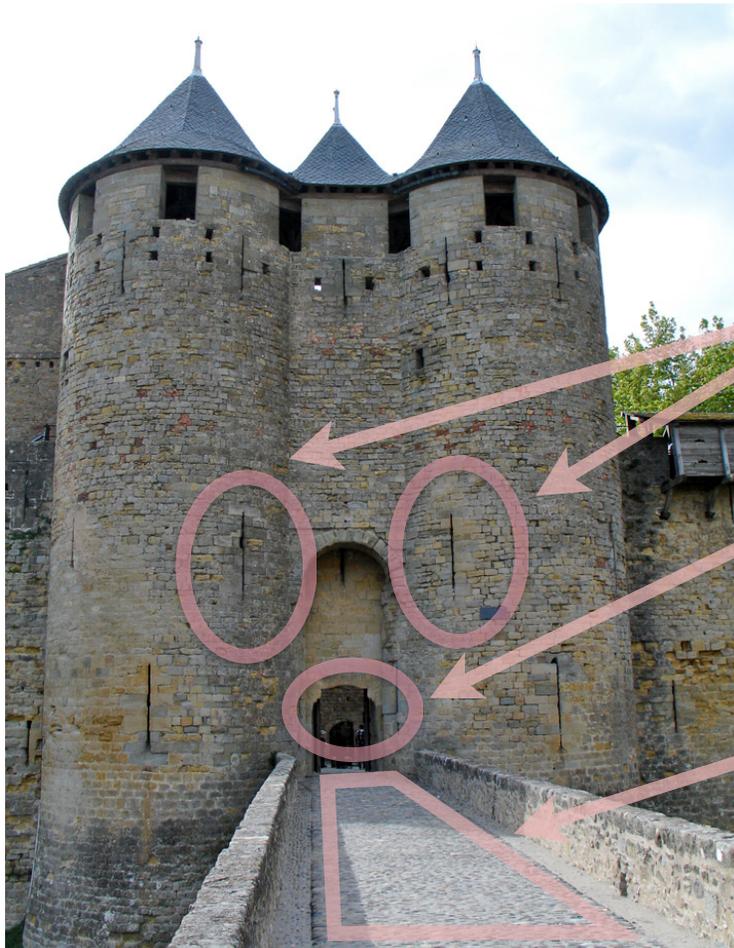
I think the "when" is a  
particularly nice touch.

Not for a while.



3.5" drives didn't  
replace 5.25" drives  
right away.  
They found a  
side market and  
eventually were  
good enough.

Linux servers didn't  
drop from the sky running Oracle,  
ready to  
handle the data center,  
it took a decade.  
And on the desktop,  
things seem to work the  
slowest.  
Linux only now  
starting to crack  
new niche markets for  
desktop software.



