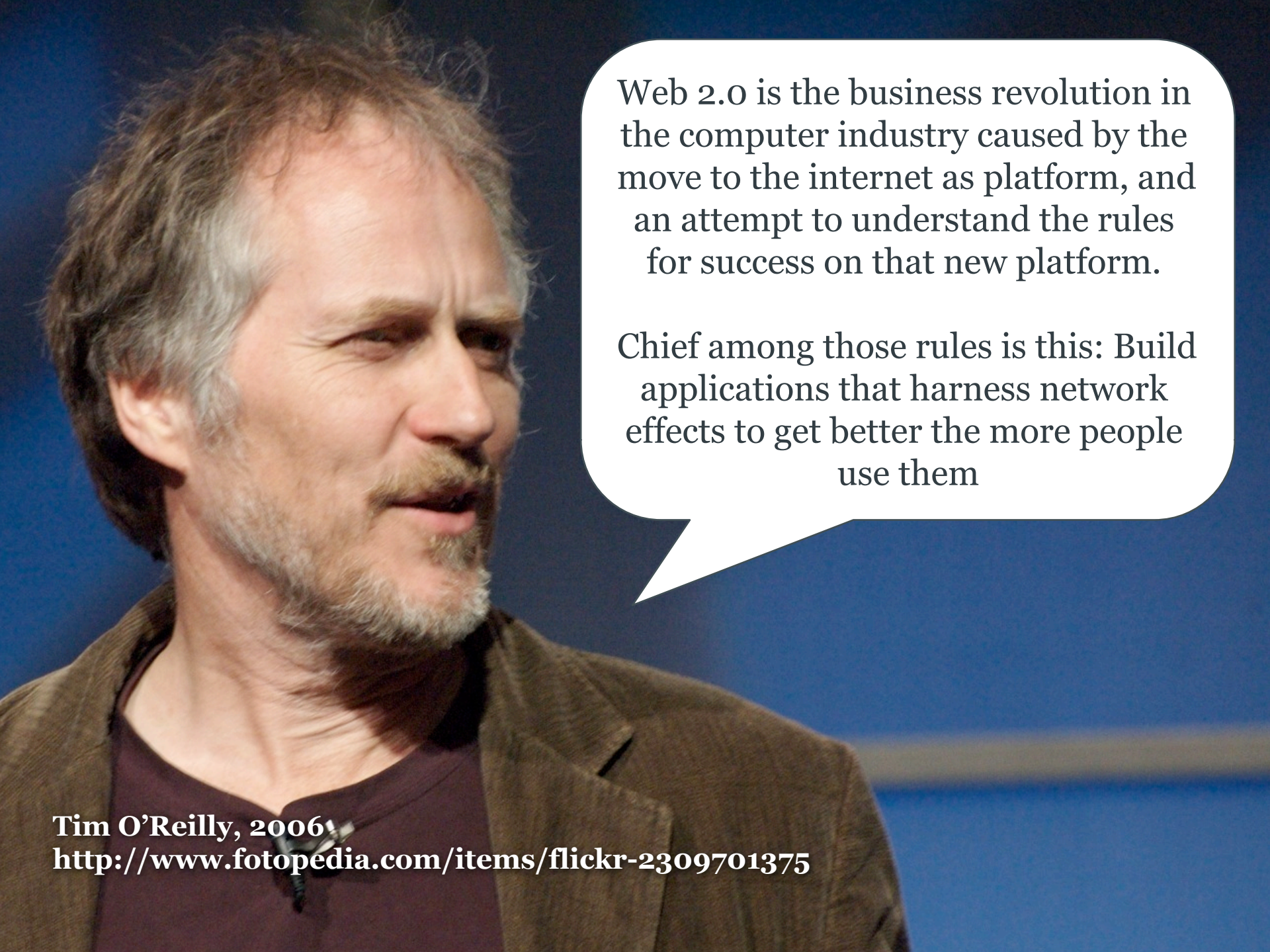


Semantic Web and Web2.0

Dr Nicholas Gibbins

A photograph of Tim O'Reilly, a man with grey hair and a beard, wearing a brown jacket over a dark shirt. He is looking slightly to the right. A white speech bubble is overlaid on the right side of the image, containing text.

Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform, and an attempt to understand the rules for success on that new platform.

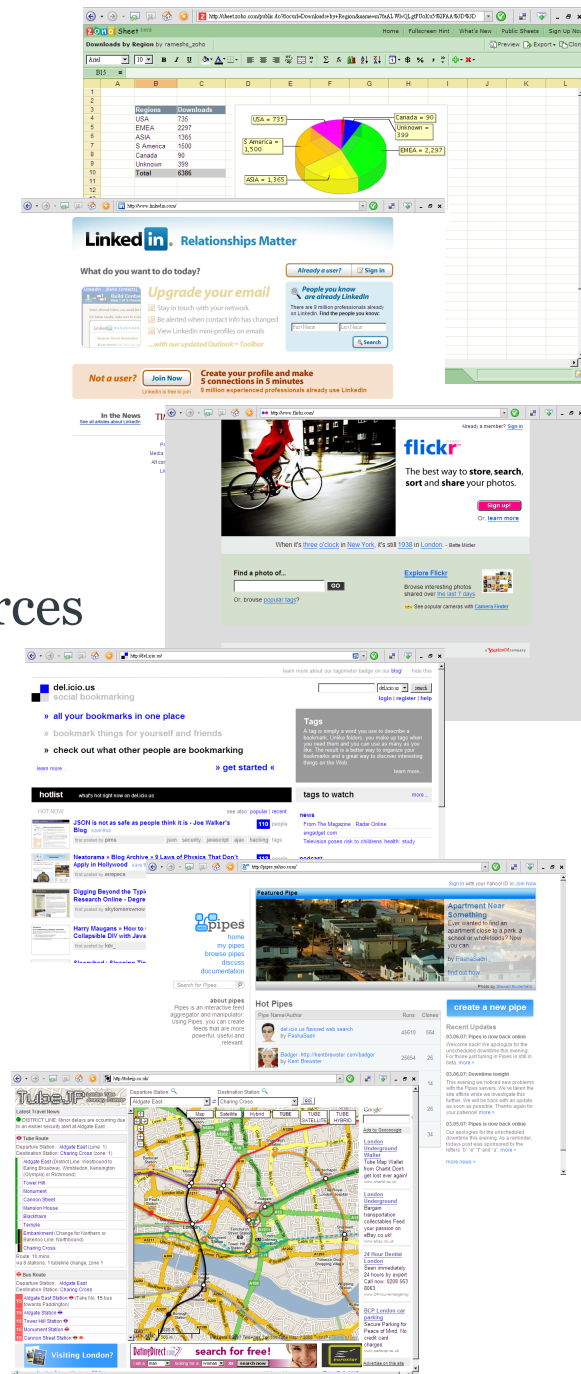
Chief among those rules is this: Build applications that harness network effects to get better the more people use them

