

Web 2.0

Core Concepts, Applications, and Implications

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Web 2.0 - Core Concepts, Applications, and Implications

1. Web 2.0 – recent evolutionary shift towards more **user-oriented** and **user-driven** web. We try to:
 - identify its **characteristics**,
 - illustrate them on **successful services**, and
 - comment on the **trends**
2. Special Topic – **Mashups**
 - **concepts, principles**, and **success stories**
 - issues of **technological, legal**, and **business** nature

The concept of Web 2.0

- ***What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software***

Tim O'Reilly, Sep 30, 2005

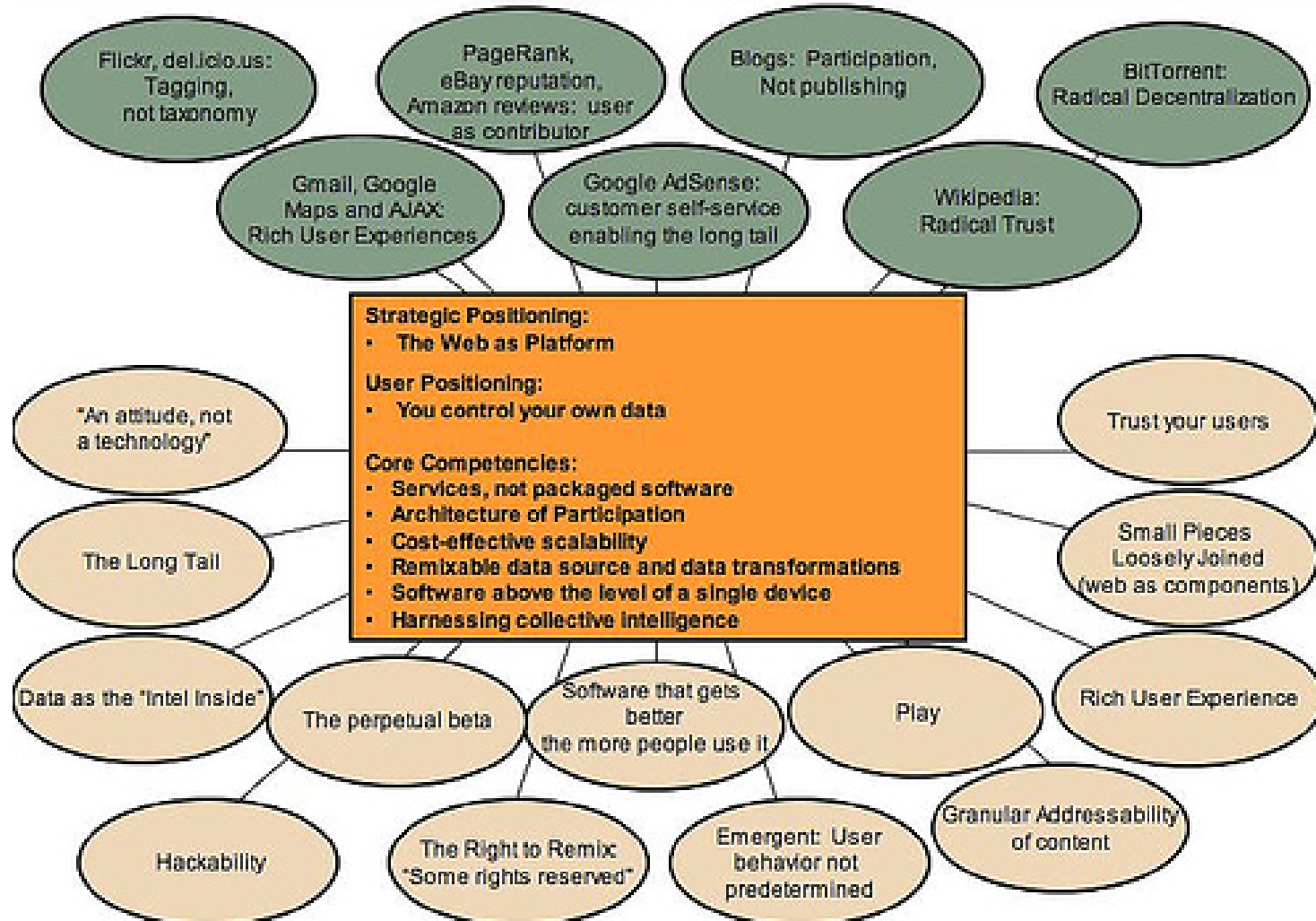
Tim O'Reilly Initial Ideas...

Web 1.0 → Web 2.0

- **DoubleClick → Google AdSense**
- **Ofoto → Flickr**
- **Akamai → BitTorrent**
- **mp3.com → Napster**
- **Britannica Online → Wikipedia**
- **personal websites → blogging**
- **evite → upcoming.org**
- **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**

The “Web 2.0 Cloud”

Web 2.0 Meme Map



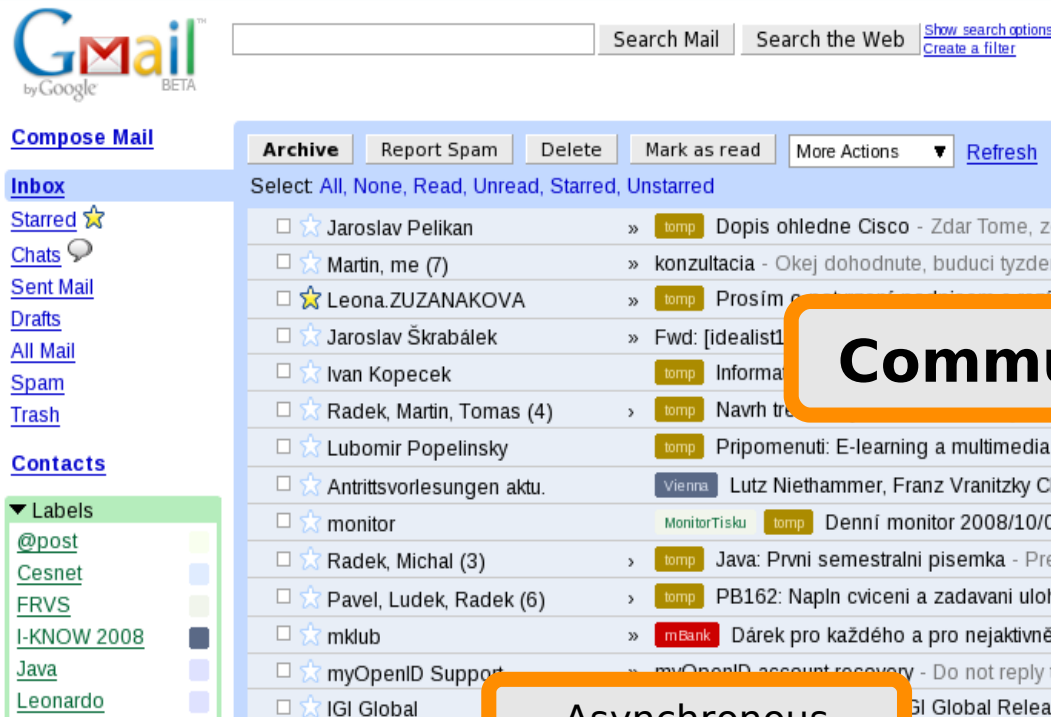
- 1. The Long Tail**
- 2. Data is the Next Intel Inside**
- 3. Users Add Value**
- 4. Network Effects by Default**
- 5. Some Rights Reserved**
- 6. The Perpetual Beta**
- 7. Cooperate, Don't Control**
- 8. Software Above the Level of a Single Device**

The concept of Web 2.0

- Tim O'Reilly provided a set of **intuitive principles** *rather than* a precise, indisputable, and exhaustive **definition**.
- Before we try to systematize the concept, let us show a couple of examples...

What is typically considered a Web 2.0 service/application?

