The background of the cover features a dark teal to blue gradient. Overlaid on this are several bright teal, wavy, scribbled lines that create a sense of movement and energy. In the bottom right corner, there is a faint, stylized network diagram consisting of interconnected nodes and lines, representing a social or digital network.

YOCHAI BENKLER

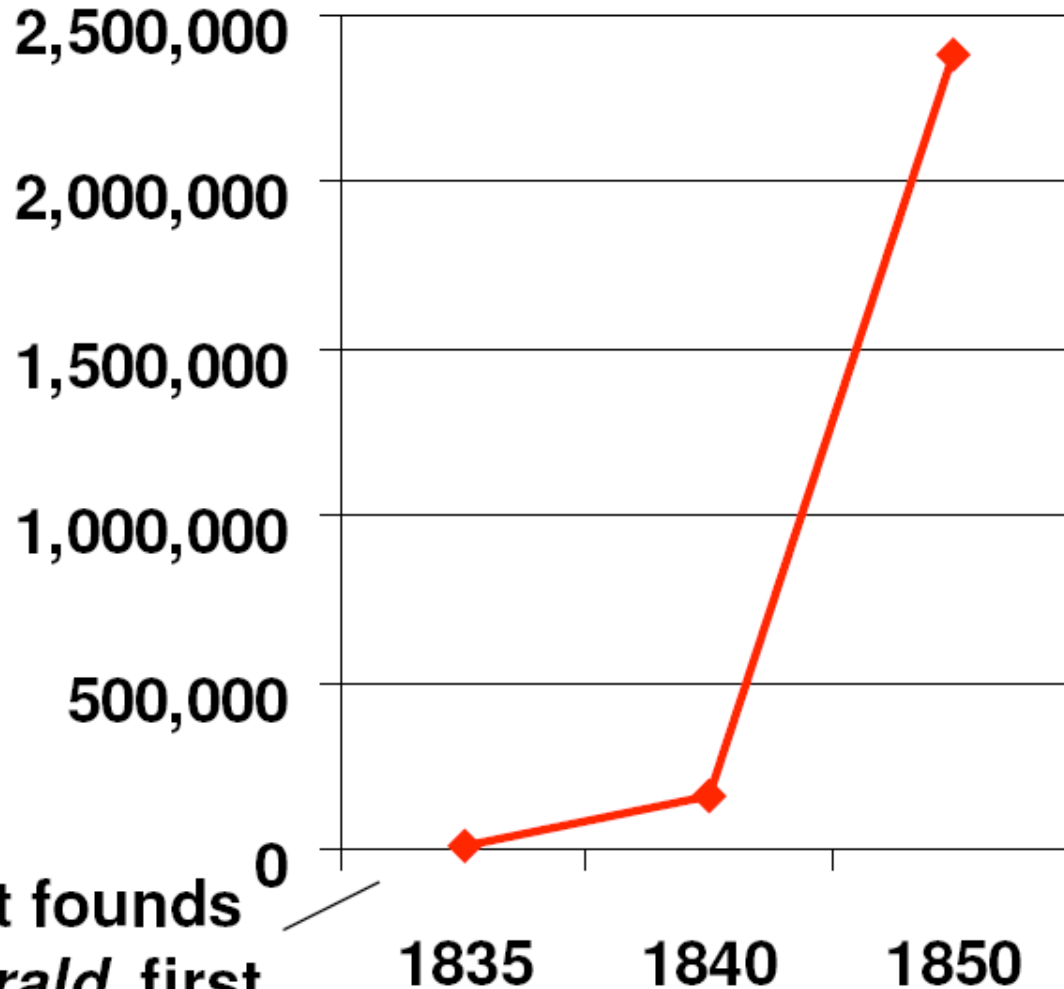
The Wealth of Networks

How Social Production Transforms
Markets and Freedom

Economics

Industrial Information Economy

2005 dollars



◆ Newspaper Startup Cost

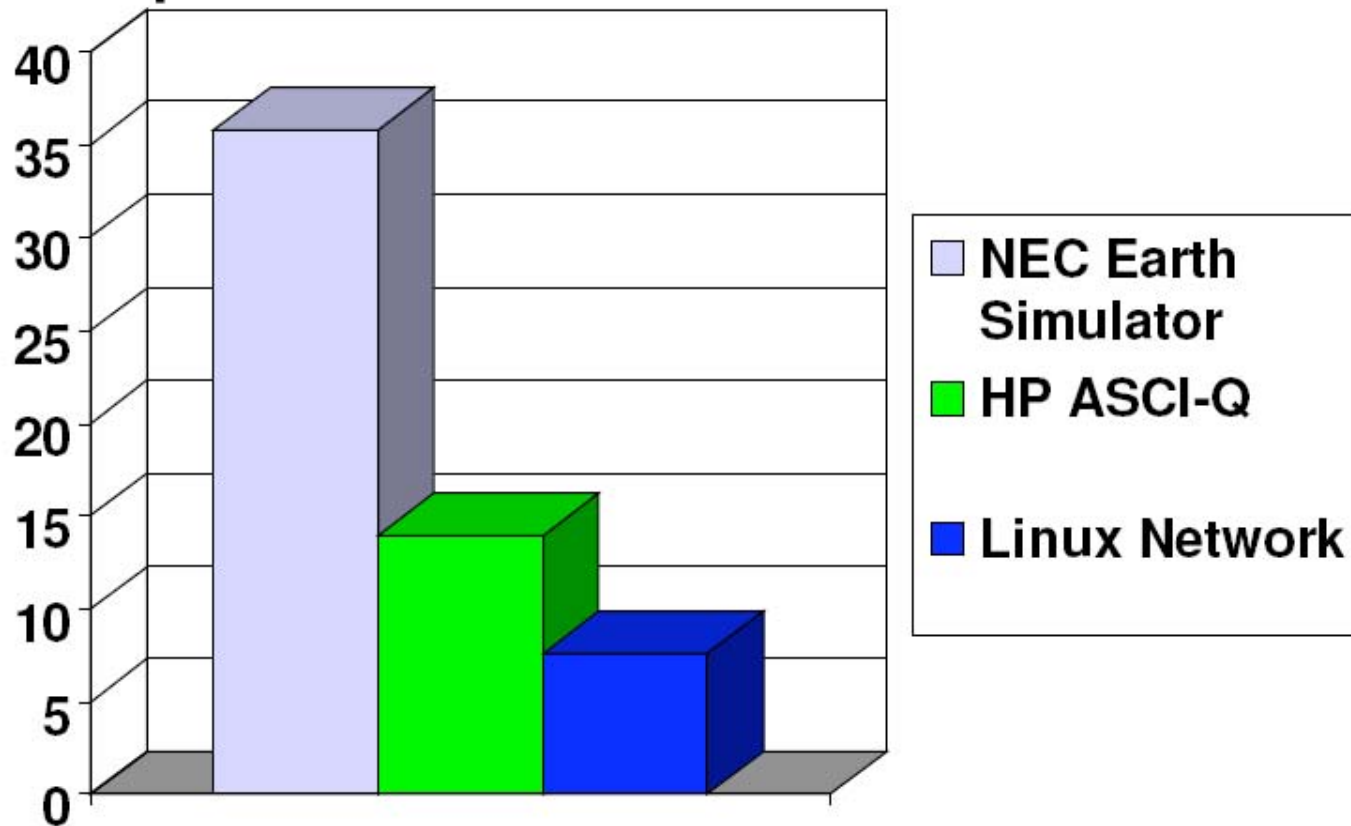
Bennett founds *The Herald*, first mass circulation paper, NYC = \$500 = ~\$10,400 2005 dollars

