

# The Advent of the Internet

**History of Information 103**  
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## Itinerary – 4/23

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What is "the internet"?

Technological roots

Economic consequences: disintermediation

The future(?) of news

Social consequences: the rise of "virtual communities"

Is the internet a community?



## Defining "the internets"

The "internet": a technology, a channel, a medium, a "place," a set of applications...?

Contrast "radio," "television" vs "video"



George Bush was right...



# A Convergence of Causes

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Technological developments

Policy choices

Economic forces

Infrastructure

e.g. Web presumes large number of pc's in place

Social responses



# Technological Bases of the Web

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Communications protocols/Packet switching

Physical Networks

Addressing system

Hypertext transfer protocols

Browsers/ Graphical browsers

Indexing & search

Broadband



# Technological Beginnings: 60s & 70s

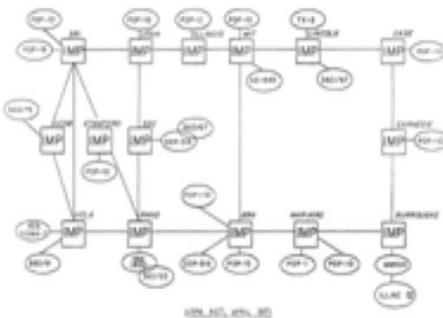


1969: ARPA (Advanced Research Projects Agency of DOD) (later DARPA) creates Arpanet, linking time-sharing computers at four research sites by telephone lines. Net makes use of packet-switching, rather than circuit switching, as with phone communication at the time.

1971: File Transfer Protocol (FTP) permits easy exchange of files between sites.

1974 Bob Kahn and Vin Cerf ("Father of the Internet") demonstrate Transfer Control Protocol, which enables machines to route & assemble data packets.

1974: Ethernet developed at Xerox Palo Alto Research Center (PARC), allowing communication among machines on local networks.



*Arpanet 1971*



## Internet Development:80s

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1980's: NSF funds national backbone to connect computer research centers. Other gov't-funded networks (BITNET, CSNET) emerge

1980's: Commercial networks begin to emerge

1983: Domain Name System (DNS) introduced to keep up with growing number of hosts, introduces domain names .com, .gov, .mil, .edu, etc.

Late 1980's: First Internet Service Providers emerge

1989: Australia, UK, Germany, Italy, etc. join Internet



# Internet Development:90s

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1990: ARPANET shuts down

**1991: NSF removes all restrictions on commercial use of Internet**

1992: Internet Society (ISOC) formed, assumes responsibility for fixing standards through the Internet Engineering Task Force (IETF), by now a voluntary organization

1995: NSF discontinues support of infrastructure

1998: Internet Corporation for Assigned Names and Numbers (ICANN) established to oversee assignment of domain names and IP addresses, formerly under control of US government. But Bush administration indicates intent to retain control in 2005.