Gmail [Calendar](#) [Documents](#) [Photos](#) [Reader](#) [Web](#) [more](#) ▾

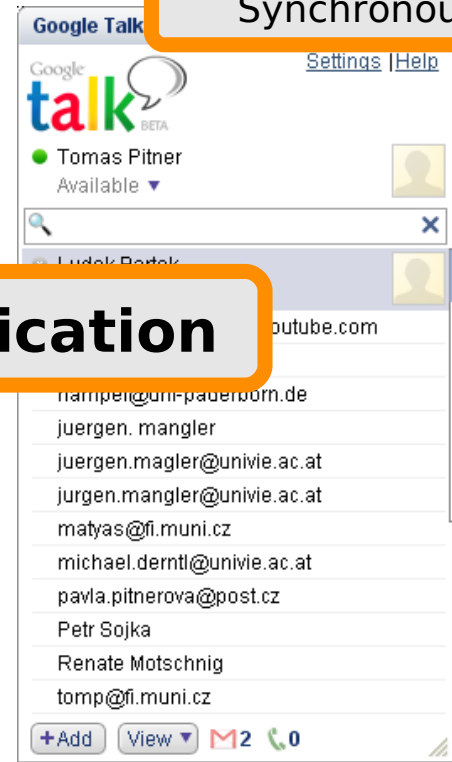


The screenshot shows the Gmail interface. At the top, there's a search bar and navigation links. Below that, the 'Compose Mail' button is visible. The main area shows an 'Inbox' with a list of emails. Each email entry includes a checkbox, a star icon, the sender's name, and a snippet of the email body. Actions like 'Archive', 'Report Spam', 'Delete', and 'Mark as read' are available for each email. A 'Labels' sidebar is on the left, and a 'More Actions' dropdown is on the right of the inbox list.

Asynchronous

Synchronous

Communication



The screenshot shows the Google Talk chat interface. At the top, there's a search bar and navigation links. Below that, the 'Google Talk' logo is visible. The main area shows a list of contacts with their names and status (e.g., 'Available'). A search bar is also present. At the bottom, there are buttons for '+Add', 'View', and a notification for 'M2'.



tomp | [Offline](#) | [Overview](#) | [Tasks](#) | [Locations](#) | [Contacts](#) | [Settings](#) | [Help](#) | [Logout](#)

Thursday, October 2, 2008 | 16:17

[Show search options](#)

Remember The Milk News

Latest from the blog: Comm and your tasks with two new ways to interact with Remember The Milk: a Ubiquity comm and a FARR plugin. Check out the [log](#) for more details.

Posted on Monday, September 29, 2008

[» Continue to Tasks](#)

[Always skip this page](#)

What's New?

BRNO, CZECH REPUBLIC | September 29, 2008



[Invite your friends to Eventful](#)

Coordination

My Eventful



pitner

- [View favorites](#)
- [Preferences](#)

Fall travel deals

Our hand-picked top deals from Travelzoo...

► **\$169** -- Las Vegas: Suite at 5-Diamond Resort w/\$50 Credit The Venetian

► **\$66** -- Suite at All-Inclusive Riviera Maya Resort BookIt.com

► **\$100-\$200** -- Fly to Orlando from Across the U.S. (Roundtrip) Orbitz

Hottest events -- coming up in the next few months...



Concert by TKO RECORDS at Yacht Club

Nov. 30 - Yacht Club



Finntroll

Nov. 04 - Masters of Rock Cafe



Concert by TKO RECORDS at Yacht Club

Nov. 30 - Yacht Club

Nov. 04 **Primordial** | Masters of Rock Cafe

Nov. 04 **Equilibrium** | Masters of Rock Cafe

Today Tomorrow Overdue

[Weekly Planner](#)

Paper Gregar SCO -	
daňový poradce DP 2007	Mar 13
submitaceis paper marc+pavel	Mar 13
Paper TPEV 2008 - Pavel + Tom	Apr 06

NEW pro Has RTM made you more organized and productive? [Upgrade to Pro](#) and support RTM.

[About](#) | [Blog](#) | [Services](#) | [Forums](#) | [Help](#) | [Terms of Use](#) | [Privacy Policy](#)

Community Support



myspace.com
Deutschland

Mein MySpace | Postfach | Profil | Freunde | Musik | MySpaceTV | Mehr

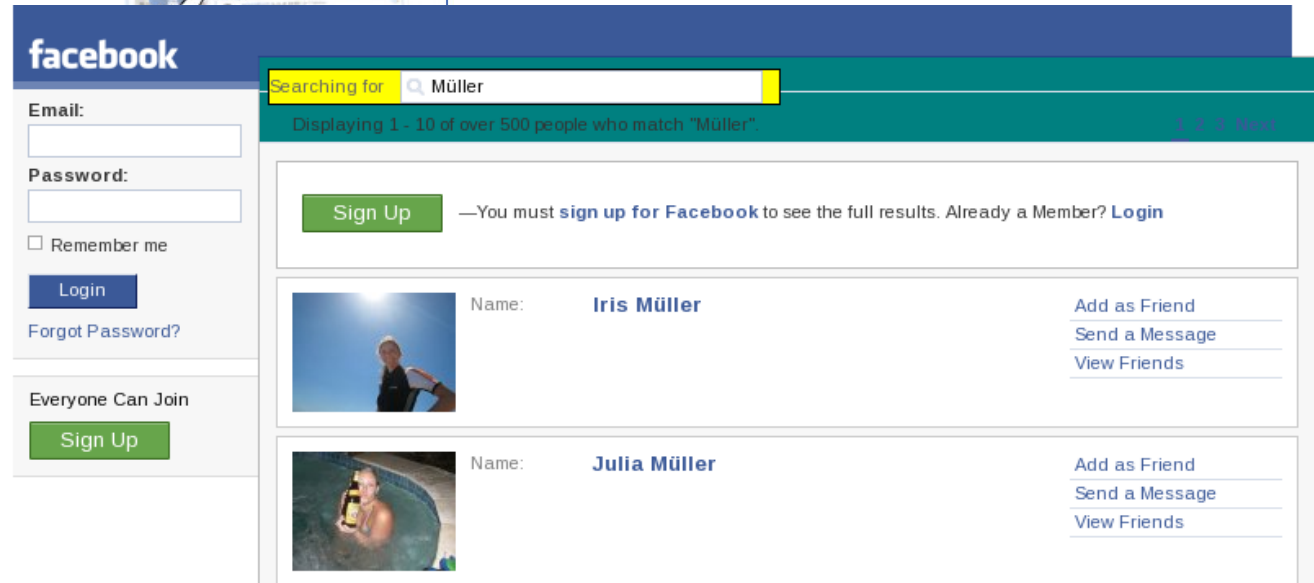
Unendlich viel Platz für deine Fotos und Videos

Lass deine Fotos und Videos nicht auf der Festplatte verstauben! Zeig anderen deine Fotos, sortiere sie in Alben und markiere, welche deiner Freunde du mit der Kamera erwischst hast. Wir sind auch gespannt auf deine Videos! Ob mit dem Handy aufgenommen oder mit einer Profi-Cam, ob spontan oder nach Drehbuch: Lade sie hoch und automatisch erhältst du deinen eigenen Videokanal auf MySpace! Wir zeigen dir, wie's geht.
[Dein MySpace Team.](#)

Community

Fotos & Fotoalben

- HOCHLADEN
- BEARBEITEN
- VERLINKE deine Freunde auf den Fotos





facebook

Searching for Müller

Displaying 1 - 10 of over 500 people who match "Müller".

Sign Up —You must sign up for Facebook to see the full results. Already a Member? Login

	Name: Iris Müller	Add as Friend Send a Message View Friends
	Name: Julia Müller	Add as Friend Send a Message View Friends

Content Creation

SEARCH BLOG | FLAG BLOG | Next Blog: tomas.pitner@gmail.com | New Post | Customize | Sign Out

Tomas Pitner's Blog

...ABOUT WEB 2.0, JAVA EE (GROOVY, GRAILS...) PROGRAMMING AND OTHER STUFF I FIND INTERESTING.

WHICH TYPES OF WEB 2.0 SERVICES DO YOU REGULARLY USE (AS READER OR WRITER/CONTRIBUTOR)?

- Mapping (Google Maps, Seznam, Atlas, etc)
- Content Creation (Blogs, Wikis)
- Online Teamwork Services/Tools (Collaborative Editing - Google Docs, Zoho Multimedia (YouTube, podcasting) etc)
- Personal Information Management (calendars, event management etc)

Dosavadní počet hlasů: 5

HOW OFTEN DO YOU ACTIVELY CONTRIBUTE TO SERVICES?

- daily (nearly each day)
- weekly (1-2 times a week)
- monthly (1-2 times a month)
- less frequently

Dosavadní počet hlasů: 5
Hlasování je ukončeno.

