

4 Communities, the Web and Multimedia

10.1 Evolution of the Web

10.2 Social Networks and Social Media

10.3 Web Content Aggregation and Integration

10.4 Virtual Worlds in the Web

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)

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

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, standardisation, liberty

Web 2.0 Meme Map



Tim O'Reilly

What is the Meaning of „Web 2.0“ ?

- O'Reilly Conferences 2004/2005/2006
 - Tim O'Reilly, Dale Dougherty
 - Current conferences, 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“ became 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

Comparison by Examples

Web 1.0

- DoubleClick
- Ofoto
- Akamai
- mp3.com
- Britannica Online
- Personal homepage
- Personal bookmarks
- Content mgmt
- Taxonomy

Web 2.0

- Google AdSense
- Flickr
- BitTorrent
- Napster
- Wikipedia
- Blogging
- Del.icio.us
- Wikis
- Folksonomy

Web 2.0 Principles

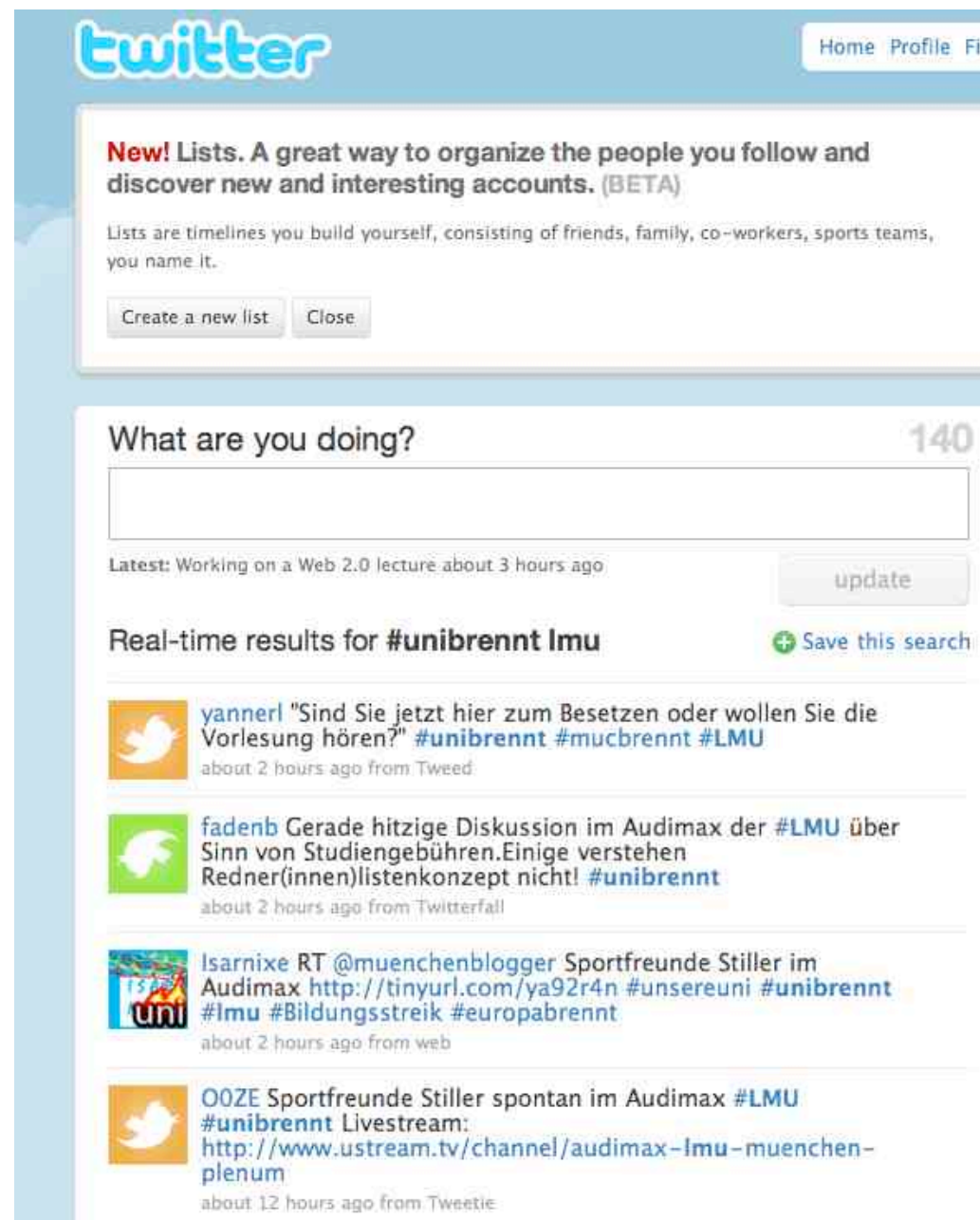
- Web 2.0 is about harnessing collective intelligence!
- Reach out to the entire Web, to the edges and not just the center, to the long tail and not just the head.
- The service automatically gets better the more people use it.
- Network effects from user contributions are the key to market domination 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