- cross fire

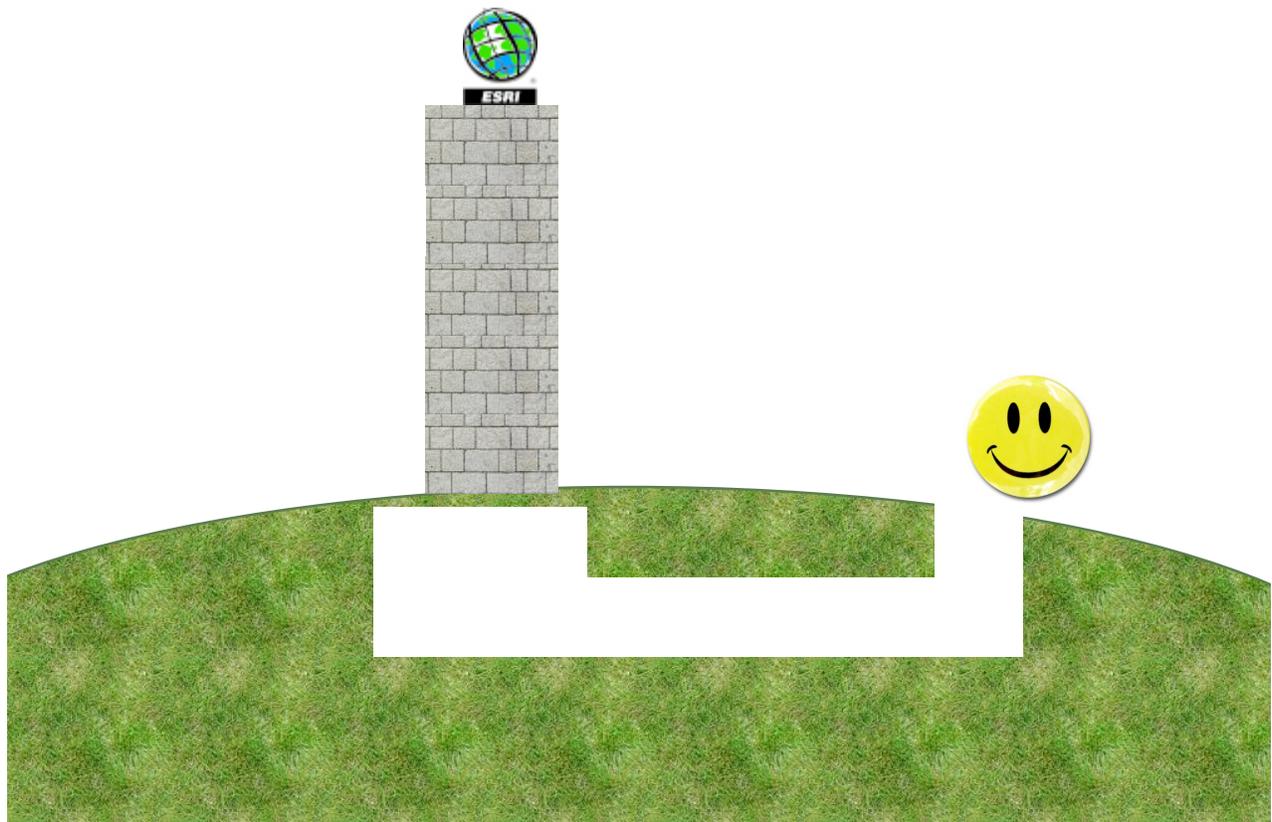
- portcullis

- boiling oil

- kill zone

Disruptive change is like storming a castle.

You don't want to rush the gate. because you have to cross a kill zone, where you'll be subjected to a withering cross-fire, from the arrow slits, and your reward when you reach the gate will be getting trapped behind a portcullis and drenched in boiling oil.



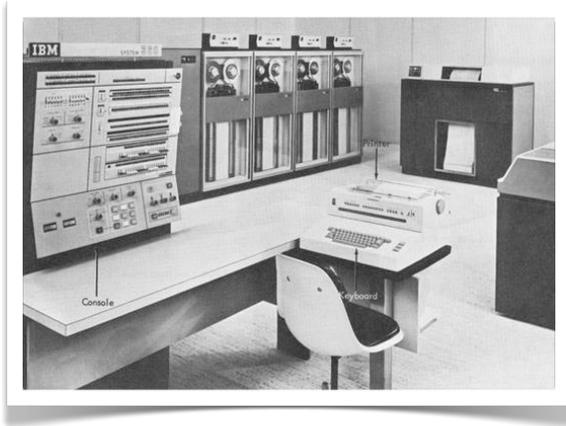
What you want to do,  
is find a safe place,  
far from the walls,

and quietly dig a tunnel.  
Undermine the walls,  
over a course of several weeks,  
and eventually they will tip over naturally,  
of their own accord.



“The stone  
age didn’t  
end for lack  
of stones.”

"The stone age didn't end  
for a lack of stones."  
The Saudi oil minister  
liked to use this phrase  
in the 1970s  
when asked about future oil supplies,  
which I think was  
mighty cheeky of him.  
But it is true  
of all  
kinds of things.



mainframe  
1970

mainframe  
2008



The mainframe age didn't end for lack of mainframes. In fact, you can still buy a mainframe from IBM, if you want one. What did end was the relevance of mainframe technology to the larger computing marketplace. The mainframe was driven from the mainstream into a niche.

# “What is IBM’s next move?”

1970

“Tell me, I  
must know!”

2008

\*yawn\*

In 1970, the question  
everyone in IT wanted the answer  
to was  
"what is IBM's next move?"  
It was a question  
with great strategic value.

