



image by neilsethlevine.com

Intelligence at the Interface

Semantic Technology and the Consumer Internet Experience

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What is the Killer App for Semantic Technology?

**Semantic
Search?**

**Integrated
Services?**

**Collective
Intelligence?**

Where's the killer app?

Search

Maps

Chat

Music

Photos

Videos

Email

Multi-touch

Mobile Phone



Intelligent Design

**The Killer App for Semantic
Technology is**

Your Life

(on-line)

Intelligence at the Interface

applying the best of the Internet
(intelligently)
to support your daily life

It's closer than you think.

Language
Understanding

Semantic
Search

Machine
Learning

Integrated
Services

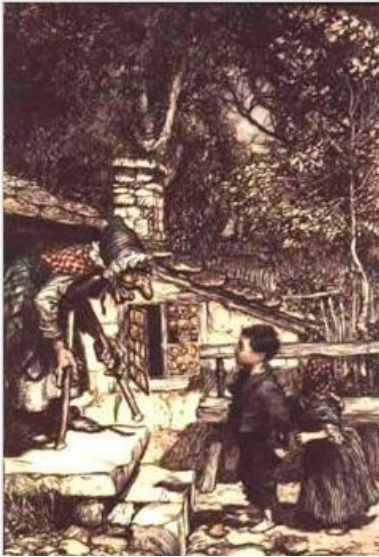


Intelligent Interface

Intelligence at the Interface

is a Paradigm Shift
for interaction
on the Internet.

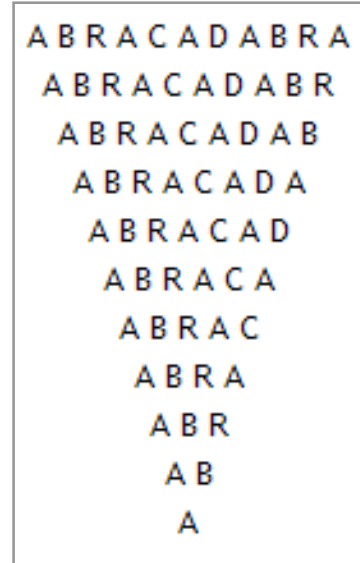
Interaction Paradigms



**Breadcrumbs
in the Forest**



**Follow the
Leader**



**Magic
Words**



**At your
Service**

Breadcrumbs in the forest: The Hyperlink



User Role

- Choose your path

System Roles

- connect the dots

Technical breakthrough: *universal resource identity*

Follow the leader: The Portal



User Role

- choose your channels
(and consume them)

System Roles

- deliver the content

Technical breakthrough: ***frictionless broadcasting***

Abacadabra: The Search Engine

A B R A C A D A B R A
A B R A C A D A B R
A B R A C A D A B
A B R A C A D A
A B R A C A D
A B R A C A
A B R A C
A B R A
A B R
A B
A

User Role

- state your query
(and shift through results)

System Roles

- find relevant content and
filter on quality

Technical breakthrough: ***web-scale indexing and ranking***

At your Service: Intelligence @ the Interface



User Role

- Live your life

System Roles

- Tell me what I need to know.
- Help me solve my problems.
- Help me meet my needs.
- Work for me. Be proactive.

Technical breakthrough: ***personalized, context-aware AI***

What can I@I do for you?

- Help you stay informed
- Help you keep connected
- Help you discover
- Help you learn
- Work for you

Helps you organize, share, and discover

twine

Home My Items My Twines My Connections Explore Start a Twine Search Twine Search

Cool

Summary Items Members Add Item

This is a twine for sharing really cool things we find on the Web.

Started Dec. 11, 2007 by Nova Spivack

cool, art, design, technology, Public | Open Membership | Comments allowed multimedia, Members may:

People

- Charlie Sorrell
- Daniel Pink
- Dante
- David Scott Lewis
- Edward
- Hrafn Thorisson
- James
- Kirk
- Matt Slater
- Miguel Lasso Copywriter
- Peter Royal
- Rasterbator
- Steve Jobs
- Steven Levitt
- Strandbeests
- Theo Jansen