Web 2.0 Five Years On: Web Squared

- Smartphones and other recent/upcoming developments:
 - Collective intelligence no longer being driven solely by humans but, increasingly, by sensors.
 - Talking to the Web becomes a reality (Google Mobile App on iPhone)
 - Information shadows, Internet of Things: Web meets World
 - Automatic geotagging of pictures by GPS built into cameras
 - Face recognition built into photo archiving software
 - Object recognition via smartphone camera
 - Infinite Images (Adobe MAX 2008, Shai Avidan, see <http://www.youtube.com/watch?v=QxNx2OyeCHA>)
- A key competency of the Web 2.0 era is discovering implied metadata, and then building a database to capture that metadata and/or foster an ecosystem around it.
- Systematic identities/primary keys are being replaced by clever recognition mechanisms (cf. CDDDB/Gracenote signature of CD)

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 Obama campaigners



Web and World

O'Reilly/Battelle 2009:

The Web is now
the world.

And the world
needs our help.



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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

Social Networks, First Generation



Hauptmenü

Anmeldung

Log in

- 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



StudiVZ-Website
Foto: StudiVZ

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

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
 - September 2006: Open to everybody of age 13 and up
- Popularity:
 - Leading social networking site (2009, according to *comScore*)
 - 300 million active users (Nov 2009)
 - Has overtaken MySpace.com in popularity by April 2008
 - Alexa:
 - » Sept. 2006: Traffic rank 60
 - » Nov. 2009: Traffic rank 2 (rank 5 in Germany)
 - Growth: **276%** in 6 months among 35-54 year old



[Wikipedia](#), [facebook.com](#), [istrategylabs.com](#)

Example: facebook.com (2)

- Features:
 - Wall, Photos, Pokes, Status, Newsfeed, Notes (blogging), Gifts, Marketplace, Events, Video, ...
 - » Facebook Photos said to be most popular online photo archive (10 billion photos, Photobucket: 6.2 million, Flickr: 2 billion)
- Facebook Platform:
 - May 2007: Software development platform (PHP5, JavaScript, ActionScript, ...)
 - November 2007: Seven thousand applications
November 2009: 350,000 active applications
- Financial side:
 - 2007: Microsoft buys 1.6% share for \$240 million (total implied value \$15 billion)
 - September 2009: First time positive cash flow

<http://tech.blorge.com/Structure:%20/2008/10/16/facebook-holds-10-billion-photos-beating-photobucket-and-flickr/>
<http://www.cbc.ca/technology/story/2009/09/16/tech-facebook-300-million-users.html>

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 copyright-free music and videos
 - MySpace Music



• Völlig kostenlos
• Lade MP3s hoch -- nicht komprimieren!
• Hol dir deinen eigenen Band-URL

Verbreite deine Musik bei 148 Millionen von Fans!