Tim O'Reilly, 2006

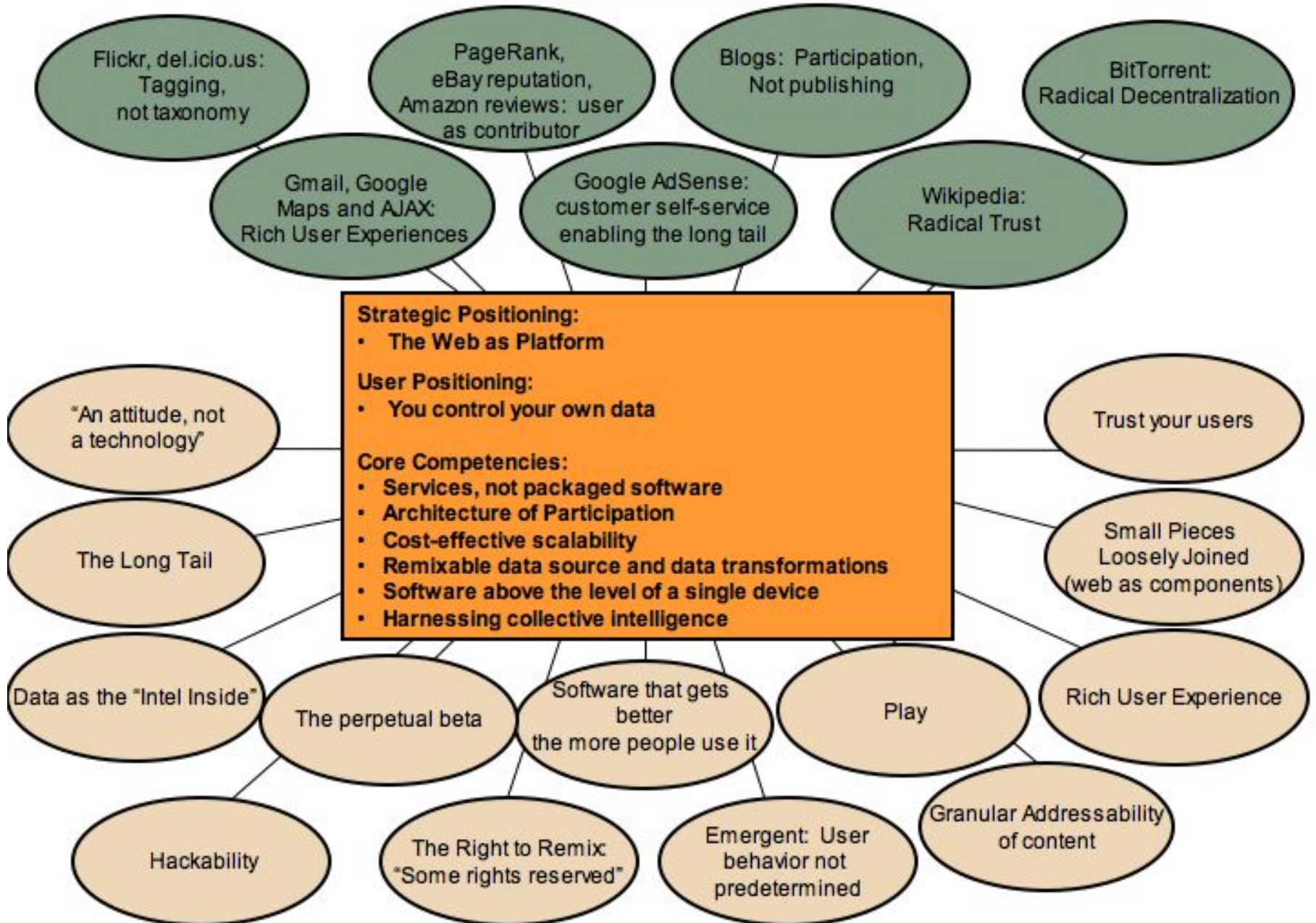
<http://www.fotopedia.com/items/flickr-2309701375>

Characteristics of Web2.0

- Enhanced user interface, experiences
 - Use of AJAX, software in the Web browser
- Linking people, forming communities
 - Social networking sites, online sharing of resources
- Organizing resources
 - Social tagging, Flickr, Yahoo Pipes, etc
- Mix and merge of the real and virtual
 - Mashups, Google Maps

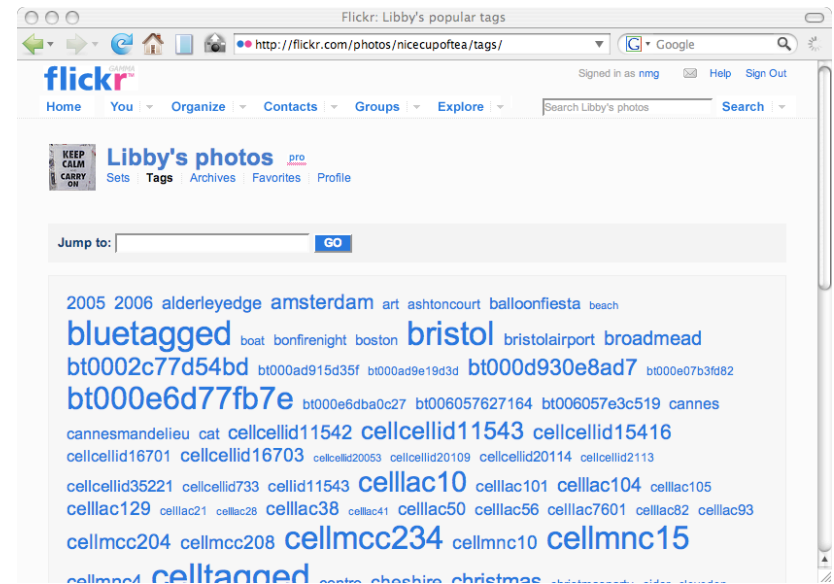
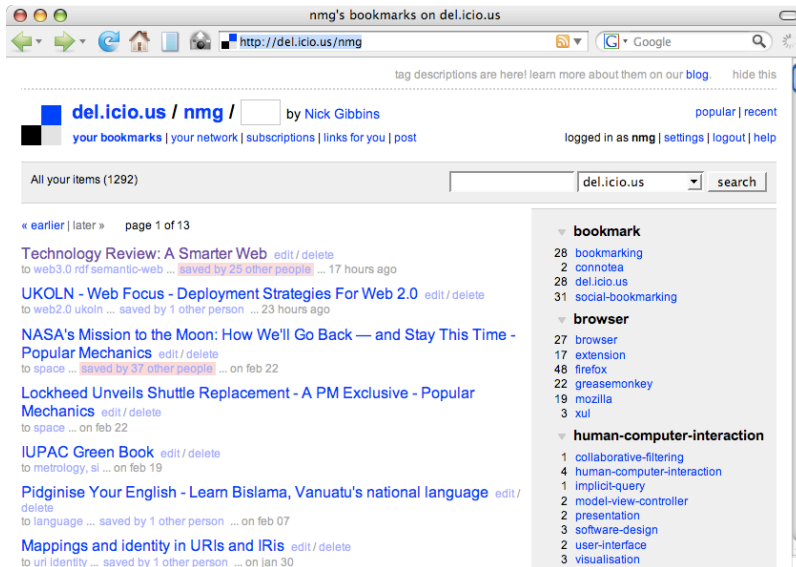


Web 2.0 Meme Map



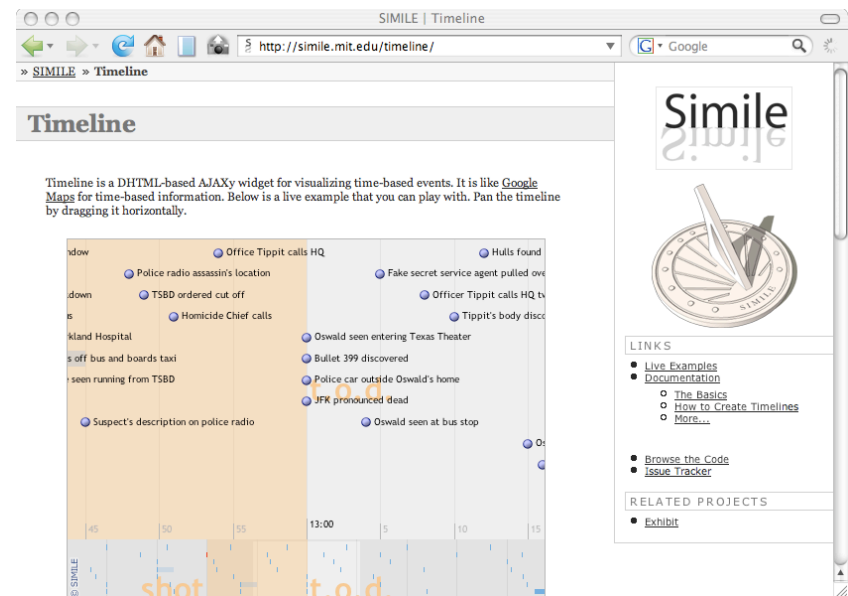
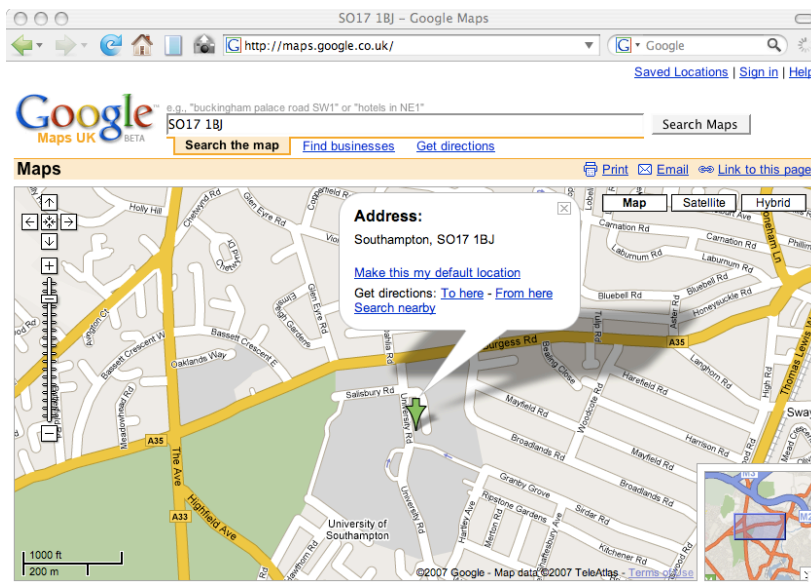
Tagging, not taxonomy

