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# In, Out, and Beyond

Emerging Trends and Practices—What's Hot

...and the barriers to getting there



# What's Hot: Technical Side

- Grid computing, distributed processing
  - Uses geographically-dispersed, untapped processing power
  - Early example: SETI; now protein folding, etc.
  - Beneficial to *massive* processing tasks: weather/earthquake simulation. genome mapping
  - Requires very large bandwidth, effective ways of prioritizing across machines
- Web Services—classic “middleware”
  - Based in XML and object-oriented, often uses Java
  - A way to use a very high abstraction layer to permit platform-independent processing
- Conceptually, both of these build on existing paradigms...



# What's Hot: New Technical Paradigms

## ● The Semantic Web

- Identifies things not as series of characters, but as clusters of meanings
- Like Web Services, relies extensively on XML, especially metatags
- Metatags/metadata (“information about information”) can be entered by hand
- Better: use statistics to develop frequencies of co-location and proximity, then generate tags; Google has a crude version of this: ask for *cricket*, it might ask, “game or insect?”

## ● Systems that “learn” or are teachable

- Anticipation of user intentions (think of MS Office’s smarmy “Clippy”)
- Able to draw tentative conclusions, usually based on statistical analysis
- “knowbots” and search bots; some spam filters
- Use of fuzzy logic and natural language processing (NLP), but don’t overstate—tropes are subtle...

## ● Collective diagnostics and negotiation among systems—good, but very real security/access questions



# Beyond/Emerging on the Social Side: Cognitive Communities

- Defined: spacially dispersed people with like interests and ideas
- Precursors
  - Phoenecian traders, Catholic Church
  - Boyle's "Invisible University" of the Scientific Revolution
  - Texts as circulating artifacts which construct/ed communities
- The Web provides a very powerful platform for new communities
  - Top end: distributed cognition
  - More banally, knowledge & opinion development outside usual channels
    - Good example in the Howard Dean campaign, gay teens in Texas: "viral" phenomena
    - Scary: pedophiles, kiddie-porn rings: fuel for reactionary fantasies
- Is the Web, therefore, a platform for a new, emerging system of knowledge-making?



# What's Hot: The Social Side

- Peer-to-peer systems & the promise of **disintermediation**
  - Napster, Kaaza, of course: but add a rating system and...
  - A new model of knowledge-building: from the bottom, up
  - Imagine a music industry connecting artists and listeners directly
- Reputation systems: using large numbers of user ratings to establish reputations of vendors, politicians, ideas, etc.
  - Now vying with polling as a way to understand public perceptions
  - Problems with both representativeness and lurkers/manipulators
- Weblogs (blogs) & Wikis: chronologically-ordered & threaded discussions
  - Combined with rating/rep systems, a new way of building mind-share
  - Frequent problems of narcissism, voyeurism, and veracity; on wikis, a problem of rights to edit [Congressional staffers performing "spin" on Wikipedia]



# More of What's Hot on the Social Side: A “Social” Web/Net

- Technical basis in Web services, AJAX, and the like, which facilitate collaboration
- Part of “Web 2.0”
- Example: del.icio.us
  - Shared bookmarks
  - Emergent collaborative filtering
  - The development of a “folksonomy”



# A Nice Comparison Table...

<b>Web 1.0</b>		<b>Web 2.0</b>
DoubleClick	-->	Google AdSense
Ofoto	-->	Flickr
Akamai	-->	BitTorrent
mp3.com	-->	Napster
Britannica Online	-->	Wikipedia
personal websites	-->	blogging
evite	-->	upcoming.org and EVDB
domain name speculation	-->	search engine optimization
page views	-->	cost per click
screen scraping	-->	web services
publishing	-->	participation
content management systems	-->	wikis
directories (taxonomy)	-->	tagging ("folksonomy")
stickiness	-->	syndication

Source: Undetermined



# Technical-Social: GIS and the Making of New Visualizations

- New notions of ways to understand space
- Implemented through “layers”; examples:
  - Google Earth, integrating satellite images with local sites—restaurants, filling stations, etc.
  - Precision agriculture: use of GPS on tractors and GIS mappings of soil quality to meter fertilizer, etc.
- A new way to perform social analysis...
  - Many new sorts of correlation-generating: property values and voting patterns, incidence of cancers and location of toxic zones...
  - Method: create a place-based vector through the layers
- Morville and “ubiquitous findability
- But as always, massive effort needed to ingest and make compatible/readable many data sets



# Reactions to New Knowledge That's Outside the Usual Boxes

- Distrust of ideas that are out of control
  - Some are quite legit: few ways of judging truthfulness—Matt Drudge
  - Fear of rivals among gatekeepers of knowledge—women's, homeopathic or New Age medicine vs. AMA
- Fear campaigns led by established authorities
  - “In dealing with terrorism, it's important for us to explain to our nation that life is important. It's not only life of babies, but it's life of children living in, you know, the dark dungeons of the Internet.”—George W. Bush
  - Wide perception that the Web is full of cranks, perverts: CIPA
- Censorship



# But Wait: Is *All* Censorship Bad?

- Should we be libertarian—“anything goes”?
  - Brandeis’ famous inflection on free speech: can’t yell, “Fire!” in a crowded theater
  - Child porn *de jure* illegal; note laws on “hate speech.” Most of EU outlaws Nazi memorabilia and texts, including *Mein Kampf*
  - Should a dissertation that maps all the critical transportation and communication nodes in the US be freely accessible?
- Libraries: “Freedom to Read” vs. reading “trash”
  - What to acquire: Playboy? Hustler? The Anarchist’s Cookbook?
  - Dilemmas of acquisitions on a limited budget
- The Minneapolis Public Library case
  - Can sexually-objectionable content constitute a form of sexual harassment against librarians?