Web | MySpace | Leute | Musik | Music Videos | Blogs | Videos | Film ▶

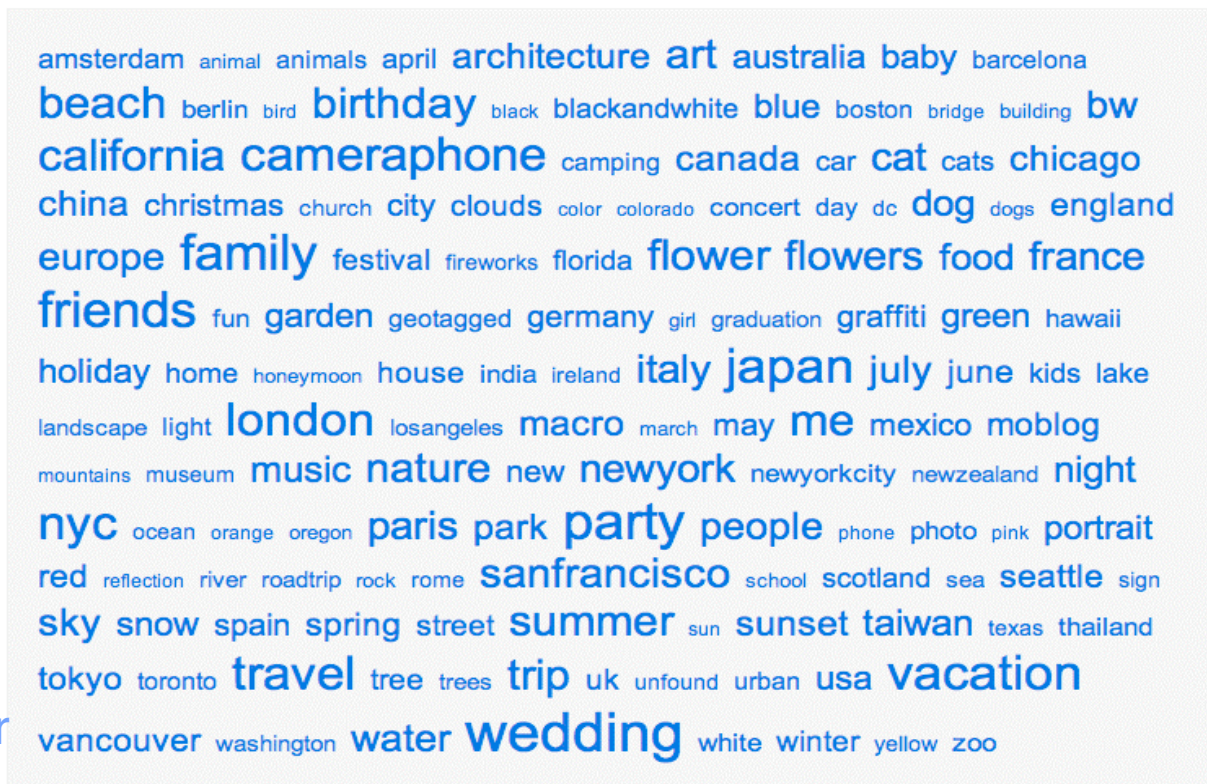
Search powered by Google

Musiker – HIER **KOSTENLOS** ANMELDEN!

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

All time most popular tags



Tag cloud from Flickr

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. Xanga.com, 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

- Traditional cultural techniques: writing and reading
 - Mostly separated activities
- Blogging:
 - Writing as a continuation of reading
 - High motivation to start writing, by external trigger (commented link)
 - Often very short texts
 - Reading as a continuation of writing (e.g. reading comments)
 - Continuous process of sign production
- A new cultural technique?
 - Reading-writing-reading-writing-...
- From Eigner et al p. 122

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.

The screenshot shows the Technorati website interface. At the top, there is a green header with the Technorati logo and a search bar. Below the header, there are navigation links for various categories like Technology, Business, Entertainment, etc. The main content area features a 'Music Channel' section with a featured article titled 'Celeb Extortion Plots All The Rage' by Dawn Olsen. Below this, there are three smaller featured items: 'Blog of the Day' (Disturbed - Be Very Afraid), 'Brett Dennen's U.S. Tour Begins' by Ross Feingold, and 'Carrie Prejean: Pretty Is As Pretty Does' by Dawn Olsen. At the bottom, there is a 'Top Music blogs' section with two columns: 'Top 5 Music blogs' and 'Top 5 movers'. The first item in the 'Top 5 Music blogs' column is 'The Boot' with a Music Authority of 979. The first item in the 'Top 5 movers' column is 'DoucheBagFace.com' with a Music Authority of 149 and 108 votes.