- Resources described by bags of keywords
 - “nyc, www2004, libby miller, posters”
 - Vocabulary is not controlled
- Cheaper annotations – users more likely to annotate resources



Rich User Experiences

- AJAX: Asynchronous JavaScript and XML
 - Googlemaps, GMail
 - More responsive interfaces
 - Richer interaction (beyond the click)



Radical Decentralisation

- Decentralisation of resources and processing
- Peer-to-peer computing (remember that?)
- Application components on Web
- Service orientation
- Open APIs allow service reuse in unexpected ways
 - Remixes, mashups and hackability

Subscribe Search + tag cloud Advertise on this

programmableweb

Home Blog Mashups APIs Developers Share Learn Discuss About

Full Mashups Listing

Get new mashups delivered every day. **Subscribe:** [Mashup RSS Feed](#)

By Date By Name 1 to 50 of 1672 mashups

Name	Description	APIs	Updated
Blog Value Calculator	This applet uses the Technorati API to compute and display what your blog is worth using the same link to dollar ratio as done in the AOL-Weblogs Inc. deal.	Technorati	2007-03-15
Stadium Hunt	Satellite images, information and directions for hundreds of stadiums across the United States.	GoogleMaps	2007-03-15
Eventpedia	See events coming to your neighborhood via this mashup of Google Maps and Upcoming.org .	Upcoming , Google	2007-03-15
TalentExpo	TalentExpo is a community site which allows you to display your talents and passions as well as create personal pages with generated content. In French.	YouTube , Flickr	2007-03-15
Netvibes Digg	This widget will display the latest items from Netvibes	Netvibes	2007-03-14

ProgrammableWeb Sp...
openkapow
Connect. Collect. Mashup. Everything!
Text Voice Video IM Chat Record
Hosted Web Platform Database-Integrated Starting at FREE
userplane
Learn about sponsors
Ads by Goooooogle

User as contributor

- User-written material forms basis for community websites
 - eBay feedback
 - Amazon reviews
- Rich-get-richer behaviour
 - The more people that contribute to a website, the more useful it is to you
 - Social bookmarking
 - Recommender systems

Enabling the Long Tail

- Amazon sells more minority books than mass-market bestsellers
- Small sites make up the bulk of the Web
 - DoubleClick used by large corporate sites
 - Google AdSense aimed at small sites

Participation, not publishing



- The rise of the blogosphere
- Publishing in a social context
 - Feedback and comments from readers
 - Ongoing polylogue
- Some high-profile successes
 - Blogs vs traditional news media (Iraq war, etc)
 - Grass-roots political blogging

Main Page - Wikipedia, the free encyclopedia

W http://en.wikipedia.org/wiki/Main_Page

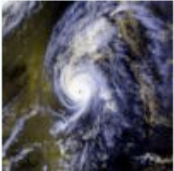
main page discussion view source history

Welcome to **Wikipedia**,
the free encyclopedia that *anyone* can edit.
1,687,553 articles in English

Arts Hist
Biography Mat
Geography Sci

Overview · Editing · Questions · Help Contents · Categories · Fe

Today's featured article

 **Hurricane Iniki** was the most powerful hurricane to strike the state of Hawaii and the Hawaiian Islands in recorded history. Forming during the strong El Niño of 1991-1994, Iniki was one of eleven Central Pacific tropical cyclones during the 1992 season. The eye of Hurricane Iniki passed directly over the island of Kauai on September 11, 1992 as a Category 4 hurricane on the Saffir-Simpson Hurricane Scale. It was the first hurricane to hit the state since Iwa in the 1982 season, and the first major hurricane since Hurricane Dot in 1959. Iniki caused around \$1.8 billion (1992 US dollars) in damage and 6 deaths. At the time, Iniki was among the costliest United States hurricanes and remains one of the costliest hurricanes on record in the eastern Pacific. ([more...](#))

Recently featured: [Same-sex marriage in Spain](#) – Cricket

In the news

- The beating and detention of Zimbabwe opposition leader **Mc Tsvangirai** prompts international condemnation of the regime of **President F**
- The **British House of renew** the country's a system despite signif **Labour Party MPs**.
- The **Cassini spacecr** several sea-sized bo (*pictured*), the largest
- **Jacques Chirac, Pre 1995** announces the

- No controls on authorship
- Everyone's an author/editor
- “With enough eyeballs, all bugs are shallow”
- Content becomes trusted because (it is assumed that) many people have vetted it

