Using Our Collective Wisdom

Supporting the Global Brain Emerging on this Planet

### Intro for Day 3 by Katy Borner, Indiana University

Howard Bloom (2000) Global Brain: The Evolution of Mass Mind From the Big Bang to the 21st Century, Wiley

Börner, Katy, Dall'Asta, Luca, Ke, Weimao and Vespignani, Alessandro. (April 2005) Studying the Emerging Global Brain: Analyzing and Visualizing the Impact of Co-Authorship Teams. Complexity, special issue on Understanding Complex Systems, 10(4): pp. 58-67.
Also available as cond-mat/0502147.

14th Century: One person can make major contributions to **many areas of science**

Humanity's Knowledge

use

Human Brain
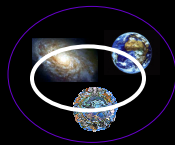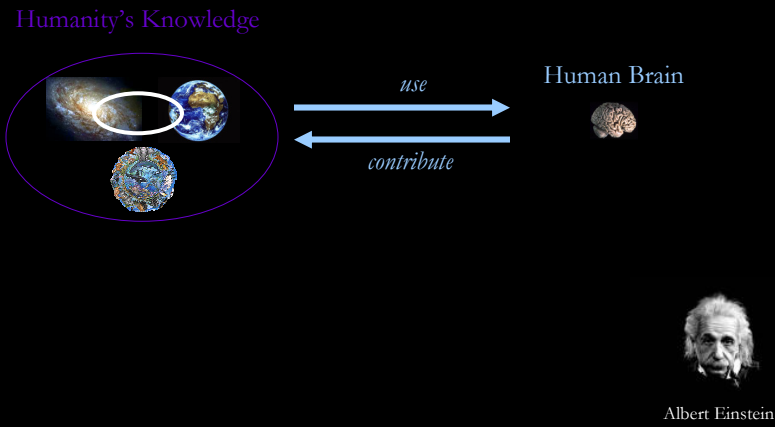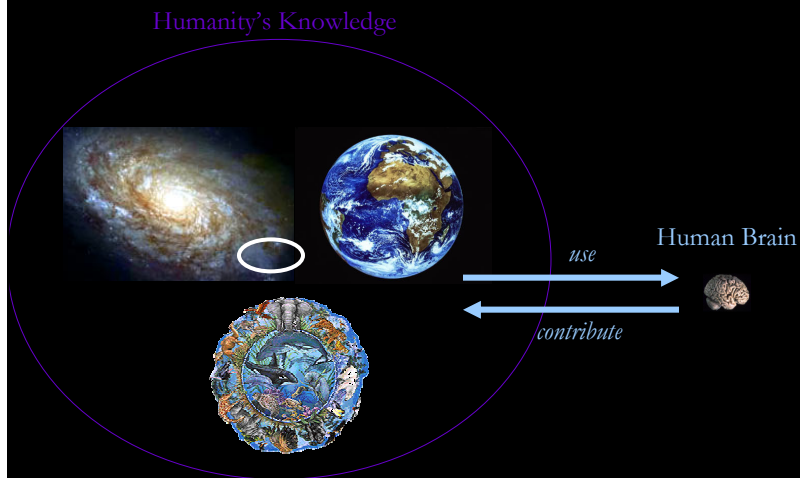
contribute

Amount of knowledge
on person can mange

Leonardo da Vinci

Circle of Life was designed by Elaine Maier

20th Century: One person can make major contributions to **a few areas of science**

Humanity's Knowledge

use

Human Brain

contribute

Albert Einstein

21th Century: One person can make major contributions to **a specific area of science**