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 (2006/7)
- 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.com

Podcasting

Suchbegriff > English | Übersicht | Abo | Impressum | Kontakt

Die Bundeskanzlerin

Angela Merkel
Bundeskanzlerin Angela Merkel

START | AKTUELL | ANGELA MERKEL | KANZLERAMT | UNTERWEGS

> Artikel
> Mediathek
> Reden
> Interviews und Beiträge
> Pressemitteilungen
> Pressekonferenzen
> Podcasts
> Archiv

PODCASTS

Anzahl der Einträge: 166

1-25 | 26-50 | 51-75 | 76-100 | 101-125 >>

Datum	Titel
17.10.2009	Investitionen in Kultur sind Investitionen in die Zukunft
10.10.2009	Buchmesse unter wunderbaren Vorzeichen

- “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

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: <https://adwords.google.com/select/afc/pricing.html>

Lead User Innovation Process with Online Communities

- Traditional Lead User Innovation Process:
 - Workshops with selected users
 - Bring together product developers and end users
 - Discuss ideas for new products and product improvements
 - Create new ideas through creativity techniques
- Closed Online Communities:
 - Lead user community organized through web-based platform
 - Specific software tools in addition to community-platform functions
- Example:
 - TMG München projects with Baluff and Webasto
 - Ideas for automotive products created and tested with large group of Chinese participants

Innovation Community: innocentive



Search Challenges:

Search

• Register • Log In • Help • Contact Us

INNOCENTIVE
Maximize your RETURN ON INNOVATION

[Learn More](#)

Interested in having a problem solved?
[Contact Us](#)

- Products [+](#)
- Seekers [+](#)
- Solvers [+](#)
- Challenges [+](#)
- FAQ

*"The ability to pick and choose **your customized solution** from a number of applicants ensures you get the best of the best."*
- Mark Bent, CEO, SunNight Solar

[Solution Seekers](#)

[Problem Solvers](#)

Featured Challenge

Novel Approaches to Protecting Maize from Insect Damage

Challenge Reward: **\$20,000 USD** Challenge Type: **Theoretical-IP Transfer** INNOCENTIVE **8836928**

The Seeker is looking for novel approaches to protecting maize from insect damage. This Challenge requires only a written proposal.

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Literature:

R. Yee: Pro Web 2.0 Mashups, Remixing Data and Web Services,
Apress 2008

Content Aggregation

- Combination of content on specific topics from various sources
- Creation of an individualized information offer:
 - Adaptable to personal preferences
 - Often selected according to community processes (voting, tagging)
- Examples:
 - wikio.com
 - Netvibes.com
 - » User-configurable
 - » Extremely easy configuration of feed modules
 - Daylife
 - » Publisher-configurable
 - » Focus on multimedia: E.g. photo covers

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)
- Using public Web Services
 - Access to information provided by large Web sites
 - E.g. Amazon, Google Maps
 - See later for details

Example: Wikio.com

The screenshot shows the Wikio.com interface. At the top, there is a navigation bar with links for News, Blogs, Shopping, Videos, and Top Blogs. A search bar contains the text 'student protest' and a 'Search In News' button. Below the search bar, there is a '+ New page' button and a help icon. The main content area displays search results for 'student protest'. The first result is an advertisement for 'Bildungsstreik - studiVZ' with the text 'Alle Informationen: wo, wann, was passiert.' and a link to 'studivz.net/bildungsstreik-2009'. The second result is for 'Protest' with the text 'Protest Schnäppchen! Garantiert den besten Preis finden' and a link to 'Shopzilla.de'. Below these results, there is a 'Sort by' dropdown menu set to 'relevance - date'. The third result is a news article titled '85,000 students protest in Germany' from the 'New Zealand Herald (Free subscription) | yesterday'. The article text reads: 'BERLIN - Tens of thousands of university students are protesting across Germany against changes they say have made the educational system worse. Organisers said Tuesday that 85,000 students in 50 cities protested reforms of the...'. To the left of the article title is a 'Vote!' button with the number '3'. Below the article text is a row of social sharing buttons: 'add comment', 'send to a friend', 'facebook', 'twitter', and 'share'.

Example: Netvibes

The screenshot displays the Netvibes dashboard interface. At the top, there is a navigation bar with a search field containing 'Auf meiner Seite', a 'Filter' button, and a 'Suchen' button. The page title 'Testseite' is visible in the top right corner. Below the navigation bar, there are several widgets:

- Ausgewählte Feeds:** A list of selected feeds including Basic Thinking Blog, BILDblog, BUNTE.T-Online.de Newline, Handelsblatt.com, heise online News, kicker.de News aktuell, SPIEGEL ONLINE, Spreeblick, VOGUE.com - Deutschland, and ZDNet Tests & Technik.
- Feed Verzeichnis:** A section for managing feeds.
- Wetter:** A weather widget.
- Webnotiz:** A web note widget.
- Aufgabenliste:** A task list widget.
- Kalender:** A calendar widget.
- Blog Suche:** A blog search widget.
- Web Suche:** A web search widget with a search bar and buttons for Google, Yahoo!, Live, and Snap.
- Bildersuche:** An image search widget.
- Video Suche:** A video search widget.
- Podcast Suche:** A podcast search widget.
- Klassische Web Suche:** A classic web search widget.
- Mail:** A mail widget.
- Gmail:** A Gmail widget with a message: 'Kein Account konfiguriert. Verwenden Sie den Editieren Link um Username und Passwort zu setzen'.