Changing links

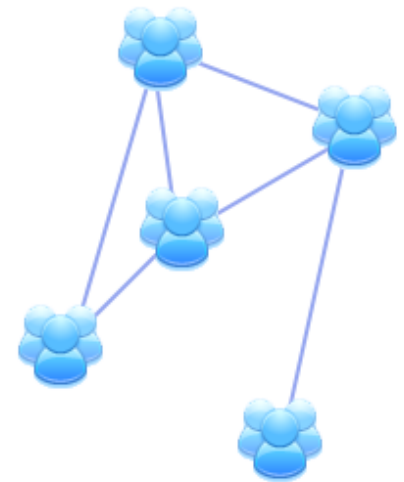
Linking Documents



Linking Users



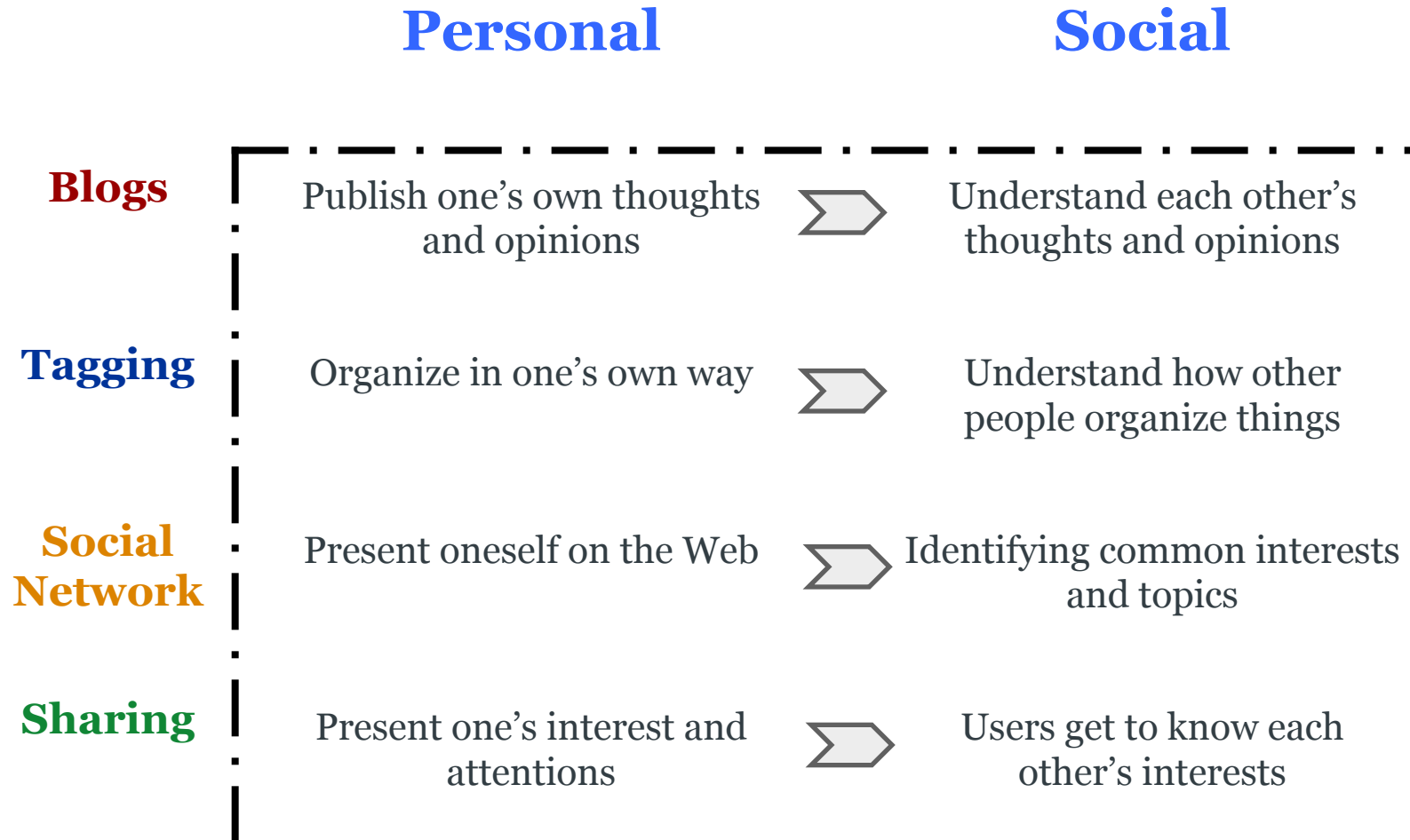
Linking Communities



Social applications

- Harnessing the network effect
- Distinct functionality/Social groups/Domains
 - Wikipedia: building an open encyclopedia
 - Flickr: sharing photographs
 - Facebook: meeting new people and keeping in touch with friends
 - Last.fm: finding new music
 - Deli.cio.us: sharing bookmarks

The Personal and Social Dimensions



Facebook

- Clean interface with good usability
- Immediate results after actions
- An understanding of the audience and the domain
- The ability to refer to other members of the network.
- Vanity and the act of publishing

Facebook

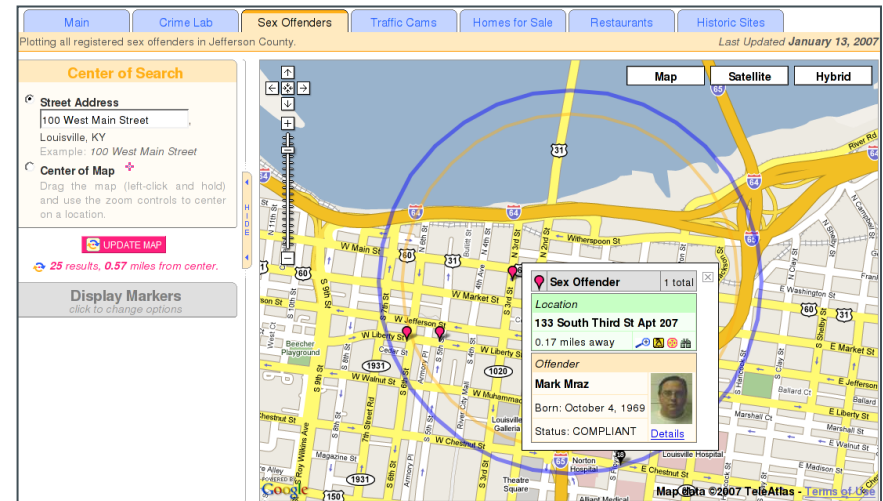
- Maximise data collection by:
 - Making publishing easier
 - Adding immediate value for the users
 - Hiding the underlying system
- Now they are exposing the data
 - And making it fun....

fql

```
SELECT name, pic FROM user WHERE uid=211031 OR uid=4801660
```


Personal Information

- You will be known for your online behaviour
- Mash-ups ...
- If you could refer to yourself using a single URI, could you more easily see where you've been mentioned?



$$F = b = (1, u, v)^T$$

$$V = \frac{1}{\sqrt{1+u^2+v^2}} \begin{pmatrix} 1 \\ u \\ v \end{pmatrix}, \|V\| = 1$$

$$t = \frac{1}{2} \frac{c^2 - 2FF + gE}{EG - F^2}$$

$$- \frac{fF}{EG - F^2} = (\tau_k + \tau - \tau)$$

$$X_u \times X_v = \begin{pmatrix} 1 \\ -v \\ u \end{pmatrix}$$

$$= (1-vX) \mathbf{b} + v\tilde{\tau} \mathbf{i}$$

$$X(u,v) = \left(uv - \frac{u^3}{3}, v + u^2v - \frac{v^3}{3}, u^2 - v^2 \right)$$

$$z_{uv} = \frac{\partial^2}{\partial u \partial v} (g)$$

$$-1 - v^2 + u^2 = \frac{\partial}{\partial v} (g)$$

$$z_{uv} = \frac{\partial^2}{\partial u \partial v} (f)$$

$$-1 - u^2 + v^2 = \frac{\partial}{\partial u} (f)$$

$$-2u = \frac{\partial}{\partial v} (h)$$

$$(1+z^2) z - 2v = \frac{\partial}{\partial u} (h)$$

$$h = 2uv^2$$

$$g = u^2v - \frac{v^3}{3} - v$$

$$f = -u - \frac{u^3}{3} + uv^2$$

$$F = \langle X_u, X_v \rangle$$

$$X(u,v) = \left(-1 + uv^2 - \frac{u^3}{3}, -v + u^2v - \frac{v^3}{3}, -2uv \right)$$

$$X_u \times X_v = \begin{vmatrix} 1 & -v & u \\ 0 & 1 & 2u \\ 0 & 2u & -2v \end{vmatrix}$$

$$= \begin{pmatrix} 1 \\ -v \\ u \end{pmatrix}$$

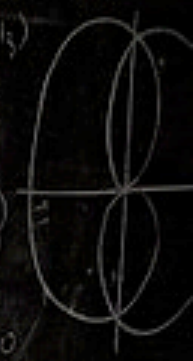
$$\|X_u \times X_v\| = \sqrt{1 + v^2 + u^2}$$

$$\frac{1}{\sqrt{1 + v^2 + u^2}}$$

Lessons Learned

<http://www.flickr.com/photos/shonk/418180402/>

2



Lessons Learned

- Google's View of the Web – links as votes of confidence
- Facebook has been successful due to ease of use and immediate feedback
- Get the Data Exposed! - Complexity
- Resolvable URIs!
- Interfaces for the Semantic Web
 - mSpace
 - Tabulator
 - Dbpedia
 - Haystack
 - ...

User Interfaces

The screenshot shows the mSpace Classical Music Explorer interface. It features a search bar at the top right, a 'Composer' dropdown menu in the center, and a 'Piece' list on the right. The 'Composer' dropdown is open, showing a list of composers including Bach, Biber, de Araujo, Gibbons, Maier, Pachelbel, Purcell, Reusner, and Sweelinck. The 'Piece' list shows several concertos. The 'Preview' section on the right displays details for 'Credo, Chorus: Et Expecto', including the sonata number and key signature. A Google search bar is visible at the bottom of the page.

▼ The Tabulator Project

testDataset

- ▶ ● Data on location of libraries mostly in the UK
- ▶ ● Martin Hepp
- ▶ ● Semantic Web Coordination Group plan includes calendar info
- ▶ ● TAGmobile road trip BOS->Amerst: photo locations
- ▶ ● Some flight itinerary options, with times and places
- ▶ ● Agent in Wordnet

developer

▼ Adam Lerer

type

- ▶ ● Person

AIM chat ID

[adamlerer](#)

based near

▼ ...

type ▶ ● Point

latitude 42.3601

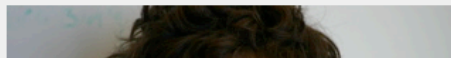
longitude -71.0783

is based near of ▶ ● Adam Lerer

birthday

[mm-dd: 04-26\[toggle\]](#)

depiction



DISCO

Query wikipedia

This semantic database contains over 10 million statements extracted from the English Wikipedia.

[Modify this query or create your own!](#)

This knowledge base contains *subject-predicate-object statements* obtained from the infobox templates of the English wikipedia, such as:

search for query

- Tennis players
- People influenced by
- Sitcoms set in
- Soccer players
- club with stadium in
- a country with
- Film music composed by
- Films longer than
- Space Missions
- People being
- Hip hop CDs
- List of Web
- Battles in
- Scientists and
- Pictures of
- Mayors of
- Planes and
- decade of the

QBE - Advanced - Options - Help - About

Reset Tools
Open
Save
Save As...
Run Query
Visualize
Get from QBE

Properties

Type: URI
ID:
Datatype:

Schemas

- unbound
- bound

http://atomowl.org/ontology

Import Remove

order by

Output format: Table Distinct Get Remote Data when Missing Locally Type: SELECT

Endpoint: /sparql

Copyright © 2006 OpenLink Software, Inc.

