4 Communities, the Web and Multimedia

Literature:

> T. Berners-Lee: Weaving the Web. Texere 2000
>
> T. O'Reilly: What is Web 2.0: Design Patterns and Business Models
> for the Next Generation of Software.
> *Communications & Strategies*, No. 1, p. 17, 2007.
> (http://oreilly.com/web2/archive/what-is-web-20.html – 2005)

The Key Idea of the Web

- T. Berners-Lee: "Information Management: A Proposal".
  CERN March 1989

  "CERN is a model in miniature of the rest of the world in a few years time."

- Disussions on Mosaic browser, 1993:
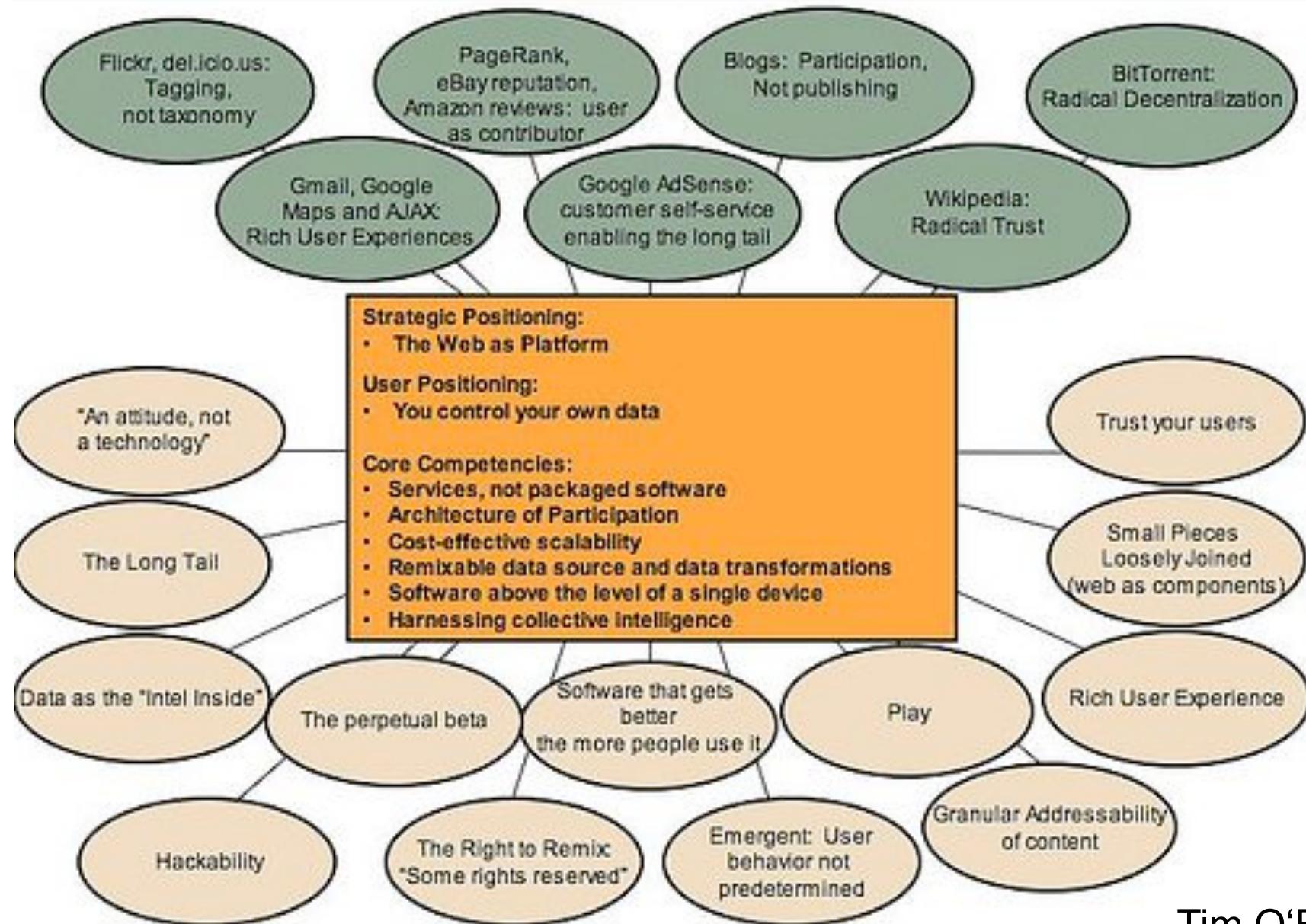
  "I ... made my now-standard case for making the Mosaic browser an editor,
  too. Marc [Andreessen] and Eric [Bina] explained that they had looked at that
  option and concluded that it was just impossible."

  (Weaving the Web p. 77)

- Tim Berners-Lee on the future of the Web:

  "My hope and faith that we are headed somewhere stem in part from the
  repeatedly proven observation that people seem to be naturally built to
  interact with others as part of a greater system."

  (Weaving the Web p. 223)

Generations of the Web

- Web 0.5
  - 1988-1995
  - Only predecessors of WWW exist
- Web 1.0
  - 1996
  - Static HTML pages, few publishers - many readers
- Web 1.5
  - 1996-2001
  - Dynamic Web pages, E-Commerce
- Web 2.0
  - 2005?
  - Collaboration, communities
  - Openness, standardization, liberty

Web 2.0 Meme Map

Flickr, del.icio.us: Tagging, not taxonomy

PageRank, eBay reputation, Amazon reviews: user as contributor

Blogs: Participation, Not publishing

BitTorrent: Radical Decentralization

Gmail, Google Maps and AJAX: Rich User Experiences

Google AdSense: customer self-service enabling the long tail

Wikipedia: Radical Trust

Strategic Positioning:
- The Web as Platform

User Positioning:
- You control your own data

Core Competencies:
- Services, not packaged software
- Architecture of Participation
- Cost-effective scalability
- Remixable data source and data transformations
- Software above the level of a single device
- Harnessing collective intelligence

"An attitude, not a technology"

Trust your users

The Long Tail

Small Pieces Loosely Joined (web as components)

Data as the "Intel Inside"

The perpetual beta

Software that gets better the more people use it

Play

Rich User Experience

Hackability

The Right to Remix "Some rights reserved"

Emergent: User behavior not predetermined

Granular Addressability of content

Tim O'Reilly

What is the Meaning of „Web 2.0" ?

- O'Reilly Conferences 2004/2005/2006
    - Tim O'Reilly, Dale Dougherty
    - Similar conference titles exist, e.g.: „Where 2.0" (geospatial web)
- Basic question for the conference:
    - Which ideas have survived the burst of the dot-com bubble?
    - Creating the next wave out of the remains of the last
- „Web 2.0" has become a „buzzword"
    - Extremely rapidly...
    - There is no agreed definition
- The conference lives on
    - Web 2.0 Summit (http://www.web2summit.com)

Two Aspects of Web 2.0

- ## Social Aspect
  - Collaboration
  - User-Generated Content

- Technical Aspect
  - Huge bandwidth, therefore graphics, audio, pictures, videos…
  - Web browser as a universal platform for application software
  - Increasing interactivity in the browser
    » Presentation based on server-side data (e.g. PHP, JSP, JSF)
    » Direct response to user reactions (JavaScript, Flash, Silverlight, …)
    » Asynchronous interaction (Ajax)
    » Real-time data (Reverse Ajax, Comet)
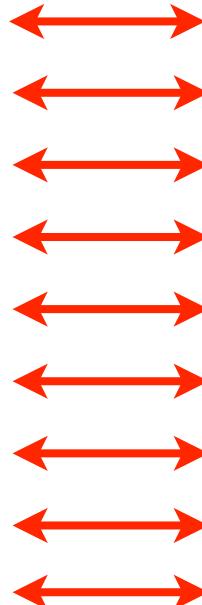
Comparison by Examples