Industrial Information Economy

- **Stark bifurcation between producers and consumers**
 - **Passive large audiences**
 - **Professional (commercial) producers**
- **Market-based or government owned**
- **Characterized and anchored the basic structure of information production for 150 years**

Top 500 Supercomputers

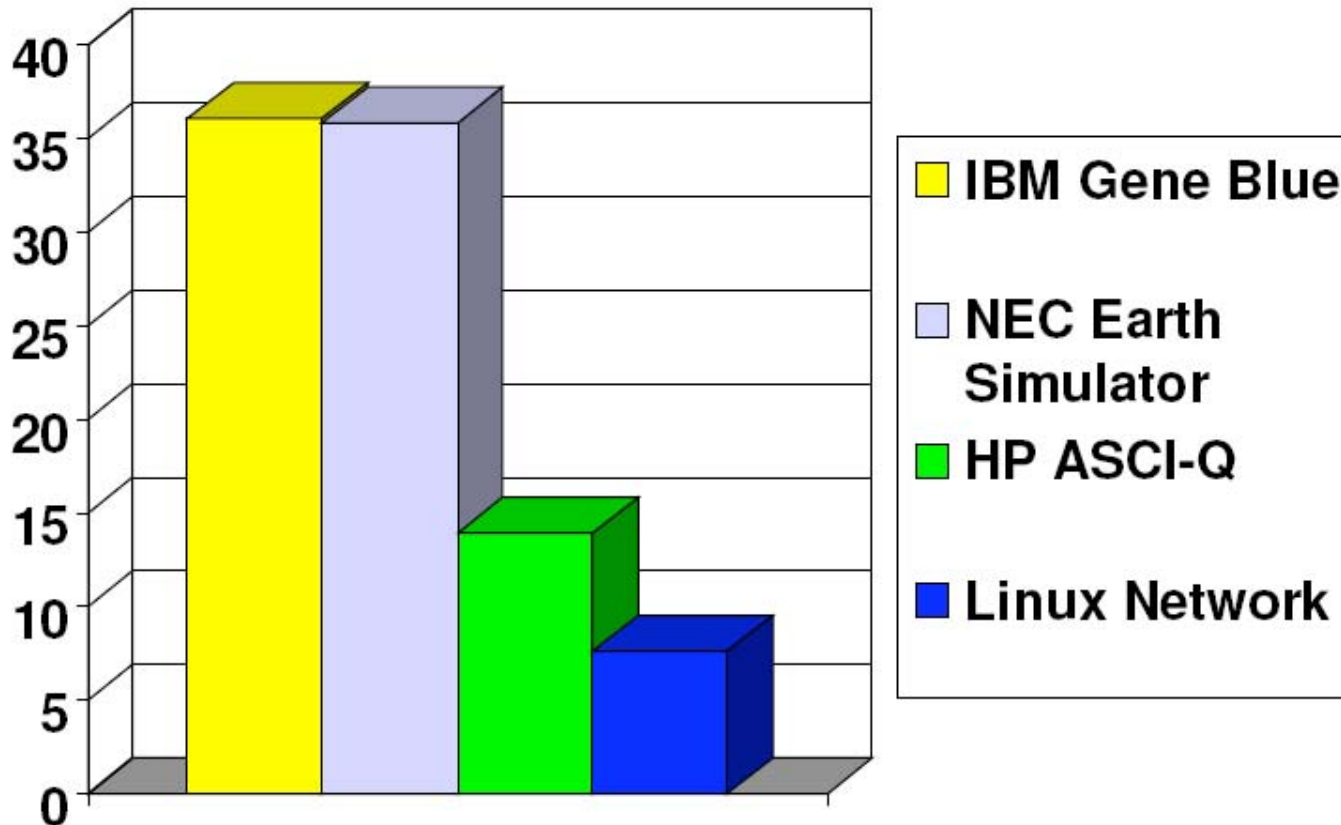
Teraflops



June 2002

Top 500 Supercomputers

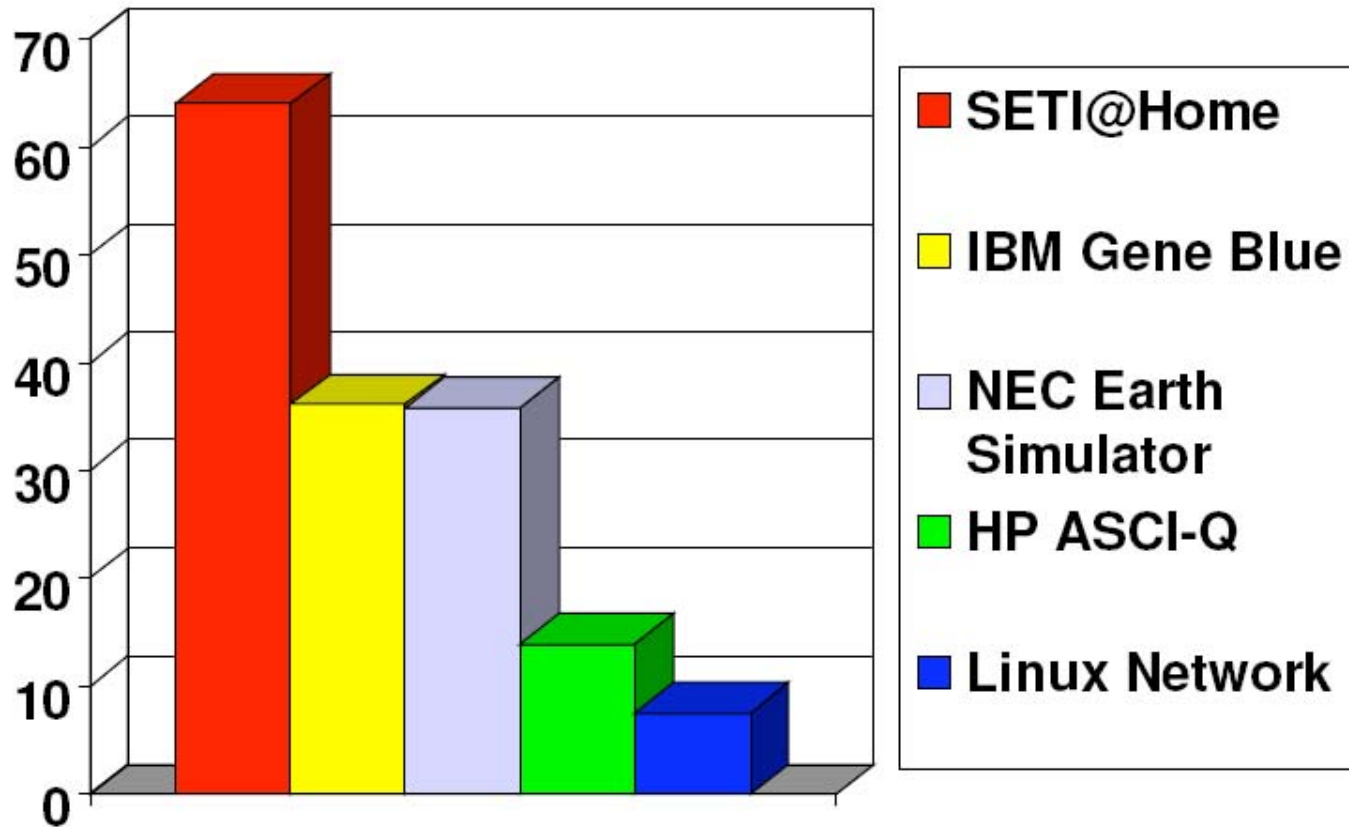
Teraflops



Mid-2004

SETI@Home

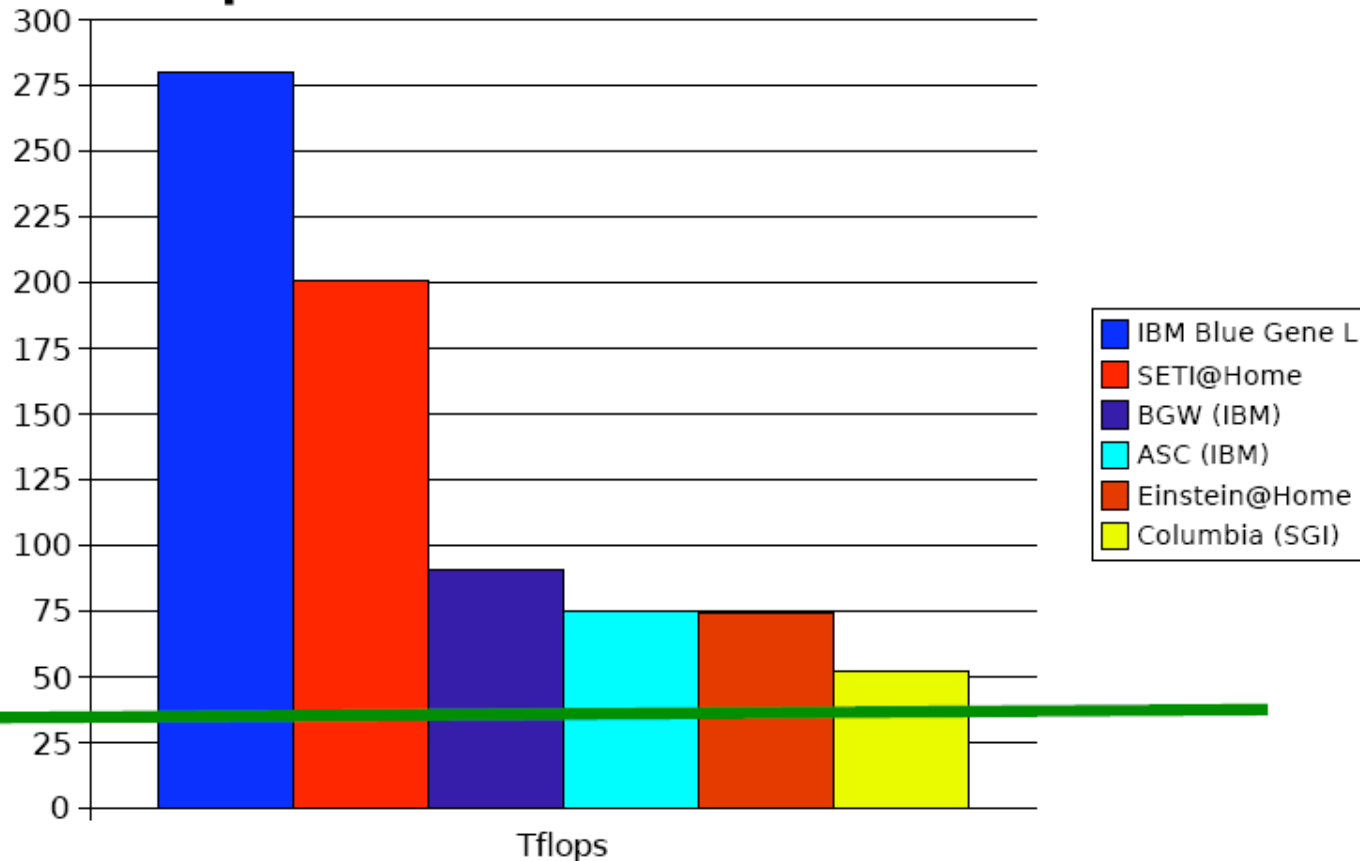
Teraflops



**speed relative to fastest
supercomputers in top 500 at that time**

SETI@Home

Teraflops



**Top 500 Supercomputer with
SETI@Home and Einstein@Home**

Networked Information Economy

- **Radically decentralized capitalization**
 - Computation
 - Storage
 - Communications capacity
- **Every connected person, ~ 600 million to 1 billion, has the physical capital necessary to make and communicate information, knowledge, & culture**

Networked Information Economy

- **The most important inputs, into the core economic activities, of the most advanced economies, are widely distributed in the population**
 - **Computation and communications resources**
 - **Human creativity, intuition, experience, and motivation**
 - **Non-fungible, individual, unique**

Networked Information Economy

- The most important inputs, into the core economic activities, of the most advanced economies, are widely distributed in the population
- **Behaviors once on the periphery: social motivations, cooperation, friendship, decency, move to the very core of economic life in the most technically and economically advanced societies**