The main content area features several news feeds:

- Spiegel Online (5):** Contains headlines such as 'Raue Zeiten für Ehebrecher: US-Gericht sieht Seitensprung als Straftat', 'Seenotleitung Bremen: "Das wird mit voller Wucht treffen"', 'Ungebetene Fleischeinlage: Italienerin findet Maus im tiefgefrorenen Gemüse', 'Sturmtief "Kyrill": Orkan versenkt Frachter', 'Dubai: Dutzende Menschen in brennendem Hochhaus eingeschlossen', and 'Sturm-Ticker: Das Neueste von "Kyrill" auf einen Blick'.
- heise online News (6):** Contains headlines such as 'Taser-Opfer verklagt Universität und Polizei', 'Belgische Zeitungen gehen auch gegen Yahoo vor', 'Bundestag verabschiedet Telemediengesetz', 'Deutsche gaben im Weihnachtsgeschäft 5,4 Milliarden Euro online aus', 'Month of Apple Bugs: Lücke in "Personal File Sharing"', and 'AMD startet Ausrüstung von neuem Reinraumgebäude in Dresden'.
- Kelkoo: ipod nano:** Displays an advertisement for the iPod nano Green 4 GB, priced at 209,00 €, with a link to 'Angebot sehen'.

Additional widgets include:

- ZDNet Tests & Technik (6):** Contains headlines such as 'Immer optimal informiert: die besten RSS-Reader', 'Renault: Formel-1-Speed auch bei Daten- und Speichermanagement', 'Schredder-Software: Sicheres Löschen von Dateien', 'Neuer Kalender und schnellere Suche: Outlook 2007 im Test', 'Schnell formatieren und perfekt publizieren: Word 2007 im Test', and 'Virtualisierung: Newcomer Microsoft fordert Vmware'.
- Netvibes.com Blog (7):** Contains headlines such as 'The Lithuanian version of Netvibes is up' and 'Best wishes and Happy New Year!'.

Example: Daylife

The screenshot shows the Daylife website interface. At the top left is the Daylife logo, a yellow circle with a white '@' symbol, followed by the text "daylife Organizing and distributing the world's news". To the right is a search bar with a "Search" button and a dropdown arrow. Below this is a navigation bar with tabs for "Top News", "World", "Business", "Politics", "Entertainment", "Sports", "Science & Technology", and "More Topics".

The main content area features a "Covers" section with a "See all covers »" link. The primary cover image shows a hand lighting a match that is melting a portrait of Barack Obama on a matchbox. The text "Obama In China" is overlaid in large white font, and "November 16, 2009" is at the bottom. A "1/25" indicator is in the bottom right corner of the cover.

On the left side, there are several promotional boxes:

- NEW** New from Daylife and Getty Images: **gettyimages SmartGalleries** by daylife. Includes a small image of a person on a horse.
- Daylife for Publishers**: Our SmartMedia Services offer quality content without adding costs. [Learn More »](#)
- Our Customers**: Logos for **Esquire**, **tbs**, and **TNT**.
- Our Products**:
 - SmartGalleries**: The most efficient way to create stunning photo galleries. [Learn More »](#)
 - Daylife Select**: A point & click tool to create dynamic content portals. [Learn More »](#)
 - Daylife API**: Unlimited smart, customizable content to suit any publisher. [Learn More »](#)

At the bottom, a horizontal carousel shows thumbnails for other covers: "Obama In China", "Besieged By Folkiness", "Our Soggy Neighbor", "The Trial", and "As Changed".