MONDAY, OCTOBER 29, 2007

Testing the Tagging @ Blogger

ABOUT ME

TOMAS PITNER
VIEW MY COMPLETE PROFILE

BLOG ARCHIVE

- 2007 (27)
 - October (6)
 - Testing the Tagging @ Blogger
 - Enterprise Web 2.0
 - Major Zeman - Ceska Soda
 - Ivan Rynda dreni CT24
 - Web 2.0 Survey #2 - University Students

create account or login

search this site search

Sandbox

Try Wikidot - experiment without consequences ;-)

WELCOME IN THE SANDBOX

Feel free to experiment with this page, If you need help, refer to the [documentation](#).

- Welcome page
- What is a Wiki Site?
- How to edit pages?
- Recent Changes
- List All Pages
- Page Tags

Looking for inspirations? Visit our [Snippets wiki](#) with hundreds of code

Mymath

$$\rho_{GJ} = -\sigma(r) \left[\left(1 - \eta_*^2 \frac{\kappa}{\eta^3}\right) \cos \chi + \frac{3}{2} \theta(\eta) H(\eta) \xi \sin \chi \cos \phi \right] \quad (1)$$

$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \dots \quad (2)$$

$E = mc^2$ is much more popular than $G_{\mu\nu} - \Lambda g_{\mu\nu} = \kappa T_{\mu\nu}$

Content Sharing

slideshare beta [tomp](#) | [Logout](#) | [All Languages](#) [Search](#)

Home Browse **My Slidespace** Upload Community Tags Widgets

Slideshows | Messages | Favorites | Comments | Wall | Contacts | Groups | Edit Profile

It's free! [Upload](#)

My Slidespace

Welcome back, tomp :-)
Your profile is 92 % complete



Tomas Pitner

Tags: academia, education, software developer,
Last login: 2 minutes ago

[Messages \(0\)](#)

[Get a widget](#)

[Create Group/Event](#)

Who is Tomas?

Gender: Male
Location: Brno, Czech Republic
Work: Vice-dean, assistant professor, researcher at Faculty of Informatics, Masaryk University, Brno, Czech Republic
About: Vice-dean at the Faculty of Informatics, Masaryk University
URL: [tomaspitner.blogspot](#)

My Slideshows (edit all)

2 (2 public)



Technologie sémantického webu pro vzdělávání
2 years ago
764 views, 0 comments
[Edit](#) [Delete](#)



Web 2.0 ve vzdělávání
2 years ago
844 views, 0 comments
[Edit](#) [Delete](#)

Wall

Comments

Tags

2.0 web semantic virtunil e-learning

Content Sharing



Home The Tour Sign Up Explore

You aren't signed in [Sign In](#) [Help](#)

Search

Search tomas_p

Slideshow



tomas_pitner's photostream

[Sets](#) | [Tags](#) | [Archives](#) | [Favorites](#) | [Profile](#)


University of Vienna, Main Building



 All rights reserved
Uploaded on Jun 21, 2007
0 comments

Firework



 All rights reserved
Uploaded on Jun 21, 2007
0 comments



Family
5 photos



Content Contextualization

[Web](#) [Obrázky](#) [Zprávy](#) [Skupiny](#) [Blogy](#) [Gmail](#) [další](#) ▼

tomas.pitner@gmail.com | [Můj profil](#) | [Nápověda](#) | [Můj účet](#) | [Odhlásit se](#)



[Hledat mapy](#) [Zobrazit r](#)
Najděte firmy, adresy a zajímavá místa. [Další informace.](#)

[Vyhledat trasu](#) [Moje mapy](#)

[Nastavit výchozí polohu](#)

Procházejte oblíbené mapy

[TravelGuide](#)

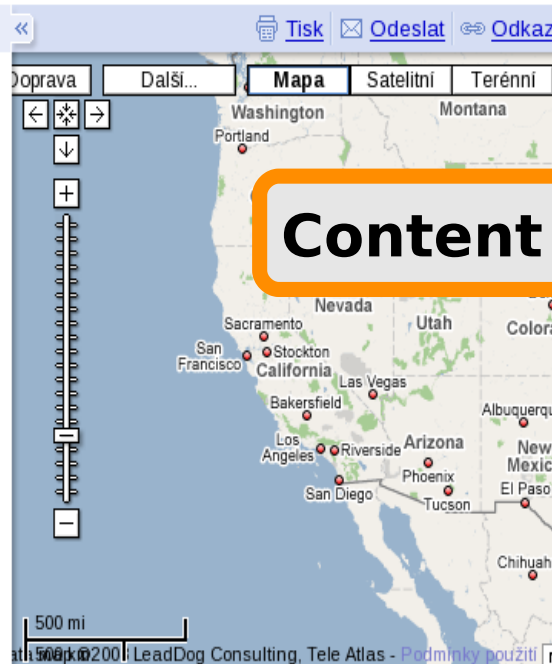
[Nemovitosti – BezReality.cz](#)

[Krimi mapy – Denik.cz](#)

[Zobrazit další mapy](#)

 Zařaďte [svou firmu do služby Mapy Google](#)

 Zobrazte [svoje reklamy ve službě Mapy Google](#)



Content Contextualization

Web 2.0 Services - Summary

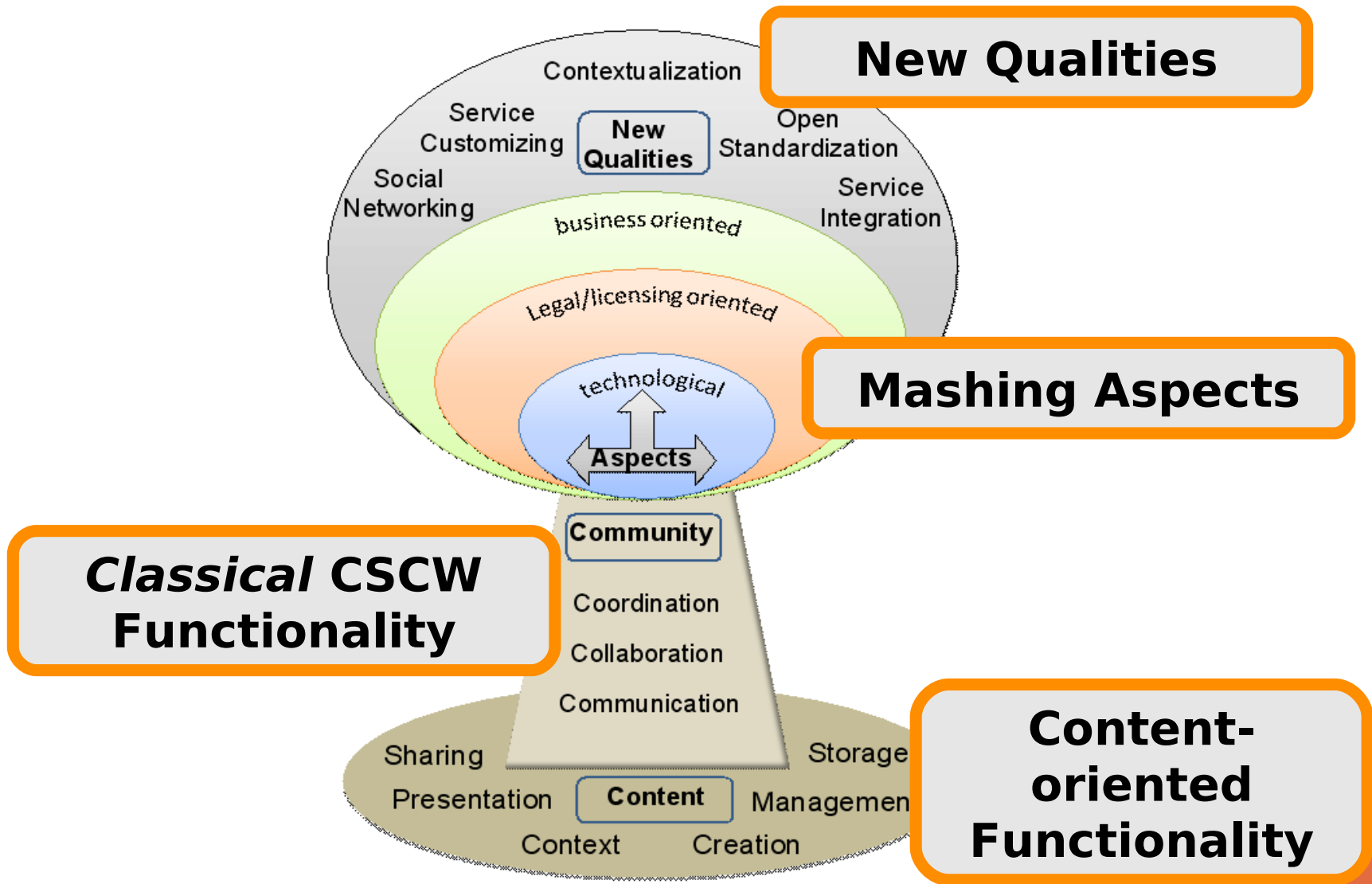
What for new qualities they bring?

