Despite Our Best Efforts,
Ontologies are not the problem.

Tom Gruber

tomgruber.org

Stealth-Company.com

outline

- Components don't matter

- Systems that matter
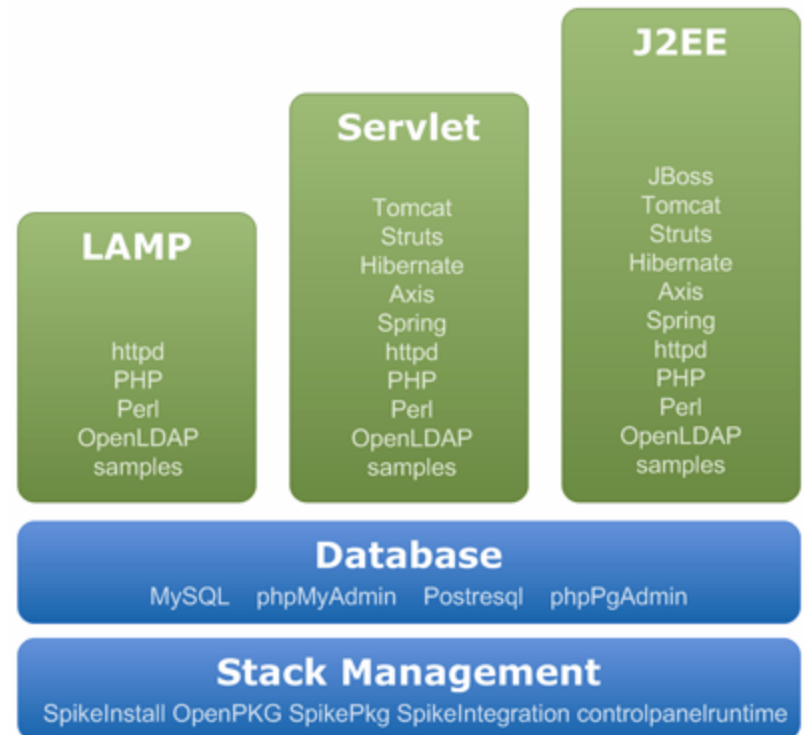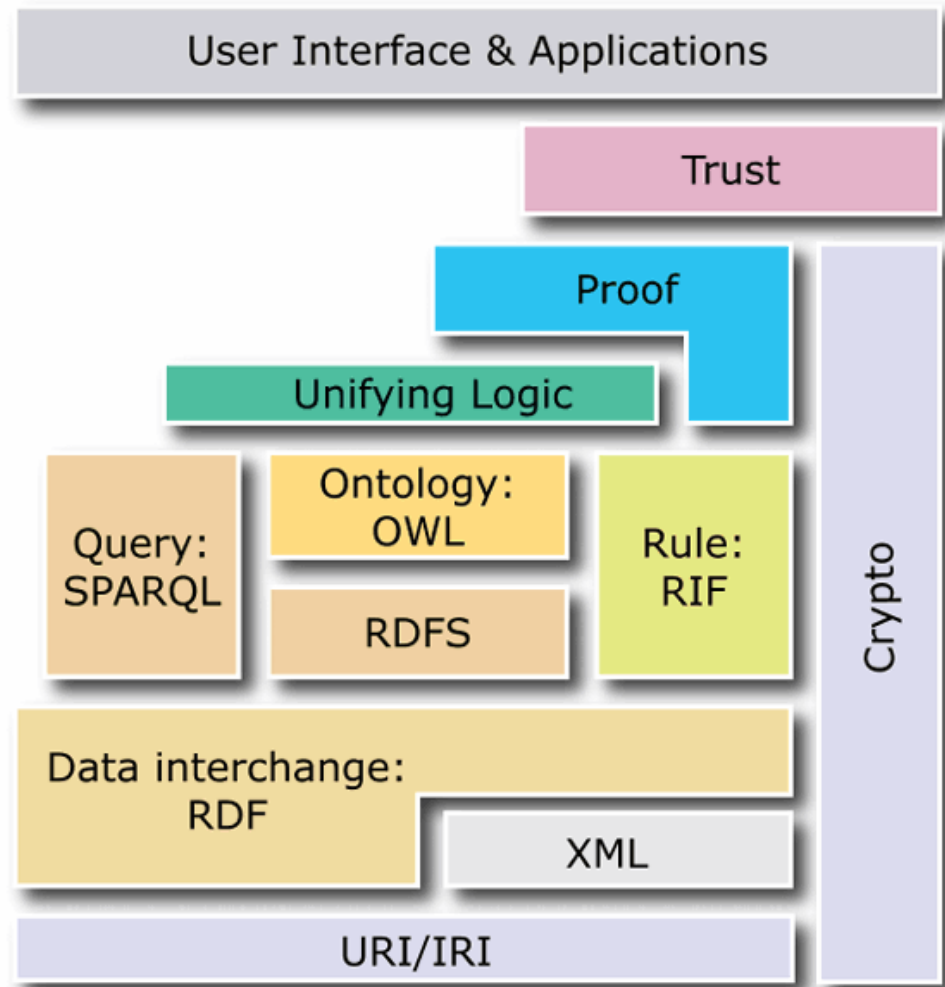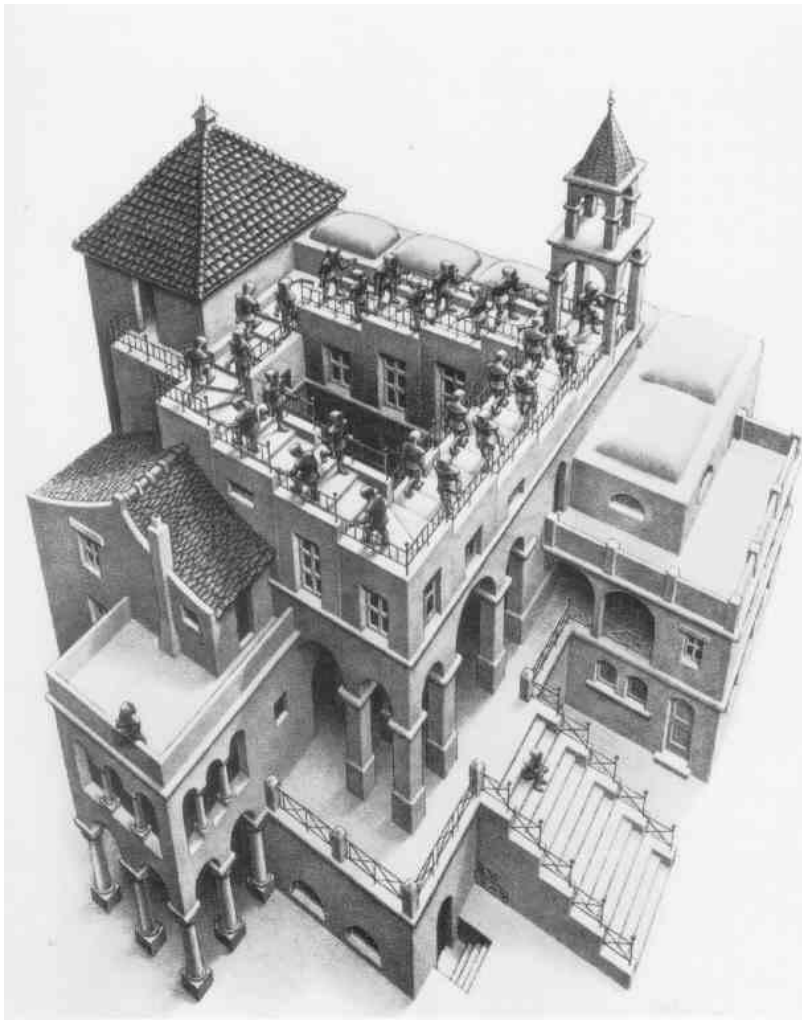 - *Collective knowledge*
  - *Intelligent Interface*