Styles of Content Aggregation

- Presenting various information sources in one screen, side by side:
 - Simple *portal* collecting links, or
 - Sophisticated portal synchronizing the components ("portlets")
 - Complex syndication algorithms computing the component contents
- Integrating information from another Web resource into the presentation interface of a certain Web site
 - Requires an add-on mechanism for the carrier Web site
 - Example: Google Maps
- Fully integrated presentation of information computed from several Web resources

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](#)

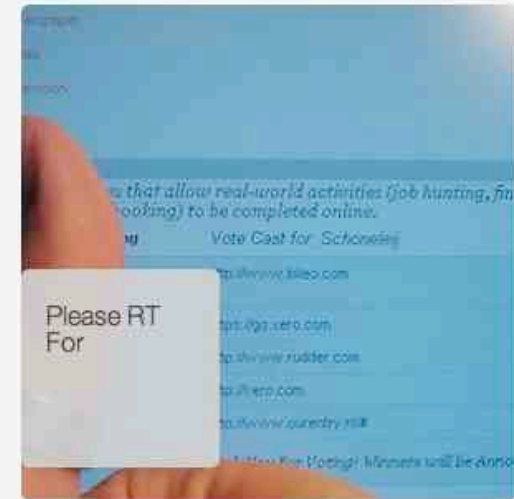
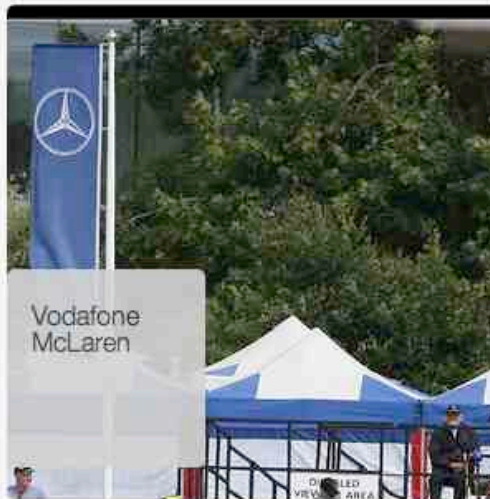
local.alkemis.com ? Combining the best of the best 'local' sites, without ads. Most features work anywhere in the USA. Click on any street to set a red pin and see more info (stored photo if available). See a map of continental USA of all cities with A9 or Live Traffic Cams. See A9 and Live Traffic Cams city list.

Karte Satellit Hybrid

FDR Dr & 36 St - LIVE

Recommended provider for this site:
Firefox

Example: Twittertimes



<http://silverbranchdesign.com/twittertimes/>

Mashup

- Application integrating diverse Web content seamlessly
- Presentation screen:
 - 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

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.setContentype](#)
- [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

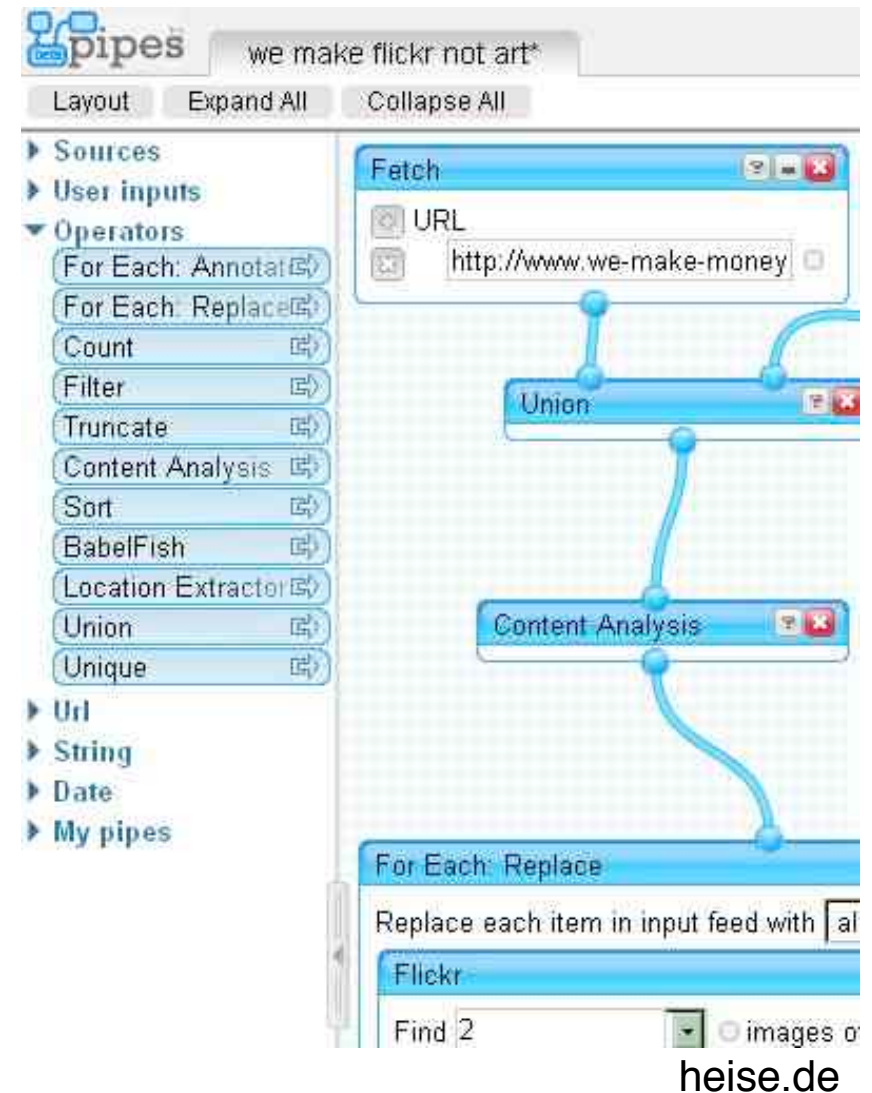
- Requests are constructed and responses are evaluated in scripts
 - Mostly server-side scripts, e.g. PHP
 - Constructing a request in PHP:
`$content = file_get_content($url);`
 - Evaluating the response:
XML parsing is standard part of PHP since version 5
- Simplifying development for specific API:
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](#)
 - [jlickr](#)
- .NET
 - [Flickr.NET](#)
- Objective-C
 - [ObjectiveFlickr](#)
- Perl
 - [Flickr::API 0.03](#)
 - [Flickr::Upload 1.06](#)
- PHP
 - [PEAR::Flickr API](#)
 - [phpFlickr](#)
- PHP5
 - [Phlickr](#)
- Python
 - [Bee'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