Places

Organizations

Other Tags

Types of Items

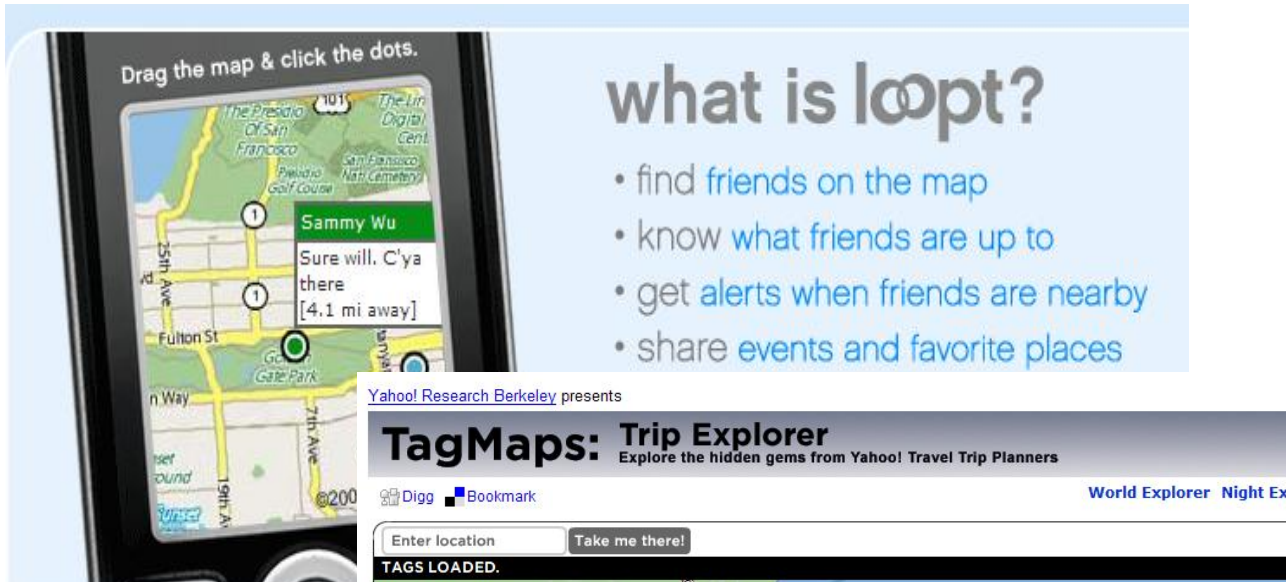
Recommended Twines

- Twitch Items: 23 | Members: 9
- Educational Technology Items: 5 | Members: 3
- Semantic Wave Applications Items: 16 | Members: 7
- The Internet & Campaign 2008 Items: 3 | Members: 2

covers are highlighted
tail view of an item.

Helps you connect, discover, stay in touch

PARC's Magitti



Drag the map & click the dots.

what is loopt?

- find friends on the map
- know what friends are up to
- get alerts when friends are nearby
- share events and favorite places

Yahoo! Research Berkeley presents

TagMaps: Trip Explorer
Explore the hidden gems from Yahoo! Travel Trip Planners

Digg Bookmark World Explorer Night Explorer

Enter location Take me there!

TAGS LOADED.

Map Lands Hybrid Satellite

find gems from geotagged trips

San Francisco

Fort Point National Historic Site Ripley's Believe It or Not! Museum

Tonga Room & Hurricane Bar (The) Virtual Tattoo Art Museum (The)

Baker Street Bistro City Lights Bookstore

Also see here: Exploratorium Prime Rib Boulevard

Palace of Fine Arts Leif de Lys Restaurant

Golden Gate National Recreation Area Yerba Buena Ice Skating & Bowling Center

obscure and holographic Gallery Napa to San Francisco

The Chronicle Building



<http://tagmaps.research.yahoo.com/>

Helps you discover things you care about

PANDORA®
radio from the Music Genome Project®

register | sign in

Help

We created Pandora to put the [Music Genome Project](#) directly in your hands

**It's a new kind of radio -
stations that play only music you like**

Type in the name of your favorite artist, song or composer and
we'll create a radio station featuring that music and more like it.

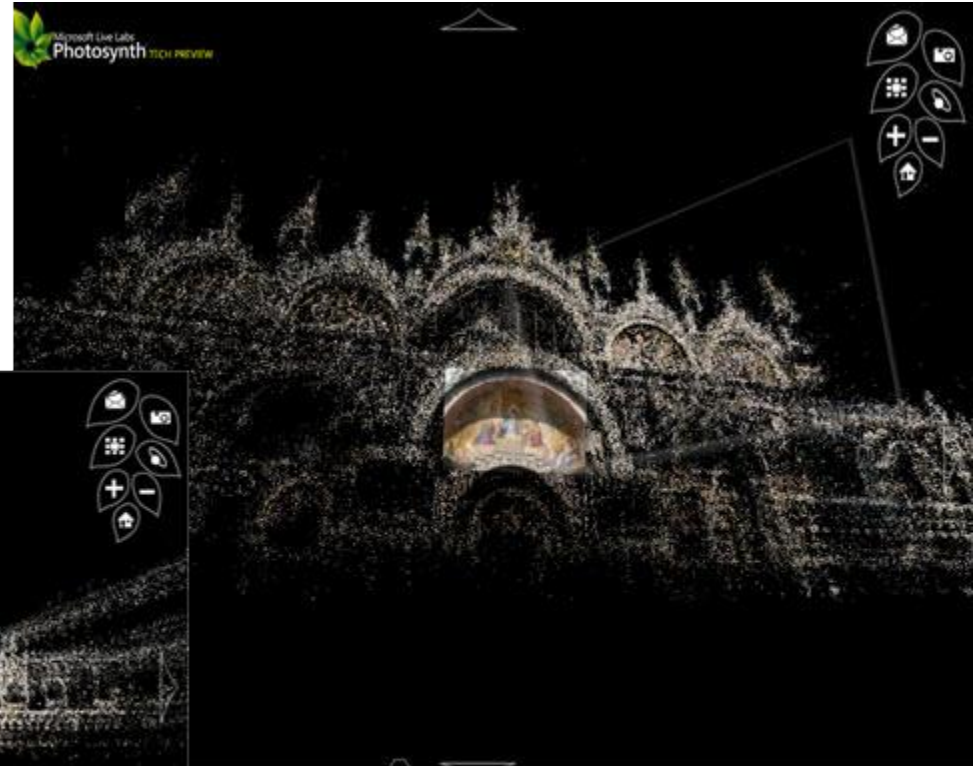
[Listen Now](#)