- Identified in **Hampel, Pitner, Steinbring: Qualität des Neuen Webs**, Proc. of GeNeMe Conference, Dresden 2007

How to classify the services according to functionality?

- Classified and Analyzed in **Drasil, Hampel, Pitner, Steinbring: Get Ready for Mashability!**, Proc. of ICEIS Intl. Conference, Barcelona 2008

Web 2.0 Services - Summary



Web 2.0 Characteristics

Functional

- **Functionality and Added Value**

Non-functional

- **Usability: (Inclusive) Universal Access**
- **Technology: Principles and Architecture**
- **Development: Process and Tools**
- **Deployment: Business Models and Legal Issues**

- **Wide variety**
 - from simple, often one-purpose service over complex apps to mashups
- **Multimedia-oriented**
 - from VoIP over Flash-played video to virtual rooms
- **Content/Knowledge management-oriented**
 - creation, sharing, publishing, processing

- **Value added by peers**
 - **End users/peers produce most of the valuable content, not the one publisher. A user (or a user community) is trusted by default.**
- **Contextualization and Repurposing**
 - **Data can be aggregated/syndicated**
 - **formats and channels based on RSS/Atom**
 - **and presented**
 - **in a different context and**
 - **for other purpose than originally supposed.**

- **Mashing-up**
 - **Added value by integrating more applications into a new one**
 - **Unique *data* and/or unique *functionality* is likely to be mixed in**