Humanity's Knowledge

use

Human Brain

contribute

21th Century: How to collectively contribute to **all areas of science?**

Humanity's Knowledge

Human Brains

use

contribute
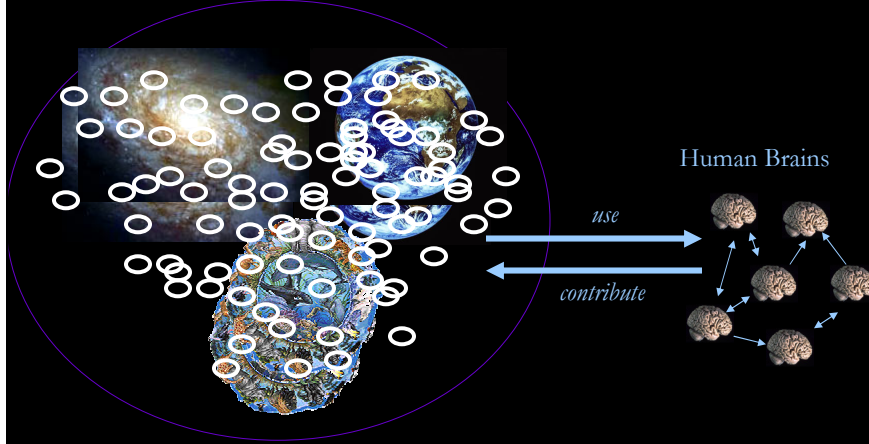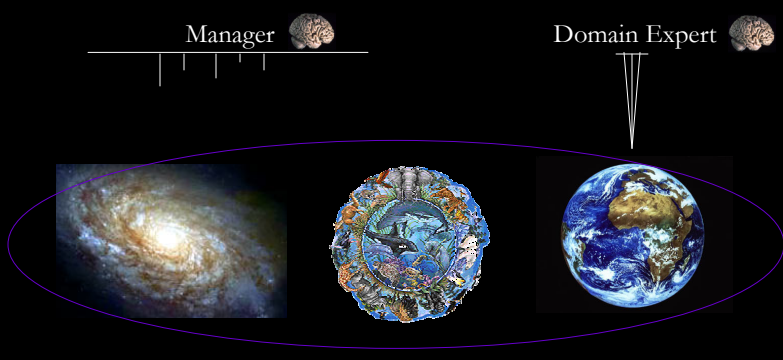
Circle of Life was designed by Elaine Maier
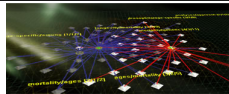

Manager

Domain Expert

Humanity's Knowledge

The problem is **not** how <u>one person</u> can access knowledge but how we can <u>collectively</u> access and manage humanity's knowledge.
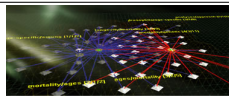

 Human Perception and Cognition

are optimized for

- ➢ Finding food and prey in natural habitats.
- ➢ Finding mating partners.
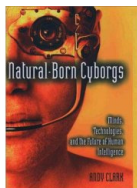- ➢ Avoiding and/or escaping predators.

We are not optimized for extended keyboard, mouse, and screen usage or surfing abstract knowledge and expertise networks.

Tool Usage

Human's are 'natural born cyborgs'. We are drawn to technology like 'moths to the flame'.
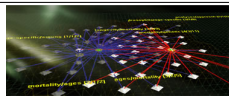
We developed and use search engines as our major means to access everything we collectively know. Let's see how they improved using http://www.archive.org/.

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10 years back in time
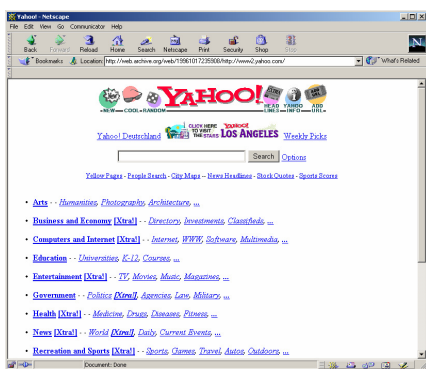
Yahoo Oct 17, 1996   Yahoo Oct 24, 2006

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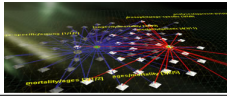
8 years back in time

Google Dec 2, 1998
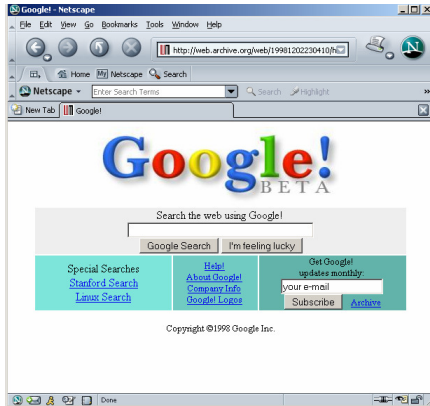
Google, Oct 24, 2006
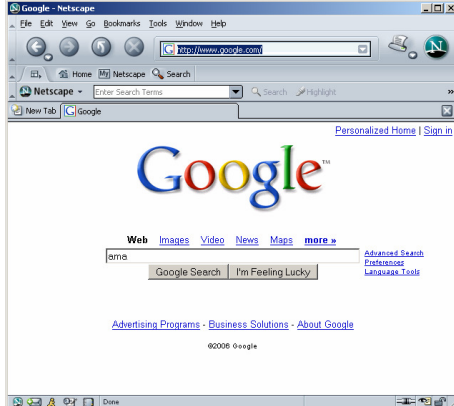
Google's mission is to organize the world's information and make it universally accessible and useful.
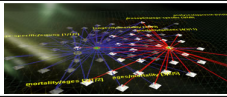
7 years back in time