If you knew what IBM was going to do,  
you knew what IT would look like in the future.

Now we don't care.

anyhow...

What were we talking about again?

Ah right!

“When will there  
be an open source  
replacement for  
ArcMap?!?”

Ah right!

The age of ESRI dominance of GIS  
won't end with ESRI going into Chapter 11,

“What is  
ESRI going  
to do?”



it will end when  
"what is ESRI going to do"  
ceases to be a question of import  
when discussing the future of GIS.

# where is the cutting edge of GIS?



In some ways,  
the age of ESRI is already over.

The growth of internet mapping,  
and the entrance of  
huge firms not named ESRI  
has already changed the  
market dynamic incredibly.



- data capture
- ad hoc analysis
- cartographic production
- scientific users
- desktop software
- mass markets
- real-time constrained analysis
- consumer products
- multi-user web systems

The places where ESRI has built an insurmountable lead in technology and processes the traditional GIS operations of capture, analysis and printed map making, are not the places where our field is going to be growing for the next decade, the mass market of consumer applications delivered over the web to new devices in real time.

# scratch a startup, find open source

You can already see  
this trend in the new  
non-traditional GIS  
marketplace.

The people building the  
next-generation  
of consumer facing apps are using  
open source tools, and tools from  
Google and Microsoft.

Here's a bunch of  
brand new companies,  
many venture funded,  
with very spatial centric  
businesses, and the  
technologies they are using.

(I know PostGIS,  
so there's a  
PostGIS-centric bent to this list.)



Zonar Systems,  
 builds their own  
 fleet tracking GPS devices and  
 manages all the data streamed  
 back in PostGIS,  
 with Google Maps and Mapserver  
 as other components of their application.

REDFIN  Search Listings Price, Beds... AGENTS BUY SELL FORUMS MY REDFIN

You asked, we listened: more personal service & online features. [Read more.](#)

300 results (10 unmapped) [Email Me New Listings](#) [Seattle Stats & Trends](#)  
 All listings, exclude: under contract [Remove Outline](#)

1401 5 Ave W #301 (1 of 2) **\$489,000**

1401 5 Ave W #301  
Seattle, WA 98119

4 of 15 [Zoom In](#)

Beds: 1 On Redfin: 122 days  
 Baths: 1 Year Built: 1920  
 Sq Ft: - Lot Size:  
 \$/Sq Ft: - MLS#: 28120307  
 Last Sale: \$221,500 (08/21/2000)  
 Listing: T L L Real Estate

[View Details](#) [Go See It](#)  
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Home 1 of 2