# Censoring the Internet

- Political censorship: Protecting dictators
  - China, Saudi Arabia with elaborate techniques to keep out democratic (or anti-regime, or pro-Israeli, or anti-Wahabbi) ideas
  - Prevents the transparency required for “clean” government, thus censorship protects crooks & kleptocrats
  - In trade relations, fosters an army of greedy intermediaries, thereby raising costs & risks—China is burgeoning perhaps only because labor is cheap and powerless
  - [Capitalism and democracy are *not* very tightly tied]
- Techniques for circumventing the political censors: SafeNet & TriangleBoy, even BitTorrent



# Censoring for “Moral Virtue”

- Earlier attempts to censor the Net in the US failed
  - Courts consistently ruled that such censorship ran afoul of the First Amendment (yet for demagogic reasons, such laws kept getting passed)
  - New strategy: deny federal funding to those Internet access venues (mostly libraries) who don't censor
  - Anti-Federalism by the back door, this approach was first used to force states to raise the drinking age
- Thus, the Children's Internet Protection Act (CIPA)
  - Upheld, 6-3, by the Supreme Court in last week of 2002-2003 term
  - Several opinions on the winning side conceded that though it was an unwise law (like Eldred), it is still constitutional



# Problems With Filters

- Filters presume that software can make moral judgment calls: seeking a technical solution to a non-technical problem
- Filters are often grossly inaccurate
  - Given the parlous state of image-recognition software, they rely on words, hence a common Net word for *porn* is “pr0n”
  - With text-based filtering, breast-cancer info and AIDs materials are often filtered: filters can not only be too free or too restrictive, but just plain wrong.
- Algorithms used in filtering software are proprietary and secret
  - Implementers of filters have no way of knowing or predicting what is getting filtered: ideological rivals can be secretly excluded
  - Given wide divergences in moral standards, no consistency



# Recent News on Censorship

- An 85-year-old granny sued Rockstar games, publisher of GTA-San Andreas for its pornographic easter egg. It turns out that she purchased the “not for those under 17” version for her 14-y.o. grandson. Hence extreme violence and shooting cops is OK, sex is not.
- MI recently passed a SB-0416, sponsored by Sen. Alan Cropsey (a 1975 graduate of all-white Bob Jones University and a winner of the NRA’s “Defender of Freedom” award). It provides civil & criminal remedies for acts of “dissemination of certain ultra-violent explicit matter to minors”. There is no extant scientific evidence to indicate that virtual violence leads to real violence. Evidently quasi-pornographic games are OK.
- Of course, the issue of MS, Yahoo, and Google working with the Chinese government—Yahoo turned over its own proprietary information which led to the 8-year imprisonment of a dissident



# Censorship by Another Name...

- Internet Service Providers (ISPs) are now making moves to block or charge for erstwhile open-access services
  - According to the the NY *Times* (2006-02-05), Yahoo, AOL, et al., want to back-charge businesses for sending email to the ISPs' clients
    - Rationale: to stop hinder spam
    - Reality: a way to get an additional revenue stream
  - Similarly, broadband ISPs such as Comcast and Time-Warner are rumored to be preparing to block competing voice-over-IP services
    - Comcast charges \$39.99/month for VoIP; SunRocket, for example, charges \$16.67/month for identical service
    - This is nothing other than a monopolistic move to get more money from subscribers, but they will probably need FCC approval to do it
  - Finally, broadband ISPs are also moving to block the use of BitTorrent, a file-sharing service
    - Rationale: band-width management, but this violates existing service agreements; also a purported "anti-piracy" move
- All such moves violate the standing "content-neutral" and "open carriage" principles of the Net



# What's the Message Here? You Decide, *Please!*

- At one extreme, one can argue that the **socio-technical** system of networked information is a life form, and that it will simply “evolve around” speedbumps that range from flaky technologies to narrow minds (watch the hackers...)
- At the other extreme, the new information order is chaotic, disordered, and rife with lurking dangers that must be countered in the name of public “health.”
- Yet maybe that frames the issue wrongly, as the “march of progress” versus the defenders of tradition... The resolution might be in a bit of pragmatism



# Major Issues Addressed: “In + Beyond”

- Integration of computation and Net-based communication
  - Technical side
    - Grid computing
    - Web Services and the Semantic Web
    - Systems that learn, are “trainable,” or self-healing; “knowbots”
    - Collective diagnostics
  - Social side
    - Peer-to-peer (p2p) systems
    - Reputation systems
    - 'blogs
    - Cognitive communities and other forms of emergent knowledge/intelligence
  - Technical *and* social sides
    - swarms and “smart mobs”
    - emergent socio-technical systems, from social networks to information-based compliance systems
    - GIS and “layered” data: a new approach to building knowledge
    - ubiquitous connectivity and ubiquitous “findability”