Web 1.0

– DoubleClick

– Ofoto

– Akamai

– mp3.com

– Britannica Online

– Personal homepage

– Personal bookmarks

– Content management

– Taxonomy

Web 2.0
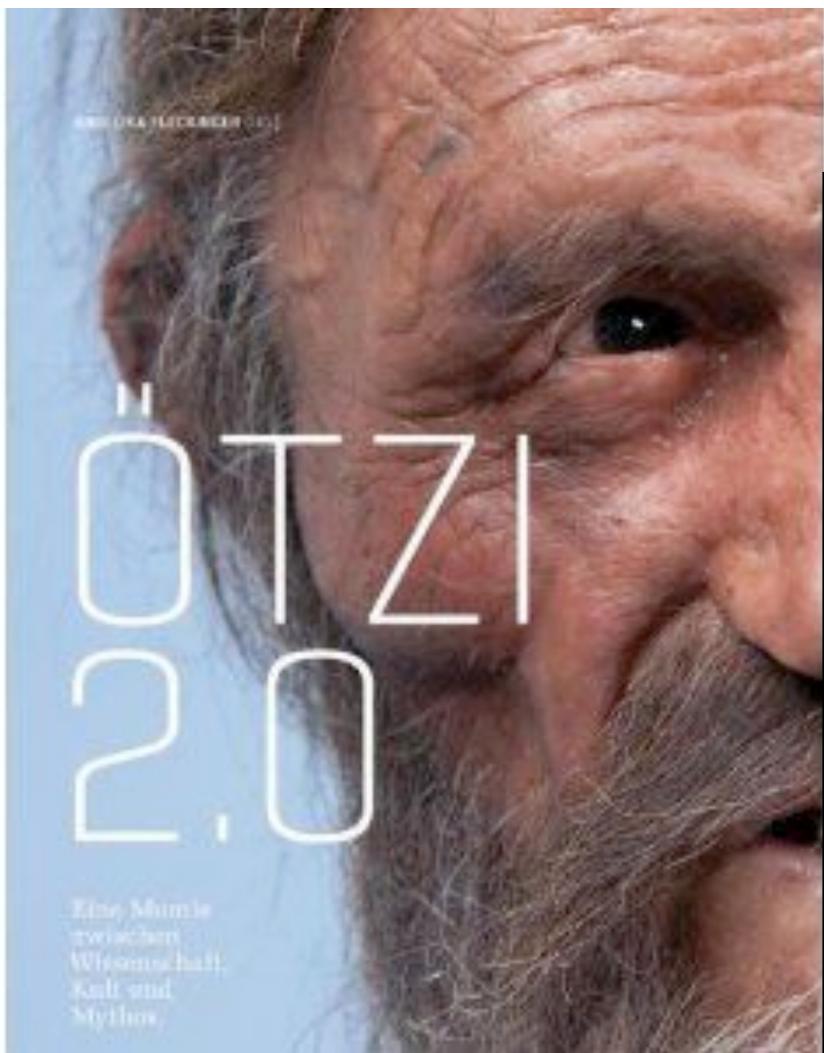
– Google AdSense

– Flickr

– BitTorrent

– Napster

– Wikipedia

– Blogging

– Del.icio.us

– Wikis

– Folksonomy

Web 2.0 Principles

- Web 2.0 is about harnessing collective intelligence!

- Reach out to the entire Web, to the edges and not just the center, to the long tail and not just the head.

- The service automatically gets better the more people use it.

- Network effects from user contributions are the key to market domination in the Web 2.0 era.

- Web 2.0 companies build value as a side-effect of the ordinary use of their application.

- The race is on to own certain classes of core data
  (e.g. location, identity, calendaring, product identifiers)

- Consequences for software development:
  - Software will cease to perform unless it is maintained on a daily basis
  - Users must be treated as co-developers
  - Lightweight programming models and loose coupling are needed
  - Design for remixability

2.0 Everywhere!

WOLFGANG CLEMENT
FRIEDRICH MERZ

WAS JETZT ZU TUN

Deutschland 2.0

Internet-Protest
gegen Online-Überwachung

Buchtitel 2010

ÖTZI 2.0

Eine Mumie
zwischen
Wissenschaft,
Kult und
Mythos.

STASI 2.0

Buch von Angelika Fleckinger 2011
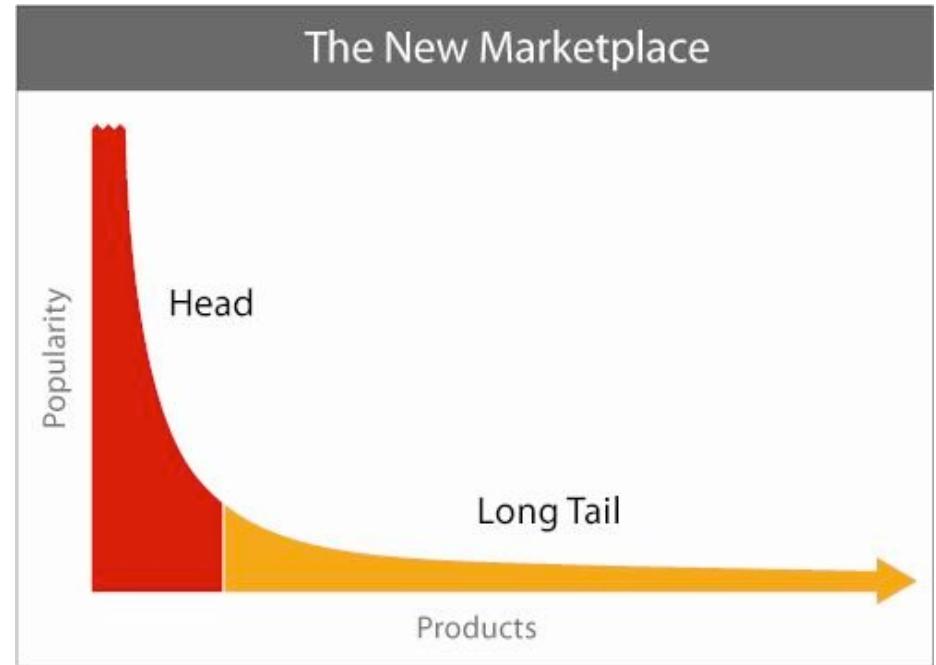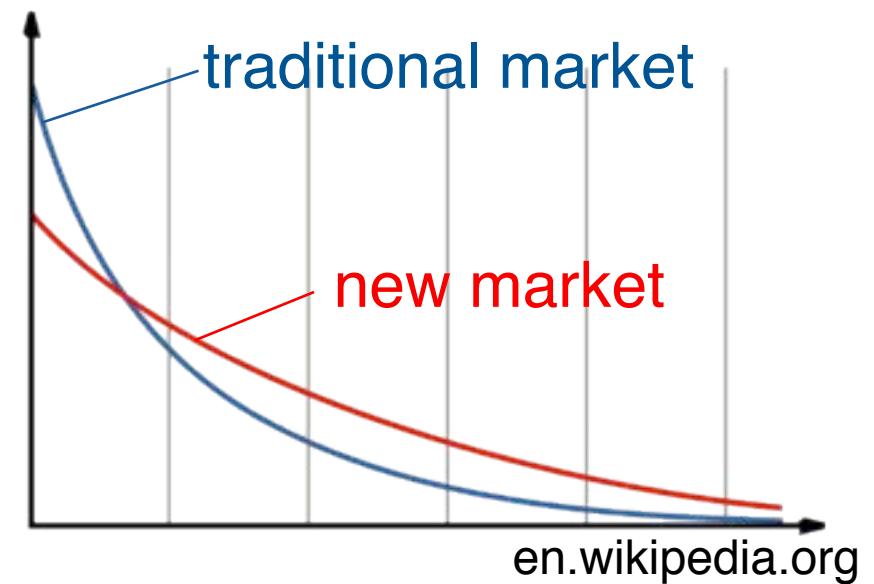
The Long Tail

- Clay Shirky 2003, Chris Anderson 2004:
  - "The future of entertainment is in the millions of niche markets at the shallow end of the bitstream" (Anderson)
- Business models for online sales:
  - Can create large revenue out of low individual sales for many niche products
  - Driven by low production and distribution costs
- Theory under discussion
  - Alternative: Pareto distribution
    20% of products give 80% of sales volume
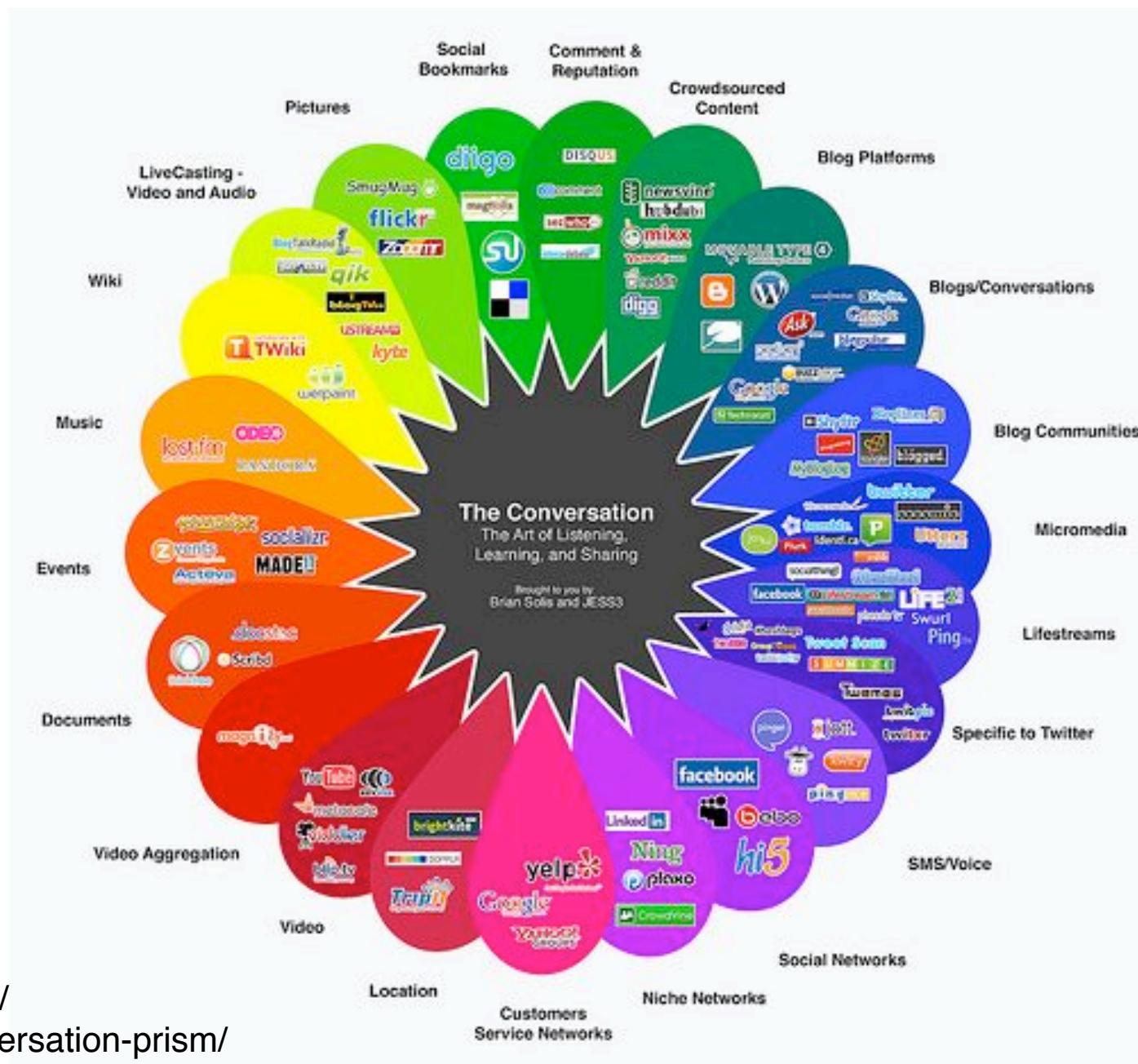
longtail.com