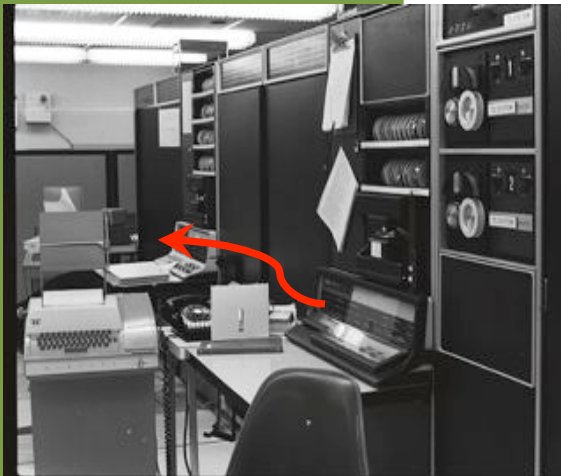


# The Origins of Email

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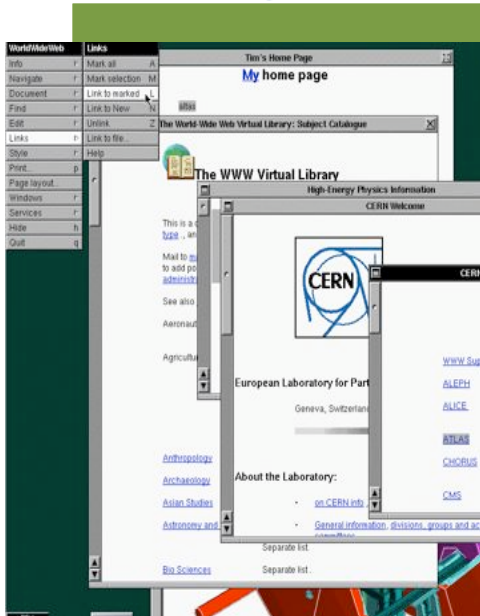
1971: First network email program created by Ray Tomlinson at Bolt, Beranek & Newman (BBN), with "USER@hostname.domain" addressing system.

But public access to email doesn't begin until 1988, when MCI mail is linked to the Internet





# The Emergence of the WWW



1945:Vannevar Bush writes "As We May Think" in *The Atlantic*; envisions Memex machine to follow links between documents on microfiche

1965:Ted Nelson coins the term "hypertext" to describe "compound documents" formed by links among documents

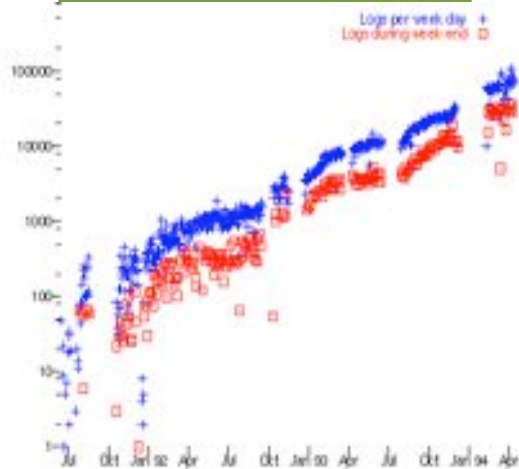
1990:Tim Berners-Lee of CERN coins the term "World Wide Web"; develops HTTP protocol for transmitting hypertext documents between clients and servers and first Web browser making use of hypertext links.

ca 1990-: Pay-based online services like AOL, CompuServe, and Prodigy market connectivity + proprietary content (games, chat rooms, e-commerce, instant messaging etc.) to users unfamiliar with computers, first for hourly and then for monthly fee. By 1998,AOL has 15m. members.





# The Growth of the WWW



1993: Mark Andreessen's Mosaic browser released by NCSA, which runs on Windows and permits easy integration of graphics in Web pages.

CERN announces that W3 technology will be available free to everyone.

1994: Over 200 HTTP servers; traffic on CERN server has grown 1000-fold since first launched. From the mid-90s on, Internet use roughly doubles every year.

1994: Andreessen, now in private sector, releases Netscape Navigator browser.

1995: Microsoft releases Internet Explorer bundled with Windows 95 to compete with Netscape.

1995 AOL makes Internet available to all subscribers



# The Addition of Search

LYCOS



YAHOO!



1991: Gopher, developed at U. Minnesota, creates searchable index of FTP sites

1994: Infoseek and Lycos search engines launched.

Jerry Yang and David Filo introduce Yahoo!, a directory of Web sites.

