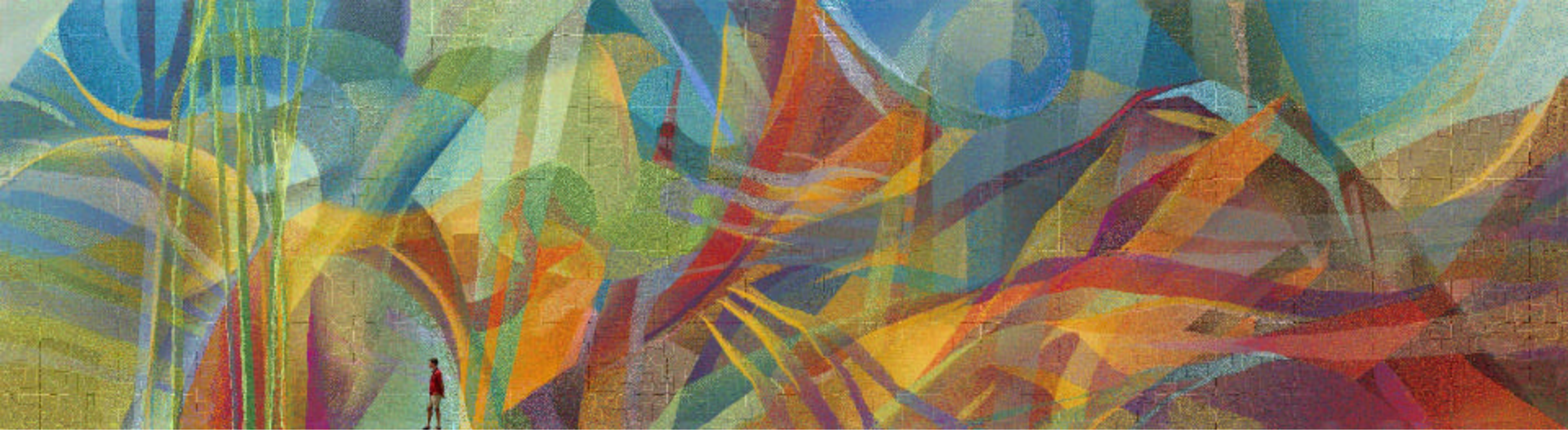
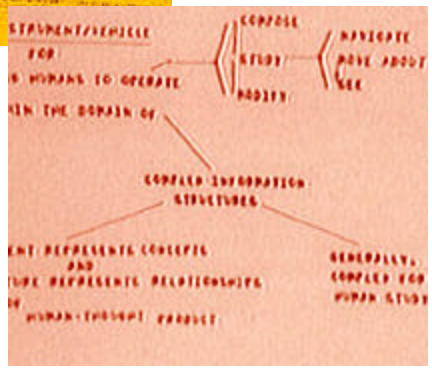


Where the Social Web Meets the Semantic Web

Tom Gruber
RealTravel.com
tomgruber.org

Doug Engelbart, 1968



"The grand challenge is to boost the collective IQ of organizations and of society. "

Tim Berners-Lee, 2001

"The Semantic Web is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better enabling **computers and people** to work in cooperation."

Scientific American, May 2001

Tim O'Reilly, 2006, on Web 2.0

"The central principle behind the success of the giants born in the Web 1.0 era who have survived to lead the Web 2.0 era appears to be this, that they have embraced the power of the web to **harness collective intelligence**"

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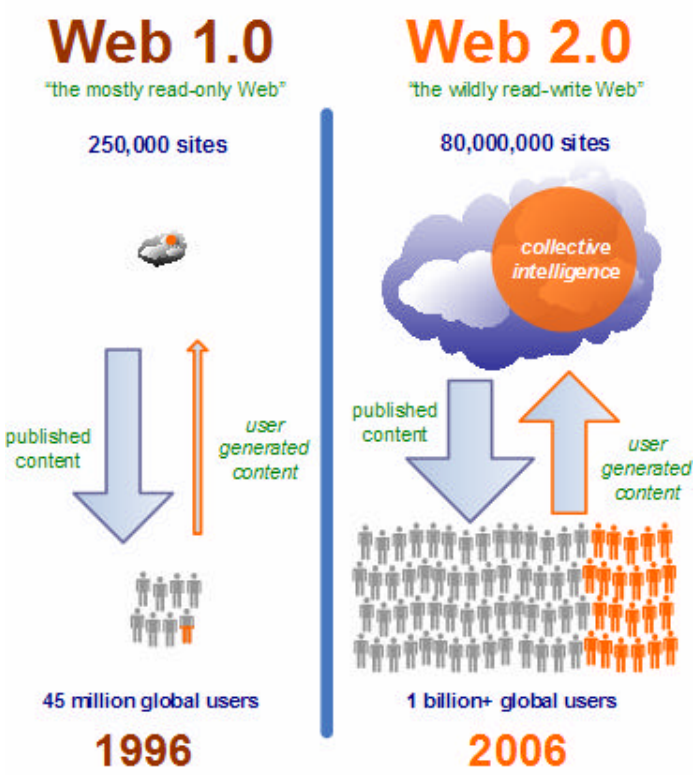
Web 2.0 is about The *Social Web*