Amazon Sept 02, 1999
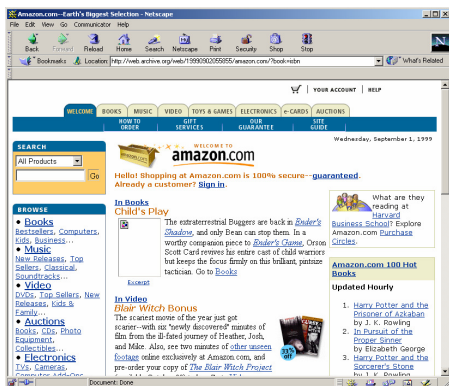
Amazon Oct 19, 2004
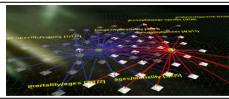
Problem:

Can't pack more text.

Solution:

Shift user's mental load from slow reading to faster perceptual processes such as visual pattern recognition.

Compare and Contrast

Router density

Population density

Yook, Jeong, & Barabasi, 2001

Geographic distribution of Internet routers (top) vs. global distribution of population (bottom).

George Chaplin

Map of human skin colors based on global ultraviolet radiation intensity and precipitation levels.

Map Attribute Overlays

Red indicates the extent of the radiation cloud on April 27, just after the accident in Chernobyl. Blue, indicates its almost worldwide distribution until the 6th of May.

Dark red circles indicate oil spills and gray-shaded areas indicate sea pollution and land pollution from chemical fertilizers. Shown is only a small part of the entire pollution spectrum in 1988. At an average of every three months this globe becomes obsolete due to yet another major oil spill.

WHAT THE WORLD WANTS

Eliminate Starvation & Malnutrition: $19 billion

Provide Shelter $21 billion

Remove Land Mines $4 bil.

Build Democracy $3 bil.

Eliminate Nuclear Weapons $7 bil.

Refugee Relief $5 billion

Eliminate Illiteracy $5 billion

Provide Health Care & AIDS Control $21 billion

Provide Clean, Safe Water $10 billion

Stop Deforestation $7 billion

Prevent Global Warming $8 billion

Stabilize Population $10.5 billion

Prevent Acid Rain $8 billion

Stop Ozone Depletion $5 billion

Provide Clean, Safe Energy:

Prevent Soil Erosion $24 billion

Energy Efficiency $33 billion

Retire Developing Nations Debt $30 billion
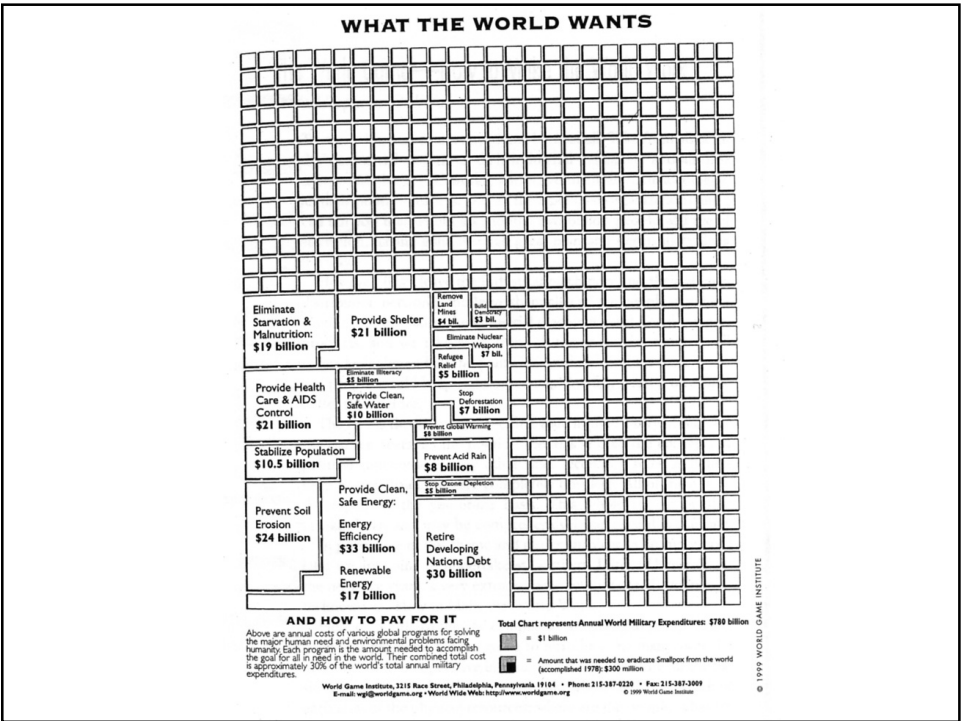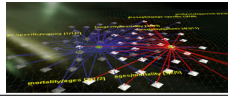
Renewable Energy $17 billion

AND HOW TO PAY FOR IT

Above are annual costs of various global programs for solving the major human need and environmental problems facing humanity. Each program is the amount needed to accomplish the goal for all in need in the world. Their combined total cost is approximately 30% of the world's total annual military expenditures.