- Discuss

context   knowledge interface conversation

Where's the key technology?

context knowledge interface conversation

Which is the important part?

context knowledge interface conversation

What part of the stack is critical?

context knowledge interface conversation

The Tower of Semantics

context knowledge interface conversation

"Let them eat layer cake."

Oops. We didn't mean that.

Field of Dreamers

"If you build it, they will come."

"If they use it, it will build itself."

context knowledge interface conversation

"Don't ask what the Web knows, ask what the World knows."

context knowledge interface conversation

World-changing Technology

- Everything can be captured.
- Everything can be stored.
- Everything can be distributed everywhere.
- Everyone can talk to everyone.
- **Everyone can learn from everyone.**
  - *Insert Semantic Web here* ☺

context knowledge interface conversation

Augmenting Human Intelligence

- Web 1.0
  - *Accessing* human knowledge
- Web 2.0
  - *Gathering* human knowledge
- Web 3.0
  - *Applying* human knowledge

➡ *How can we use technology to make us smarter, individually and collectively?*

context knowledge interface conversation

The Semantic Web Potential

How can the Semantic Web fundamentally change our experience of the world?

- Enable Collective Intelligence

- Bring Intelligence to the Interface

Collective Intelligence

Where the Social Web Meets the Semantic Web

context **knowledge** interface conversation

Collective Intelligence 1968

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

Doug Engelbart
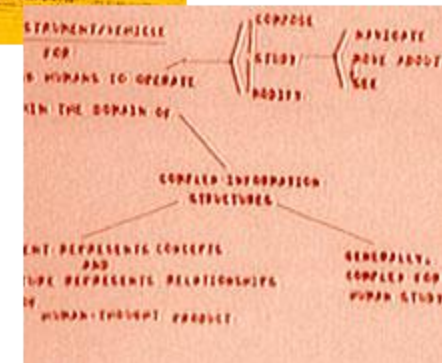
Collective Intelligence 2001

"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."

Tim Berners-Lee

Scientific American, May 2001

context **knowledge** interface conversation

Collective Intelligence 2006

"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**"

Tim O'Reilly

context **knowledge** interface conversation

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

context **knowledge** interface conversation

Collective Knowledge Systems

- provide new and useful information
  - *from large collections of data*
- based on human contributions
  - *augmented by technology*
- get better as more people participate
  - *increasing returns with scale*

Web 2.0: *Collected* Intelligence

06 africa amsterdam animals april architecture art august australia autumn baby barcelona beach berlin birthday black blackandwhite blue boston bw california cameraphone camping canada canon car cat cats chicago china christmas church city clouds color concert day dc dog england europe fall family festival film florida flower flowers food france friends fun garden geotagged germany girl graffiti green halloween hawaii hiking holiday home honeymoon hongkong house india ireland island italy japan july june kids lake landscape light live london macro may me mexico mountain mountains museum music nature new newyork newyorkcity newzealand night nikon nyc ocean october paris park party people portrait red river roadtrip rock rome san sanfrancisco scotland sea seattle september show sky snow spain spring street summer sun sunset sydney taiwan texas thailand tokyo toronto travel tree trees trip uk urban usa vacation vancouver washington water wedding white winter yellow york zoo

The Wisdom of Clouds

- Intelligent *collection?*
  - *social bookmarking, search*
- "Database of intentions"
  - *attention (click streams)*
  - *Opinion (ratings, tags)*
  - *Behavior (buying)*
- Collected communications
  - *blogs, wikis, discussion lists*

"database of intentions" – Tim O'Reilly

context **knowledge** interface conversation

Web 3.0: *Emergent* Knowledge Systems

- provide new and useful information
  - *from **multiple**, large collections of data*
- based on human contributions
  - *augmented by technology **and structured data***
- get better as more people participate.
  - *with increasing returns at scale*
- **provide answers, solutions, discoveries or other results beyond the original data.**
  - *based on computation and inference*

context **knowledge** interface conversation

Roles for Semantic Net Technology

- **Composing and integrating** user-contributed data across applications
  - *The Gigantic Join*