"Web 2.0 Is Much More About A Change In People and Society Than Technology"

-Dion Hinchcliffe, tech blogger



- 1 billion people connect to the Internet
- 100 million web sites
- over a third of adults in US have contributed content to the public Internet.
  - 18% of adults over 65

source: Pew Internet and American Life Project via futureexpolporation.net

diagram source: http://web2.wsj2.com/

Tim Berners-Lee, 5 days ago

"The Web isn't about what you can do with computers. It's people and, yes, they are connected by computers. But computer science, as the study of what happens in a computer, doesn't tell you about what happens on the Web."

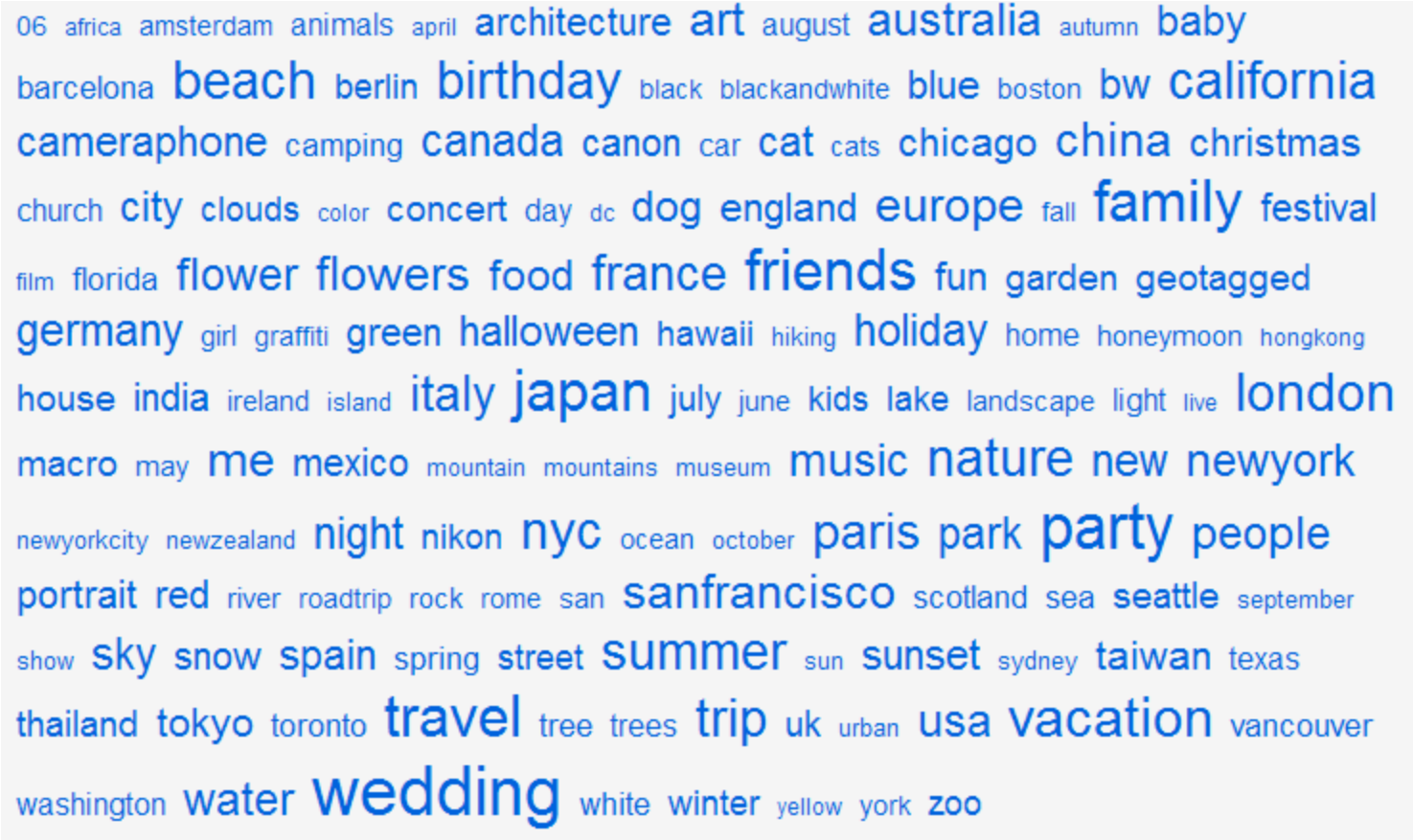
NY Times, Nov 2, 2006

But what is “collective intelligence” in the social web sense?

- intelligent *collection?*
  - *collaborative bookmarking, searching*
- “database of intentions”
  - *clicking, rating, tagging, buying*
- what we all know but hadn’t got around to saying in public before
  - *blogs, wikis, discussion lists*

“database of intentions” – Tim O’Reilly

the wisdom of clouds?



http://flickr.com/photos/tags/

“Collective Knowledge” Systems

- The capacity to provide useful information
- based on human contributions
- which gets better as more people participate.

- *typically*
  - mix of structured, machine-readable data and unstructured data from human input

Collective Knowledge is Real

- FAQ-o-Sphere - self service Q&A forums
- Citizen Journalism – “We the Media”
- Product reviews for gadgets and hotels
- Collaborative filtering for books and music
- Amateur Academia

What about the Semantic Web?

Roles for Technology

- capturing everything
- storing everything
- distributing everything
- enabling many-to-many communication
- **creating value from the data**

Potential Roles for Semantic Net Technology: Two examples

- **Composing and integrating** user-contributed data across applications
  - *example: tagging data*
- **Creating aggregate value** from a mix of structured and unstructured data
  - *example: blogging data*

“Ontology is overrated.” -- Clay Shirky

- “[tags] are a radical break with previous categorization strategies”