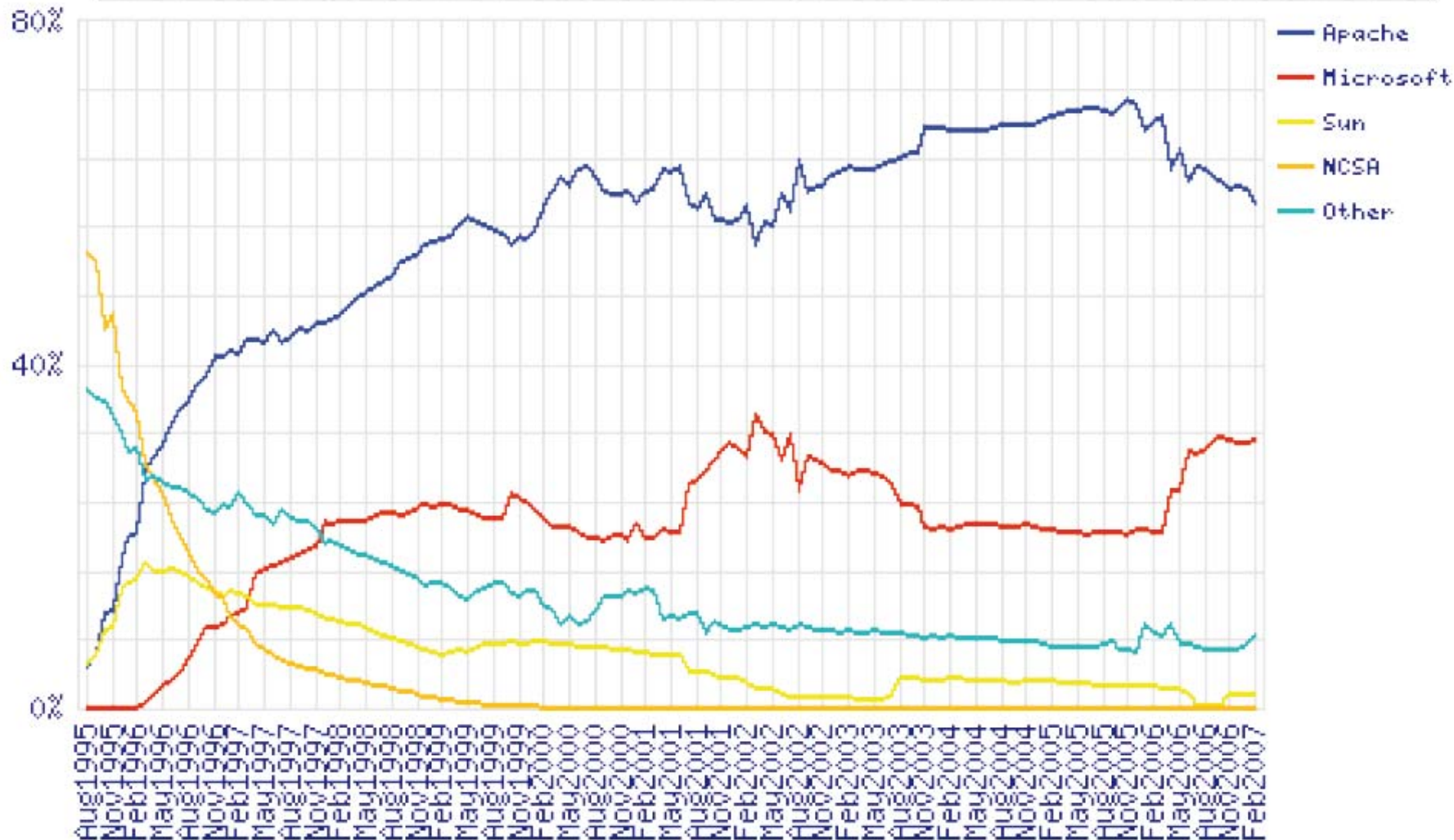
Commons-based production

- **Production without exclusion**
 - From inputs
 - From outputs
- **Individual or collaborative**
- **Commercial or noncommercial**
- **Important because it decentralizes authority to act, paralleling what technology/economy has done for practical capacity to act**

Peer Production & Sharing

- **Peer production**
 - Large scale cooperation among human contributors
 - without price signals
 - or managerial commands
- **Sharing material resources**
 - Distributed computing (SETI@Home)
 - Wireless mesh networks
 - Distributed storage
 - Mixtures (like Skype)

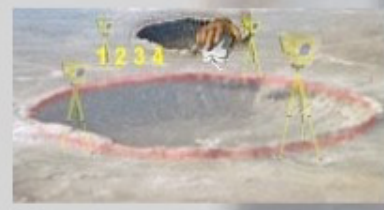
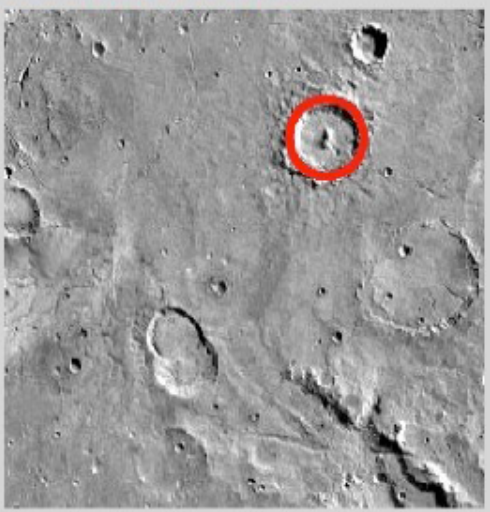
Free/Open Source Software



Apache market share 1995-02/2007 Source: Netcraft Survey March 2007

Mars Clickworkers

Your task:
Mark all craters
[\(training -- click here to do a real one\)](#)




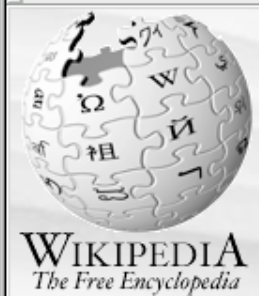
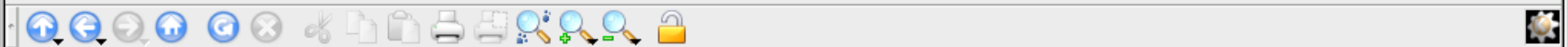
Pretty good.

See the circle you've drawn around your first crater.

Hint

Show me

Your task, should you choose to accept it: Click on four points around the rim of each crater. You may ignore craters that are smaller than this: 



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Science

From Wikipedia, the free encyclopedia

For the scientific journal named Science, see [Science \(journal\)](#).
The scope of this article is limited to empirical sciences. For mathematical sciences, see [Mathematics](#).



Science (from Latin *scientia* = *knowledge*) refers to a system of acquiring knowledge — based on [empiricism](#), experimentation, and methodological [naturalism](#) — aimed at finding out the [truth](#). The basic unit of knowledge is the [theory](#), which is a [hypothesis](#) that is predictive. The term *science* also refers to the organized body of [knowledge](#) humans have gained by such [research](#).

Most [scientists](#) maintain that scientific investigation must adhere to the [scientific method](#), a process for evaluating [empirical knowledge](#) under the working assumption of [methodological materialism](#), which explains [observable](#) events in [nature](#) as a result of natural causes, rejecting [supernatural](#) notions. Less formally, the word *science* often describes any systematic field of study or the knowledge gained from it. Particular specialized studies that make use of empirical methods are often referred to as *sciences* as well. This article concentrates on the more specific definition.

Science as defined above is sometimes termed [pure science](#) to differentiate it from [applied science](#), the application of research to human needs.

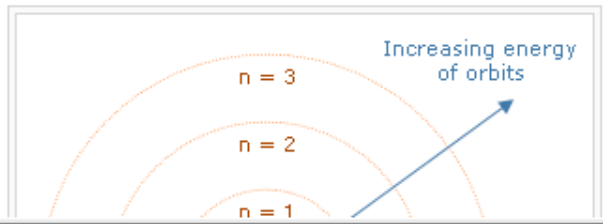
Fields of science may also be classified along two major lines:

- [Experiment](#), the search for first-hand information, versus [theory](#), the development of [models](#) to explain what is observed
- [Natural science](#), the study of the natural phenomena, versus [social science](#), the study of [human behaviour](#) and [society](#)

[Mathematics](#) is often referred to as a science, but the fruits of mathematical sciences, known as [theorems](#), are obtained by [logical](#) derivations, which presume [axiomatic](#) systems rather than a combination of observation and reasoning. Many mathematical methods have fundamental utility in the empirical sciences, of which the fruits are [hypotheses](#) and [theories](#).