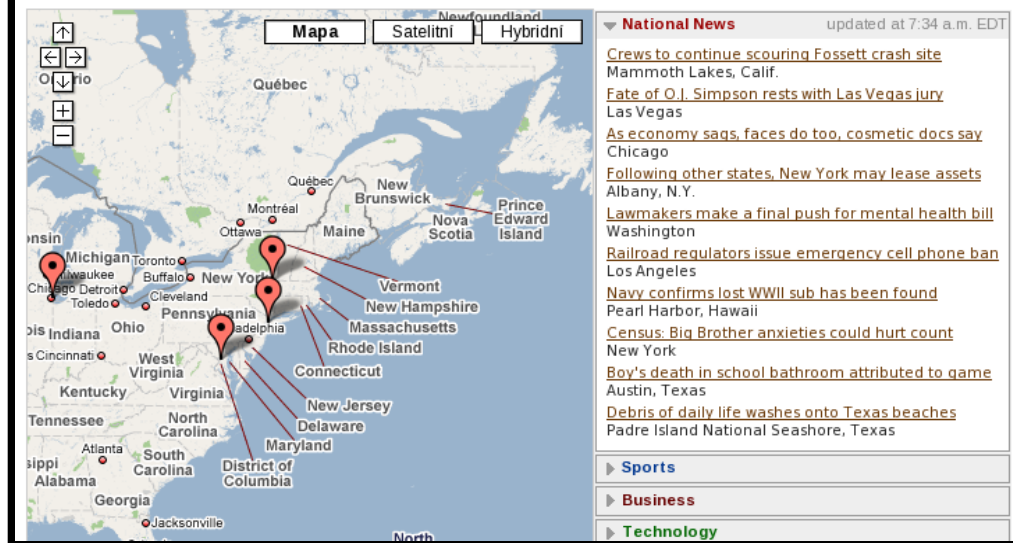
Functionality /3



Amazon + Last.fm

Google Maps + AP News

AP Associated Press

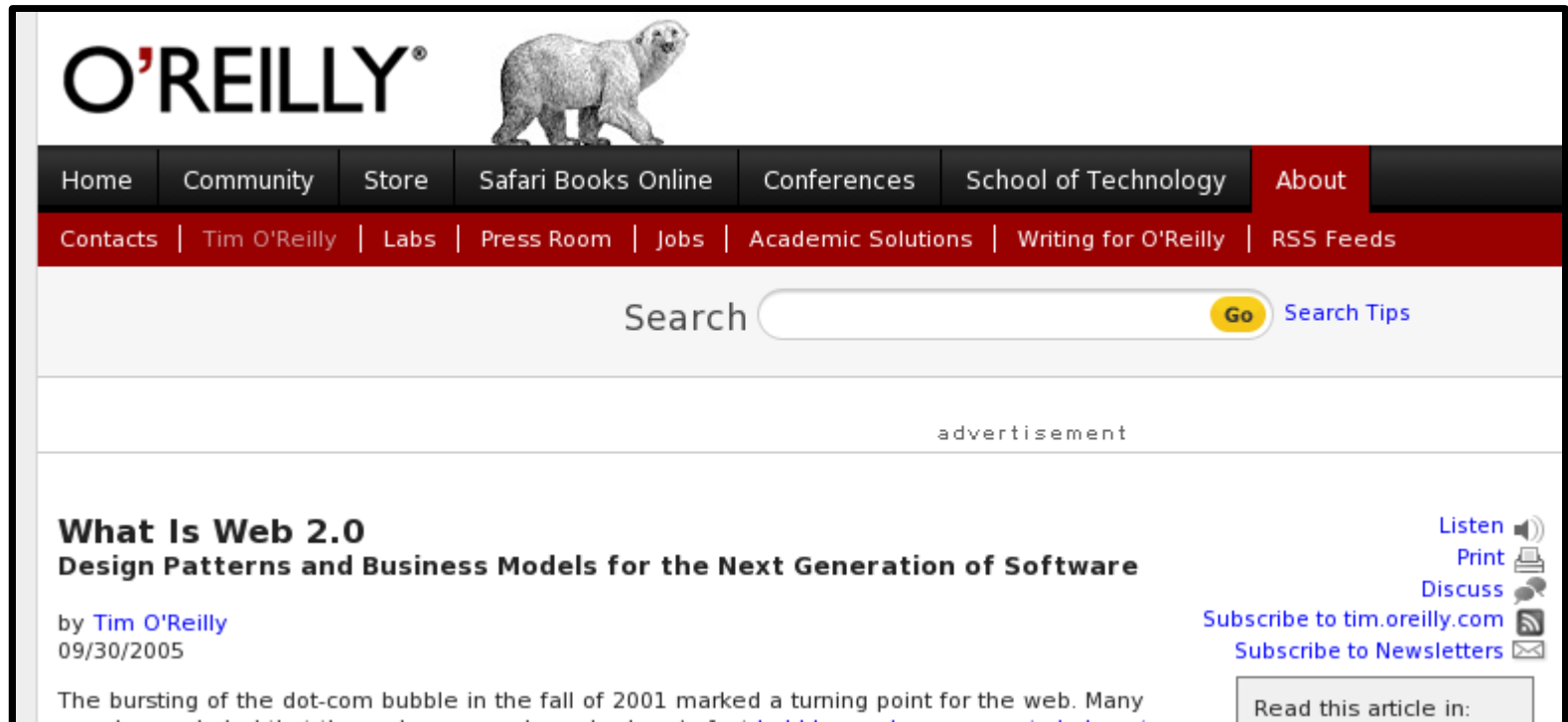


Cross-linking-based integration



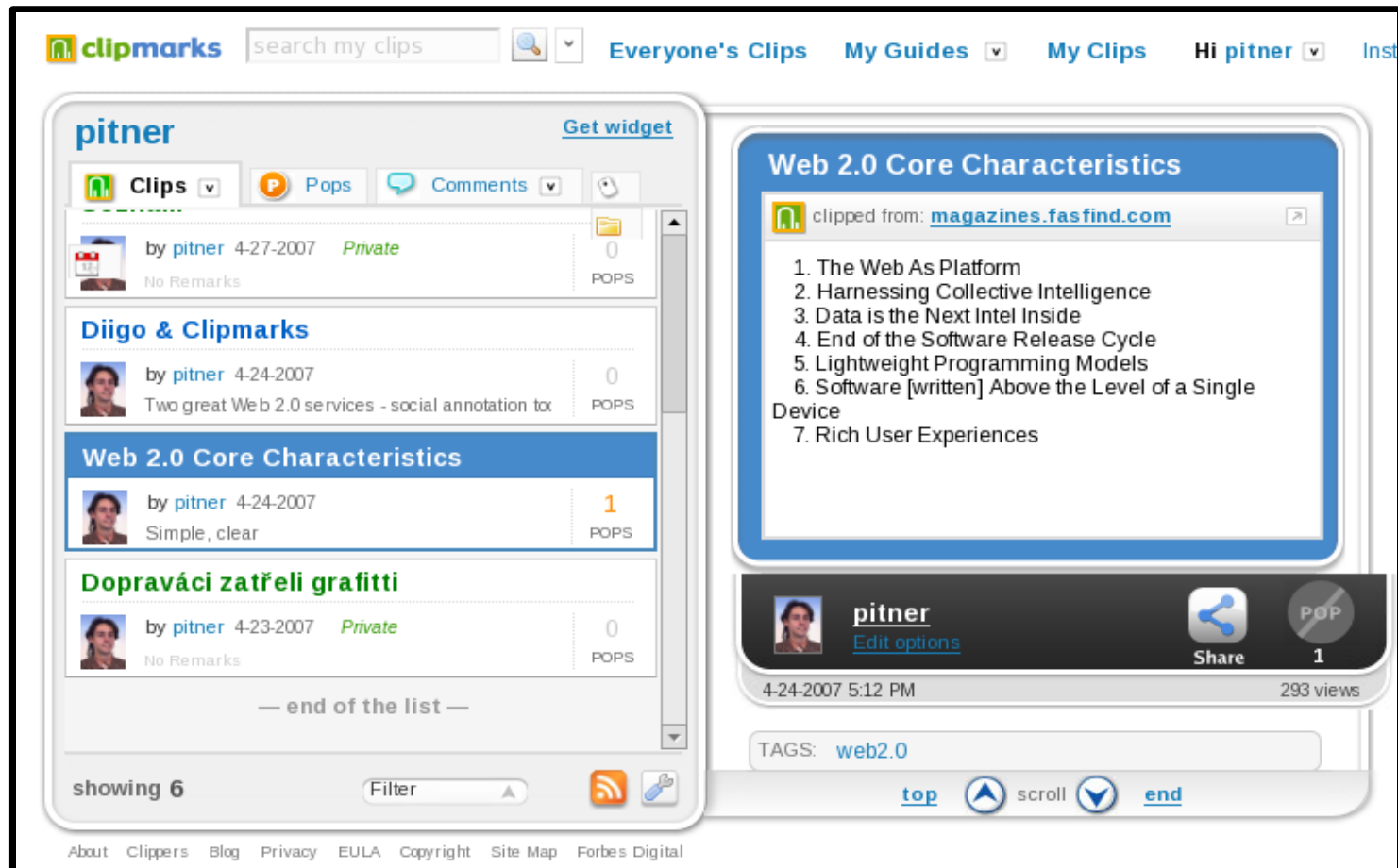
Functionality - Workflow

1. Original resource: an article

A screenshot of the O'Reilly website. At the top left is the O'Reilly logo and a polar bear illustration. Below this is a navigation menu with links: Home, Community, Store, Safari Books Online, Conferences, School of Technology, and About. A secondary menu includes: Contacts, Tim O'Reilly, Labs, Press Room, Jobs, Academic Solutions, Writing for O'Reilly, and RSS Feeds. A search bar with a 'Go' button and 'Search Tips' link is present. Below the search bar is an 'advertisement' placeholder. The main content area features an article titled 'What Is Web 2.0' with the subtitle 'Design Patterns and Business Models for the Next Generation of Software' by Tim O'Reilly, dated 09/30/2005. To the right of the article are links for Listen, Print, Discuss, Subscribe to tim.oreilly.com, and Subscribe to Newsletters. The article text begins with 'The bursting of the dot-com bubble in the fall of 2001 marked a turning point for the web. Many'. A 'Read this article in:' box is at the bottom right of the article content.

Functionality - Workflow

2. Resource is clipped & shared



The screenshot displays the Clipmarks web application interface. On the left, a user profile for 'pitner' is shown with a list of clips. The clips include:

- A clip titled 'Diigo & Clipmarks' by pitner, dated 4-24-2007, with 0 POPS.
- A clip titled 'Web 2.0 Core Characteristics' by pitner, dated 4-24-2007, with 1 POP.
- A clip titled 'Dopraváci zatřeli grafitti' by pitner, dated 4-23-2007, with 0 POPS.


On the right, a detailed view of the 'Web 2.0 Core Characteristics' clip is shown. It was clipped from magazines.fasfind.com and contains the following list:

1. The Web As Platform
2. Harnessing Collective Intelligence
3. Data is the Next Intel Inside
4. End of the Software Release Cycle
5. Lightweight Programming Models
6. Software [written] Above the Level of a Single Device
7. Rich User Experiences

The detailed view also shows the user 'pitner' with a 'Share' button and a 'POP' count of 1. The clip was posted on 4-24-2007 at 5:12 PM and has 293 views. The interface includes a search bar, navigation tabs, and a footer with links to 'About', 'Clippers', 'Blog', 'Privacy', 'EULA', 'Copyright', 'Site Map', and 'Forbes Digital'.

Functionality - Workflow

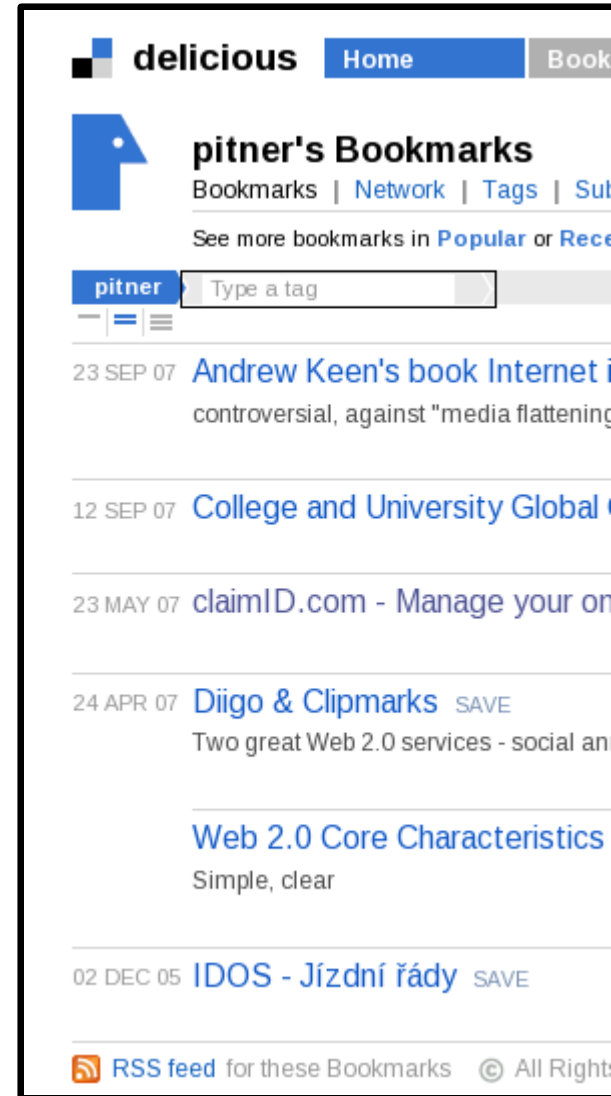
3. The clip is blogged

A screenshot of a blog post. At the top, it says 'FRIDAY, OCTOBER 3, 2008' in red. Below that is a blue icon of a building followed by the title 'Web 2.0 Core Characteristics' in blue. A horizontal line separates the title from the text 'Simple, clear'. Below this is a grey box containing a small green icon and the text 'clipped from magazines.fasfind.com'. At the bottom, there is a numbered list:

1. The Web As Platform
2. Harnessing Collective Intelligence
3. Data is the Next Intel Inside


Functionality - Workflow

4. The blog entry is bookmarked

A screenshot of a Delicious bookmark page. The page title is 'delicious' with a 'Home' button. The user profile is 'pitner's Bookmarks'. Below the profile, there are navigation links for 'Bookmarks', 'Network', 'Tags', and 'Sub'. A search bar with the placeholder 'Type a tag' is visible. The main content area lists several bookmarked items with their dates and titles: '23 SEP 07 Andrew Keen's book Internet...', '12 SEP 07 College and University Global...', '23 MAY 07 claimID.com - Manage your or...', '24 APR 07 Diigo & Clipmarks', and '02 DEC 05 IDOS - Jízdní řády'. Each item has a 'SAVE' button next to it. At the bottom, there is an 'RSS feed' link and a copyright notice '© All Right'.