en.wikipedia.org

The Conversation Prism

Brian Solis

4   Communities, the Web and Multimedia

Literature:

      Eigner/Leitner/Nausner/Schneider: Online-Communities, Weblogs
            und die soziale Rückeroberung des Netzes,
            Nausner & Nausner 2003
      C. Stöcker: Die Zeit der Kopfjäger,
            Spiegel-online.de, 1. August 2006
      Brian Solis: The Essential Guide to Social Media
            http://www.briansolis.com/2008/06/essential-guide-to-social-media-free/

Social Networks, First Generation
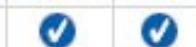
- College traditions:
  - Class listings, alumni listings, freshman listings
  - Personal profiles
  - Keeping in touch (classmate reunions)
- 1995: Classmates.com
  - German version: stayfriends.de
- Many similar platforms
  - E.g. facebook.com
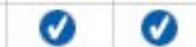
Leistungen	Basis	Gold
Klassenfoto einstellen und Mitschüler markieren	✓	✓
Aktives Auffinden selbst festlegen	✓	✓
Klassentreffen melden	✓	✓
Alle Klassentreffeninformationen einsehen		✓
Mit dem Organisator des Klassentreffens in Kontakt treten		✓
Mailingliste für Klassentreffen verwalten		✓
»Eigene Seite« anlegen und Profil erstellen	✓	✓
Fotos auf »Eigene Seite« hochladen	✓	✓
»Eigene Seite« von anderen komplett einsehen		✓
Fotos ansehen		✓
Nachrichten hinterlegen	✓	✓
Nachrichten lesen und beantworten		✓
Kontaktliste anlegen	✓	✓
Ein Poesiealbum führen	✓	✓
Jedes Poesiealbum lesen		✓
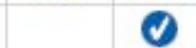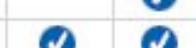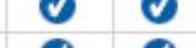
Social Networks, Second Generation

- From documentation of existing relationships to creation of new relationships

- General platform for self presentation
  - Easy way to personal homepage

- Examples:
  - MySpace.com
  - Friendster.com
  - StudiVZ.de
  - Xing.com (OpenBC)

- Establishment of "friend" link by mutual agreement

- Tracing of social network
  - 2nd degree contacts
  - Former colleagues

Einzigartige Suchfunktionen
- Finden Sie neue Vertriebskanäle, Mitarbeiter und Jobs
- Finden Sie schnell die richtigen Entscheidungsträger
- Erreichen Sie Ansprechpartner tausender Unternehmen

Xing.com

Holtzbrinck zahlt Millionenpreis für StudiVZ
03. Jan 2007 17:52, ergänzt 18:54

Der Verlagskonzern Holtzbrinck hat das Internetportal StudiVZ vollständig übernommen. Mehr als 50 Millionen Euro zahlte das Unternehmen für die Kontaktbörse.
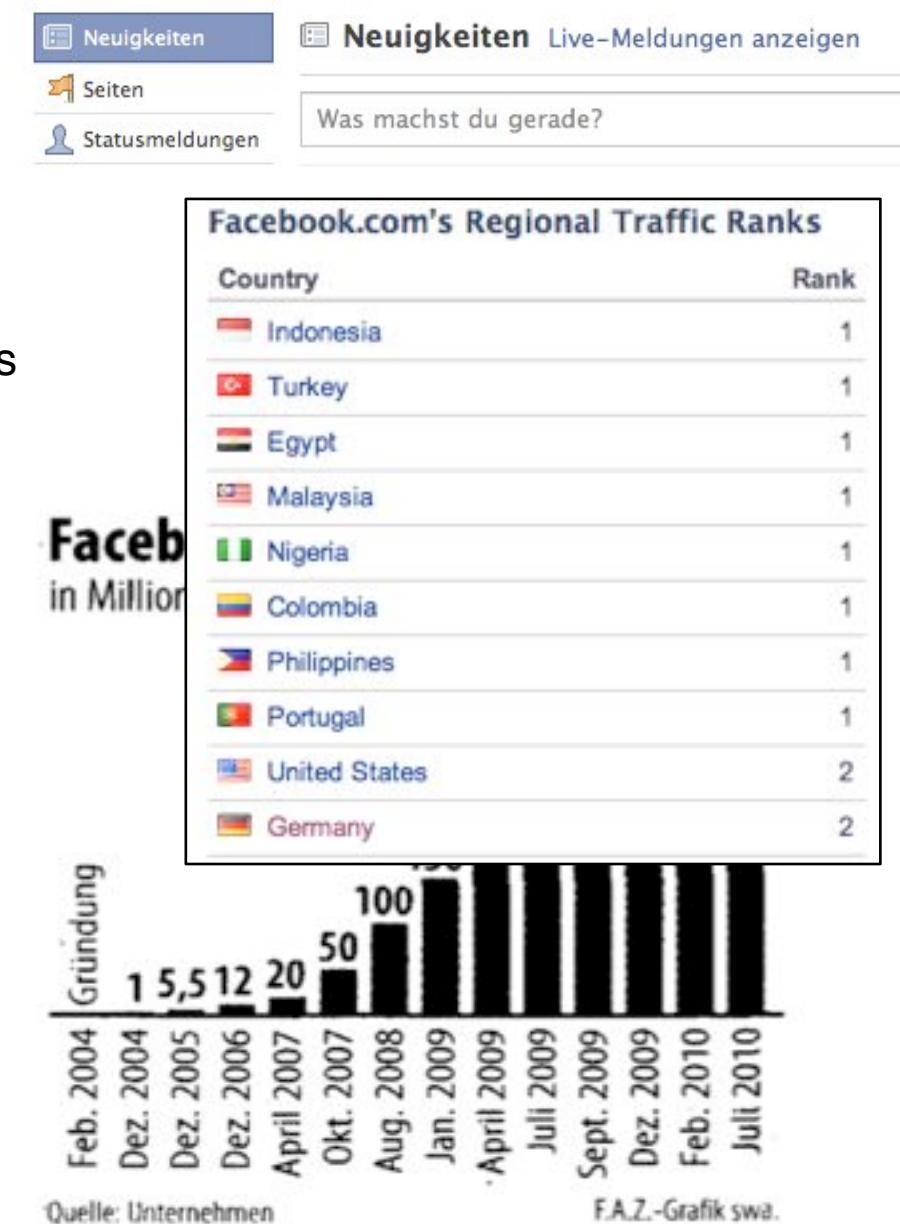
StudiVZ-Website
Foto: StudiVZ

Quelle: netzeitung.de

Example: facebook.com (1)

- History:
  - Mark Zuckerberg and friends, Harvard, October 2003:
    - » Facemash: Comparing student photos
  - Mark Zuckerberg, February 2004: "The Facebook" for Harvard students
  - Stepwise expansion to other universities, colleges and high schools
  - Sept, 2006: Open to everybody of age 13 and up
- Popularity:
  - Over 800 million active users (November 2011)
  - Alexa.com traffic rank:
    - » Sept. 2006: Traffic rank 60
    - » Nov. 2011: Traffic rank 2 (rank 2 in Germany, rank 1 in 8 countries)
  - Still high user growth

facebook | Startseite | Profil | Freunde | Postfach

Neuigkeiten

Seiten

Statusmeldungen

Neuigkeiten | Live-Meldungen anzeigen

Was machst du gerade?