Put technology to work for you

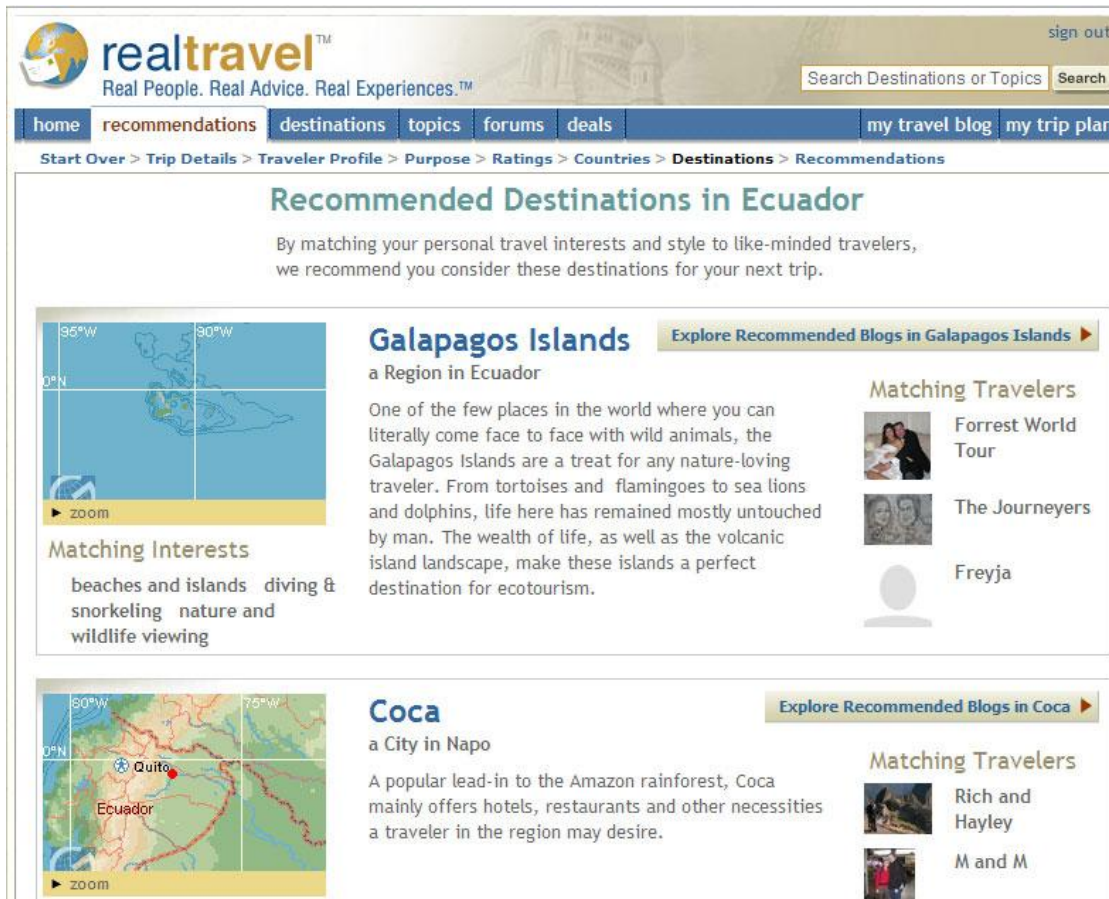
The screenshot displays a travel website interface with several components:

- Top Navigation:** Includes logos for "kango" (travel planning that works for you, almost beta) and "uptake" (your first step to a great trip, almost beta).
- Search Bar:** A search bar with the text "monterey romantic hotels".
- Refine Your Search:** A section with filters for Vacation Theme (Kid Friendly, Romantic Getaway, Pet Friendly), Price (under \$50, \$50-\$150, \$150-\$250, \$250-\$350, \$350+), and Hotel Amenity (Pool, Jacuzzi, Exercise Facility, Spa Treatments, Restaurant, Room Service, Cocktail Lounge, Comp Breakfast, Minibar, Refrigerator, Kitchen, Color TV, In-room Movies, Internet Access, Concierge, Shuttle Service, Multilingual Staff, Wheel Chair Access, Dry Cleaning, On-site Laundry).
- Hotel Listings:** Two hotel listings are shown: "Hotel Pacific" with a user rating of 8.7 and "The Del Monte Pines" with a user rating of 8.6. Each listing includes a photo, a user rating, and a brief description of the hotel's features.
- Farecast Section:** A section titled "Farecast" with a logo showing a plane flying over a landscape. It includes tabs for "Flights" and "Hotels" (marked as BETA). The "Flights" tab is active, showing a search for flights from San Francisco, CA (SFO) to Milan, Italy (MXP) - Malpensa Airport. The search includes options for Round Trip, One Way, and Multi-City, and a "Compare Search" link.
- Smart Travel Search:** A section titled "Smart Travel Search" with five arrows (green up, green right, yellow right, orange right, red down) and two buttons: "Buy Now. Fares will rise." and "Wait. Fares will drop." Below the buttons, there are four bullet points: "Search multiple travel sites", "Check the Airfare Prediction", "Refine and compare results", and "Buy directly with suppliers". A "More" link is also present.

Explore Collective Experience



Learn from Collective Knowledge



The screenshot shows the realtravel website interface. At the top, there's a navigation bar with links: home, recommendations, destinations, topics, forums, deals, my travel blog, and my trip plan. A search bar is also present. Below the navigation bar, a breadcrumb trail reads: Start Over > Trip Details > Traveler Profile > Purpose > Ratings > Countries > Destinations > Recommendations.