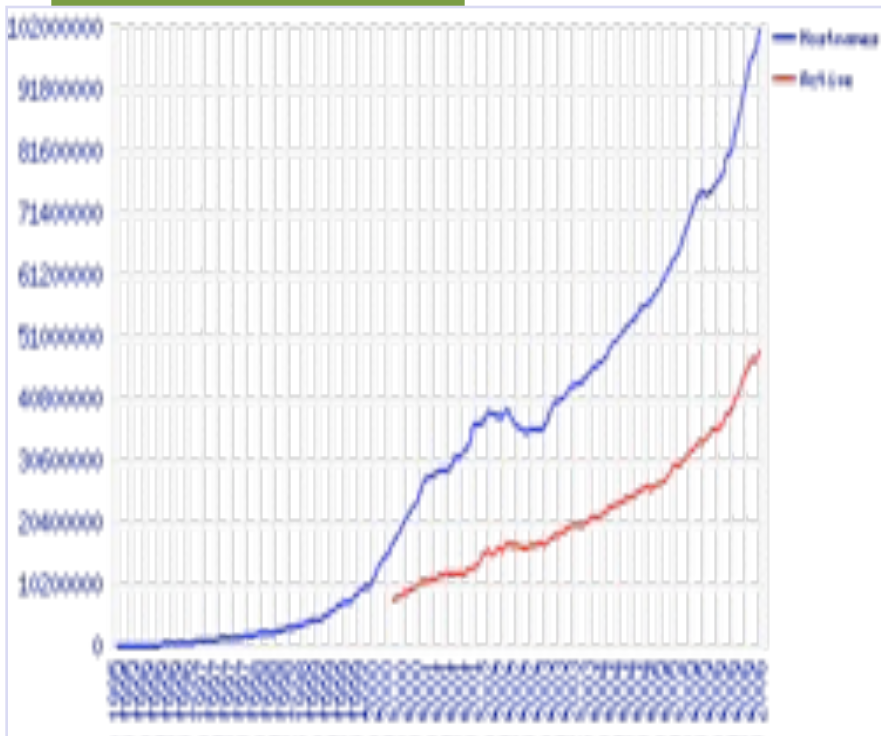
1995: AltaVista launched by DEC; company regards it as showpiece for its hardware

1997 Larry Page and Sergey Brin launch Google, which makes use of Page Rank algorithm to rank pages according to popularity.

1998: Goto.com (later Overture, later Yahoo! Search) introduces pay-per-click advertising



# The Web Takes Off



1994-2005: Internet use increases rapidly, driven by email, E-commerce, news & information, pornography & gambling. By 2005 there are an estimated 100m Web sites.

~2000- Growth of broadband enables exchange of audio & video content; blogs and social networking sites proliferate, etc.

2005: 68 percent of American adults and 90 percent of <sup>13</sup> American teenagers have used the Internet.



# The Promise of the Web

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# The Promise of the Web

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## Predictions that Internet/Web will:

Dematerialize online content ("end of the book")

"Disintermediate" commerce & discourse (eliminate the middleman, like retailers & wholesalers)

Destabilize the "old media"

Decentralize authority & permit ground-up social & political organization.

Create a new, global consciousness

Ensure the dominance of English as a world language



# **The Internet as Disintermediator**

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# Disintermediating Commerce

E-commerce is dominant or major channel

Downloadable products (software, mp3's, pornography)

Travel/event tickets/etc.

Retail stocks & investment products

Public records

Successful disintermediation

Books (new & used)

Some electronics & photo

Some apparel (c. 10-15%)





# Disintermediating Commerce

Limited or niche disintermediation

Real estate

Groceries & beverage

Automobiles

... but price information etc. is disintermediated in all markets





# Displacing "Old Media"

The screenshot shows the YouTube homepage with the following elements:

- Header: YouTube logo, "Broadcast Yourself", "Worldwide | English", and navigation tabs for Home, Videos, Shows, Channels, and Community.
- Categories: A list of content categories including Autos & Vehicles, Comedy, Education, Entertainment, Film & Animation, Gaming, Howto & Style, Music, News & Politics, Nonprofits & Activism, People & Blogs, Pets & Animals, Science & Technology, Sports, and Travel & Events.
- Featured Video: A video titled "Obama touts green jobs on Earth Day" with a thumbnail of Barack Obama speaking. The description reads: "The U.S. President called on Congress to pass comprehensive energy and climate change legislation to reduce U.S. oil imports and fight global warming." It includes a "4 Videos" link and credits to Reuters/Video, CBS, AFP, and Associated Press.
- Right Sidebar: A vertical list of video thumbnails with titles like "In T...", "D.C.", "Sri L...", "Bulg...", "Durh...", "Gam...", and "Tubr...".