Contents [hide]

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- 2 Etymology
- 3 Scientific method
- 4 Philosophy of science
- 5 Mathematics and the scientific method
- 6 Goals of science



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nature International weekly journal of science

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News

Nature 438, 900-901 (15 December 2005) | doi:10.1038/438900a

Special Report
Internet encyclopaedias go head to head

Jim Giles

Jimmy Wales' Wikipedia comes close to Britannica in terms of the accuracy of its science entries, a *Nature* investigation finds. UPDATE: see details of how the data were collected for this article in the [supplementary information](#).

One of the extraordinary stories of the Internet age is that of Wikipedia, a free online encyclopaedia that anyone can edit. This radical and rapidly growing publication, which includes close to 4 million entries, is now a much-used resource. But it is also controversial: if anyone can edit entries, how do users know if Wikipedia is as accurate as established sources such as Encyclopaedia Britannica?

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star wars movies, and the cover, and [Lawrence Krauss of the Physics of Star Trek](#) wrote a foreword.)

With that pedigree, I'm sure you'll want to read the rest of czarnecki's review, below.

([Read More...](#) | [6503 bytes in body](#) | [83](#) of [122](#) comments)

Just One Page a Day

Posted by [michael](#) on Friday November 08, @09:36AM
from the [stuff-to-read dept.](#)

[Charles Franks](#) writes "*Two years ago I started building an online proofreading system as a way to help Project Gutenberg (PG) get more books online: [Distributed Proofreaders \(DP\)](#). The concept is simple, we scan books and load the image and OCR output for each page into the online system. Next, proofreaders compare the OCR text to the image making any corrections as necessary, each page gets looked at twice. Finally the output from the site is massaged into a PG e-text and submitted to PG for posting to the archive. Now, nearly 600 books and a lot of PHP code later, we have snuggled into our new home which is graciously provided by the [Internet Archive](#) and [Project Gutenberg](#). Now that we have 'real' resources available to us (the original site ran on a Pentium 200 over my 128kbps upstream cablemodem) I would like to invite the online community at large to help us put even more books online. To this end I would like to ask everyone to do 'Just One Page a Day'. Thank you, Charles Franks*"



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Landshark

Posted by [michael](#) on Friday November 08, @08:54AM
from the [knock-knock-who's-there dept.](#)

An anonymous reader writes "*This has got to be, or will be when they actually make one, the coolest amphibious vehicle around. It's a [cross between a motorcycle and a jet ski](#), and it seats three. It can travel at 200 mph on land and 50 mph on water. Just what you need to get you from point A to point B.*"



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BSD: Accelerated nVidia Drivers for FreeBSD

Posted by [michael](#) on Friday November 08, @08:03AM

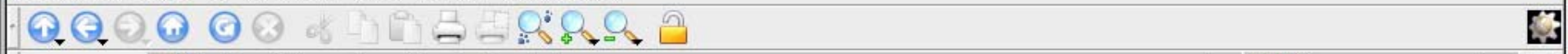
Pick your poison: [XML and Java, Developing Web Applications](#); [JavaScript: The Definitive Guide, 4th Edition](#); [Perl and XML](#); [Python Programming with the Java Class Libraries](#); and many more books on computer languages await.

You maintain an Internet hookup, or administer a database, or need wireless connectivity -- and you want these things to be secure? Guarantees are hard to come by, but check out readers' reviews of [O'Reilly's 802.11 Networks, The Definitive Guide](#), [Lance Spitzner's Honeypots: Tracking Hackers](#), and the excellent [Translucent Databases](#) from Peter Wayner.

Round out your reading with some books based on character, plot and vision -- for instance, see Brooks Peck's review of [Robert Charles Wilson's The Chronoliths](#), and Brooks Talley review of Stanislaw Lem's [Memoirs Found in a Bathtub](#).

Don't forget Matt Eberle's review of Alton Brown's [I'm Just Here for the Food](#), or timothy's take on Andrew Marlatt's [Economy of Errors](#).

Submitting your own review for consideration is easy, too! Just read the Slashdot [book review guidelines](#), and then use the [web submission form](#).



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Commons-Based Peer Production

- **Radically decentralized authority and practical capability to act**
 - **Peer production allows self-selection:**
 - Taps diverse motivations, particularly intrinsic and social-relational
 - Taps diverse insights, capability, availability, attention

Commons-Based Peer Production

- **Diverse cooperation platforms (integration)**
 - **Task construction=> cost of action**
 - **Modularity**
 - **Granularity**
 - **Integration**

Commons-Based Peer Production

- **Diverse cooperation platforms (integration)**
 - Task construction=> cost of action
 - Modularity, granularity
 - Self-selection
 - Communication
 - Humanization
 - Trust construction
 - Norm creation
 - Transparency
 - Monitoring/Peer review/Discipline
 - Fairness

Experimental literature
on cooperation and
reciprocity; game theory;
anthropology;
evolutionary biology

Commons-Based Peer Production

- **Diverse cooperation platforms (integration)**
 - **Task construction=> cost of action**
 - **Modularity, granularity**
 - **Self-selection**
 - **Communication**
 - **Humanization**
 - **Trust construction**
 - **Norm creation**
 - **Transparency**
 - **Monitoring/Peer review**
 - **Fairness**
- Crowding out/
money vs. Non-
monetary motivations
complicates design**
-
- ```
graph LR; A["Crowding out/
money vs. Non-
monetary motivations
complicates design"] --> B[Self-selection]; A --> C[Humanization]; A --> D[Trust construction]; A --> E[Transparency];
```

# Four transactional frameworks

---

---

|                      |                     |                                    |
|----------------------|---------------------|------------------------------------|
|                      | <b>Market-based</b> | <b>Non-market</b>                  |
| <b>decentralized</b> | <b>Price-system</b> |                                    |
| <b>centralized</b>   | <b>Firms</b>        | <b>Government;<br/>Non-profits</b> |

# Four transactional frameworks

---

---

|                      |                     |                                      |
|----------------------|---------------------|--------------------------------------|
|                      | <b>Market-based</b> | <b>Non-market</b>                    |
| <b>decentralized</b> | <b>Price-system</b> | <b>Social sharing &amp; exchange</b> |
| <b>centralized</b>   | <b>Firms</b>        | <b>Government;<br/>Non-profits</b>   |

# New competition

---

---

**P2P** → **Recording industry**

**Free/Open source software** → **Microsoft**

**Wikipedia** → **Grolier; Encarta**

**Skype** → **Telecomms**

# New opportunities

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**Well-behaved  
appliances  
(TVs; CD players)**