The main content area is titled "Recommended Destinations in Ecuador" with a subtitle: "By matching your personal travel interests and style to like-minded travelers, we recommend you consider these destinations for your next trip."

Two destination cards are displayed:

- Galapagos Islands**: a Region in Ecuador. Description: "One of the few places in the world where you can literally come face to face with wild animals, the Galapagos Islands are a treat for any nature-loving traveler. From tortoises and flamingoes to sea lions and dolphins, life here has remained mostly untouched by man. The wealth of life, as well as the volcanic island landscape, make these islands a perfect destination for ecotourism." Matching Travelers: Forrest World Tour, The Journeyers, Freyja.
- Coca**: a City in Napo. Description: "A popular lead-in to the Amazon rainforest, Coca mainly offers hotels, restaurants and other necessities a traveler in the region may desire." Matching Travelers: Rich and Hayley, M and M.

Travel Recommendation Engine

- Content from real travelers
- Machine learning to extract clusters and dimensions
- Interview users to elicit profile and interests
- Recommend destinations and trips based on multidimensional matching
- Output is human readable experiences, selected by machine inference

An assistant that learns from you

The image displays a collage of screenshots from the CALO (Cognitive Assistant for Learning and Operations) system, illustrating its various components and user interactions.

- Semantic Graph Viewer:** A window showing a complex network of nodes and edges, representing the system's knowledge base. Nodes include "Participants", "Sub-Tasks", "Notes", "Categories", "Tasks", "Projects", and "Regions".
- Chat Window:** A window showing a conversation with the assistant. The assistant is scheduling a meeting for "PEXA" and asking the user to choose a schedule.
- Meeting Agenda:** A window titled "Lynn_Voss in meeting Project_Review_Meeting" showing a list of meeting agenda notes, including "Task: Schedule next meeting assigned to: Lynn_Voss".
- Mercury v3.1.9 (j...):** A window showing a meeting interface for "Project Review Meeting" at "MT Conference Room". It includes a list of participants (Lynn Voss, Clint Frederickson, E J228, Mark Lewis) and a "Join" button.
- Video Feed:** A small video window showing a group of people in a meeting.
- TODO List:** A window titled "Todo" showing a list of tasks, including "Trip reimbursement", "Boston", "Reschedule Meeting", "AAAI Reimbursement", "Sign reimbursement form", "DARPA Presentation", "Evite: John ..., Evite: Ockto...", "SPARK build script - Cleaning up \$py.class files in ant clean", and "Reschedule Action Meeting".

The CALO logo is visible in the bottom left corner.