- **Creating aggregate value** from a mix of structured and unstructured data
  - *Example: Recommendation engines*

context **knowledge** interface conversation

Ontologies for the Gigantic Join

context   **knowledge**   interface   conversation
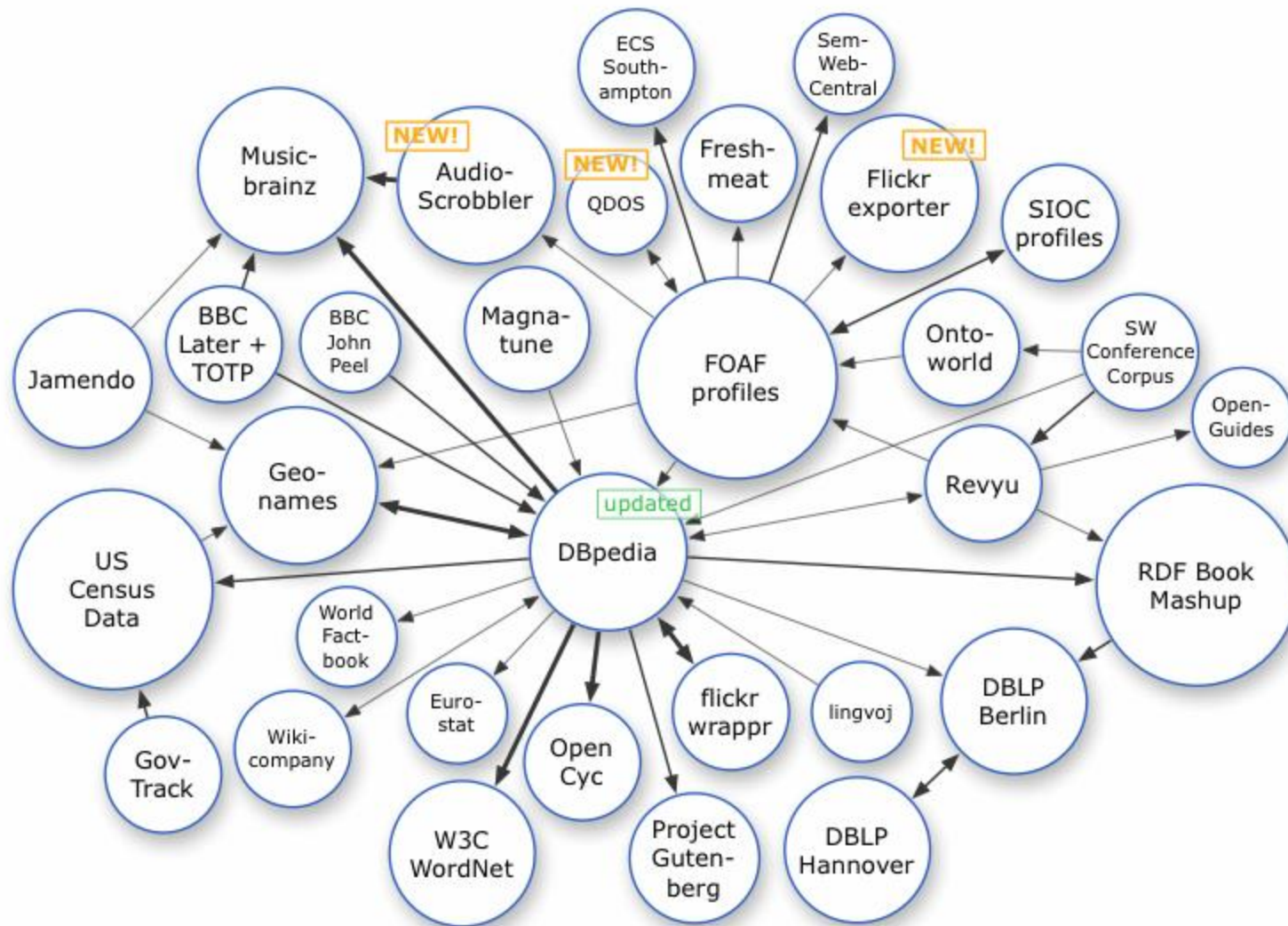
Travel Recommendation Engine

- Mix of structured and unstructured data
- Machine learning to extract clusters and synthetic 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

http://tomgruber.org/writing/collective-knowledge-systems.htm

context **knowledge** interface conversation

Intelligence at the Interface

The Killer App for Semantics
is your online life.