Facebook.com's Regional Traffic Ranks

Country	Rank
Indonesia	1
Turkey	1
Egypt	1
Malaysia	1
Nigeria	1
Colombia	1
Philippines	1
Portugal	1
United States	2
Germany	2

Faceb
in Millio

Gründung 1 5,5 12 20 50 100

Feb. 2004 Dez. 2004 Dez. 2005 Dez. 2006 April 2007 Okt. 2007 Aug. 2008 Jan. 2009 April 2009 Juli 2009 Sept. 2009 Dez. 2009 Feb. 2010 Juli 2010

Quelle: Unternehmen | F.A.Z.-Grafik swa.

Example: facebook.com (2)

- Features:
  - Wall, Photos, Pokes, Status, Newsfeed, Notes (blogging), Gifts, Marketplace, Events, Video, ...
    » More than 250 million photos uploaded per day
- Facebook Platform:
  - May 2007: Software development platform (PHP5, JavaScript, ActionScript, ...)
  - Nov. 2007: 7,000 applications
    Nov. 2011: More than 7 million apps and websites integrated with Facebook
- Financial side:
  - 2007: Microsoft buys 1.6% share for $240 million
  - September 2009: First time positive cash flow
  - Value estimate 2010: $41 billion, 2011: $100 billion
  - IPO expected for 2012

http://www.facebook.com/press/
info.php?statistics
http://www.cnbc.com/id/43339651

BREAKING NEWS FROM CNBC'S KATE KELLY: FACEBOOK VALUATION COULD TOP $100B

Published: Monday, 13 Jun 2011 | 12:51 PM ET   ᴛT Text Size − +

By: Beth Goldman

Twitter 79   +1 0   LinkedIn   Share

Multimedia and Social Networks

- Obvious parts of homepage:
  - Personal photograph
  - Private pictures
  - Background music
- Copyright for all uploaded content owned by the user
  - User-generated (multimedia) content
- Legal trading of public domain music and videos
  - MySpace Music

Social Media

- Media consisting of user-generated (multimedia) content
- Classics: Flickr.com (photo), YouTube.com (video)
- Tagging
  - By originator
  - By others
  - Folksonomy
  - Tag clouds
- Comments
  - Discussion
  - Feedback
- Ratings
- Automation
  - Most recent, most popular

Tag cloud from Flick'r

All time most popular tags

amsterdam animal animals april architecture art australia baby barcelona beach berlin bird birthday black blackandwhite blue boston bridge building bw california cameraphone camping canada car cat cats chicago china christmas church city clouds color colorado concert day dc dog dogs england europe family festival fireworks florida flower flowers food france friends fun garden geotagged germany girl graduation graffiti green hawaii holiday home honeymoon house india ireland italy japan july june kids lake landscape light london losangeles macro march may me mexico moblog mountains museum music nature new newyork newyorkcity newzealand night nyc ocean orange oregon paris park party people phone photo pink portrait red reflection river roadtrip rock rome sanfrancisco school scotland sea seattle sign sky snow spain spring street summer sun sunset taiwan texas thailand tokyo toronto travel tree trees trip uk unfound urban usa vacation vancouver washington water wedding white winter yellow zoo

Giving, Exchanging, Buying

- Elementary way of exchanging goods
  - Reciprocal needs
- Buying:
  - Exchange is eased by money
- Media products may be different!
  - Artist has a need for being recognized, getting feedback
  - Consumer has a need for being entertained, informed
  - Reciprocal needs exist
- Amateur content producers
  - Do not in the first place expect revenue
  - "Giving" instead of exchanging
  - See Open Source software
- Global medium is more than its parts
  - Automatic creation of new valuable content by aggregation, filtering
  - "Wisdom of the crowd"

Social Bookmarks

- Organizing Web content:
  - Hierarchical directories, taxonomy:
    - » Gopher, Yahoo
  - Personal bookmarks
    - » Retrieval problem, metadata
  - Sharing platform for links to information in the Web
  - Classics: Del.icio.us, digg.com, spurl.net, furl.net (with archive)
- Tagging:
  - Adds a semantic dimension to Web search
- Browser extensions for keeping personal bookmarks on server
- Digg effect:
  - Small web sites becoming quickly popular – overload situations
- Overview paper (found via del.icio.us...):
  - http://www.dlib.org/dlib/april05/hammond/04hammond.html

Weblog, Blog

- Definition: A collection of chronologically (backwards) ordered, regularly added contributions to an umbrella topic.

  (adapted from Ebner/Baumann/Krcmar)

  – Traditionally: Contributions comment on one specific hyperlink

- Technical view:

  – Simple content management system

- History:

  – First online diary by Simon Gisler 1994 (according to Wikipedia)

  – John Barger 1997: Term "Weblog"; Term "Blog" since 1999 (Peter Merholz)

  – Huge popularity since 2002

- Platforms: e.g. wordpress.org, blogger.com

  – Links point to individual contribution and are permanent ("permalinks")

- Variants by media type:

  – Vlog, linklog, photoblog, moblog

- Problematic issues:

  – Borderline between advertisement, propaganda, free speech

  – Law violations, offensive statements

Blog as an "Oscillation Medium"

- Traditional web sites (including online versions of traditional media):
  - Closed content
  - Links mostly internal to web site
  - Plus a few "related links"
- Bookmark collections:
  - Completely open content
  - Only reference to outer location
- Oscillation media:
  - Both closed and open
  - Blog comments on a link and contains external links
  - Reader is "oscillating" between open and closed reading
    - » Shall I follow the link?
    - » Shall I read on?
  - Hypertextuality as a media creation force
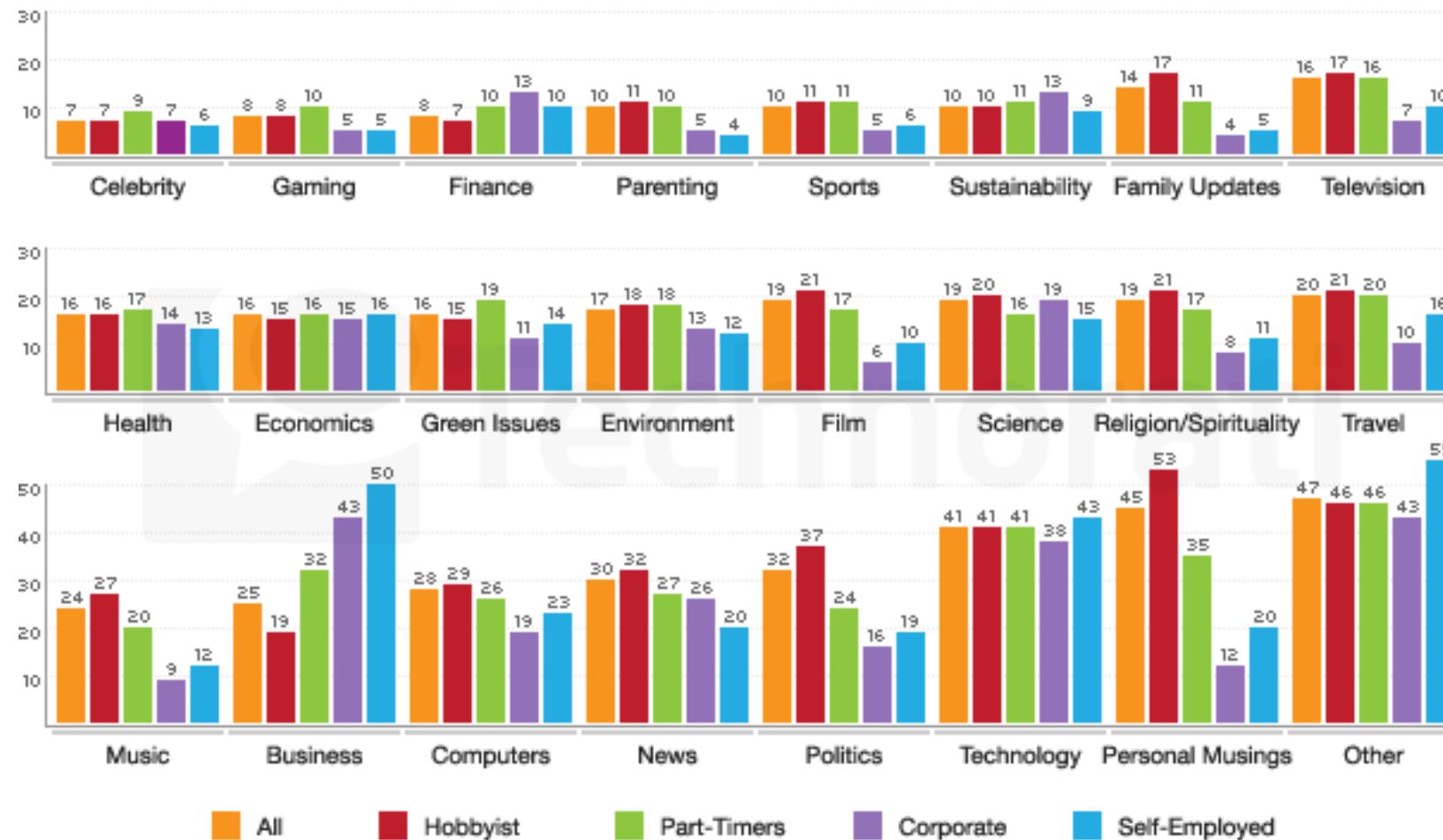
From Eigner et al p. 119

Reading and Writing, Talking and Listening

- Traditional cultural techniques: writing and reading
  - Mostly separated activities
- Blogging:
  - Writing as a continuation of reading (external trigger)
  - Reading as a continuation of writing (e.g. reading comments)
- A new cultural technique? (Eigner et al.)
  - Reading-writing-reading-writing-…

- Publishing in a blog is not speaking to an audience spreading a message (Brian Solis)
  - Listening, participation
  - Self-organizing cultures

Diversity of Blog Topics

What topics do you blog about?