- hierarchical, centrally controlled, taxonomic categorization has serious limitations
  - *e.g., Dewey Decimal System*
- free-form, massively distributed tagging is resilient against several of these limitations

http://shirky.com/writings/ontology_overrated.html

But...

- ontologies aren’t taxonomies
- they are for sharing, not finding
- they enable cross-application aggregation and value-added services

Ontology of Folksonomy

- What would it look like to formalize an ontology for tag data?

- Functional Purpose: applications that use tag data from multiple systems
  - *tag search across multiple sites*
  - *collaboratively filtered search*
    - “find things using tags my buddies say match those tags”
  - *combine tags with structured query*
    - “find all hotels in Spain tagged with “romantic”

http://tomgruber.org/writing/ontology-of-folksonomy.htm

Example: formal match, semantic mismatch

- System A says a tag is a property of a document.
- System B says a tag is an assertion by an individual with an identity.
- Does it mean anything to combine the tag data from these two systems?
  - *“Precision without accuracy”*
  - *“Statistical fantasy”*

Engineering the tag ontology

- Working with tag community, identify core and non core agreements
- Use the process of ontology engineering to surface issues that need clarification
- Couple a proposed ontology with reference implementations or hosted APIs

Core concepts

- **Term** – a word or phrase that is recognizable by people and computers
- **Document** – a thing to be tagged, identifiable by a URI or a similar naming service
- **Tagger** – someone or thing doing the tagging, such as the user of an application
- **Tagged** – the assertion by Tagger that Document should be tagged with Term

Issues raised by ontological engineering

- is term identity invariant over case, whitespace, punctuation?
- are documents one-to-one with URI identities? (are alias URLs possible?)
- can tagging be asserted without human taggers?
- negation of tag assertions?
- tag polarity – “voting” for an assertion
- tag spaces – is the scope of tagging data a user community, application, namespace, or database?