Put it all together

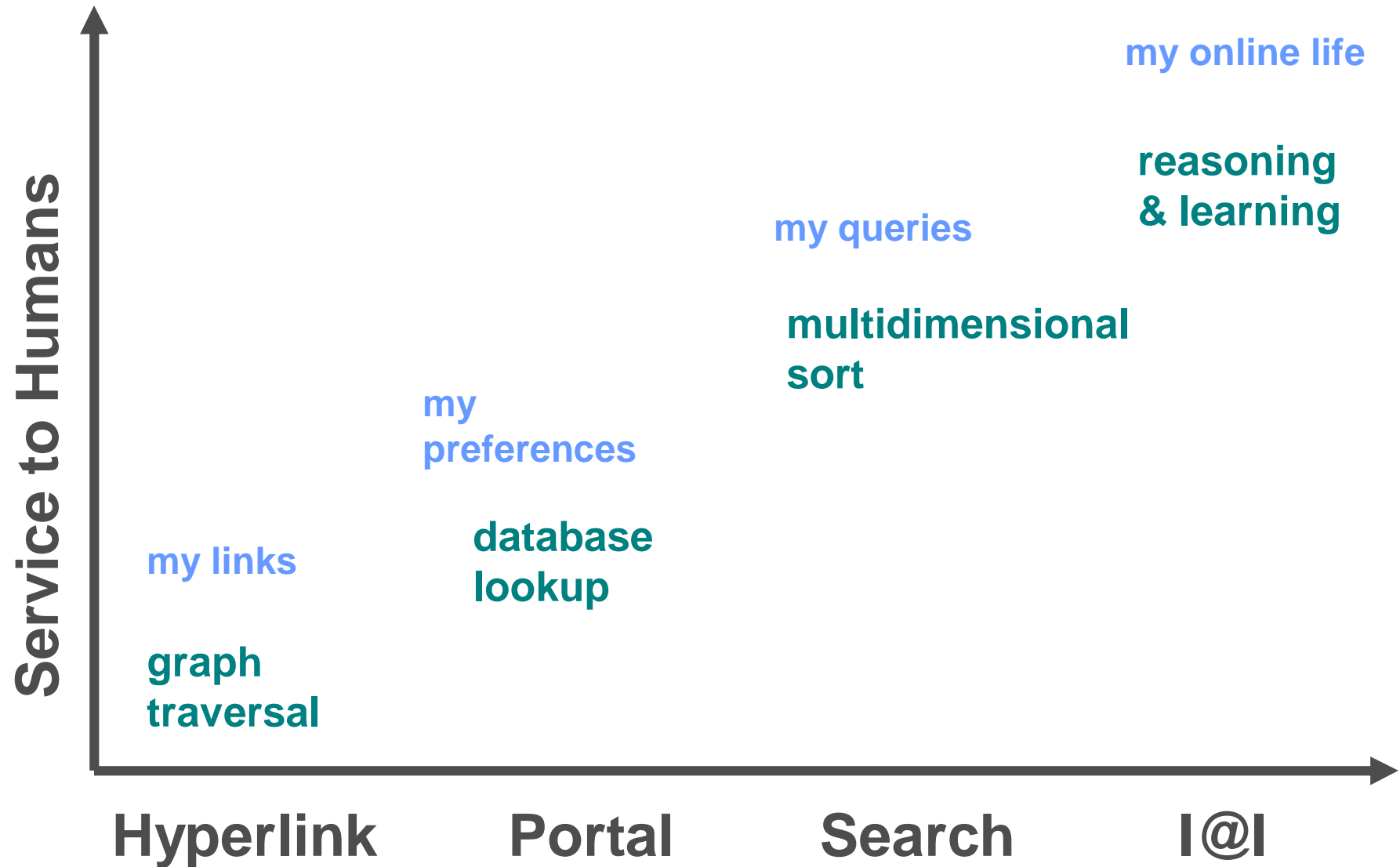


- Where should I go on vacation?
- What is it like there?
- Where should I stay?
- How do I get the best fare?
- What do I need to know about it?
- Please arrange my travel schedule.

What makes an Interface Intelligent?

- It knows a lot about you.
- It understands you in context.
- It is proactive.
- It gets better with experience.

Knowledge and Reasoning



**But what about
Semantic Technology?**

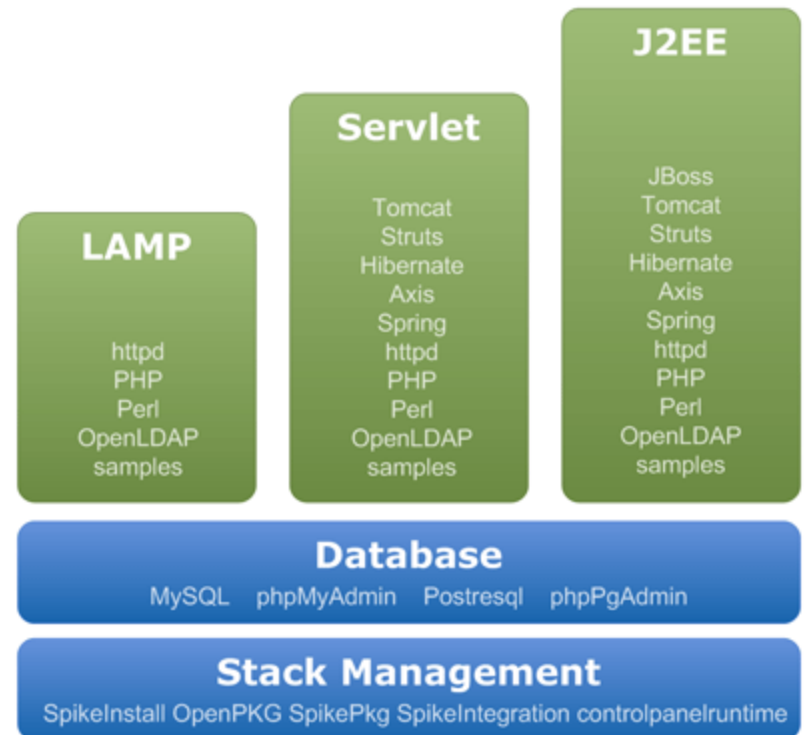
Where's the key technology?