Legend: All, Hobbyist, Part-Timers, Corporate, Self-Employed

Technorati.com State of the Blogosphere 2010

Blog Search

- Blog search engine
  - Combining information from many blogs
  - Including tagging, rating etc.
  - Examples: Technorati.com, blogsearch.google.com
  - Being expanded towards multimedia
    - » Counting links from blogs to music albums, videos, movies etc.

Microblogging

Anarchaia — Experimental, impressionistic sub-paragraph tumblin' (think obstsalat)

April 2005: Term "tumblelog"

- Tumblelog:
  - Relatively unstructured "stream of consciousness"
  - Small bits of information and media
- Simplified blogging platforms
  - Tumblr (2006)
  - Twitter (2006/2007)
- Microblog:
  - Brief updates (text or small media units), published on the Web
  - Submitted through various means, also from mobile devices
- Microblogs built into social Web platforms
  - "Status Update" on Facebook

Tumblr: Microblogging Done Right. — cnet

CEO Spotlight: Tumbling is a fast form of blogging, and it's catching on. — Forbes

tumblr.com

Real Time Media

- Current main example: Twitter
  - Search, analytics and social networks built around real-time communication
  - Triggering of innovations:
    - » Example: Shorthand URLs
- ***Everything in the world is now real time.***
  - Technically, it is no problem notifying the manufacturer *immediately* if a certain type of shoe is not selling at a certain shop.
  - "Houdini" system used by Obana campaigners

Podcasting

- "History":
  - Discussed since 2000, massive use since 2003
  - iPod & Broadcasting
  - Word of the year of the New Oxford American Dictionary 2005
- Media file distributed by subscription (paid or unpaid)
  - Playback on computers or mobile devices
  - Mainly audio, partly video information, may be any file technically
  - Automation of download by "feeds" (RSS or Atom)
- Often *User-Generated Content (UGC)*:
  - Amateur podcasts
  - Production of audio podcasts has minimal hardware/software requirements

Corporate Blogs and Podcasting

- Companies use blogs and podcasts for:
    - General information on company
    - Brand formation, general public relations
    - Topic blogs, campaign blogs
    - Knowledge distribution and customer service
    - Internal information channels (intranet blogs)
        - » Executive blog, team blog

- Problematic issues (for the company):
    - Negative image campaigns (e.g. attac)
    - Confidential or problematic issues discussed openly in internal blogs (e.g. cases of mobbing)
    - Danger of emotional escalations

- Future of communications for marketing (Brian Solis):
    - Listening is marketing. Participation is marketing. Conversations are marketing. […]

Peter Wolff: Die Macht der Blogs, Datakontext 2006

Context-Sensitive Advertisement

- Important source of revenue in Web 2.0 sites
  - Advertisement precisely targeted at customer
- Market leader: Google AdSense
  - Ad server operated by Google
  - Websites register with Google
    - » Advertisement placed based on analysis of content of page to be shown (Javascript)
    - » Generate revenue per click or per thousand impressions
  - Selection among relevant ads and order of ads by real-time auction
    - » Ads creating highest revenue are shown
    - » Using bid price of advertised and quality score of the ad (e.g. Click-Through-Rate)
    - » Paid price may be lower than the bid (minimal price to keep position on the list)
  - Advertisers arrange fixed budgets in advance
- See: http://www.google.com/adwords/displaynetwork/control-your-costs/pricing.html

Improper Placement of Advertisement (1)

LA Times,
7 July, 2009

jimparsons.posterous.com

Improper Placement of Advertisement (2)

http://img34.imageshack.us/img34/7545/bilddefail.jpg

4 Communities, the Web and Multimedia

Literature:

R. Yee: Pro Web 2.0 Mashups, Remixing Data and Web Services, Apress 2008
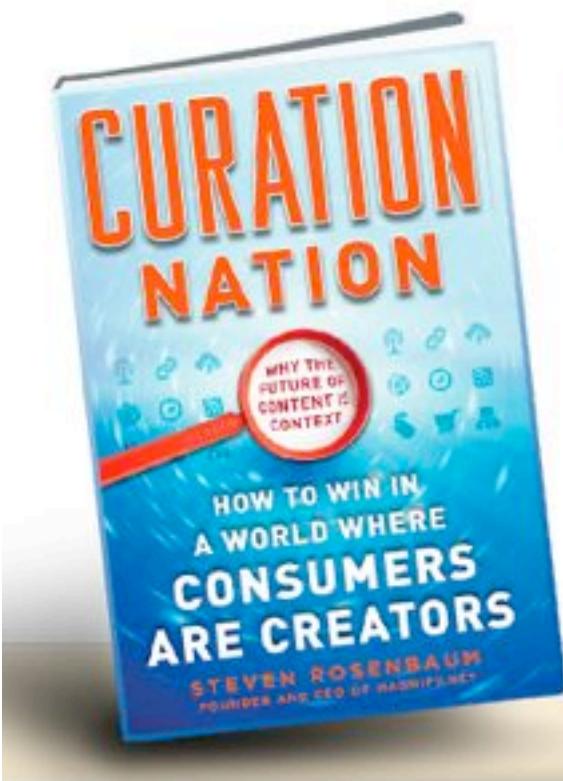
Content Aggregation, Indexing, Curation

- Content aggregation:
  - Combination of content on specific topics from various sources
  - Essential steps:
    Finding content (indexing), filtering content, publishing combined content

- Indexing:
  - May address different types of source (web, blogs, local sources)

- Filtering:
  - Automatic filtering
  - Careful manual selection of content: *Curation*
  - Community-based automatic filtering (voting, tagging, counts)

- Publishing
  - User-configurable content (personal news)
  - Syndication to other online media
  - Basis for non-online media (e.g. print media)

http://emediavitals.com/article/1005/how-publishers-curate-world-content

Curation

Steven Rosenbaum's Curation Nation

"With the explosion of content, curation is the next great frontier."

"Curation Nation is a must-read to succeed in this hyper-connected age where community and contribution is of utmost important to creating value and relevancy."

-Shira Lazar,
Creator / Host "What's Trending" CBS News

BUY THE BOOK   amazon.com   8ooceoread   BORDERS.   BARNES&NOBLE   BUY IN BULK

curationnation.org

Content Indexing + Automatic Filtering: Examples

hpana.com

News Curation Tools and Services: Examples

loud3r.com

daylife.com

Video Curation and Aggregation: Example

video.nymag.com

Print Media from Curated Online Content

In May 2010, we conducted a two-day media experiment. 8,000 people signed up, 1,500 submissions came in, 35 editors selected 70 pieces to fill a 60-page magazine.

People liked it. We broke our distributor's sales records, received positive reviews in The New York Times, PBS, and the Village Voice, and won a Knight-Batten Award for Innovation in Journalism. Here, we present selected work from the print edition of Issue Zero.