Volunteers Needed ☺

- Applications that need shared tagging data
- Tag spaces and sources of tag data
- Ontology engineers who can run an open source-style project

http://www.tagcommons.org

Role 2: Creating aggregate value from structured data

Role 2: Creating aggregate value from structured data

- Problem: In a collective knowledge system, the value of the aggregate content must be more than sum of parts

- Approach: Create aggregate value by integrating user contributions of unstructured content with structured data.

Example: Collective Knowledge about Travel

- RealTravel attracts people to write about their travels, sharing stories, photos, etc.
- Travel researchers get the value of all experiences relevant to their target destinations.

http://tomgruber.org/technology/realtravel.htm

Bangkok, Thailand - Travel Blogs

Nearby Destinations:

Silom | Nakhon Pathom

TOP RATED TRAVEL BLOGS FROM BANGKOK

Guide & Map
Ideas
Travel Photos
Travel Blogs
Dining Reviews
Attractions
Useful Links
Hotel Reviews

The King and I. And Claire. (Mar 01 '06)

By: Alan & Claire on a trip to: Bangkok, Thailand

The King and I. And Claire. * Thailand is about the size of France * Building a replacement for its airport due to open this summer. Supposed to be the largest in Asia. * Bangkok the capital ... read entry

Bangkok: Our "how many modes of transportation can we take in one day" challenge (Jun 13 '06)

"What's my favourite thing in Bangkok so far? Pad thai...in air conditioning."

By: Caroline in Asia on a trip to: Bangkok, Thailand

We woke up in time for the hotel's breakfast (or, more accurately, we set an alarm so that we wouldn't miss the free ... read entry

'The City of Angels' (Oct 29 '05)

"If you can displace yourself from the pollution and vice of Khao San + Patpong, Bangkok offers a range of less obvious culture, lovely food and happy bustling people"

By: Louis on a trip to: Bangkok, Thailand

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Thailand.Traveller-Offer.com

Online Bangkok Guide
Bangkok Guide for Sightseeing, Tour Nightlife, Museums, Hotels, Maps
www.onlinebangkokguide.com

Pivot Browsing – surfing unstructured content along structured lines

- Structured data provides dimensions of a hypercube
  - *location*
  - *author*
  - *type*
  - *date*
  - *quality rating*
- Travel researchers browse along any dimension.
- The key structured data is the destination hierarchy
  - *Contributors place their content into the destination hierarchy, and the other dimensions are automatic.*

Destination data is the backbone

- Group stories together by destination
- Aggregate cities to states to countries, etc
- Inherit locations down to photos
- From destinations infer geocoordinates, which drive dynamic route maps
- Destinations must map to external content sources (travel guides)
- Destinations must map to targeted advertising

Thailand - Travel Photos

Most Blogged Destinations in Thailand:

Bangkok | Chiang Mai | Koh Phangan | Phuket | Kanchanaburi | Koh Samui | Ko Phi Phi Don | Chiang Rai | Krabi | Ayutthaya | Mae Hong Son | Pai | Ko Tao | Railay | Khao Sok | Sukhothai | Ko Chang | Koh Lanta | Chiang Khong | Rayong

TOP RATED TRAVEL PHOTOS FROM THAILAND

Guide & Map
Ideas
Travel Photos
Travel Blogs
Dining Reviews
Attractions
Useful Links
Hotel Reviews

Ah non... il m'a touche!

Une promenade tres touristique

Thyu-Ly a l'ouvrage! Test des features de sa camera!

Chiang Mai - Doi Suthep

Mega grosse fasse de Bouddha...

our guide taking it easy

Autre vue d'un site de temples

Temple on the river

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Travel to Thailand
Malaria is a Risk in Thailand: View Global Risk Assessment Map
Malarone.com

Thailand Vacations
US office. Specialize in Thailand Vacation. Call 866-Thai-Trip
www.thailandvacationtour.com

THAILAND TRAVEL PHOTO

from the journal entry ***Bangkok, ville de Bouddha*** by Martin & Thuy-Ly about a trip to Bangkok

◂ Previous ▲ Up Next ▸ 6 of 2456 in Thailand

Mega grosse fasse de Bouddha...

Destination: Thailand see more images of Thailand ▸

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www.iTravelkit.com

Contextual Tagging

- Tags are bottom up labels, words without context.
- A structured data framework provides context.
- Combining context and tags creates insightful slices through the aggregate content.