The screenshot shows the Google News homepage with the following elements:

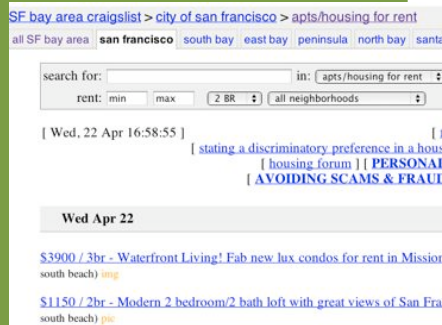
- Header: "Web Images Maps News Video Gmail more" navigation, the Google News logo, and search boxes for "Search News" and "Search the Web". A tagline reads "Search and browse 25,000 news sources updated continuously."
- Top Stories: A section titled "Top Stories" with a "u.s." filter and a "Go" button. It features several news items with thumbnails and brief descriptions:
  - GM to close plants for up to 9 weeks this summer**: "The Detroit News - 47 minutes ago. General Motors Corp. is expected to announce Friday it's cutting about 170000 vehicles from its planned production this year, closing factories for as long as nine weeks this summer as the automaker works to dramatically toughen its restructuring plan ... Sources: GM to shut most US plants up to 9 weeks. The Associated Press. GM plans extended shutdown of most US plants. AP story. Automotive News. WELAR - Wall Street Journal - The Business Insider - USA Today. #1373.news.articles."
  - FDA's Morning-After Pill Shift Stirs Debate**: "ABC News - 2 hours ago. By DAN CHILDS and LISA STARK. Seventeen-year-olds will be able to get the "morning-after" birth control pill without a doctor's prescription, a government health official said Wednesday. FDA says morning-after pill over the counter for 17-year-olds. CNN. Morning After Pill Cleared for 17-Year-Olds. New York Times. Reuters - Euronews - AEP - NY1. #1737.news.articles."
  - Bills spending stimulus dollars derailed from fast track in ...**: "Kansas City Star - 2 hours ago. ICEEERON.COM/CTV - Business. Why did the stimulus dollars get derailed from fast track in ..."
- Other News Items: "South Africa vote" (BBC News - 7 min), "Million claims of 'illegality', court to..." (guardian.co.uk - 3), "Apple gets huge" (CNNMoney.com -), "Apple happy with iPhone" (Apple Insider - 11), "Who Wants to be..." (Reuters - 1 hour a...), "Red Sox extend a..." (MLB.com - 3 hour), and "Anti-inflammatory..." (USA Today - 1 ho...).
- Bottom: "In The News" section.



# Challenges for the Old Media

Craigslist etc. divert classified advertising  
News aggregators, blogs & online sources  
capture audience

National sources displace local sources online.

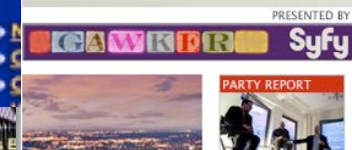




# The Disaggregation of Content



Specialized sites displace newspapers as sources of information about sports, business, entertainment, weather, listings, opinion, other traditional newspaper features (advice, puzzles, reviews).







# The end of the newspaper?

Why keep paper newspapers around?

"The newspaper model - putting text on paper - is becoming a dinosaur; much like the horse and buggy disappeared when the automobile came on the scene."





# The Future of News

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2008: "Free" newspaper readership exceeds paid readership

"We don't have a crisis of audience. We have a crisis of revenue."

"People are used to reading everything on the net for free, and that's going to have to change," Rupert Murdoch, 4/6/09



# The Future of News

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Economic models for digital newspapers or news gathering:

- advertising

- "pay wall" (WSJ) or "freemium" (NYT until recently)

- pay-per-view via microcredit

- monthly "all you can read" for group of publishers à la cable packages

- "tax" on ISP fees

- Subsidized foundations & universities