Web 2.0
CSE 454

AJAX Companies – Web 2.0??

- Writely
  - Collaborative editor
- gOFFICE
  - Desktop publishing, wordprocessor
  - Plans for spreadsheet & presentation authoring
- Numsum
  - Social spreadsheets
- Zimbra
  - Email client (but so is Exchange web client)
- Zazzle
  - T-shirt design

Web 2.0 Themes
(according to Tim O’Reilly; Chris Alexander)

- The Long Tail
- Data is the Next Intel Inside
- Users Add Value
- Network Effects by Default
- Some Rights Reserved
- The Perpetual Beta
- Cooperate, Don’t Control
- Software Above the Level of a Single Device

Evolution of Web 2.0

<table>
<thead>
<tr>
<th>Web 1.0</th>
<th>Web 2.0</th>
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<td>DoubleClick</td>
<td>Google AdSense</td>
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<tr>
<td>Obito</td>
<td>Flkier</td>
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<tr>
<td>Akamai</td>
<td>BitTorrent</td>
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<tr>
<td>eBay.com</td>
<td>MySpace</td>
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<tr>
<td>Enterprise Online</td>
<td>Wikipedia</td>
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<td>personal websites</td>
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<td>eBays</td>
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<td>directory (taxonomy)</td>
<td>tagging (&quot;folksonomy&quot;)</td>
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<tr>
<td>stickiness</td>
<td>syndication</td>
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</tbody>
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Web 2.0 Meme Map

Web as Platform ?!

- True for web 1.0 as well as 2.0
- Netscape
- Web services
  - Akami
  - Doubleclick
Leverage customer self-service to reach edge

- Aim for long tail, not the center
- Doubleclick
  - Over 2000 successful implementations
- Google AdSense
  - X00,000s of advertisers
- Ebay, Napster
- Akamai vs. BitTorrent

Principle: network effects from user contrib

- Service gets better the more people use it
- eBay
- Amazon reviews
- Wikipedia
- Del.icio.us & flicker – ‘folksonomy’
- Cloudmark – collaborative spam filtering
- Viral marketing in general

Architecture of participation

Ways to build a large database

1. Yahoo:
   Pay people
2. OpenDirectory:
   Get volunteers
3. Napster:
   Side-effect of other actions

Data is king

- SQL is the new HTML – Varian
  - Most web 2.0 companies are DB/service driven
- Who owns the data
  - Mapquest – early leader, but…
    - Competition licensed same data from NavTeq
  - In contrast:
    - Amazon licensed data from ISBN register RR Bowker
    - But they kept improving it: submissions, reviews, …
      - Embrace & extend!

Owning classes of core data

- Identity
  - Paypal, Amazon 1-click, Google cell-phone/gmail
  - Sxip.com – federated identity “Identity 2.0”
- Product identifiers
  - Amazon’s ASIN
- Calendaring
  - Eventful.com – Largest shared calendar
    - Wiki-style & with tagging
- Location
Perpetual Beta – end of software release cycle

- Operations must be a core competency
- Users as co-developers
  - Real-time monitoring & datamining
  - User testing
- Flickr – new builds every 30 minutes ?!

Cooperate, Don’t Control

- The Past
  - Microsoft: proprietary APIs
  - Netscape & MSFT: incompatible HTML tags
- The Future?
  - Mashups: Google maps & (craigslist, burglaries…)
  - RSS & REST encourage syndication
  - Design for hackability
  - Creative commons: “some rights reserved”

Software above the level of one device

- Success Stories
  - iTunes / iPod
  - TiVo
- The Future
  - Phones & cars report data (not just consume)
    - Real-time traffic monitoring
    - Flash mobs
    - Citizen journalism
    - (Harrassment)

Web Services: Vision Vs. Reality

- Complex XML Standards
- Static BPEL processes
- Point-to-point requests

Lightweight programming models

- Web Services too heavy
- Amazon web services
  - SOAP
    - Used by ToyRUs & big vendors
  - XML over HTTP using lightweight REST
    - Used by other 95%
- Loosely coupled systems
- Syndication, not coordination
- Design for ‘hackability’ – mashups
  - Low barriers to reuse: RSS, AJAX, … “some rights…"