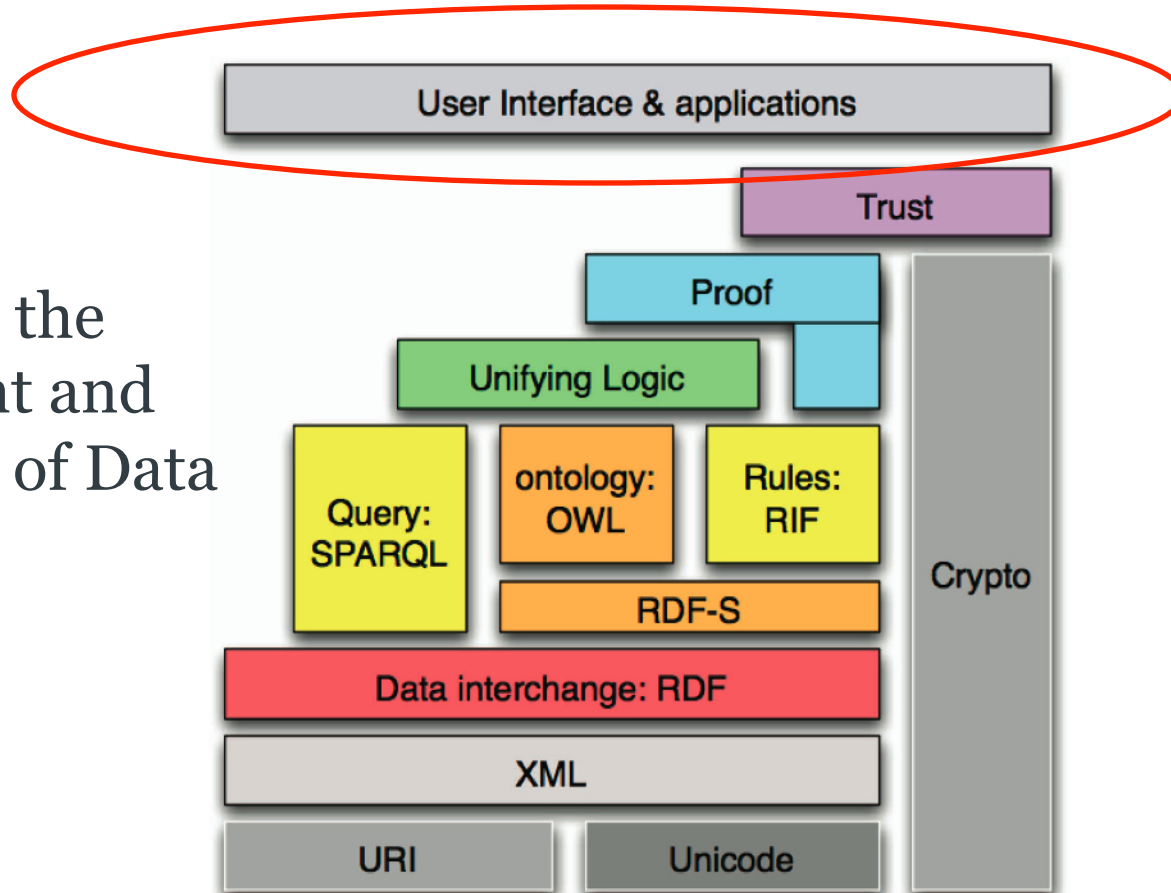
dbpedia.org

Querying Wikipedia like a Database.