Interaction Paradigms

- Breadcrumbs in the forest
- Follow the leader
- Abracadabra
- Room service

context **knowledge** **interface** conversation

Breadcrumbs in the forest:
The Hyperlink

User Role

- Choose your path

System Roles

- connect the dots

Artwork by Arthur Rackham, 1909.

Technical breakthrough: *universal resource identity*

context   knowledge   **interface**   conversation

Follow the leader:
The Portal

User Role

- choose your channels (and consume them)

System Roles

- deliver the content

Technical breakthrough: *frictionless broadcasting*

context   knowledge   **interface**   conversation

Abracadabra:
The Search Engine

User Role

- state your query
  (and shift through results)

System Roles

- find relevant content and
  filter on quality

```
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
```

Technical breakthrough: *web-scale indexing and ranking*

Room Service:
Intelligence at 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*

context   knowledge   **interface**   conversation

What can IaI do?

- Know about your context

- Keep you informed and connected

- Help you remember

- Help you discover

- Work for you

context knowledge **interface** conversation

Helps you organize, share, and discover

http://twine.com

context   knowledge   interface   conversation

Helps you connect, discover, stay in touch

http://loopt.com
http://tagmaps.research.yahoo.com/
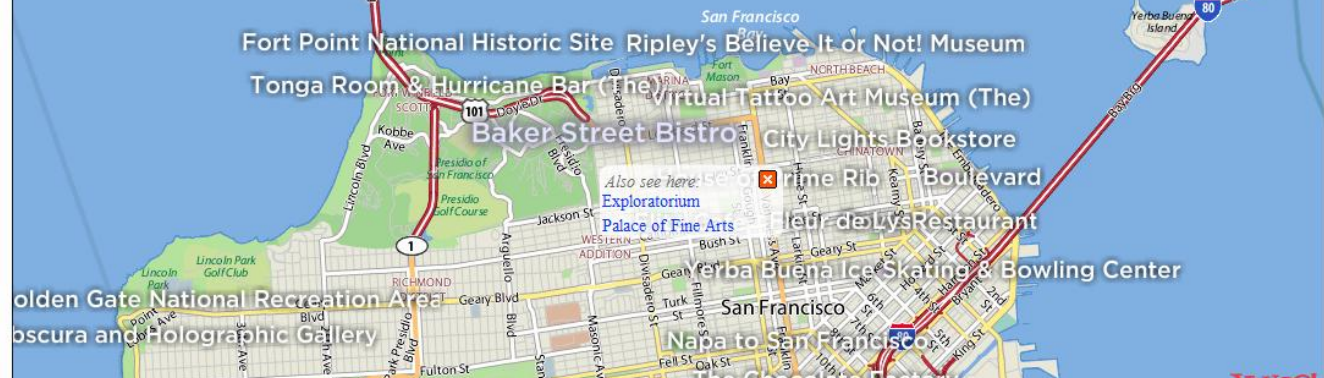
Helps you discover things you care about

context knowledge **interface** conversation

Works for you

context knowledge **interface** conversation

Your Assistant that Learns

context **knowledge** **interface** conversation

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

Service to Humans (vertical axis)