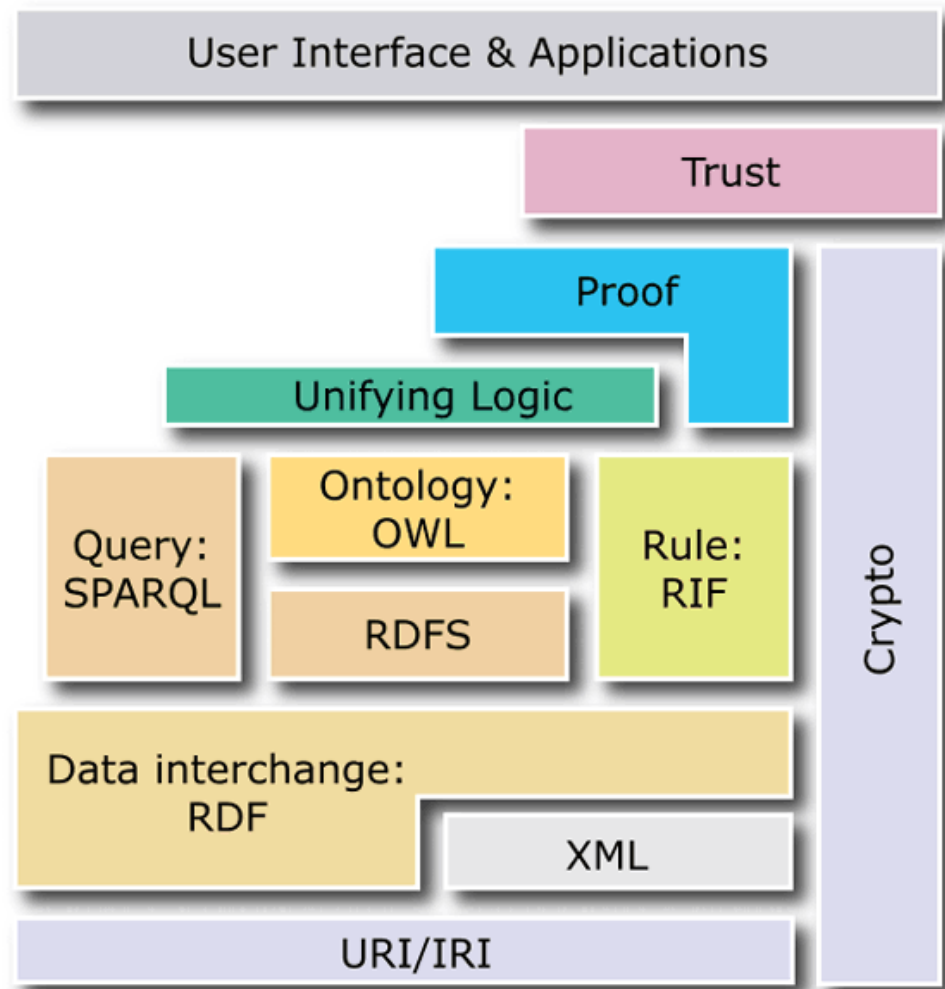
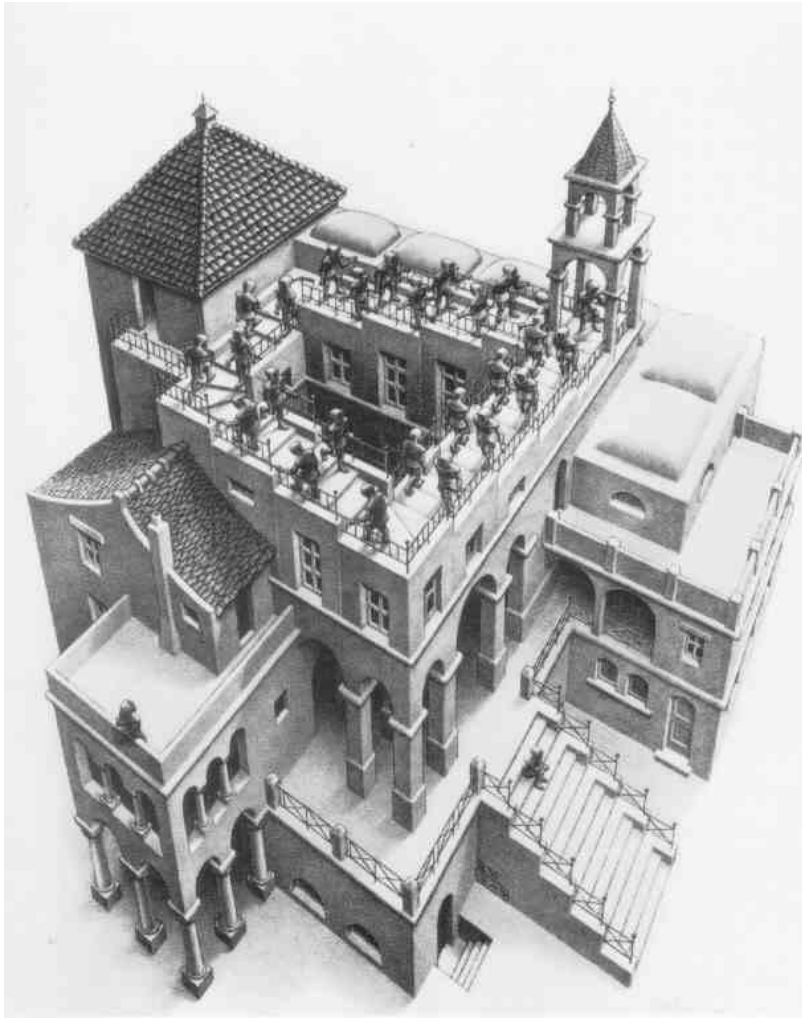
Which is the important part?



What part of the stack is critical?



The Tower of Semantics



“Let them eat layer cake.”

Oops. We didn't mean that.

The important part isn't on the inside.

- It's about how it works in the world.
- It's about how people experience it.
- It's about changing our lives.

Field of Dreamers

~~“If you build it, they will come.”~~

“If they use it, it will build itself.”

Why won't they vote for it?

"It's the economy, stupid."

- James Carville

Why won't they use it?

"It's the interface stupid."

That's where intelligence will pay off.

The role of Semantic Web at the Interface

- Reasoning about human context
- Harvesting Collective Knowledge

Contexts worth reasoning about

- Location: Geosemantics
- Identity: FOAF, PURLS, and beyond
- Community: Socially constructed meaning
- Action: Services Integration