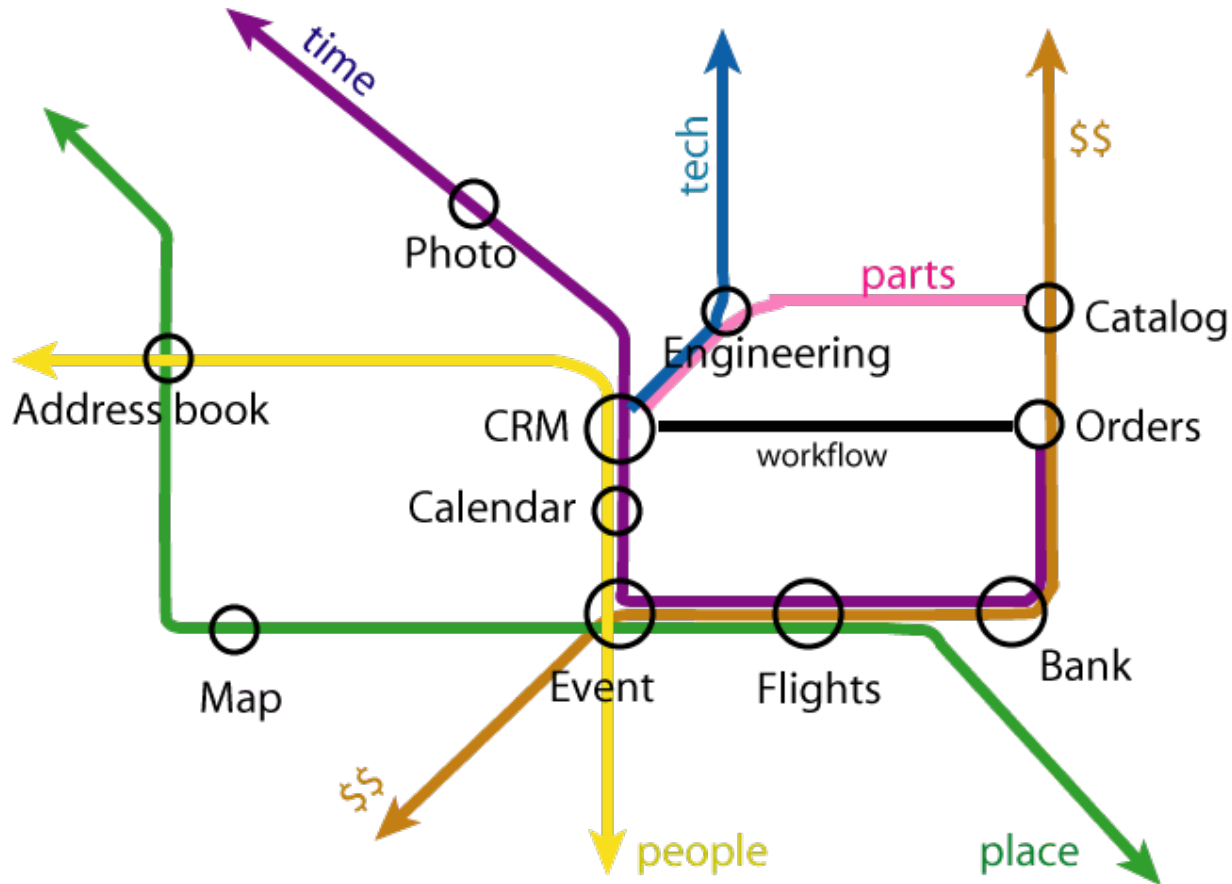
OpenLink QBE
visual query builder

The New Layer Cake

Encourage the
deployment and
publishing of Data



Linking Data



Tim BL

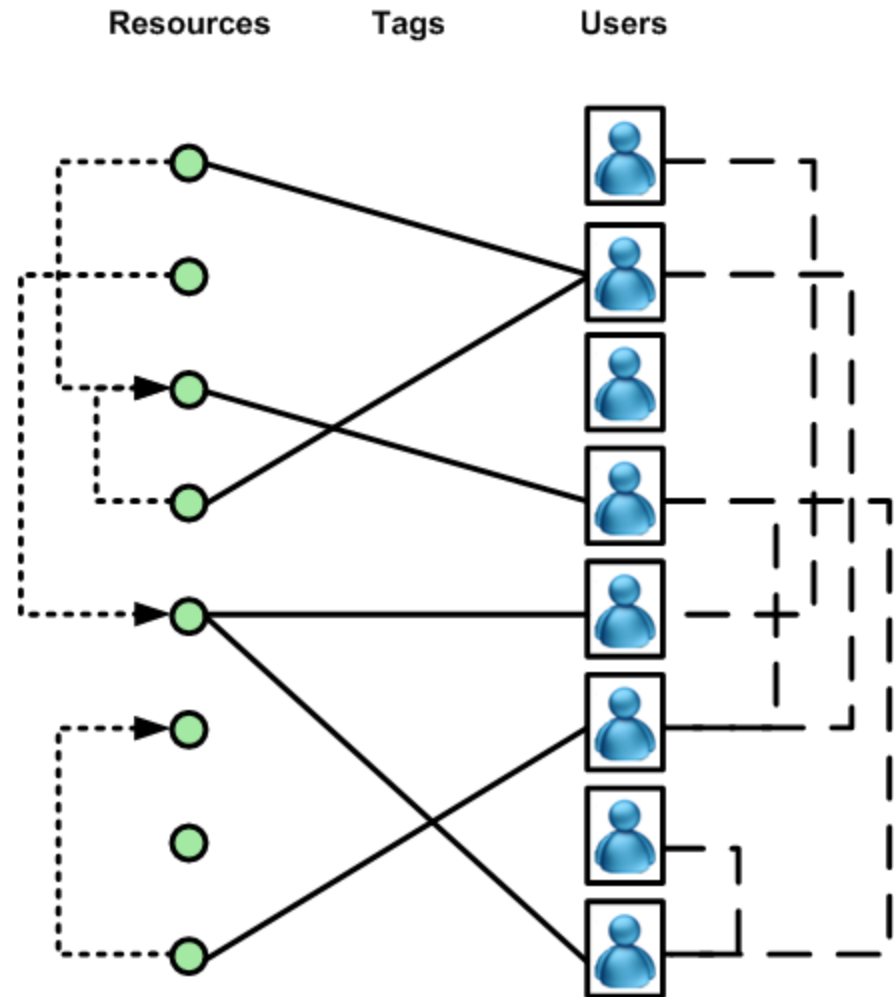
Tagging in context

Users

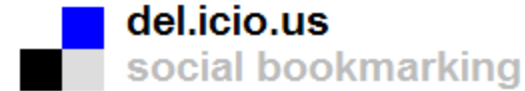
- Assign tags to resources
- Associated with other users
- Connected by the resources they tag

Resources

- Connected to other resources
- Implicit relationship through the users that tag them