48hrmag.com

Content Sources
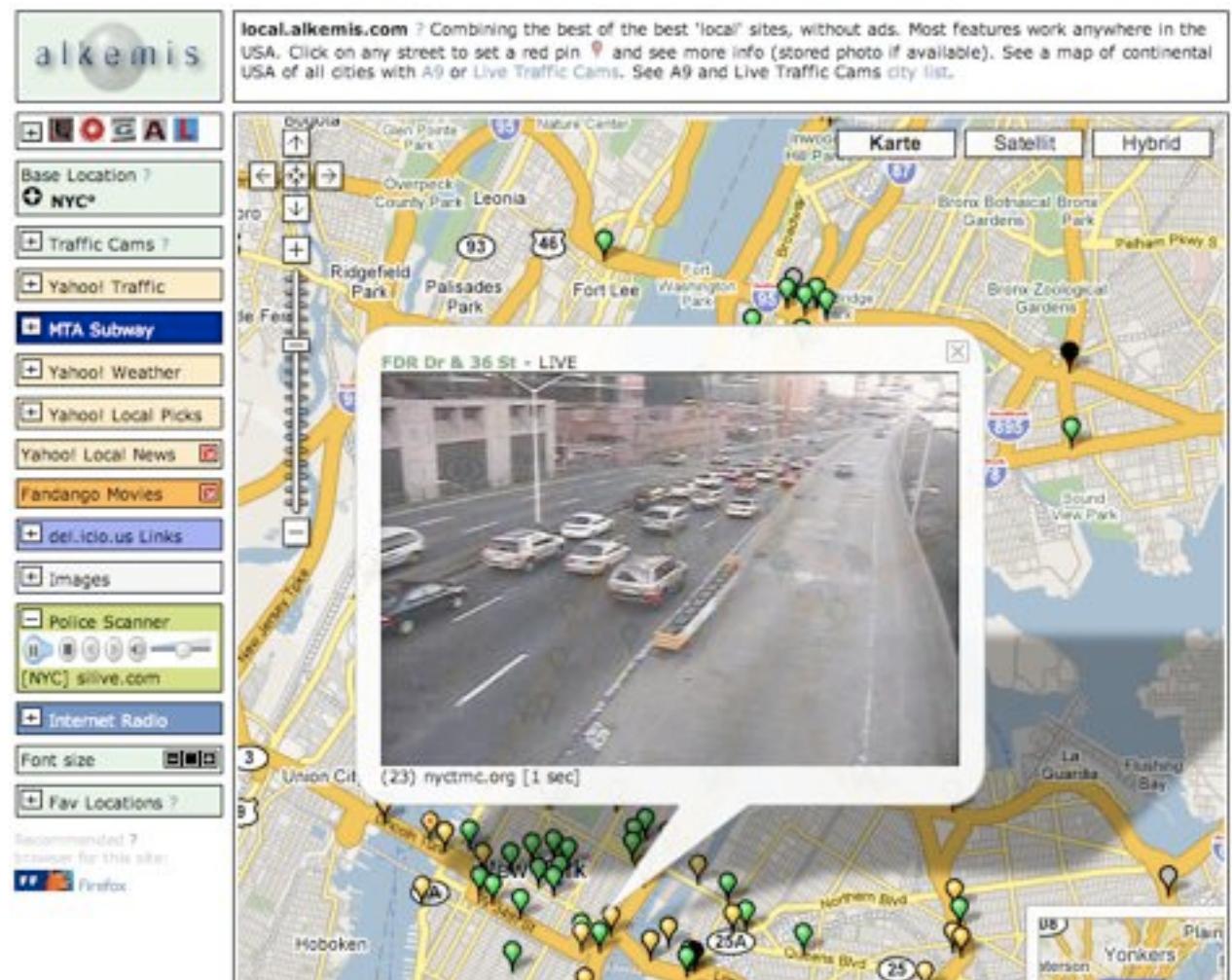
- Data feeds (XML files)
  - RSS (Really simple syndication)
    - » Channels and items
  - Atom, Atom Syndication Format (ASF)
    - » Successor for RSS
    - » IETF Standard
  - Proprietary file formats
- Database access
  - Often databases specific for application domain (e.g. in a company)
- Public Web Services
  - Access to information provided by large Web sites
  - E.g. Amazon, Google Maps
  - See later for details

Mashup

- Application integrating diverse Web content seamlessly
- Presentation screen and layout:
  - May be based on existing Web site
  - May be created specifically
- General architectural principle:
  - Web sites provide program access (API) over the Internet (Web Services)
  - Several Web Services are contacted and results are evaluated
- Basic alternatives:
  - Client-side mashup
  - Server-side mashup (more frequent)
- Various technologies for transmission/invocation:
  - REST
  - SOAP
  - XML-RPC

Example: Alkemis Local

- local.alkemis.com
- NYC live traffic cams
- Yahoo Traffic News
- Flickr images
- Del.icio.us links
- A9 Blockview photos
- APIs:
  - Amazon A9 OpenSearch
  - del.icio.us
  - Flickr
  - Google Maps
  - Yahoo Traffic
- See programmableweb.com

Web Service APIs

- Example: Flickr API

- Existing methods are grouped in packages

- For each method, allowed parameters are defined

- Often a registration key is required which has to be obtained from Web service provider

flickr.photos.getInfo

Get information about a photo. The calling user must have permission to view the photo.

Authentication

This method does not require authentication.

Arguments

api_key (Required)
Your API application key. See here for more details.

photo_id (Required)
The id of the photo to get information for.

secret (Optional)
The secret for the photo. If the correct secret is passed then permissions checking is skipped. This enables the 'sharing' of individual photos by passing around the id and secret.

people

- flickr.people.findByEmail
- flickr.people.findByUsername
- flickr.people.getInfo
- flickr.people.getPublicGroups
- flickr.people.getPublicPhotos
- flickr.people.getUploadStatus

photos

- flickr.photos.addTags
- flickr.photos.delete
- flickr.photos.getAllContexts
- flickr.photos.getContactsPhotos
- flickr.photos.getContactsPublicPhotos
- flickr.photos.getContext
- flickr.photos.getCounts
- flickr.photos.getExif
- flickr.photos.getFavorites
- flickr.photos.getInfo
- flickr.photos.getNotInSet
- flickr.photos.getPerms
- flickr.photos.getRecent
- flickr.photos.getSizes
- flickr.photos.getUntagged
- flickr.photos.getWithGeoData
- flickr.photos.getWithoutGeoData
- flickr.photos.recentlyUpdated
- flickr.photos.removeTag
- flickr.photos.search
- flickr.photos.setContentType
- flickr.photos.setDates
- flickr.photos.setMeta
- flickr.photos.setPerms

(excerpt)

REST (Representational State Transfer)

- REST is one of many possible methods to call a Web Service API

- History:
  - Roy Fielding 2000, Ph.D. thesis
    - » Analyzes and generalizes architecture of the Web

- Main features which made the Web architecture successful:
  - Identification of resources (in most cases by URIs)
  - Manipulation of resources through these representations
  - Stateless operation of server (regarding application state)
  - Hypermedia as base engine

- Applying REST to Web Services:
  - All resources on the server are identified by URI strings
    - » API method plus parameters coded in URI
  - Client uses only standard HTTP methods, mainly GET
  - Response contains clear metadata about the used language and an information body containing hyperlinks (to further resources)

- Atom feeds also provide a REST-based API

Example: REST Request/XML Response

- Request:

```
http://api.flickr.com/services/rest/
?method=flickr.photos.search&api_key=8c...93
&tags=puppy&per_page=3
```

- Response:

```
<?xml version="1.0" encoding="utf-8" ?>
<rsp stat="ok">
<photos page="1" pages="276125" perpage="3"
total="828375">
    <photo id="41150XXXX20" owner="41905YYY@N03"
        secret="13a...1c" server="2638" farm="3"
        title="MY PHOTO TITLE!" ispublic="1"
        isfriend="0" isfamily="0" />
    <photo id="4116JJJ47" owner="225GGG@N08"
        ... />
    <photo id="4176GGG653" owner="45HHHH06@N00"
        ... />
</photos>
</rsp>
```

SOAP and XML-RPC

- Remote procedure call (RPC):
  - Technology to execute a procedure (method) with certain parameter values on a different (remote) computer
  - Various technologies exist (e.g. CORBA, DCOM) outside the Web area
- Web Service Invocation:
  - Invoking a Web Service using Web standards
- SOAP (earlier acronym: Simple Object Access Protocol)
  - XML-based syntax for messaging between applications
  - Independent of transport protocol
  - Web Services are a special application of SOAP
  - W3C standard
- XML-RPC:
  - Similar to SOAP (somehow its predecessor)
  - Transport protocol is HTTP
  - Simpler but limited in functionality

SOAP Example

- From Flickr.com:

```
<s:Envelope
    xmlns:s=http://www.w3.org/2003/05/soap-envelope
    xmlns:xsi=http://www.w3.org/1999/XMLSchema-instance
    xmlns:xsd="http://www.w3.org/1999/XMLSchema">
    <s:Body>
        <x:FlickrRequest xmlns:x="urn:flickr">
            <method>flickr.test.echo</method>
            <name>value</name>
        </x:FlickrRequest>
    </s:Body>
</s:Envelope>
```

- SOAP makes use of XML namespaces
- Relatively high organizational overhead
- Compare equivalent REST request format

```
http://api.flickr.com/services/rest/
?method=flickr.test.echo&name=value
```

XML-RPC Example

- From Flickr.com:

```
<methodCall>
  <methodName>flickr.test.echo</methodName>
  <params>
    <param>
      <value>
        <struct>
          <member>
            <name>name</name>
            <value><string>value</string></value>
          </member>
        </struct>
      </value>
    </param>
  </params>
</methodCall>
```

- Simple structure, deep nesting, also large overhead

Conceptual Difference REST vs. SOAP/XML-RPC

- Tradeoff between
  - diversity of method names and
  - complexity of parameter structure

- Simple classical example
  - Special method name: fib
    - » Call: fib(13)
    - » SOAP style
  - Universal method name: exec
    - » Call: exec(fib, 13)
    - » REST style (GET is universal method name)

- Programs as data structures
  - Universal interpreter (compare Turing machine)
  - Basic idea of all current computer technology