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 Tours Now Free

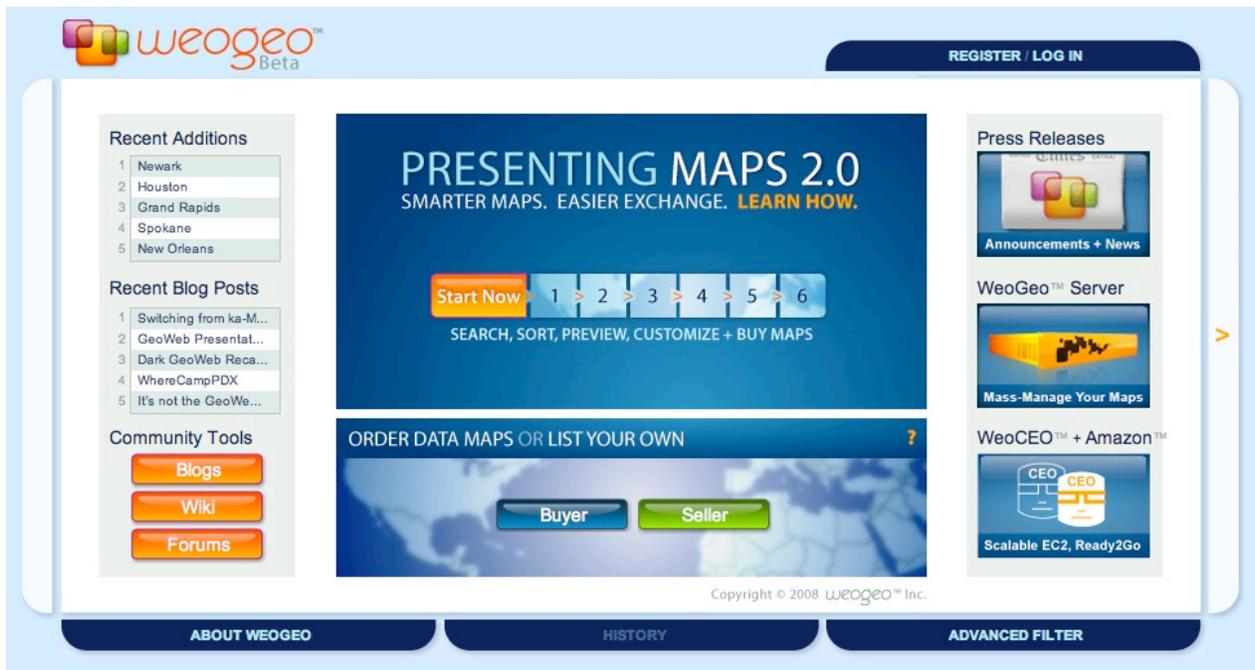
ADDRESS	LOCATION	PRICE	BEDS	BATHS	SQFT	\$/SQFT	DAYS
1401 5 Ave W #301	Queen Anne	\$489,000	1	1	-	-	122
1401 5th Ave W #307	Queen Anne	\$339,000	0	1	572	\$593	47
510 Lee St #3	Queen Anne	\$369,900	2	1.75	910	\$408	314
1 Ward St #6	Queen Anne	\$400,000	1	1	786	\$509	136
1 Ward St #10	Queen Anne	\$775,000	2	1.75	1,425	\$544	155
1 Ward St #11	Queen Anne	\$695,000	1	1.5	1,180	\$589	155

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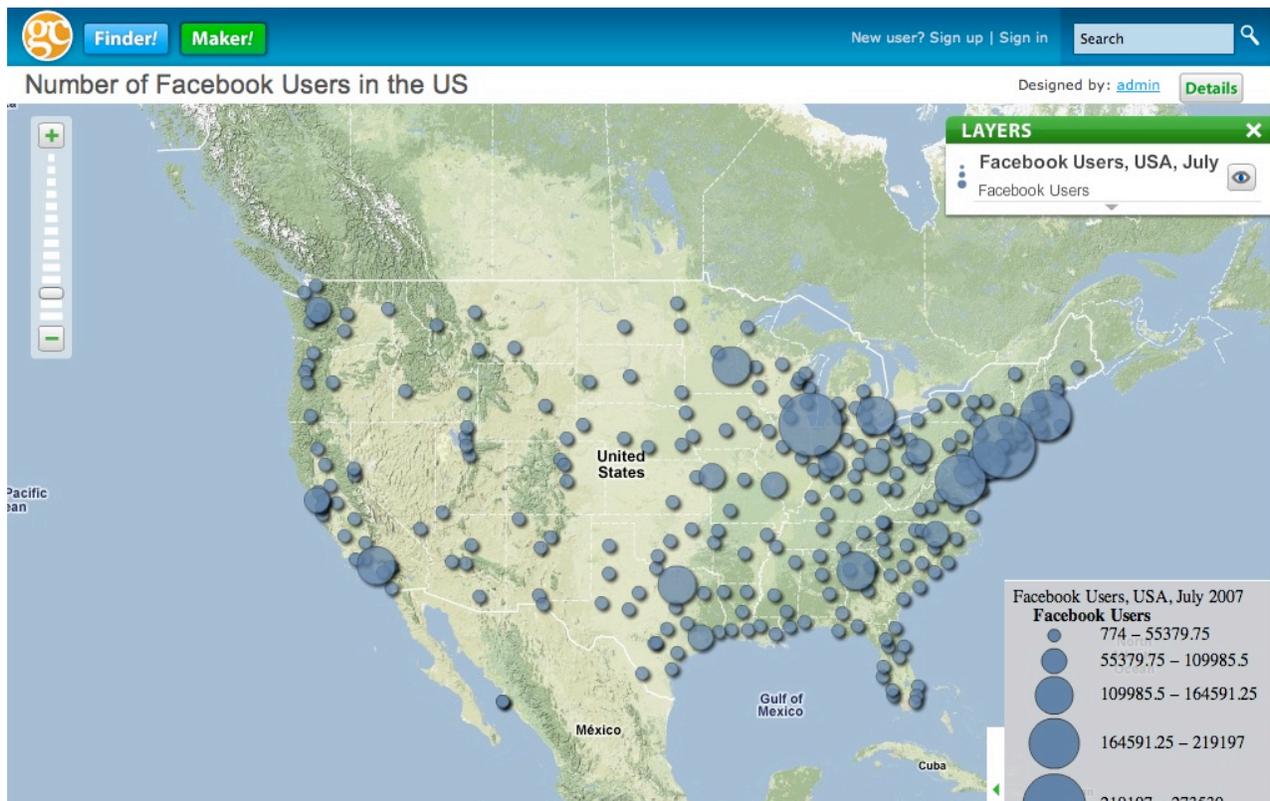
LISTING STATS: \$92,050 2.2 2.0 1,077 \$494 96