Knowledge worth harvesting

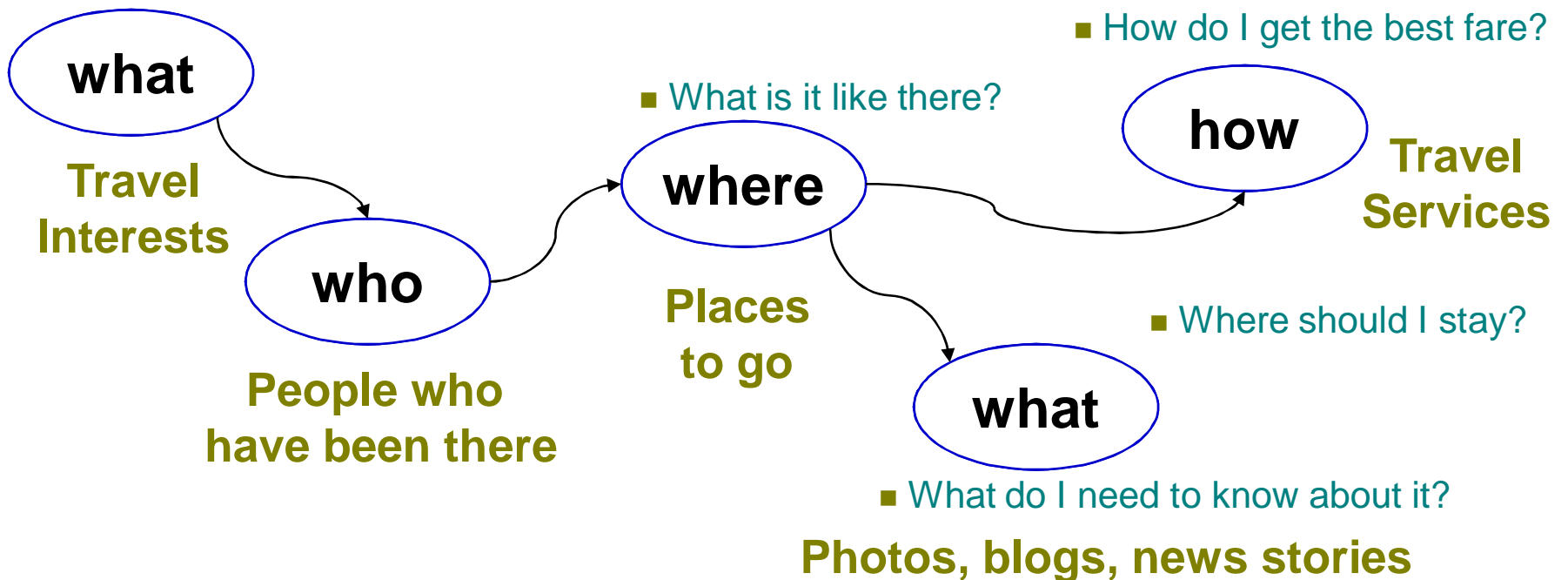
- Collective Experience
 - *Stories, photos, reviews*
- Collective Attention
 - *Useful links, articles, perspectives*
- Collective Creation
 - *Semantic wikis, data commons*