**Production tools  
(PCs; handhelds;  
wireless)**

# New opportunities

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---

Well-behaved  
appliances



Production tools

**Bifurcated  
consumer/  
infrastructure goods**

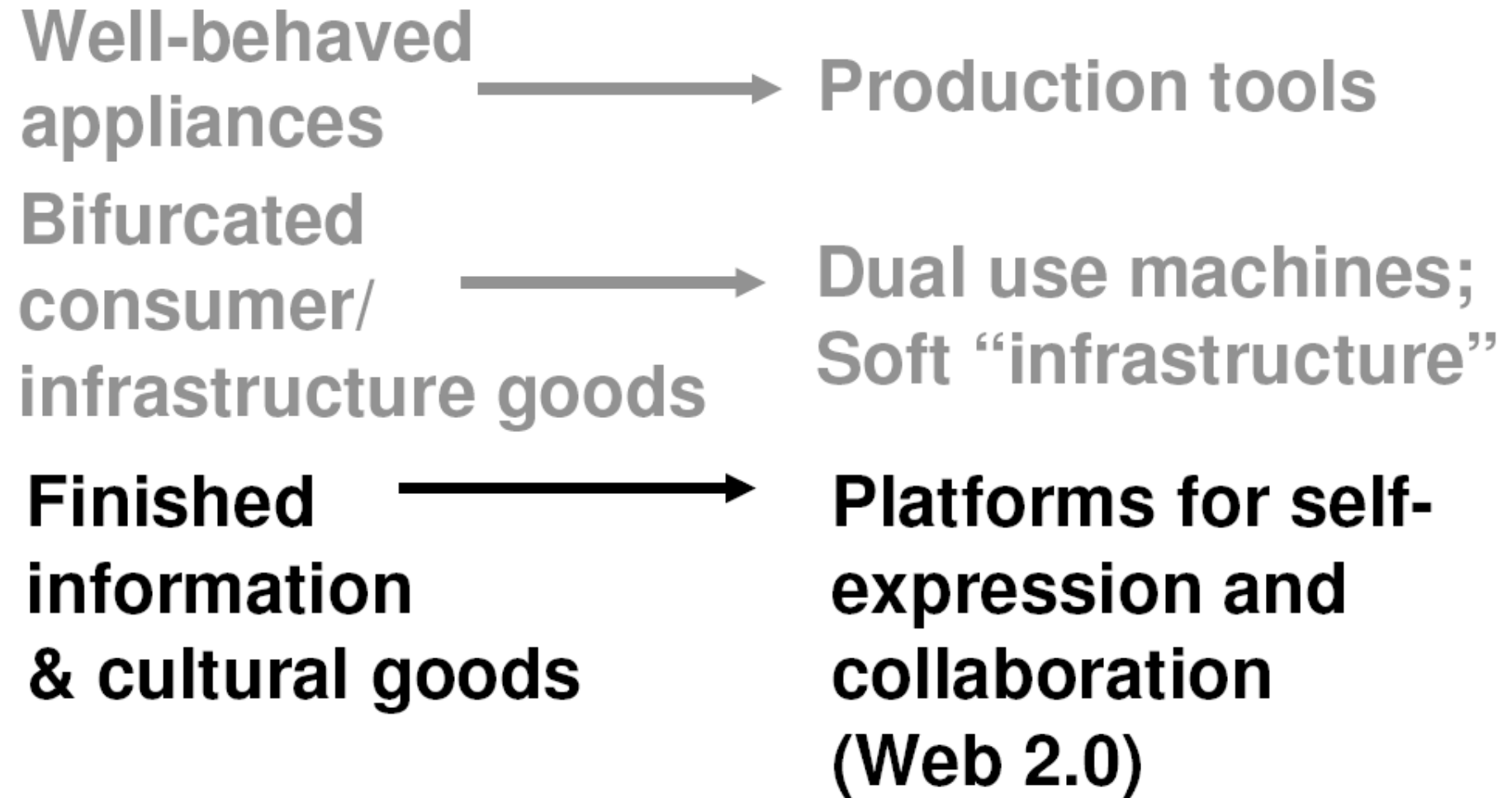


**Dual use machines;  
Soft “infrastructure”  
(WiFi, Skype)**

# New opportunities

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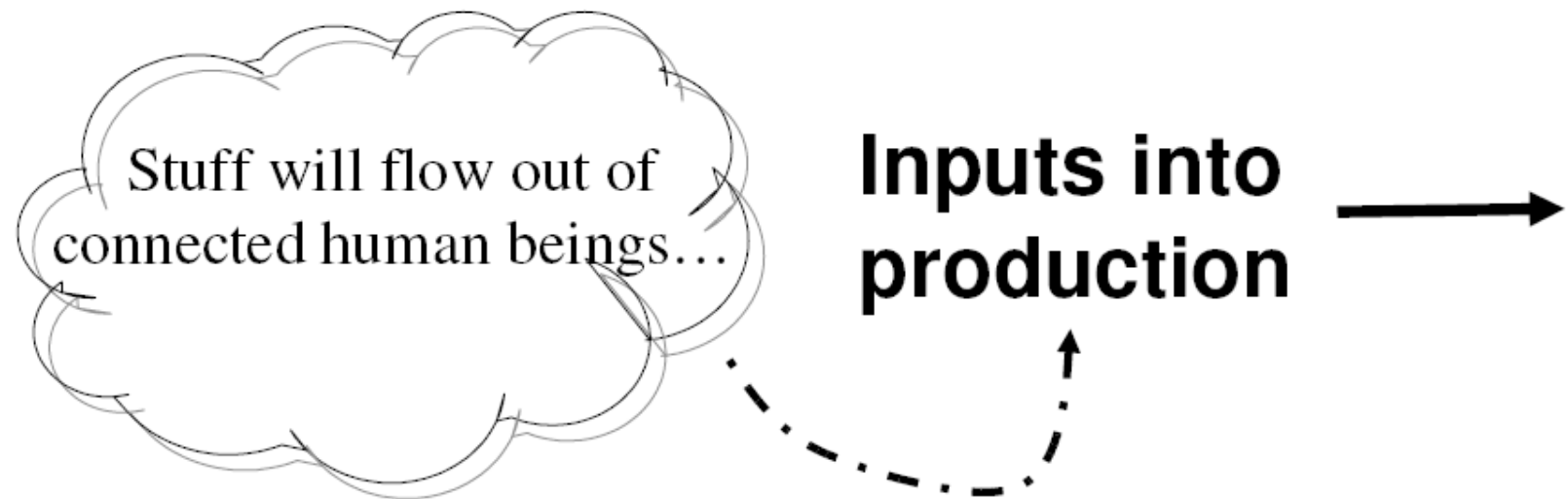


# New opportunities

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- “Surfers”