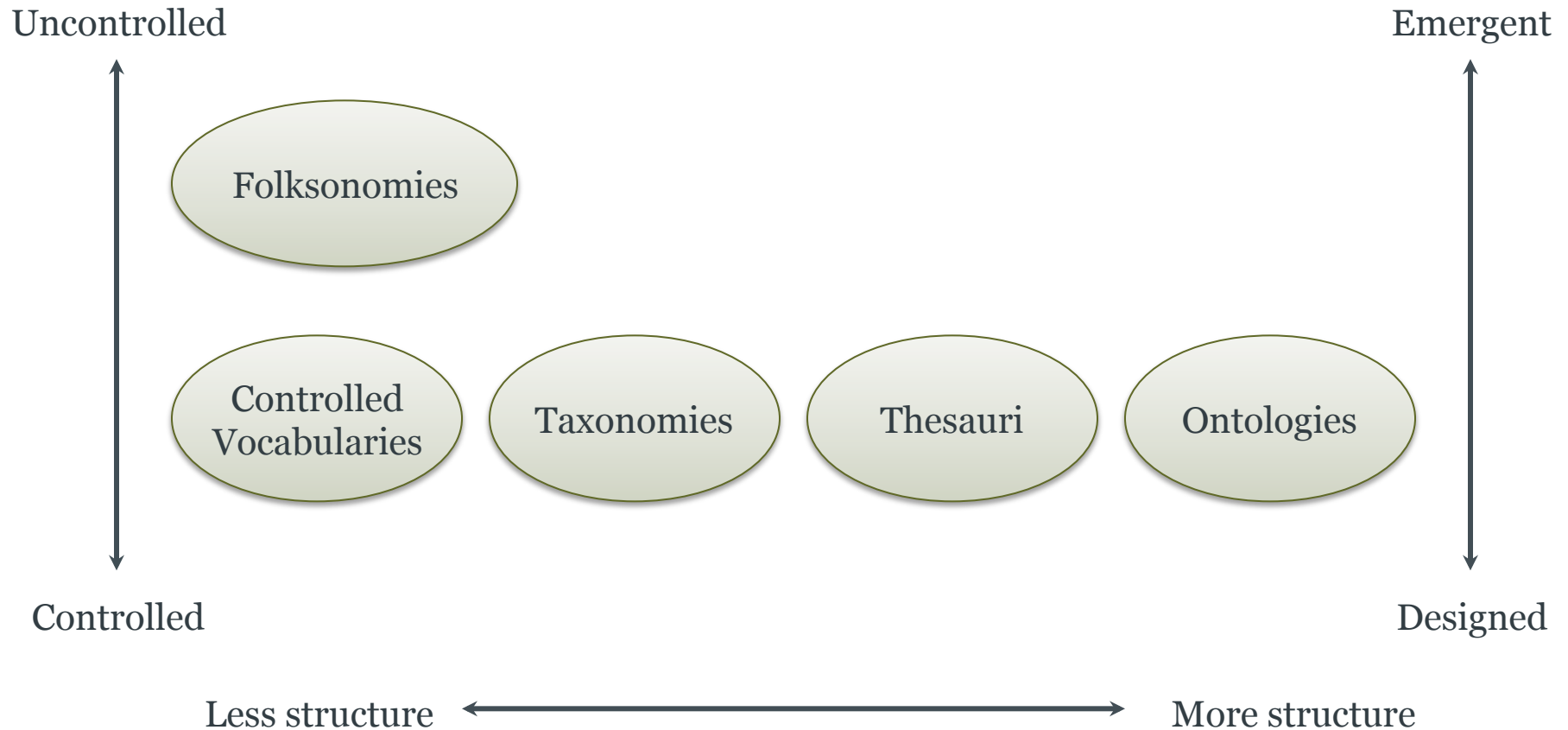
Applications



LIVEJOURNAL

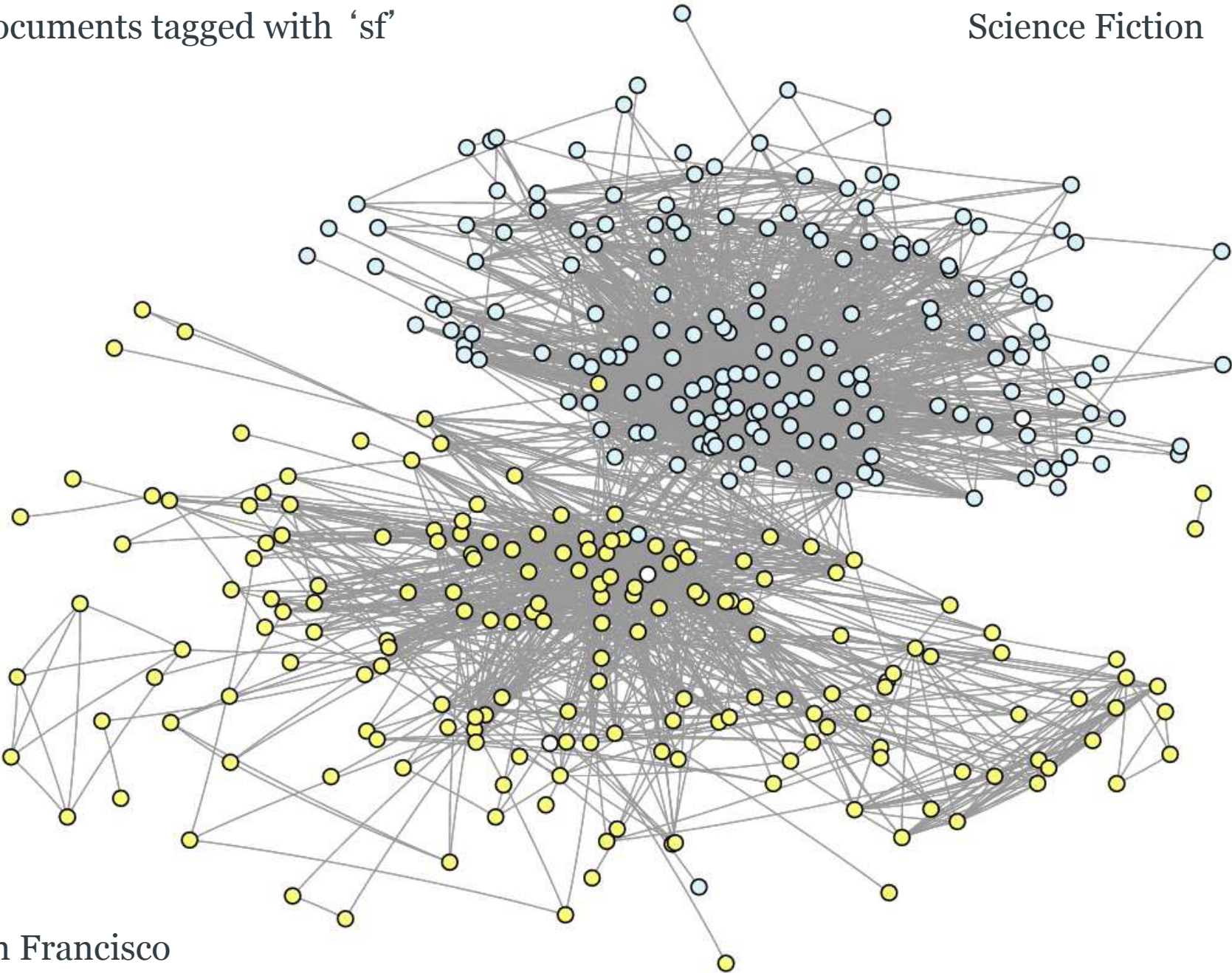
The ESP Game

Ontologies and other animals



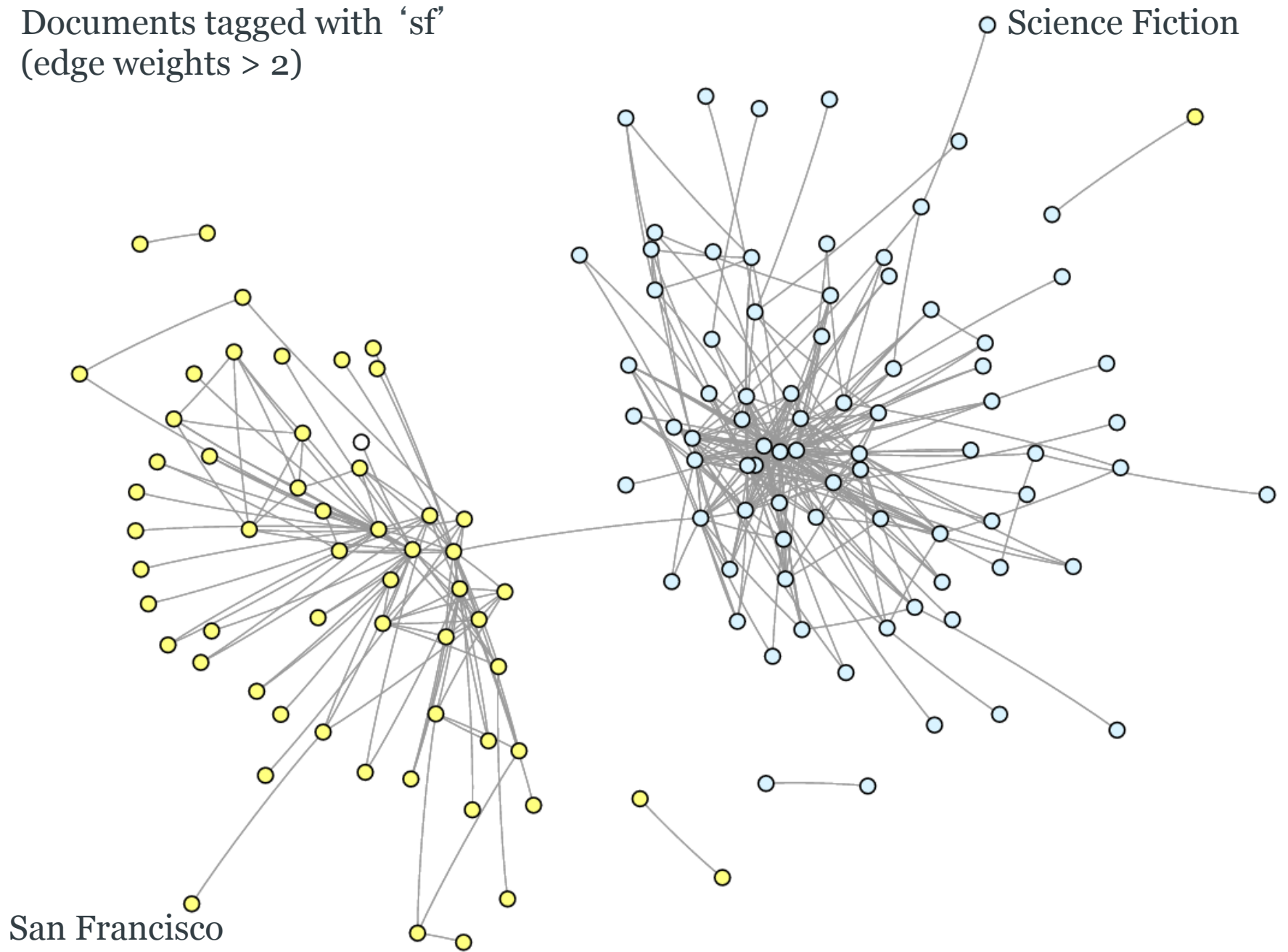
Documents tagged with 'sf'