Functionality - Workflow

5. The bookmarks are syndicated



The screenshot shows a web browser interface for a Delicious bookmark syndication page. On the left, there is a sidebar with navigation links: "Domovská stránka", "Všechny položky (1000+)", "Označené položky ☆", "Trendy", and "Váš obsah". Under "Váš obsah", there are links for "Sdílené položky" and "Poznámky". A text box states: "Vaše sdílené položky uvidí vaši přátelé ze služby Google. Další informace" with a "Začít sdílet" button. Below this is a green button "+ Přidat odběr" and a link "Objevujte »". The main content area shows a list of feeds: "Aktuality Masarykovy ... (15)", "Ceskaskola.cz (97)", "claimID weblog - Mana...", "claimID.com: pitner", "Fragen zur Vorlesung", "Grails New Pages Feed", "IBM alphaWorks Emergi... (140)", "Novinky.cz (1000+)", "PersonalDiggRSS", "RoBorg.co.uk - GeoNew...", "Tomas Pitner's Blog (1)", and "Delicious/pitner (1)". On the right, a detailed view of a bookmark is shown for "Web 2.0 Core Characteristics" by "pitner". It includes a "Bookmark this on Delicious" button, a star icon, and sharing options: "Přidat hvězdičku", "Sdílet", and "Sdílet s poznámkou".

- **Simple, lightweight user interface**
 - **Less colors, less effects,... (less content)**
- **High interactivity**
 - **Resembles desktop apps, gaining much better user experience**
 - **Technology: AJAX (Asynchronous JavaScript and XML - Asynchronous more important), and JSON (JavaScript Object Notation)**

- **Low entrance barrier**
 - Zero or easy configuration (browser-based)
 - Informal nature
 - Easy user/identity management (3rd party, shared)
- **Suited for wide variety of devices**
 - Centralized user data & profile management
 - Mobile devices

Development Process

- **Continuous development, perpetual β services, so no needs for reinstall**
- **Lightweight development methods**
agile methods, online tools, apps can be hosted
- **User involved in the development**
instant feedback, user communities involved
- **Ready-to-integrate apps**
API, web service interface or at least legal screen scrapping

- **Business Models**
 - More **robust** than pre-dot-com-bubble web applications
 - **Lower start-up** costs
 - hosted solutions, cheaper hardware and software, online development tools
 - Typically a **mixture** of
 - advertisement
 - transaction profit-sharing
 - paid add-on services, extended versions
 - peer cost-sharing

- **Specific problems with mashups**
 - ***Terms of Use* have variable quality**
may be too restrictive or too unspecific
 - **No stable models how to share the profit**

That were our characteristics but...

**Web 2.0 is user-centric, so
what do the users think about it?**

**Are they aware of all the potentials
and shortcomings?**

How would *they* describe it?

What is Web 2.0 - *Vox populi*

- **Web 2.0 is *not* like London. For London, you do not know where it ends but you know what it is. It's a city. But what is Web 2.0? New look? AJAX?**

-- David Antoš, Lupa.cz

Even worse...

- **Instead of saying “Error #123456 occurred in the database“, a Web 2.0 app replies “Oh no, this should not happen“**
-- *L. Mach*
- **“Orange, blue, and *beta* in the title“**
-- *L. Polivka*
- **“The difference between 1.0 and 2.0? It's spamming your blog comments instead of mailboxes.“**
-- *Anonymous*
- **“It's... mostly about visage, graphics... large fonts, something like wicked worn look :-)”**
-- *Filosof*

**We were describing
the current state-of-the-art till now...**

**What's likely to happen in the next few
years?**

...and how we try to contribute to it

Trends & Vision

- **Identity Consolidation** and More **Trust**
- More **Inclusive Universal Accessibility (*)**
- Better **Interoperability**, More **Standards**
- Towards the **Semantic Web**
- New **Distributed Architectures**
- More **Open Content (*)**
- Facilitated **Development**
- **Enterprise Applications!**

Distributed Identity Consolidation

Problem: A user often has dozens of service registrations (login/email, password) - impractical, difficult to remember

Trends towards a solution:

- Large service providers and integrators (Google, Yahoo) consolidate identity management at their services using proprietary standards and solutions (*Google Account, Yahoo! ID*)

Identity Consolidation and More Trust


Distributed Identity Consolidation

Problem: A user often has dozens of registrations (login/email, password) which is impractical, difficult to remember

Trends towards a solution:

- Large service providers and integrators (e.g. Google, Yahoo) consolidate identity management services using proprietary standards (*Google Account, Yahoo! ID*)

Sign in to Yahoo!

 **Are you protected?**
Create your sign-in seal.
(Why?)

Yahoo! ID:

(e.g. free2rhyme@yahoo.com)

Password:

Keep me signed in
for 2 weeks unless I sign out. [Info](#)
[Uncheck if on a shared computer]

[Forget your ID or password?](#) | [Help](#)

Don't have a Yahoo! ID?
Signing up is easy. [Sign Up](#)

Distributed Identity Consolidation (cont.)

Problem: A user often has dozens of service registrations (login/email, password) - impractical, difficult to remember



Trends towards a solution:

- There are open standards and services for distributed authentication and identity management with rapidly growing popularity (*OpenID*, *CardSpace*).
- OpenID offered by about 100+ independent providers, and accepted at 700+ sites | <http://openiddirectory.com>
- Growing interoperability between large providers vs. open standards (“Google login as an OpenID”)

Distributed Identity Consolidation

Problem: A user often has dozens of service registrations (login/email, password) - impractical, difficult to remember

Limited workaround:

- *Credentials management (e. g. Agatra.com)*



- Home
- Add Account
- Manage Accounts
- Options
- Logout

My Accounts

- ▶ GMail
- Clipmarks
- Eventful
- ▶ Delicious
- rememberthemilk
- ▶ Yahoo Mail
- slideshare
- ▶ Flickr
- YouTube

More Trust: Claiming Ownership of Web Resources

Problem: How can other users trust what are my web resources?

Trends towards a solution:

- Services for “web asset management” - users can maintain a list of their possessed artifacts (wikis, blogs, webs,...) and get their “ownership” verified.
- Frequently based on an *open identity*, such as OpenID

[Viewing 6 links](#) | [Create New Group](#) | [Reorder Groups](#) | [Contacts](#) | [Verified](#)

My Pictures ▾

photos, images, diagrams...

[Create New Link](#) | [Edit this Group](#) | [Delete this Group](#) | [\(Help\)](#)

* My Flickr account

▶ Not About Me | By Me

pictures from business trips mainly

My Webpages & Blogs ▾

[Create New Link](#) | [Edit this Group](#) | [Reorder Links in this Group](#) | [Delete this Group](#) | [\(Help\)](#)

* Web 2.0 Wiki

▶ Not About Me | By Me From 2007 Tagged with: web 2.0 e-learning

Wiki about Web 2.0

* Lifelong Learning @ FI MU

▶ Not About Me | by my workgroup

Lifelong Learning at the Faculty of Informatics, Masaryk University, Brno

* My Blogspot Blog

▶ Mostly about Web 2.0 stuff (but also about me) | By Me Tagged with: web 2.0 e-learning

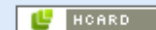
* My Homepage @ Masaryk University - *Verified*



Tomas Pitner [\[edit\]](#)

In this section, you can add information about yourself, your [flickr](#) pictures or [del.icio.us](#) links, a [web counter](#) - whatever you'd like to personalize your claimID page. If you'd like to see some other claimID pages for reference, this [post on the claimID blog](#) has some great examples.