my online life

reasoning & learning

my queries

multidimensional sort

my PIM
my page

my links

database lookup

graph traversal

Hyperlink   **Portal**   **Search**   **I@I**

context   knowledge   interface   conversation
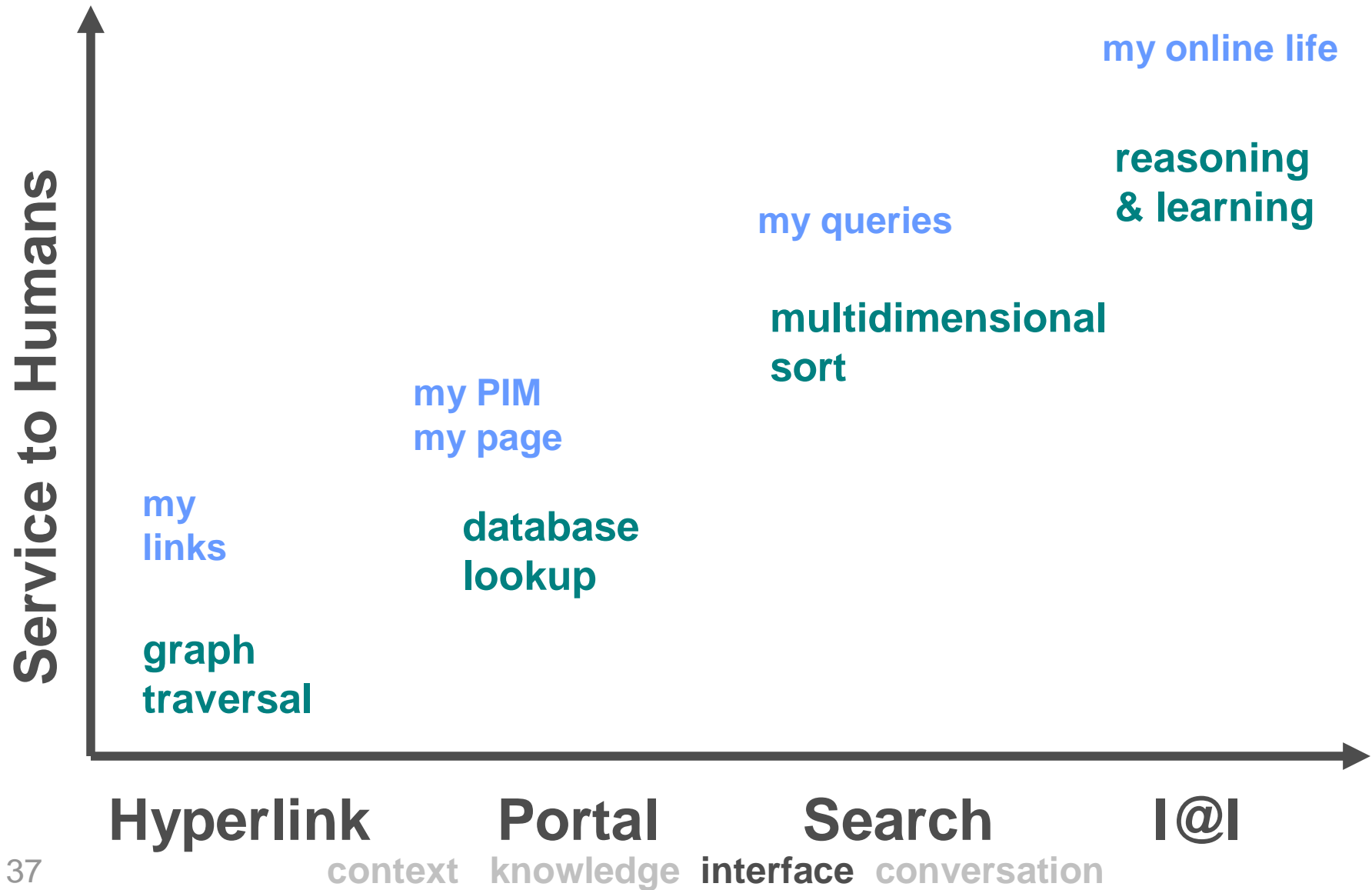
Knowledge, Reasoning, Collective Intelligence

Learn from Collective Knowledge

Service to Humans (vertical axis)