Science Fiction

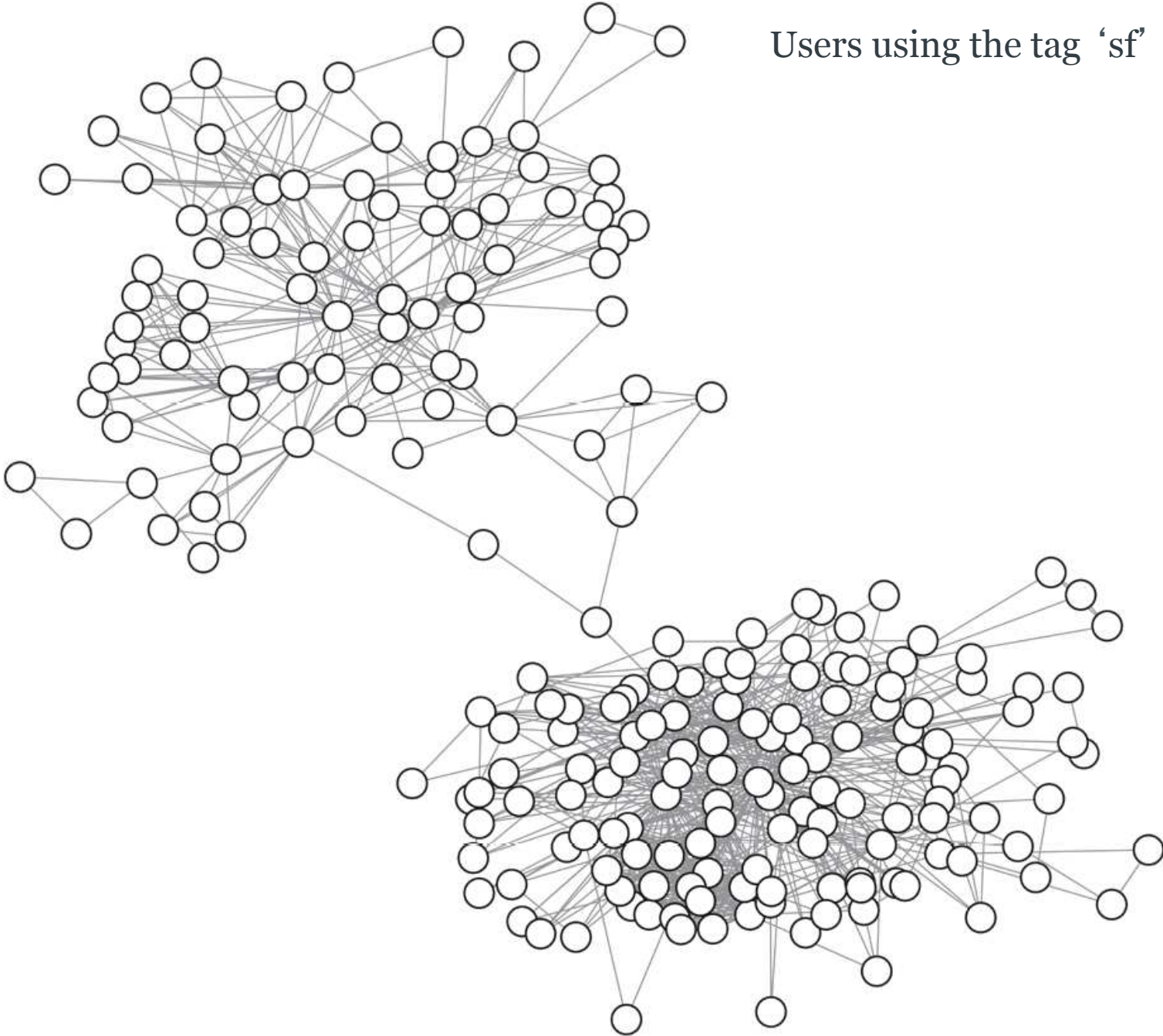


San Francisco

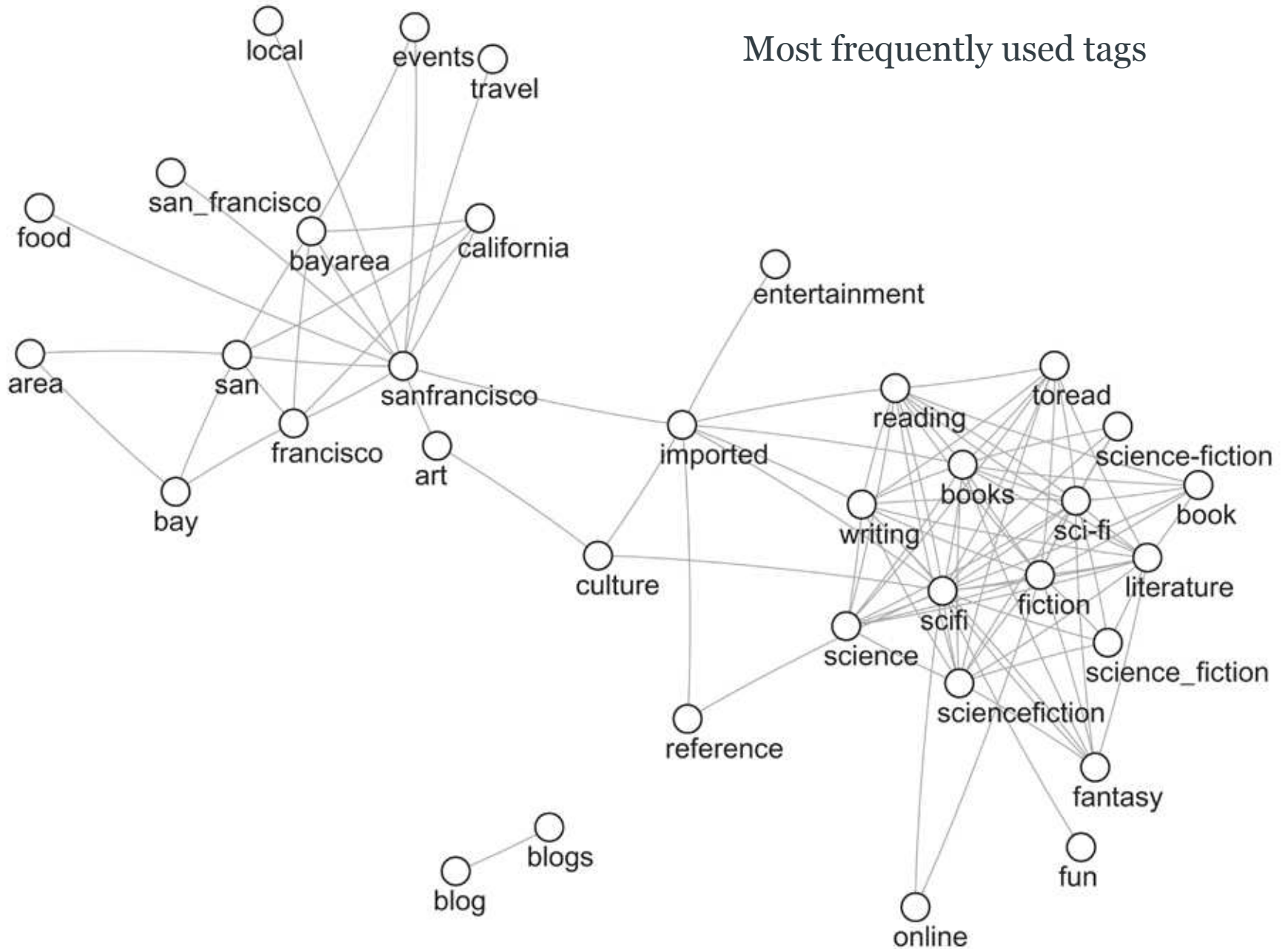
Documents tagged with 'sf'
(edge weights > 2)



Users using the tag 'sf'



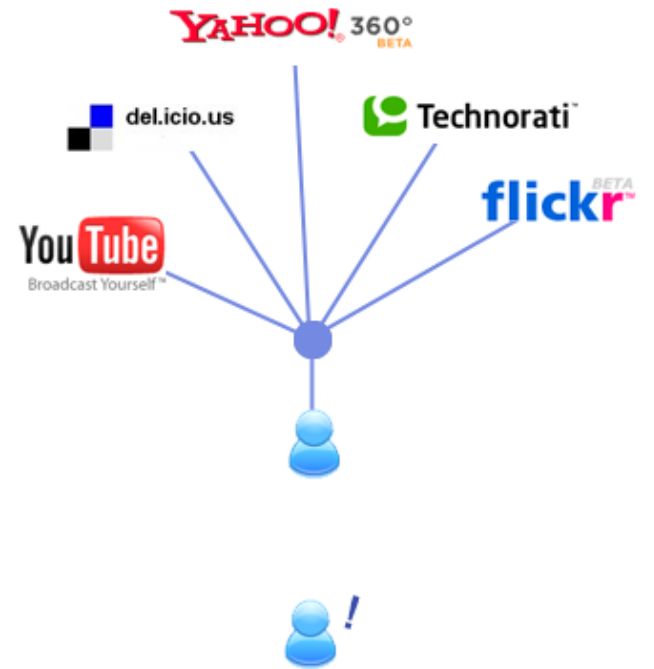
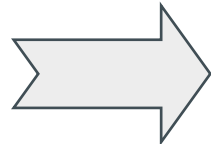
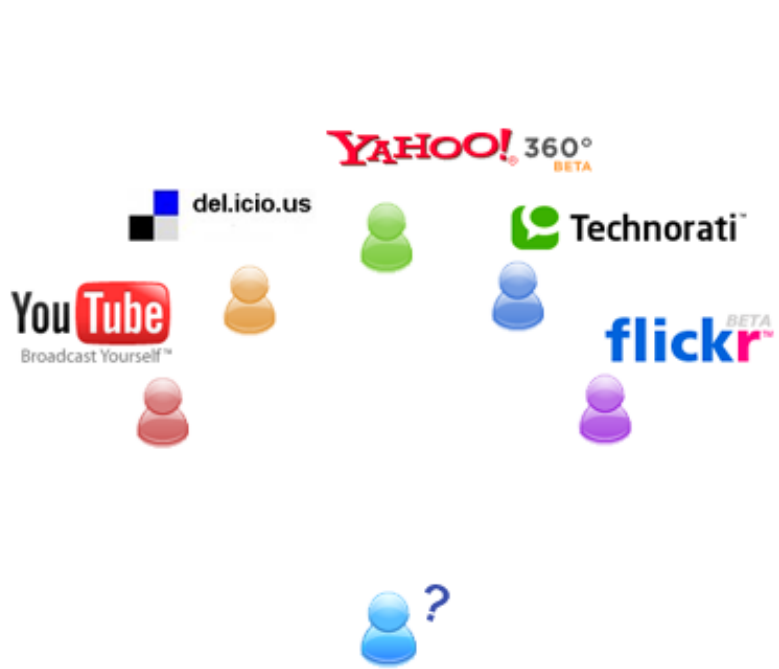
Most frequently used tags



Web 2.0 for the Semantic Web

- A platform with high demands:
 - Structured data
 - Information integration
 - Information discovery
- Richer user interfaces
- Domains with vibrant user communities
(travel, web design, programming, photos, etc.)

- A true mashup of data from different sources
(not dealing with different APIs of different sites)
- A true social network for users
(not separate data being locked up in different SNS)
- A better way for users to represent themselves
(not different identities in different sites)



Conclusions

- Web 2.0 needs more efficient ways to integrate data
- The Semantic Web offers ways to integrate data
- The Semantic Web and Web 2.0 open mutual opportunities