RedFin, a real estate data startup,  
 (yeah, bad timing)  
 manages all their data in  
 PostGIS and uses Virtual Earth for the UI.

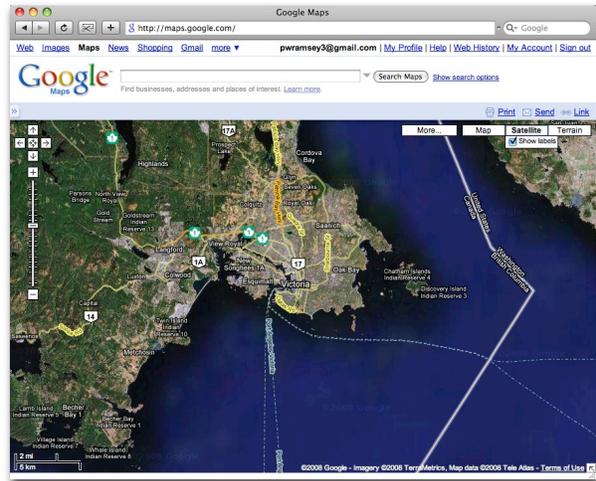


WeoGeo, a map sharing site, manages their data in PostGIS



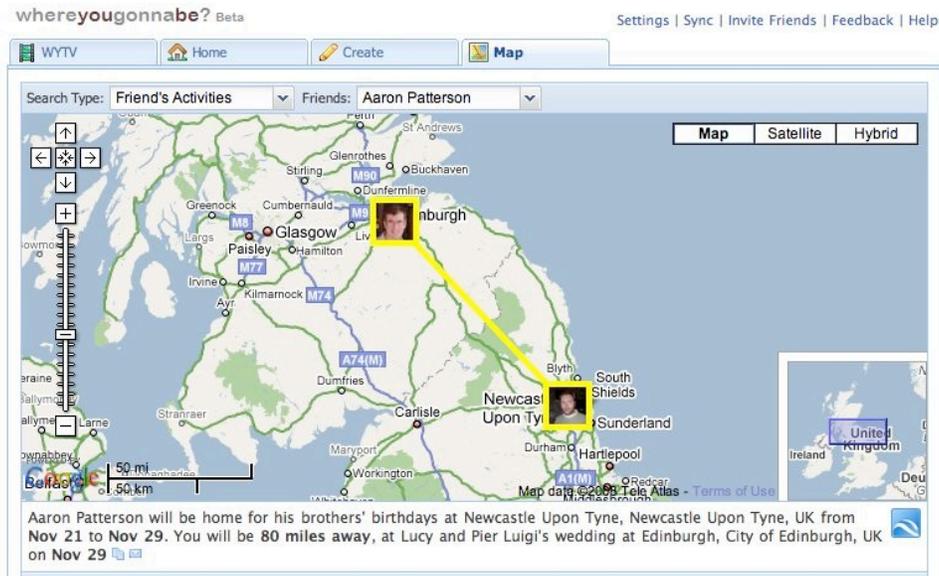
GeoCommons, a data sharing site, manages their data in PostGIS, and uses Google Maps for their UI.