Only you can see this message, and once you [edit your biography](#), it will go away.



Tomas Pitner

More Trust Problem: web re Trends to

- Service mainta
webs,..
- Frequent

sources re my

; can
kis, blogs,
s OpenID

More Inclusive Universal Accessibility

Problem: How to make Web 2.0 more Inclusive UA?

Trends towards a solution:

- Apply principles of Inclusive Universal Access in all aspects of all types of Web 2.0 services
- Elaborated for social tagging in two papers, see
 - **Derntl, Hampel, Motschnig, Pitner: Inclusive Social Tagging: A Paradigm for Tagging-Services in the Knowledge Society** [Best Paper at WSKS, Athens, Sept 2008, Springer LNAI]
- Proved that tagging in Web 2.0 is generally more IA-compliant than legacy metadata-based systems or current Semantic Web efforts
- Still a long way to go in many aspects: device independence, aspects of inclusiveness and service adaptivity

Problem: Large social networks cannot smoothly cooperate

Trends towards a solution:

- Manifold standardization of **data models** and **exchange formats** (e.g. data about user profiles, relationships)
- Simple **APIs** (nearly 2000 third-party apps using Facebook API)
- Finer-grained user profile info and shared data, better IPR management and authorization in real services
- ↗ Published in several **papers** (with **T. Hampel, J. Schulte, M. Steinbring**)
- ↗ Being implemented in the **portal „4students“** by **Marek Jelen**

Problem: Gap between Web 2.0 and Semantic Web

Trends towards a solution:

No universal one reached but efforts from both directions

- Semantic Web gradually reaches the **Web 2.0 ease-of-use** ↗ *Semantic Wiki*
- **Semantically richer Web 2.0** artifacts grow also bottom-up ↗ *enhanced tagging (grouping, querying)*
- **Domain-specific** tools/services
 - ↗ *Web 2.0 math resources* (focused in P. Sojka: Digital Mathematics Library; Ch. Müller, M. Kohlhase: Joining Educational Mathematics Network)
 - ↗ *learning* (aimed at in E-learning in the Semantic Web Context Project)

Problem: How to reduce initial investments and maintenance costs?

Trends towards a solution:

- Create Mashups
 - do what you can do best; where the added-value is
 - use your unique, hard-to-(re)gain data
 - integrate the missing functionality from other services
 - Outsource and Host
 - use hosted storage, computational power, network capacity, supporting services, monitoring... (*Amazon ECS*)
- Being implemented by **Pavel Drášil: An ESB-based Web 2.0 service integrator for technology enhanced learning**

Problem: Unclear, unspecific, or restrictive ToU

Trends towards a solution:

- *Use open software and standards*
 - OSS community often provides viable solutions
 - commercial vendors go towards open standards
 - *Create and share open content*
 - enabled by reduced publishing costs
 - radically simplifies IPR management
 - fosters reuse and repurposing
 - popularity in scientific community „Open Science“
- **Identified and analysed in [Drášil, Hampel, Pitner, Steinbring: Get Ready for Mashability, ICEIS 2008](#)**

Problem: Development is still an ad-hoc effort

Trends towards a solution:

- Platforms covering the development and deployment circle at some/all application tiers
 - both commercial and open source
 - for a range of computer platforms
 - increasing importance of pure online tools!
- Examples: Google GWT, Adobe Flex, JavaFX, and MS Silverlight

Compared and applied by

➤ **J. Tesařík: Techniques and Tools for Building Web 2.0 Services**

➤ **M. Kotlík: Tools for Web 2.0 Services Integration**

Web 2.0 in Enterprise or “Enterprise 2.0”?

Problem: Web 2.0 is still a “global community” trend rather than a part of enterprise computing

Trends towards a solution:

- It *is* an important topic: **40M+** links on Enterprise Web 2.0...
- Do **not** mix with **Web 3.0** (it is rather the *Web 2.0 + Semantic Web* merger)
- Important set of **principles, patterns, techniques, and tools** for the enterprise knowledge management, increased marketing potential, or better customer relationship support.
- Large enterprise systems and solution providers have already identified the needs and come with proposals – **business patterns** and **development tools** (IBM Mashup Starter Kit)

Selected patterns (Robinson, 2008):

- **Content and/or widget provider** → we provide, partner app integrates
- **Enterprise mashups** → we integrate (mash), both internet and intranet user profite
- **Marketing as a conversation** → exploit social networking potential for marketing while the traditional broadcast impact declines
- **Community enablement** → shared community experience in both intra- and internet
- **Rich interfaces** → reduce barriers, device dependencies, more intuitive interface

More details in PhD topics:

↗ **J. Škrabálek: Web 2.0 Service Development Patterns**

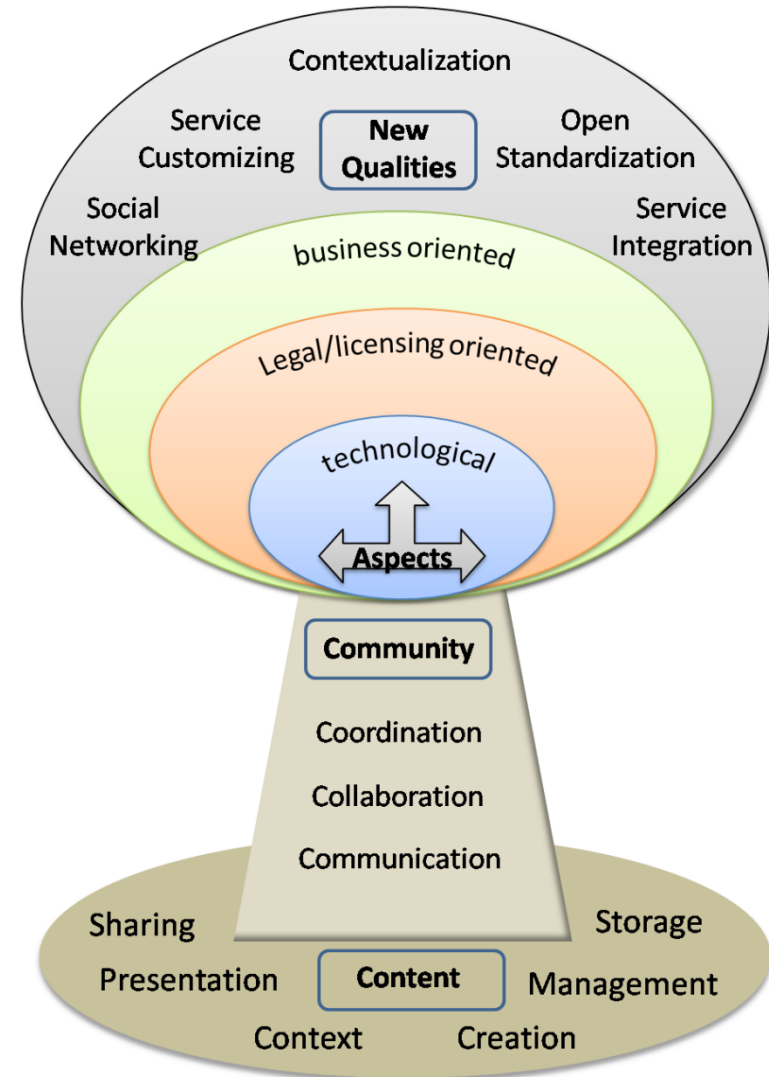
↗ **M. Steinbring (Uni Vienna): Enterprise Potential of Web 2.0**

Mashing as a Web 2.0 Phenomenon

- **Mash-up/mashup** („míchanice“ in Czech, “Mischung” in German, both translations being used rarely) is a common term denoting a Web application based on *integration* of other (typically third-party) Web applications.
- Mashups represent implementations of **service-oriented architecture** in present Web environment.
- Examples
 - Map-/**Geoinfo**-based mashups
 - Syndication**-based mashups
 - RSS, Atom...*
 - Mashups using “**infrastructural**” services
 - payment services, monitoring, storage,...*