Total Chart represents Annual World Military Expenditures: $780 billion

☐ = $1 billion

■ = Amount that was needed to eradicate Smallpox from the world (accomplished 1978): $300 million

World Game Institute, 3215 Race Street, Philadelphia, Pennsylvania 19104 • Phone: 215-387-0220 • Fax: 215-387-3009
E-mail: wgi@worldgame.org • World Wide Web: http://www.worldgame.org
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How Much Wisdom is Needed to Save the World?

H. G. Wells' (1938) World Brain:

The idea of a permanent world encyclopaedia.

Need to interconnect the few bright brains to save the world.

Buckminster Fuller (1961) World Game:

"Fuller's game was intended to be a tool that could be used by people around the world to understand and develop solutions to what he called the real enemies of humanity: hunger, illiteracy, lack of health care, environmental degradation, and "you or me" thinking."

http://www.worldgame.org/

Jimmy Wales (2001) Wikipedia:

"Imagine a world in which every single person on the planet is given free access to the sum of all human knowledge. That's what we're doing."

http://en.wikipedia.org/wiki/Jimmy_Wales
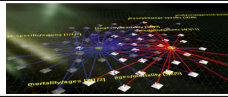
'Meta-Engineering'
Empty Shells that Facilitate the Global Brain

Wikipedia's sister projects

Wikipedia is hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other projects:

Wiktionary
Dictionary and thesaurus

Wikinews
Free-content news

Wikiquote
Collection of quotations

Wikibooks
Free textbooks and manuals

Wikispecies
Directory of species

Wikisource
Free-content library

Wikiversity
Free learning materials and activities

Commons
Shared media repository

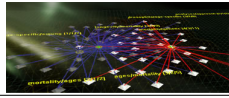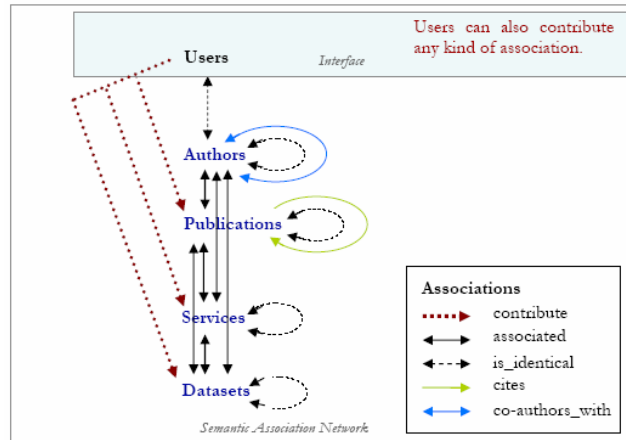**Meta-Wiki**
Wikimedia project coordination

http://www.wiktionaryz.org

*Cyberinfrastructure Shell http://cishell.org*

Flickr, YouTube, Del.icio.us, …, Mashups

Taking Better Care of Our Collective Knowledge:
**e.g., using Semantic Association Networks**

Katy Börner. (2006) Semantic Association Networks: Using Semantic Web Technology to Improve Scholarly Knowledge and Expertise Management. In Vladimir Geroimenko & Chaomei Chen (eds.) Visualizing the Semantic Web, Springer Verlag, 2nd Edition, chapter 11, pp. 183-198.
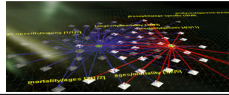
Making Knowledge Easy to
Access, Navigate, and Manage

Overlay
➤ Inventions & Inventors
➤ Learning Modules
➤ Concept Maps
➤ Arguments
➤ Scientific Revolutions
➤ …

Interactivity
➤ Zoom, pan
➤ Filter
➤ Get details
➤ Turn on and off layers

Interlink both maps.
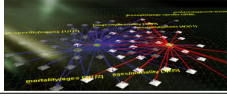
Serve User Desires

Linda Stone, former VP at Microsoft argues that

- 1965 to 1985 valued **self-expression** - instilling a narcissistic quality in us.
- 1980-1990 saw a shift to a **networked, constantly connected lifestyle**.
- Today, we are faced with **continuous partial attention**. We long for
    - Protection – privacy, security.
    - Filtering – automatic & collective (wiki).
    - Trust – explainability, data provenance.
    - Meaning – knowledge/wisdom instead of data/information + eternal life.
    - Belonging – communities, families.