API Toolkits
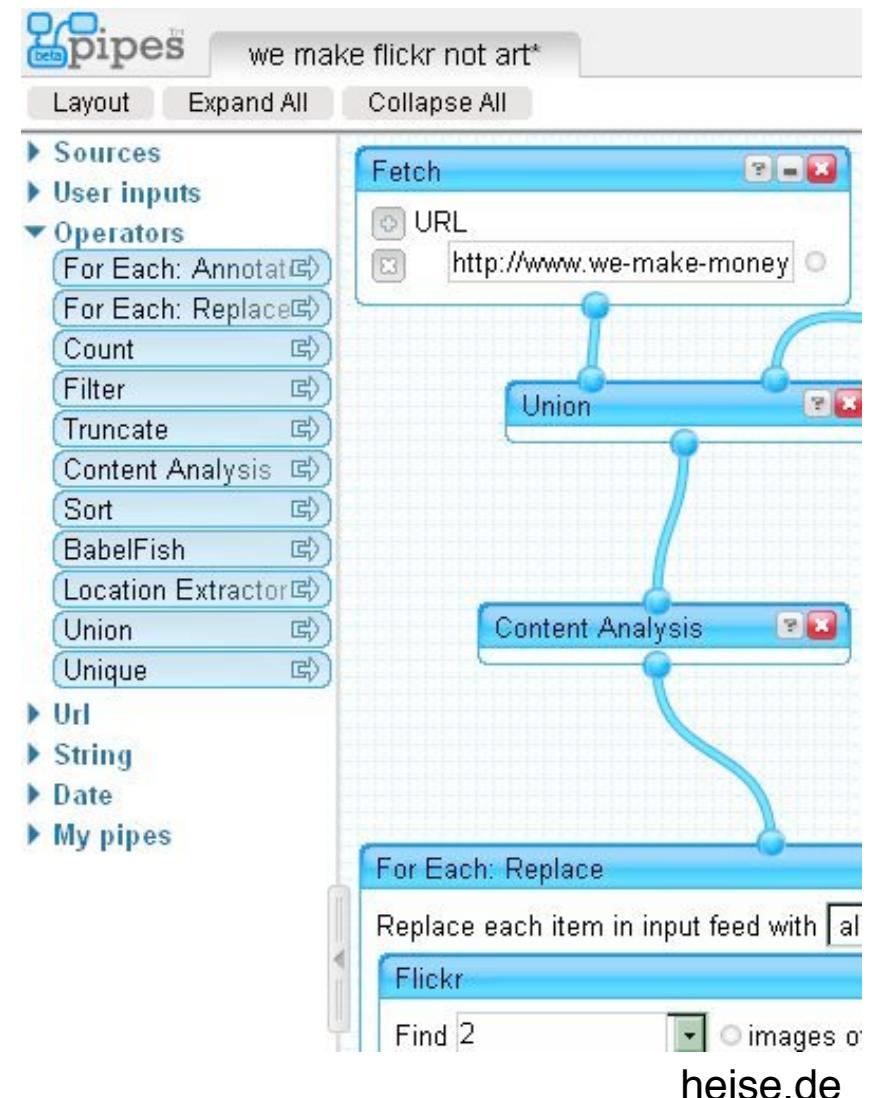
- Requests are constructed and responses are evaluated in scripts
  - Mostly server-side scripts, e.g. PHP
  - Constructing a request in PHP:
    `$content = file_get_content($url);`
  - Evaluating the response:
    XML parsing is standard part of PHP since version 5
- Simplifying development for specific API:
  API toolkits
  - Example: phpflickr.com
  - "Wrapper" around API functions and invocation
  - Direct PHP call to required functionality
  - Response processed and data array returned
    - » Example functions:
      `people_findByUsername(), getPhotos()`

Selected(!) API toolkits
for Flickr

ActionScript
- flickr api (docs)
- Flashr
- Flickr API Interfaces REST
- as3 flickr lib

C
- Flickcurl

Cold Fusion
- CFlickr

Common Lisp
- Clickr

cUrl
- Curlr

Delphi
- dFlickr

Java
- flickrj
- jickr

.NET
- Flickr.NET

Objective-C
- ObjectiveFlickr

Perl
- Flickr::API 0.03
- Flickr::Upload 1.06

PHP
- PEAR::Flickr_API
- phpFlickr

PHP5
- Phlickr

Python
- Beej's Python Flickr API
- flickr.py

Yahoo Pipes

- Example of a tool (Web application itself) for *data mashup* development:
  - Interactive feed aggregator and manipulator
- Graphical environment to
  - Fetch data from source
  - Extract data
  - Apply filters
  - Apply simple programming tools

heise.de

pipes.yahoo.com

Screenscraping

- Technically the following is possible (*"Screenscraping"*):
  - Send HTTP request from server script to a Web site
    (even if it does not offer a Web Service API)
  - Analyze the returned HTML code
  - Proceed depending on the result
- The script simulates a human person using a Web browser
  - "Web Robot"
  - Frequently used by search engines
- Most Web site providers do not agree with automated access
  - Dangerous in particular in the area of authentication
  - Recommendation:
    Check Terms of Use carefully, or better refrain from Screenscraping

4 Communities, the Web and Multimedia

Virtual Worlds

- Online communities and online games are merging
    - Example World of Warcraft
- Non-Game online communities with virtual world
    - Old idea, see
        - » Gibson: Neuromancer
        - » Stephenson: Snow Crash
    - Was tried several times, but this time a bit more successful...
- Secondlife.com
    - Created and run by Linden Labs
    - Sixteen million accounts (2009), twenty thousand concurrent users
    - Full virtual environment, avatars, extensive creative tools
- Many simpler virtual worlds
    - E.g. www.habbo.de
        - » Virtual hotel for kids

Example: Habbo.de

Second Life

Linden
Gallery
Of Resident Art

http://video.google.com/videoplay?docid=-5182759758975402950
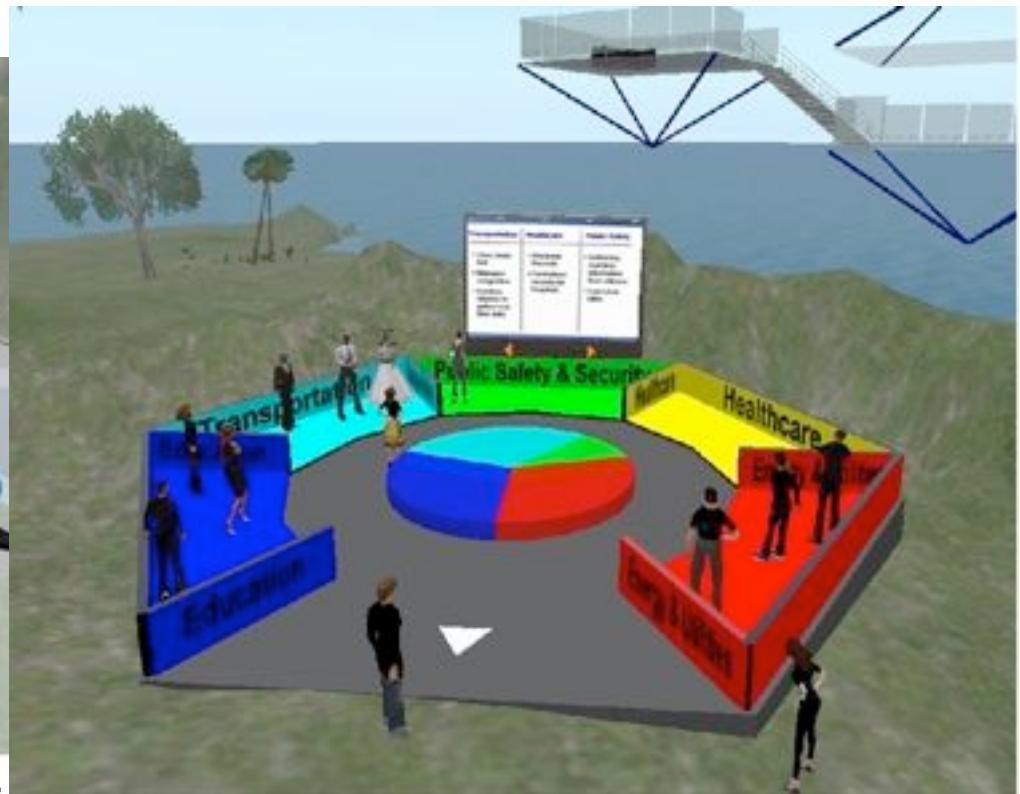
Second Life and Business