Aspects of mashing

1. Legal/Licensing
2. Business
3. Technological



Mashing: Technological aspects

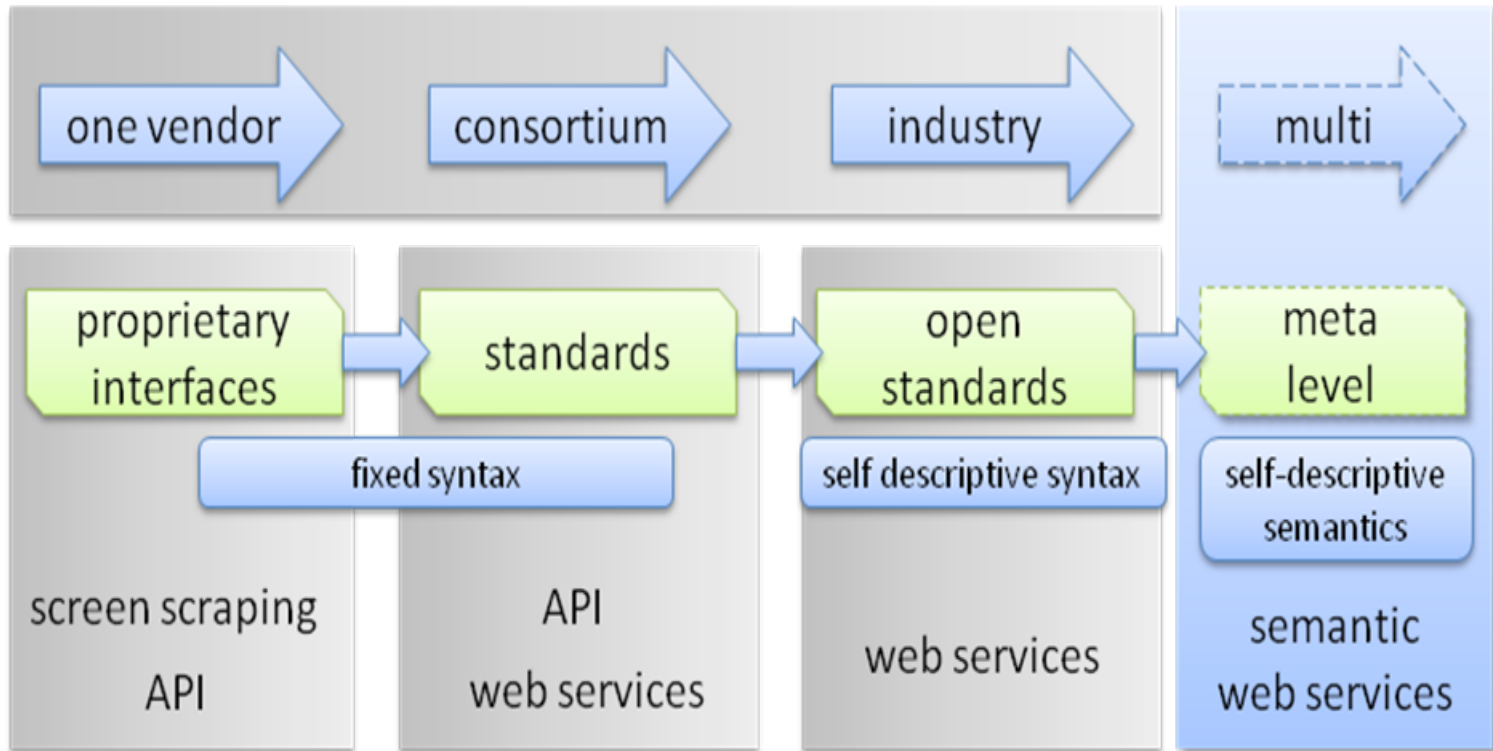
- **APIs - are vital for “web as a platform” ...
... but 1/3 of the services does not have it**
- **Communication protocols**
 - HTTP (except IM and emailing services)
- **Messaging models**
 - RPC (SOAP, XML-RPC, or non-standard), REST
- **Data formats**
 - XML-based, JSON, plaintext, syndication formats
- **On server or on client?**
 - Simple protocols & formats allow client-side mashing too, but client environments mostly prevent it
- **Development tools**
 - Online and offline, even enterprise-oriented (IBM...)

Technological Aspects - API

- Is there an **API** at all?
- **Object**-based API vs. **Web**-based API (objects vs. lower level protocols)?
- **Common** API in a service family?
- Web services: **SOAP**-based or **REST**-architectural style?
- Specific (non-HTTP-based) protocols
- Common exchange **formats**?
- **XML** or **JSON** (or **other**)?

Service	Official API
Adobe Share	REST
Amazon S3	REST, SOAP
Backpack	XML over HTTP
Blogger	GData
bubbl.us	no
Calendarhub	no
Clipmarks	no
Diigo	no
DivShare	REST
Flickr	REST, XML-RPC, SOAP
GMail + GTalk	POP3/SMTP/IMAP, XMPP
Google Base	GData
Google Calendar	GData
Google Docs	GData
Google Groups	no
MediaMax	REST
MySpace	no
Picasa Web Albums	GData
Remember The Milk	REST
SlideShare	REST
wikidot.com	no
Zoho Online Office	REST, XML-RPC

Technological Aspects - Level of Integration



Mashing: Legal/licensing aspects

- **Legal issues (Terms of Use, Terms of Service)**
 - User accounts (who may create, for what purpose)
 - Automated access (pitfalls of many scientific projects...)
 - Content limitations (not all content is allowed)
- **User-supplied data licensing**
 - For service provider (what they are allowed to do?)
 - Data ownership (the service or content provider has it?)
 - Data privacy (how secure it is?)
 - Service provider rights (for its own business?)
 - For other users
 - Possible usages of published data?

Licensing of the Content

Service	Licensing for service provider	Licensing for other users
Ad. Share	Necessary only	
Amazon S3		All rights reserved
Backpack	Service promotion	
Blogger	Service promotion?	
Bubbl.us		
Calendhub	Data ownership	All rights reserved
Clipmarks	Complete rights	
Diigo	Use in their services	All rights reserved
DivShare		All rights reserved
Flickr		7 possibilities (CC [*])
Gmail/Talk	Necessary only	
G. Base	Use in their services	
G. Calendar	Necessary only	

G. Docs	Necessary only	All rights reserved
G. Groups	Use in their services, promotion	
MediaMax		
MySpace	Use in their services	All rights reserved
Picasa	Use in their services, promotion	
Remember The Milk	Necessary only	
SlideShare	Usage for their business	7 possibilities (CC [*])
Wikidot	Usage in their services	14 possibilities (CC [*])
Zoho		All rights reserved

Mashing: Conclusion

- **Mashing potential of a service is determined by the combination of its technological, legal and business properties.**
 - **We have found that a sufficient maturity is reached in none of these three areas.**
- ↗ For further details, see ***Drasil, Hampel, Pitner, Steinbring: Get Ready for Mashability!, Proc. of ICEIS Intl. Conference, Barcelona 2008***

- **Web 2.0 Concepts**

 - original (intuitive) view*

 - examples*

 - systematic view*

- **Trends and Visions**

 - where the main problems are*

 - how we are approaching them*

- **Mashups and related issues**

Further Reading

- ✓ **Hampel, Pitner, Steinbring: *Virtuelle Gemeinschaften - die Qualität des Neuen Web - eine Taxonomie*, Proc. of GeNeMe, Dresden, 2007**
- ✓ **Drasil, Hampel, Pitner, Steinbring: *Get Ready for Mashability!*, Proc. of ICEIS, Barcelona, 2008**
- ✓ **Hampel, Pitner, Schulte: *Web 2.0 Mashups for Contextualization, Flexibility, Pragmatism, and Robustness*, Proc. of ICEIS, Barcelona, 2008**
- ✓ **Derntl, Hampel, Motschnig, Pitner: *Social Tagging und Inclusive Universal Access*, Chapter in “Good Tags - Bad Tags”, WAXMANN, Münster, New York, 2008**
- ✓ **Derntl, Hampel, Motschnig, Pitner: *Inclusive Social Tagging in Springer LNAI 5288*, 2008. Best paper at the World Summit on Knowledge Society, Athens 2008**
- ✓ **Extended version to appear in *Journal of Computer and Human Behaviour*, Elsevier**

Summary, Further Reading

- ✓ **Deep Thoughts Portal (T. Gregar, R. Pospíšilová)**
<http://kore.fi.muni.cz:5080/deep/master/>

Thank you for your attention!

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