our online lives

reasoning & learning

Share our experience

our interests

multidimensional sort

Share our information

our lifestreams

database lookup

our content

graph traversal

Collected   **Aggregated**   **Emergent**

context   knowledge   **interface**   conversation
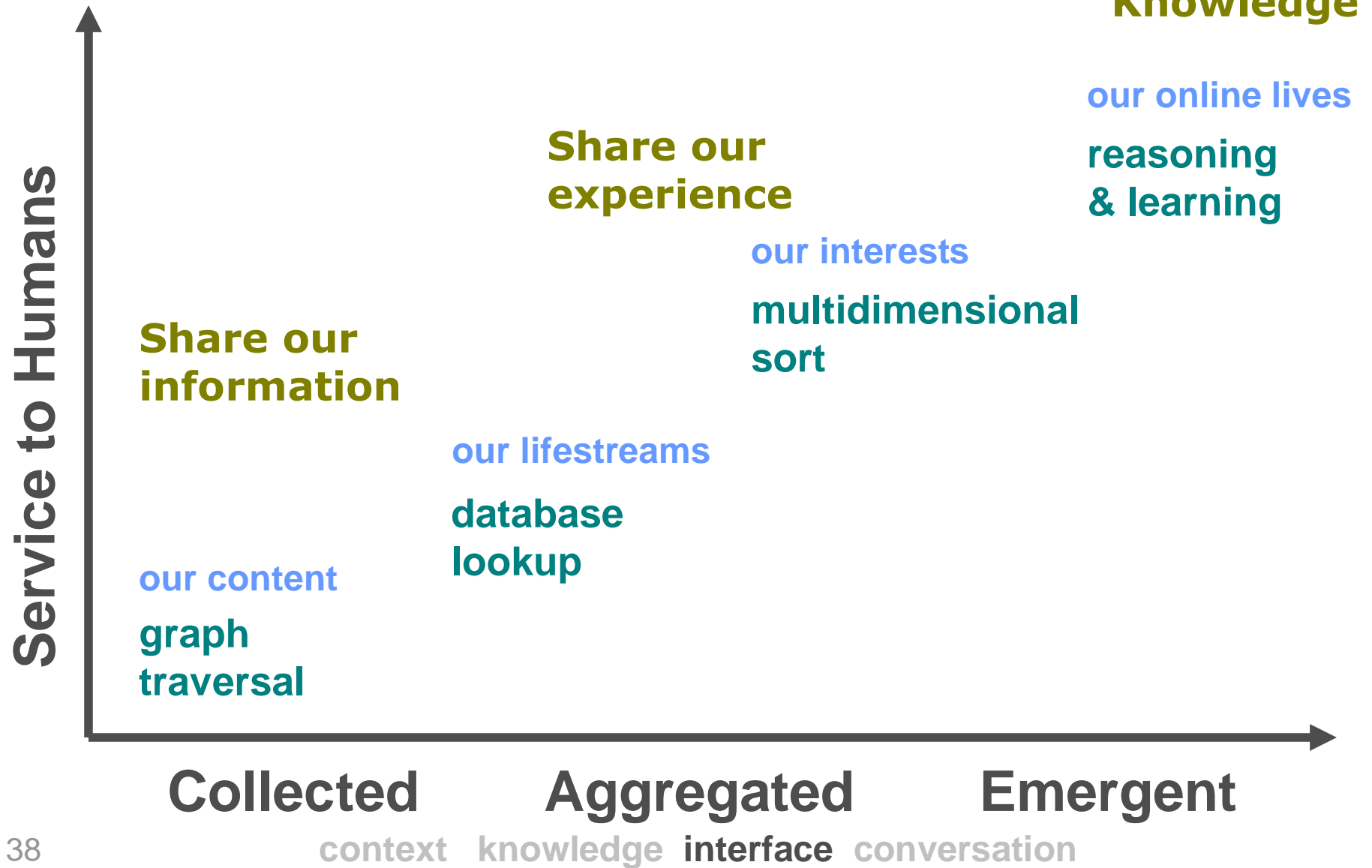
Last Word: What I Think Matters

When we're making our layer of the cake, consider how it contributes to these goals:

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

context   knowledge   interface   **conversation**

For more information

- [Tom Gruber](http://tomgruber.org/)
  http://tomgruber.org/

- [Collective Knowledge Systems](http://tomgruber.org/writing/collective-knowledge-systems.htm)
  http://tomgruber.org/writing/collective-knowledge-systems.htm

- [Intelligence at the Interface](http://tomgruber.org/news/sdforum-dec13.htm)
  http://tomgruber.org/news/sdforum-dec13.htm

- Rights: Attribution No Derivatives
  http://tomgruber.org/writing/aaai-ss08.htm