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)
 - Analyse 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

10 Communities, the Web and Multimedia

10.1 Evolution of the Web

10.2 Social Networks and Social Media

10.3 Web Content Aggregation and Integration

10.4 Virtual Worlds in the Web

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 successful...
- Secondlife.com
 - Created and run by Linden Labs
 - Two million accounts, 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

The screenshot displays the Habbo.de website interface. At the top, it shows '2,782 Habbos im Hotel' and navigation links for 'Mein Habbo', 'Meine Taler', and 'Habbo Club'. A central banner features the Habbo logo and a character holding a key, with the text 'Hallo! Bitte einloggen bzw. registrieren.' and buttons for 'Kostenlos registrieren!' and 'Einloggen'. A 'Check ein! HABBO HOTEL' badge is also visible. Below the banner is a navigation bar with icons for 'START', 'NEU HIER?', 'TALER KAUFEN', 'EVENTS', 'GAMES', 'COMMUNITY', 'SHOP', 'HILFE & SICHERHEIT', and 'MOBILE'. A secondary navigation bar lists various hotel features like 'Habbo Hotel', 'Willkommen im Habbo Hotel', 'Haustiere', 'Möbel', 'Renovierung', 'Habbo Homes', 'Habbo Web', and 'Habbo Games'. The main content area is titled 'HABBO HOTEL' and is divided into several sections: 'Neu im Habbo?' with numbered steps '1. Check ins Hotel ein!' and '2. Erstell dir einen Habbo'; 'Wichtigste Funktionen' listing 'Habbo Konsole', 'Habbo Geldbörse', and 'Hotel Navigator'; 'Werbung' with a 'Wohin möchtest du gehen?' section featuring 'Freibad' and 'Battle Ball'; and two 'Jackie Chan Adventures' advertisements, one for 'SNOWSTORM'.

Second Life



Linden
Gallery
Of Resident Art

<http://video.google.com/videoplay?docid=-5182759758975402950>

Second Life and Business

- Large companies are using Second Life
 - For meetings, conferences, customer care
 - As sales channel



☆ AP Photo by IBM Corp. - 1 month ago

In this screen grab provided by IBM Corp., one of their virtual islands which will open to the public next week is shown.

Web Two Point Oh



Web Two Point Oh!

Create your own Web 2.0 Company

Below you will find a pre-created VC friendly Web 2.0 company just for you!

Hit reload to create another potential million dollar idea

Your company name:
Zimodiorb

Your company product:
ad-supported bookmarks via api mashups

<http://www.andrewwooldridge.com/myapps/webtwopointoh.html>