Despite Our Best Efforts, Ontologies are not the problem.

Tom Gruber
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outline

- Components don’t matter
- Systems that matter
  - Collective knowledge
  - Intelligent Interface
- Discuss
Where’s the key technology?

Cost of Components:
- $266 (£130)
- Retail Cost of Phone: $600 (£300)
Which is the important part?
What part of the stack is critical?
The Tower of Semantics

- User Interface & Applications
- Trust
- Proof
- Unifying Logic
- Query: SPARQL
- Ontology: OWL
- Rule: RIF
- Data interchange: RDF
- XML
- URI/IRI

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.”
“Don't ask what the Web knows, ask what the World knows."
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 😊*
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?*
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
"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
"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
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
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*

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

“The Wisdom of Clouds

“database of intentions” – Tim O’Reilly
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
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*
Ontologies for the Gigantic Join

http://richard.cyganiak.de/2007/10/lod/
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
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
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
Abracadabra: The Search Engine

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
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
What can IaI do?

- Know about your context
- Keep you informed and connected
- Help you remember
- Help you discover
- Work for you
Helps you organize, share, and discover

http://twine.com
Helps you connect, discover, stay in touch

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

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.

artist or song

Listen Now
Works for you
Your Assistant that Learns
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

- Hyperlink
  - context
- Portal
  - knowledge
- Search
  - interface
- I@I
  - conversation

- my PIM
- my page
- my queries
- my online life
- reasoning & learning
- multidimensional sort
- database lookup
- graph traversal
- my links
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.
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**

- **Rights: Attribution No Derivatives**
  [http://tomgruber.org/writing/aaai-ss08.htm](http://tomgruber.org/writing/aaai-ss08.htm)