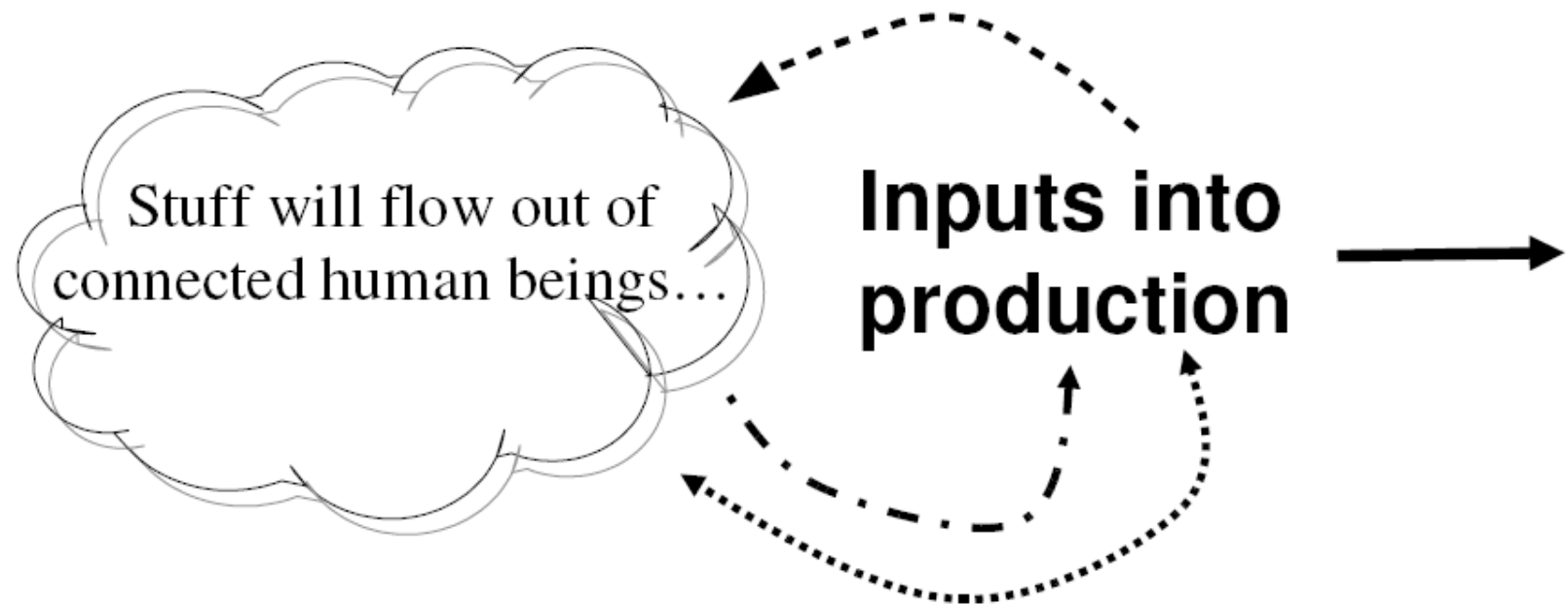


# New opportunities

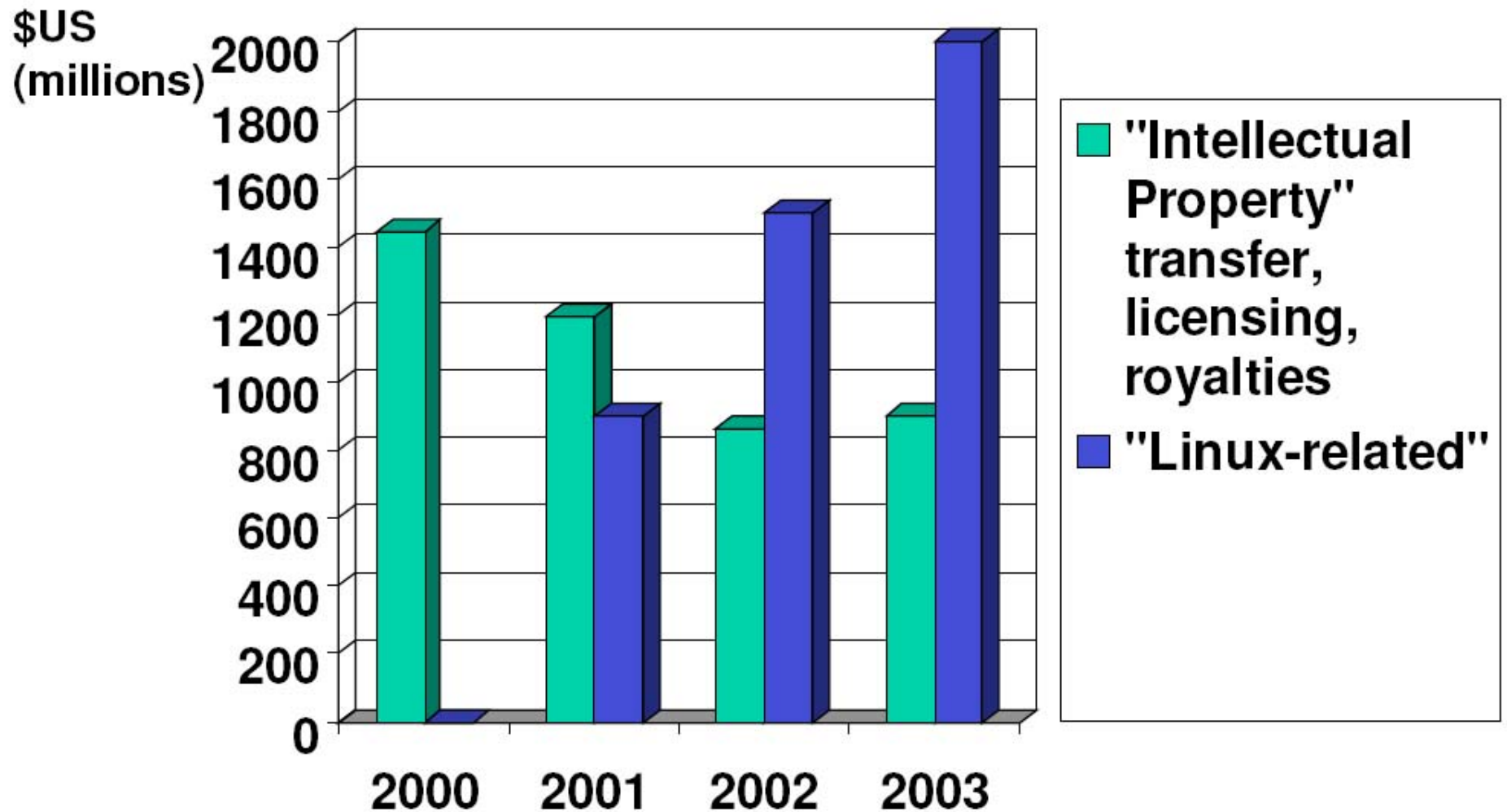
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- “Surfers”



# Selected IBM revenues



Sources: IP income: IBM annual reports

"Linux-related":

2003 Forbes Magazine, [http://www.forbes.com/forbes/2004/0607/086\\_print.html](http://www.forbes.com/forbes/2004/0607/086_print.html)

2002 CNET News <http://news.com.com/2100-1001-981633.html>

2001 CNET

<http://news.com.com/IBM%3A+Linux+investment+nearly+recouped/2100-1001-3-825723.html?tag=nl>

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by-pass infrastructure



500,000 servers



# London rocked by terror at

**At least two people have been killed and scores injured after three blasts on the Underground network and another on a double-decker bus in London.**

UK Prime Minister Tony Blair said it was "reasonably clear" there had been a series of terrorist attacks.

He said it was "particularly barbaric" that it was timed to coincide with the G8 summit. He is returning to London.

An Islamist website has posted a statement claiming it was behind the attacks.