Web 2.0 Themes (according to Tenenbaum)

- Participatory (P2P)
  - Blogs, wikis, social networking, RSS feeds
- Semantic
  - Tags, microformats, semantic web, vertical search
- Real time
  - Instant messaging, events (publish/subscribe)
- Pervasive
  - Billions of edge devices (gizmos) with substantial computing and broadband access – phones, cars, RFID readers…
- Community
  - Simplicity, Rapidity, Mass Collaboration, Empowerment
Wikipedia, The Free Encyclopedia

- 616,000 articles in English
- 314,293 registered users
- 1.8 million pages with ~10 edits each
- 4,700 new articles daily

Wikipedia Traffic

- 2nd most popular reference site [HitWise]
  - May ’05 (up from 13th Jan ’04)
- 1st in education / reference [Nielsen Netratings]
  - 289% annual growth in traffic
  - 12.8 M unique visitors [Sept ’05]
  - vs. 99.2 M for Yahoo!

Semantic: Tags

- A different way of organizing knowledge
  - Personal labels
  - Flat folksonomies v. hierarchical ontologies
  - Refined through mass collaboration

Tags for this photo:
- china
- shenzhen
- buildings
- urban
- fountain
- pyramid
- pool
- water
- skyscrapers
- park
- light rail
- development

Tags: Flickr

Tags: del.icio.us

Tags: del.icio.us
AI Opportunity: Folksonomies => Ontologies

Folksonomies: fuzzy, flexible, informal, human-oriented, no experts required

Ontologies: precise, inflexible, formal, system-oriented, experts required

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Microformats

- **Microformats** are simple, open data formats
  - E.g., people, friends, places, events, reviews, lists...
  - Humans first – machines later
- Explicitly encourage the “Spirit of the Web”
  - Decentralized development of content and services
  - Publish a review on your site, and it gets
    - discovered,
    - indexed,
    - aggregated
Microformats.org

Design Principles

- Solve a specific problem
- Start as simply as possible, and evolve
- Humans first and machines second
- Reuse existing widely adopted standards
- Modular and embeddable

Microformat Example: hCalendar (Events)

AI Opportunity: Semantic Highlighter

Datamining + ontology => Structured data

Exploit models of the domain and user to
- Mine the deep web
- Organize the results
- Draw inferences
Greasemonkey: Greasemap

Future: zBay: Blowing Up The Center

Future: zBay

Future: zBay

Future: zBay

Personal Agents

Future: zBay

Personal agents watch the market and take action for users.
Future: zBay

Trust services make use of reputations and reviews.

Semantic Web Revisited

Electronics Supply Chain

- It's about time
  - 90-180 day product cycles
  - Forecasting accuracy ~50%
- Instantaneous response to demand and supply signals
  - Stores, emarketplaces, suppliers, distributors, shippers...
  - News feeds, blogs
  - Real time "Edge sensors" (e.g., RFID)

Electronics Industry Supply Chain

Sense Plan Act Learn

- Fire at Heathrow
  - Oil hits $60/barrel

Electronics Industry Supply Chain

Sense Plan Act Learn

Supplier Network

I need a new supplier that can deliver 1,000 80 GB drives by Friday

Electronics Industry Supply Chain

Sense Plan Act Learn

Supplier Network

Who has 80GB drives in stock?

Electronics Industry Supply Chain

Sense Plan Act Learn

Supplier Network

500 drives available in Dallas, 700 in Denver, 300 in Chicago
500 drives available in Dallas, 700 in Denver, 300 in Chicago

Delivery available from Denver and Chicago!

Here's a new service for rush orders

I've found these suppliers to be reliable

Blogs shows lots of interest in 80GB iPods

10,000 80GB drives are available at 60% off
### Implications
- Business process transformation
- Disaggregate service chains and re-aggregate around information chains
  - Improve business agility, streamline operations, and generate new revenue
- New business models
  - Blow up center, reverse the arrows (e.g., zBay)
  - Everyone an Amazon, eBay, CBS...
  - Reselling K processes on eBay

### Semantic Web 2.0 Wiki
- Slides
- People, projects, papers, companies...
- Public discussion forum
- Open source research proposals
- Open source code libraries
  
  www.commerce.net/semweb2