Inferences worth making

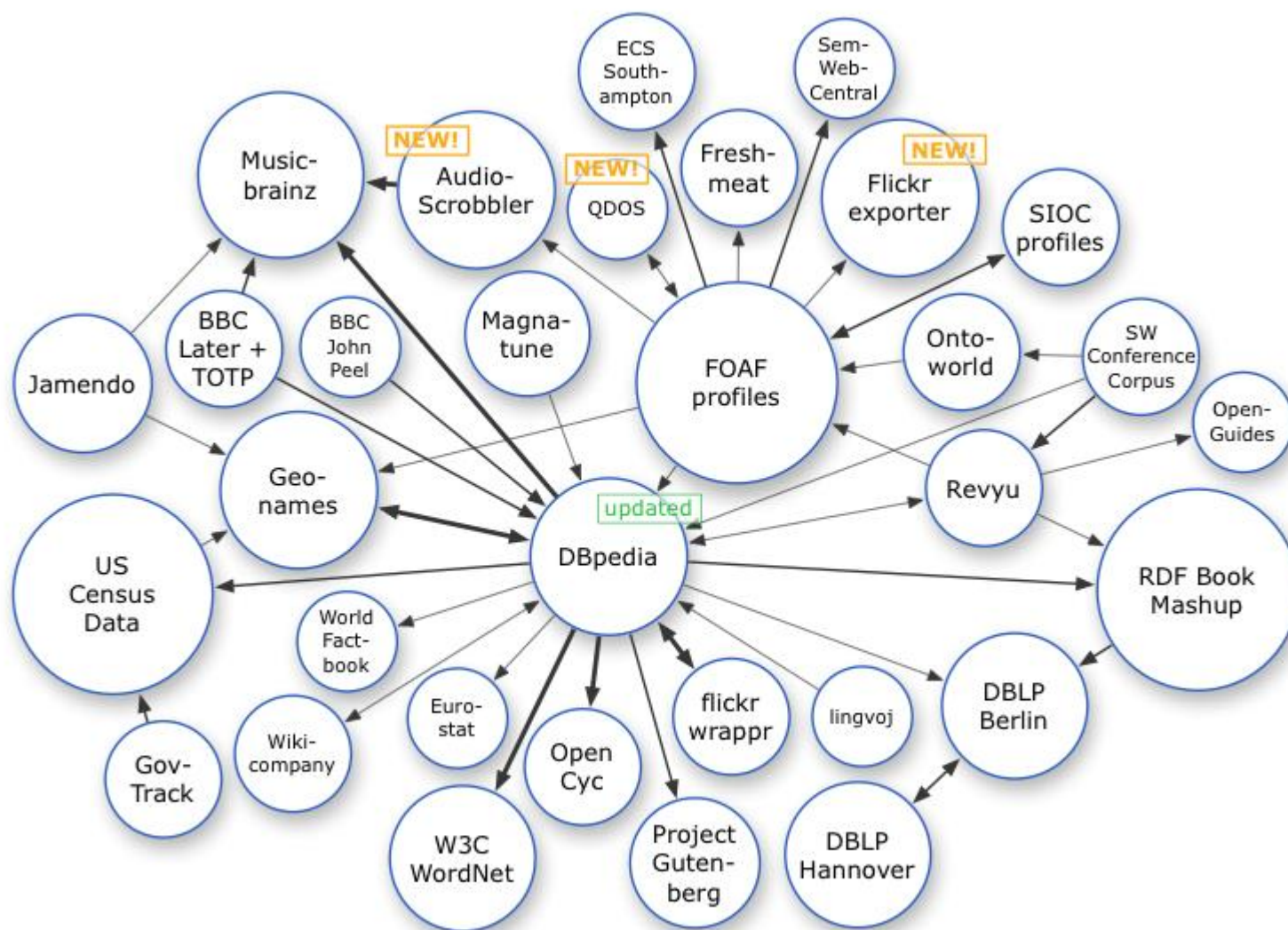
The Gigantic Join

Composing and integrating data across applications

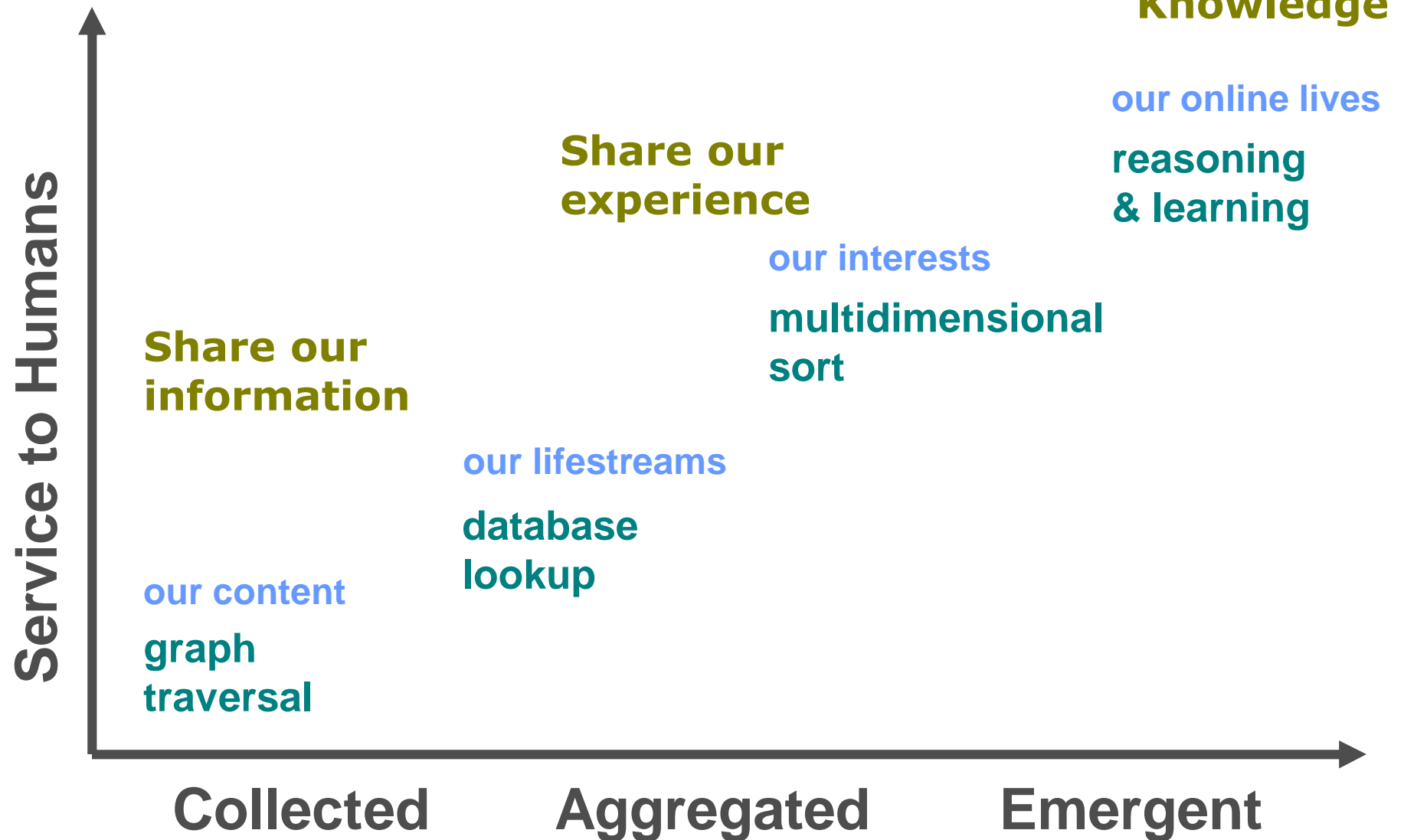
- Where should I go on vacation?



Ontologies for the Gigantic Join



Knowledge, Reasoning, Collective Intelligence



Last Word

If we want our technology to have world-changing impact, bring it to the interface:

- get useful knowledge from all those intelligent people on the Internet
- give the benefit of this knowledge to everyone.

For more information

- Tom Gruber
<http://tomgruber.org>
- Collective Knowledge Systems
<http://tomgruber.org/writing/collective-knowledge-systems.htm>
- Intelligence at the Interface
<http://tomgruber.org/writing/semtech08.htm>



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