Man of where the blasts happened





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# **Social Production**

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- **A real fact, not a fad: the critical long term shift caused by the Internet**
- **In some contexts more efficient than markets or firms**
- **Sustainable and growing fast**

# Social Production

---

---

- long term shift caused by Internet
- In some contexts more efficient than markets or firms
- Sustainable and growing fast
- **But a threat to, and threatened by, incumbent business models**
  - Intellectual property, telecomms, etc. are the battlefield over institutional ecology
    - focal points for political and social action
    - actual potential levers in the technical, social, and economic structure of communications

Politics



# Freedom & Justice

---

---

- **Autonomy**
  - people can do more for a by themselves
  - alone or in loose cooperation with others
- **Democracy**
  - Political public sphere
  - A critical culture
- **Justice & Development**

# Democracy

---

---

- **Our experience is purely with a mass mediated public sphere**
- **We will begin to learn what it means to have social production of the public sphere**

# **“Internet democratizes” & critique**

---

- **“Everyone a pamphleteer”**
- **First Generation Critique**
  - **Babel Objection**
    - **Fragmentation: The “Daily Me”**: public sphere disappears
      - **The culture of Web speech**
        - **mutual linking**
        - **“see for yourself”**
        - **aggregation and search capabilities (e.g. Technorati; MoveOn.org)**
      - **power law distribution of links**

# **“Internet democratizes” & critique**

---

---

- **“Everyone a pamphleteer;”**
- **First Generation Critique**
- **Second Generation Critique**
  - **Power law distribution of attention nullifies “everyone a pamphleteer”**
  - **You can talk, but no one will hear**
  - **Note: “solves” the fragmentation critique, but at the expense of losing the benefits of Internet technology**

# What is a power law?

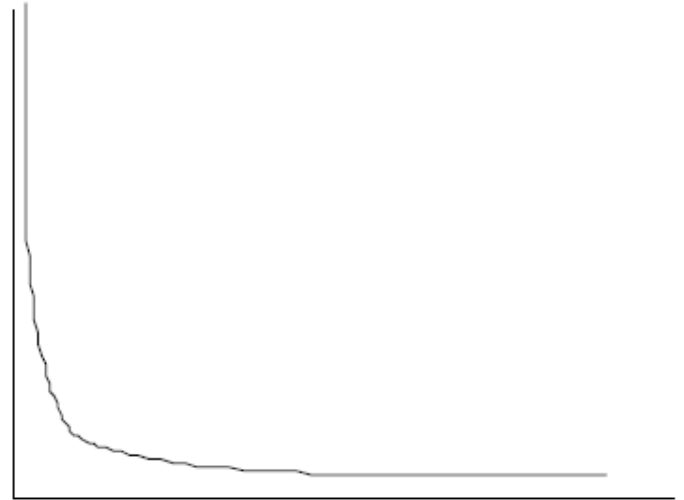
Number of  
websites



Number of links-in  
to a website

Normal distribution: A small number of sites have few or no links, a large number of sites have a moderate number of links into them, and a small number have a very large number of links pointing to them.

Number of  
websites



Number of links-in  
to a website

Power law distribution: A large number of sites have few or no links, a small number have a moderate number of links into them, a tiny number have a very large number of links pointing to them.

George Bush Don't Care About Black People

--Legendary K.O.

-->Kanye West *Gold Digger*

-->Ray Charles, *I Got a Woman*

--> More in James Boyle's musicological narrative of copyright, borrowing, and culture (not yet published)

# Justice

---

- **More of what makes for human welfare and development depends on information, knowledge, and culture**

# HDI and Information

---

**Health/  
Life expectancy**

**Education/  
Literacy**

**GDP per capita  
-- Growth**

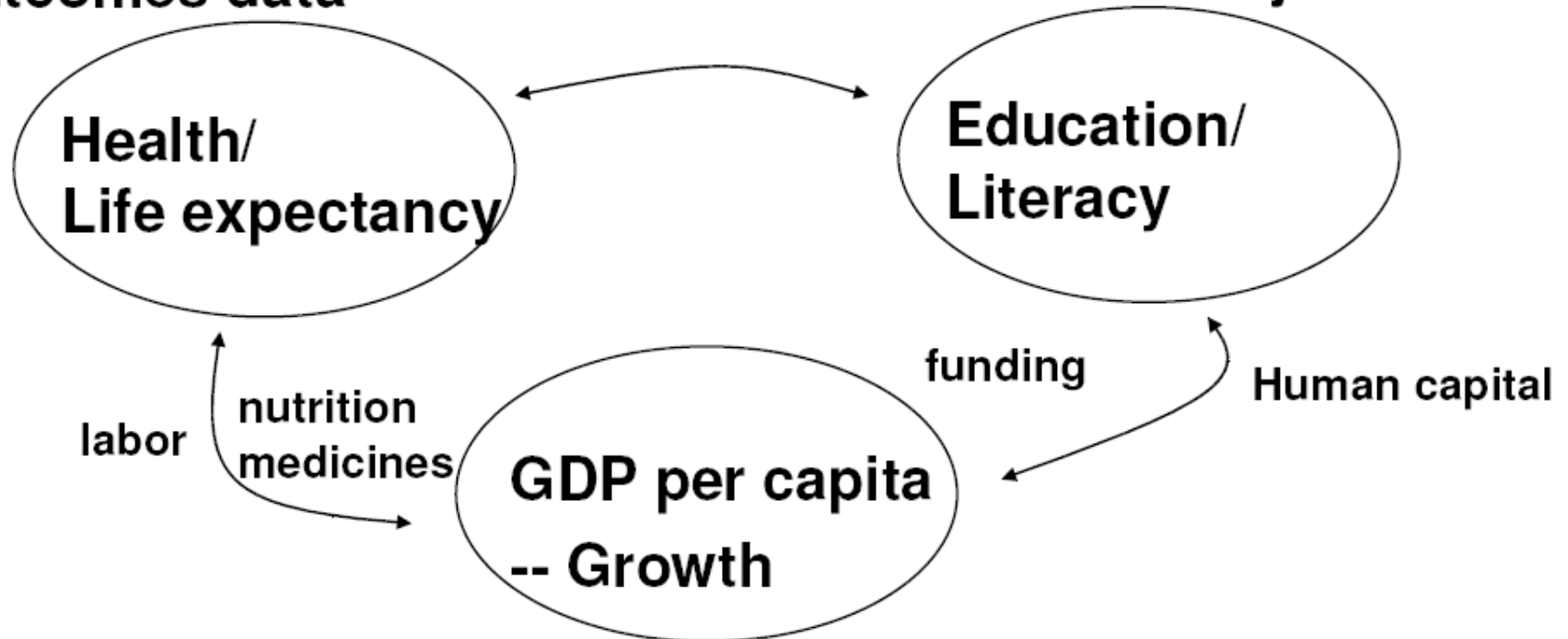


# HDI and Information

---

- Food security
- Medicines
- Research & journals
- Outcomes data

- Books, teaching materials
- Computation/communication
- Libraries
- Academic centers: journals



- Growth driven by innovation & information everywhere
- Particularly for latecomers: adopting best practices

# Justice

---

- More of what makes for human welfare and development depends on information, knowledge, and culture
- **Commons-based and peer production are beginning to help**
  - Free & open source software
  - Open academic publishing (learning materials?)
  - Open source agricultural innovation? BIOS
  - Bio informatics; HapMap project
  - Open source biomedical innovation?