# Google™



Google itself, uses PostGIS to manage the metadata associated with their vast holdings of raw imagery.

# wherelyougonnabe



WhereYouGonnaBe,  
a spatial add-on for FaceBook,  
founded by  
Peter Batty, the former CTO of  
\*InterGraph\* uses  
PostGIS for their data.



GlobeXplorer uses PostGIS to store image metadata, and vector data, and Mapserver to render vector data. They were purchased by DigitalGlobe three years ago.



### Enter your address, find news nearby

We gather all sorts of local info daily so you can follow news near you.

Seattle only, for now. Examples: 4000 Woodlawn Ave. N, 98133, or Capitol Hill



### Explore the city

78 Neighborhoods

27 ZIP Codes

4,831 Streets



NEW  
HERE?

READ OUR  
FAQ

#### FEATURED NEIGHBORHOOD Or, explore other neighborhoods...



### Capitol Hill

#### For-sale building burns on Republican, draws crowd

Extinguished fire at 506 Republican

November 13 CHS Capitol Hill Seattle Blog

506 Republican

#### Candle may have caused fire in vacant house

A fire late Wednesday in a vacant house on 502 Belmont Ave. E. was caused by a candle, perhaps left by transients, Seattle Fire Department spokeswoman Dana Vander Houwen said Thursday.

November 13 Seattle Post-Intelligencer

502 Belmont Ave. E.

#### State gas prices lowest since February 2006

"Normally we don't go down I-5 if we don't have to," Glen Henderson said from the 76 Station at Broadway and Roy Street on Seattle's Capitol Hill. But gas prices "are a little more in our comfort zone now that we're not paying a hundred bucks a week between the two cars," he said.

November 12 The Seattle Times

Broadway and Roy Street

177 more articles in Capitol Hill in the last 30 days.

#### LOCAL MEDIA Which neighborhoods are in the news?



931 more articles in the last 30 days.

Everyblock, a "hyperlocal news services" stores their data in PostGIS, uses Mapserver to render their map tiles and uses OpenLayers for their UI.



Neighborhood, city or zip code:

Go

Local Places by Category

- Arts and Culture
- Bars and Clubs
- Education
- Public Spaces
- Real Estate
- Restaurants/Cafés
- Services
- Shopping
- Sports and Leisure

Local News and Blogs

Sort by most active | title

Brooklynian.com

View map

The Gowanus Lounge

View map

Latest thread in Discussions NEW

tooren

Anonymous Neighbor · Be the first to reply

See all 377 threads about Brooklyn · or start a new one!

View Brooklyn NY by News Places

Top stories for Brooklyn NY »

raccoons »

Downtown Brooklyn Raccoon Spotted!

Gothamist · 3:07 PM Today 11:10 AM Today

Brooklyn Born noticed the "elusive Downtown Brooklyn Raccoon" last night in Clinton Hill and took photographs (one above) and video. He writes:The...

See more on...

what: news · animals · environment · photos · video

scams »

Nonprofit Director Accused of Stealing Poor Kids' Food

NBC New York · 3:31 AM Today 8:51 AM Today

The former director of a Brooklyn nonprofit is accused of stealing more than a half million dollars in federal aid that was intended to pay for foo...

See more on...

where: Better Brooklyn Community Center

what: community · politics · food · crime · kids

toll brothers »

Not A Big Surprise: Full C.B.6 Votes Yes For Toll Gowanus Project

Pardon Me For Asking · 1:09 PM Today 7:27 AM Today

CB6 Board at last night's general meetingRobert LevineRaymond LohierBrad LanderDebbie ScottoMark Shames23 Yes Votes10 No Votes4 Abstained without...

See more on...

where: Gowanus Canal · Toll Brothers' Gowanus Village

what: development · real estate · affordable housing · rezoning · toll brothers

outside.in RADAR



Zoom in on the places that matter to you.