- Large companies are/were using Second Life
  - For meetings, conferences, customer care
  - As sales channel
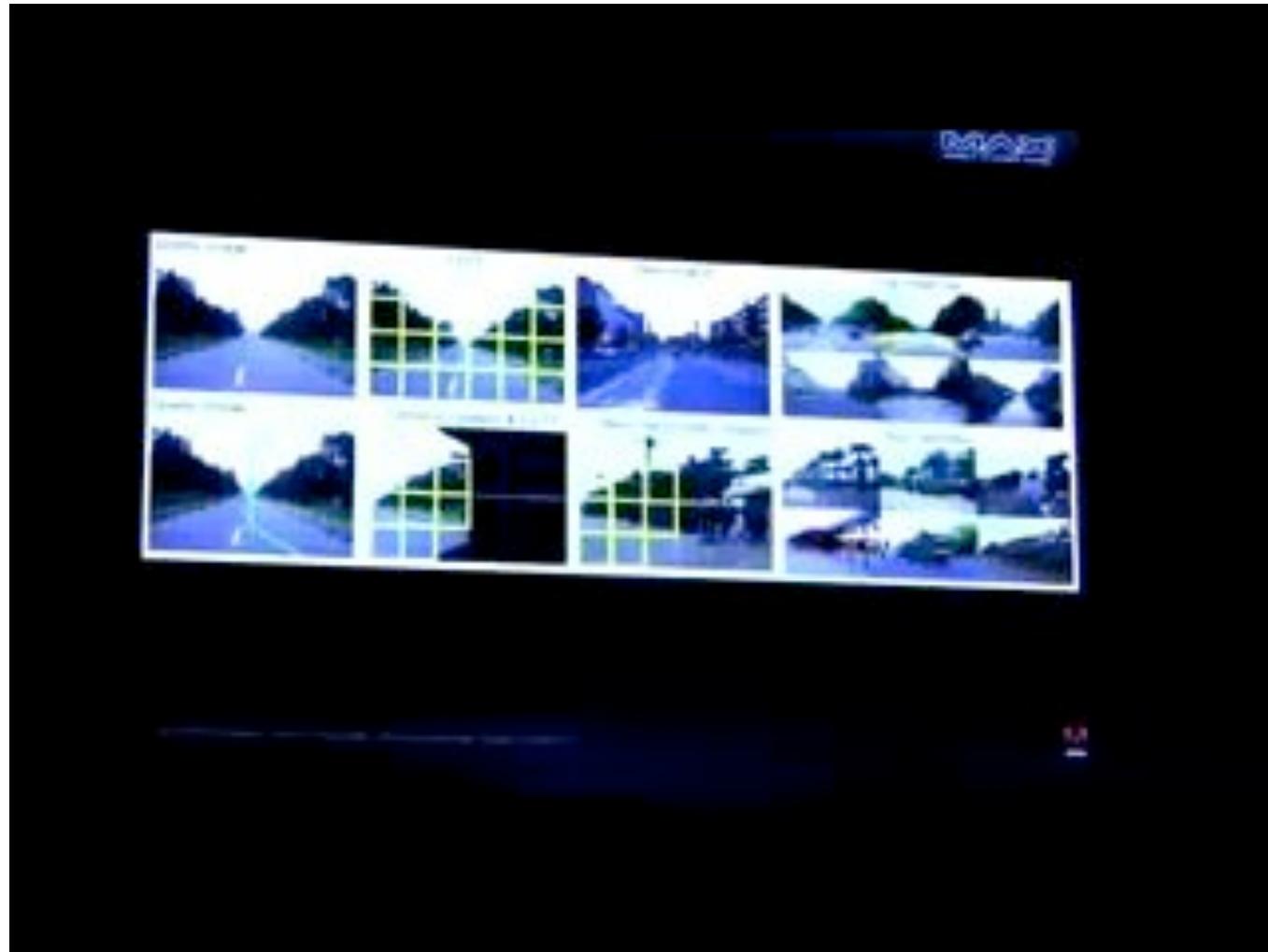
IBM Conferences, using Opinionator

https://www.ibm.com/developerworks/opensource/library/os-social-secondlife/

Infinite Images

- Shai Avidan, Adobe MAX 2008
- see YouTube v=QxNx2OyeCHA

4 Communities, the Web and Multimedia

Literature:

T. O'Reilly, J. Battelle: Web Squared: Web 2.0 Five Years On
(www.web2summit.com/websquared – 2009)

Web 2.0 Five Years On: Web Squared

- Smartphones and other recent/upcoming developments:
  - Collective intelligence increasingly being driven by sensors.
  - Talking to the Web becomes a reality
    - » Google Mobile App on iPhone, Siri
  - Information shadows, Internet of Things: Web meets World
  - Automatic geo-tagging of pictures (GPS built in cameras)
  - Face recognition built into photo archiving software
  - Object recognition via smartphone camera
- Key competency of the Web 2.0 era: Discovering *implied metadata*
- Systematic identities/primary keys:
  - Being replaced by clever recognition mechanisms (cf. CDDB/Gracenote signature of CD)

Casio prototype of GPS camera (2010)   dpnow.com
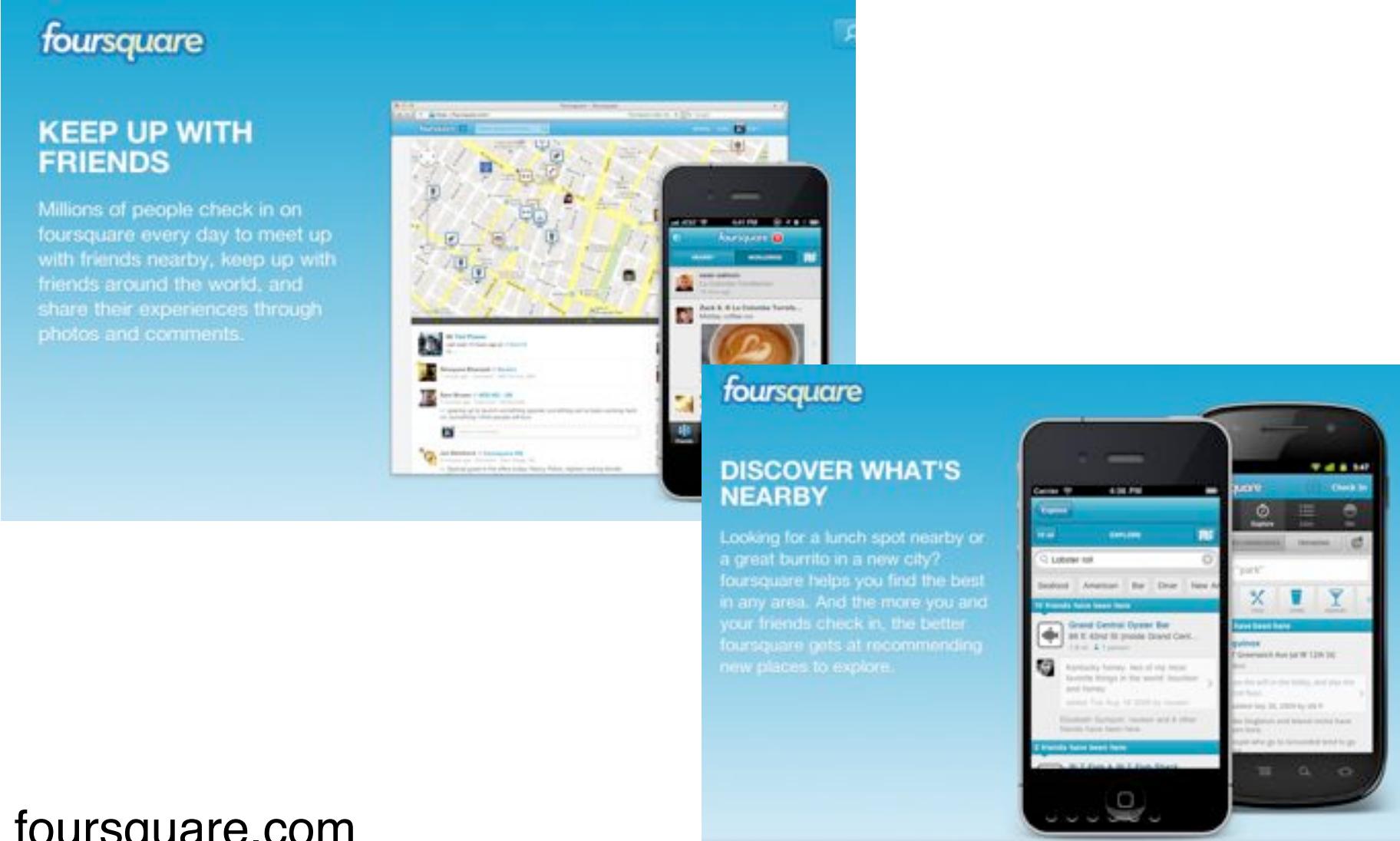
Facebook and Mobility

- Mobile access to the social network:
    - "More than 350 million active users currently access Facebook through their mobile devices." (Press information 2011, facebook.com)
- Facebook Places (August 2010):
    - "Check in" with mobile device to share current location
    - Discontinued after one year (competition FourSquare?)
- Facebook Location Tagging:
    - Sharing the current location as an attribute to posts, messages etc.
    - Works also for fixed network access, WLAN etc.

Share where you are

Let people know where you've been, where you're heading and where you are now.

Foursquare Location Based Services

foursquare.com

HTML5 Geolocation API

- Very simple high-level JavaScript API to deal with geolocation
- Implementation automatically uses best available information source
  - GPS for mobile devices if available
  - GSM/CDMA cell
  - WLAN/Bluetooth/IP data
- Getting a position:
  - `navigator.geolocation.getCurrentPosition
    (successCallback, errorCallback)`
- Reading out location:
  - `function showMap(position) {
    // Show a map centered at
      (position.coords.latitude, position.coords.longitude).
    }`
- Supports "one-shot" requests as well as continuous updates