Destinations > Southeast Asia > Thailand Travel Guide

Thailand - Travel Ideas

Most Blogged Destinations in Thailand:

Bangkok | Chiang Mai | Koh Phangan | Phuket | Kanchanaburi | Koh Samui | Ko Phi Phi Don | Chiang Rai | Krabi | Ayutthaya | Mae Hong Son | Pai | Ko Tao | Railay | Khao Sok | Sukhothai | Ko Chang | Koh Lanta | Chiang Khong | Rayong

IDEAS FROM PEOPLE WHO HAVE BEEN HERE

- Guide & Map
- Ideas
- Travel Photos
- Travel Blogs
- Dining Reviews
- Attractions
- Useful Links
- Hotel Reviews

ACTIVITIES

beach | climbing | cycling | diving & snorkeling | golf | hiking | sailing

INTERESTS

architecture | art & museum | cultural immersion | festival | food & wine | nightlife | shopping | wildlife viewing

TRAVEL STYLE

adventure | off the beaten path | relaxation

SPECIAL PLACES

island | mountain | natural wonder | park | world heritage site

TRIP TYPE

road trip | round the world | safari | trek

WHAT REALTRAVELERS ARE TALKING ABOUT

Bangkok | buddhist | Cambodia | city life | cool photos | funny | historic | Kanchanaburi | market | River Kwai | Thailand | train

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- Subscribe: email/RSS
- Email this page
- Mark as favorite
- Write a review

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Seniors Travel
Find Great Ideas & Info to Plan Great Vacations for Seniors Today!
www.BudgetTravelOnline.com

Cheap Flights to Thailand
Up to 50% off fares on major airlines even for last minute trips
www.asaptickets.com

Escorted Seniors Holidays

photo by Pangdora

TAG IN CONTEXT

beach *in Thailand*

experiences in Thailand about "beach"

See also:

- other tags in Thailand
- beach *around the world*

Life on the beach

Koh Phangan , Thailand

a journal entry by Looney

"Prelude The waves chase each other across the sinewy landscape. The sky darkens as the sun finally gives up its hopes of a proper burial. There is no red today - blue is the master of these lands. The horizon is pockmarked with rocky ... " read entry

Looney

Tags: beach, island, cultural immersion

The King and I. And Claire.

Bangkok , Thailand

a journal entry by Alan & Claire

"The King and I. And Claire. * Thailand is about the size of France * Building a replacement for its airport due to open this summer. Supposed to be the largest in Asia. * Bangkok the capital of Thailand and its twin city across the ... "

read entry

Alan & Claire

Tags: golf, architecture, art & museum

Island Bliss

Ko Phi Phi Don , Thailand

a journal entry by banyantree

"We loved Koh Phi Phi, it was 9 days of bliss on a very quiet beach, in a single 'resort' (beach shacks) with the nicest resort owner we have met thus far. Pon became our host, friend, doctor (when Chris stuck his foot on a sea urchin) ... "

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Problems that Semantic Web could have helped

- No standard source of structured destination data for the world
  - *or way to map among alternative hierarchies*
- Integrating with other destination-based sites is expensive
  - *e.g. travel guides*
- No standard collection of travel tags
  - *or way to share RealTravel's folksonomy*
- Integrating with other tagging sites is ad hoc
  - *need a matching / translation service*

Resources That *Did* Help

- Open source software or free services
  - *powerful databases*
  - *fancy UI libraries*
  - *search engines*
  - *usage analytics*
- Open APIs from Google (maps) and Flickr (photos)
- Commercially available geocoordinate data and services

(Semantic Web) projects that could help collective knowledge systems

- Tag spaces and tag data sharing
- World destination hierarchy and other geocoordinate databases
- Portable user identity and reputation
- Site-independent rating and filtering
- Alternatives to Google-style search
- ___*audience contributions here*___

Activities already going

- Semantically-Interlinked Online Communities (SIOC)
  http://sioc-project.org/
- *semantic wiki projects*
  http://wiki.ontoworld.org/wiki/Category:Semantic_wiki
- *__audience contributions here___*

Challenges for our Community

- How to get knowledge from all those intelligent people on the Internet
- How to give everyone the benefit of everyone else's experience
- How to leverage and contribute to the ecosystem that has created today's web.

What will the future look like?

Social Web

Social + Semantic Web