Enter a location:

GO



Get ready for your free night in

Vancouver

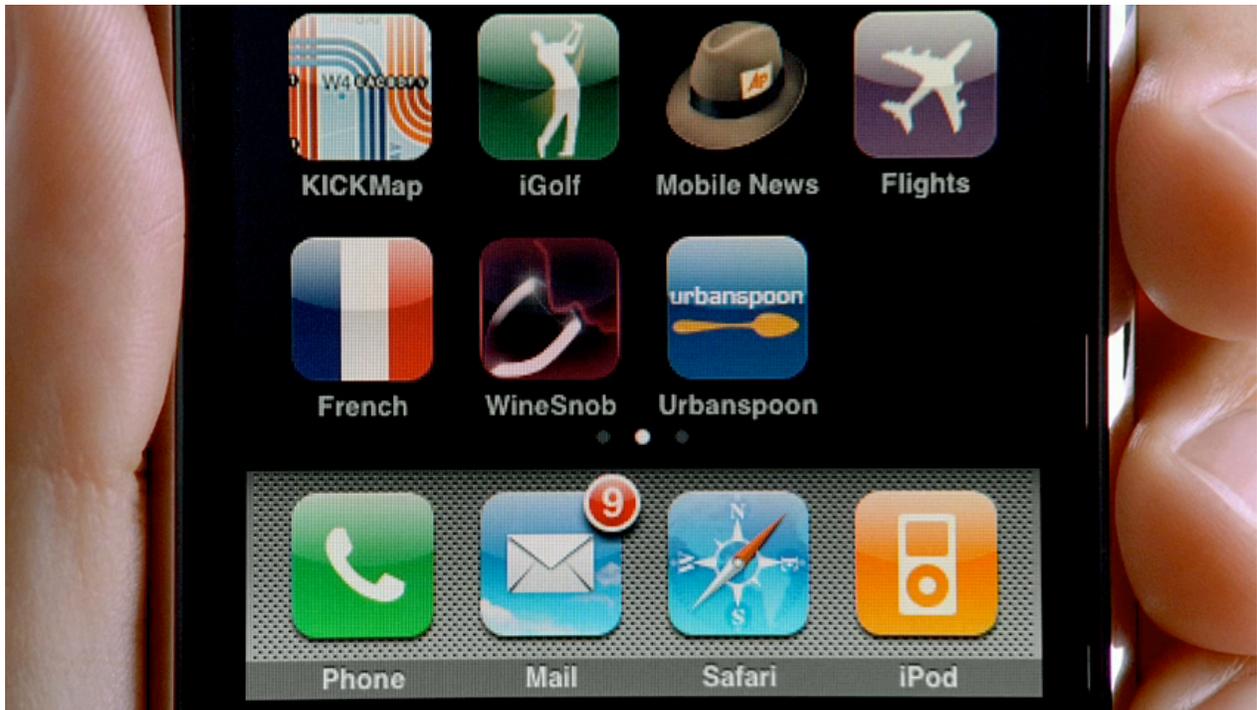
Calgary

Toronto

Montreal

Ottawa

Outside.in, Another "hyperlocal news service", also stores their data in PostGIS.



The Urban Spoon,  
which I recently saw featured  
in this Apple television commercial,  
uses MySQL to drive their  
"shake'n'eat" iPhone application,

# recently recently

All these folks have in common that they  
built their  
infrastructures  
recently and  
therefor evaluated their technical  
options

recently.

open source is  
good enough

and it's a heck of a  
lot cheaper

And for building a  
web-based multi-user service,  
most evaluations are going to come to the  
same conclusions:

"open source is good enough"  
"and it's a heck of a lot cheaper"  
Does this formulation  
sound familiar at all?

How about...

the minicomputer  
is good enough

and cheaper than  
the mainframe

or

the PC is good  
enough

and I don't have to  
beg IT for system  
time

or

this laptop is  
good enough

and I can take it  
with me when I  
travel too

it's the disruptive technology  
soundtrack, this is what you hear

this [option] is good  
enough  
[for the default need]  
and [has some extra  
compelling attribute]

as a disruptive technology  
moves upwards into the  
space previously held by an  
incumbent technology.

We are just beginning to see  
open source poke it's head into  
the geospatial world.

But it's not going away.

# open source is a disruptive technology



It's a disruptive technology.

And it's going to change the way we think about GIS software forever.

fin

Thanks!  
Do we have  
Time for questions?