2001 - dreams and reality

Weaving the Web ... of the future

… for a safe voyage in knowledge space

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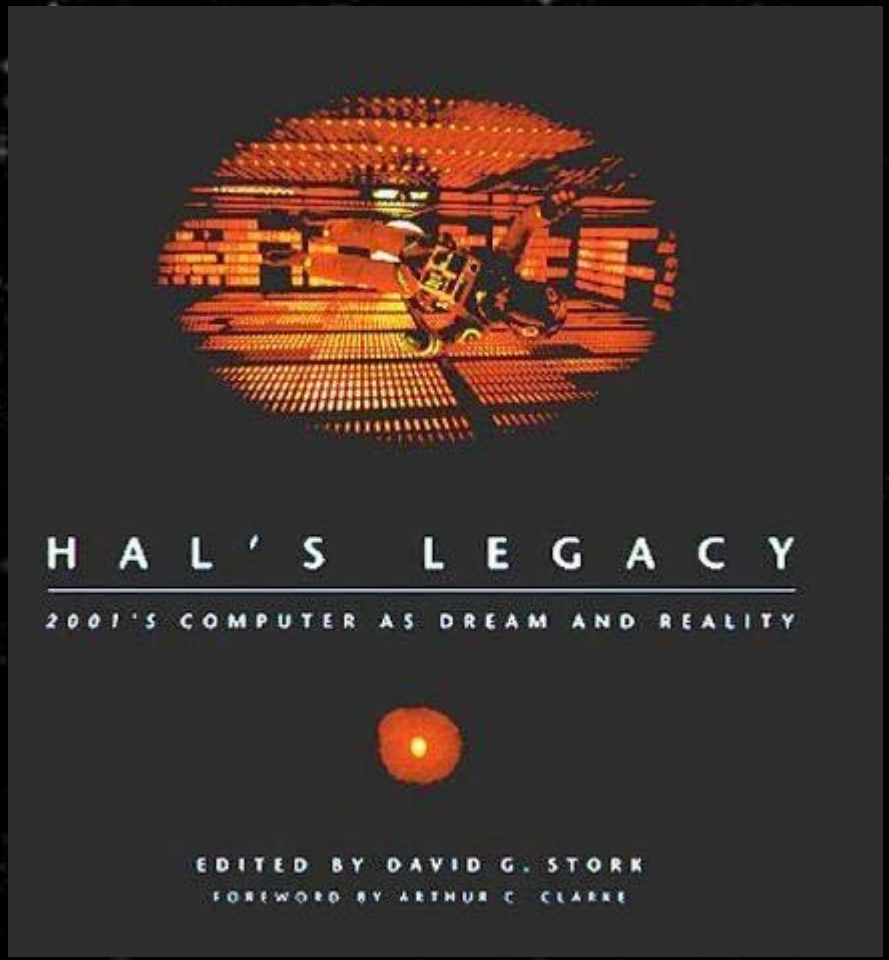
2001 - dreams and reality



Today's dreams are not new:

HAL

… recognizes who you are

… understands what you say

… surmises what you feel

… talks to you

HAL knows !

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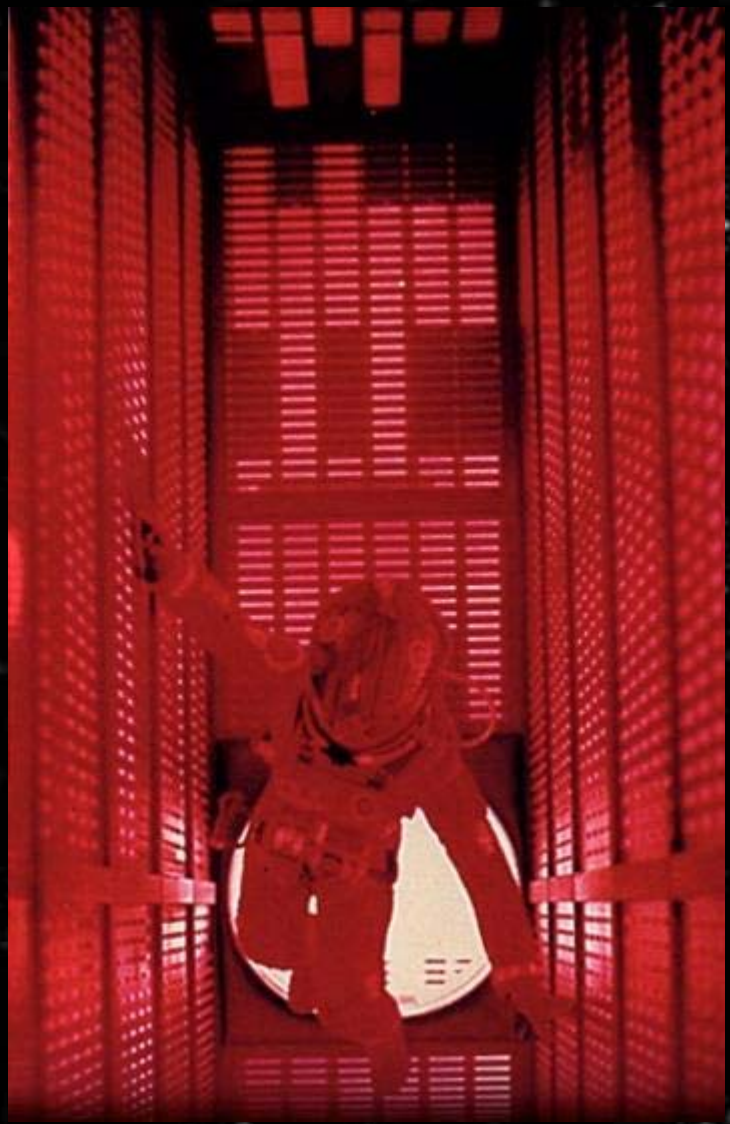
2001 - dreams and reality



But 2001 reality is quite different from 1968 dreams ...

The inventors of HAL ignored (e.g.):

Vannevar Bush's MEMEX (1945)

Ted Nelson's XANADU (1960)

Moore's Law (1965)

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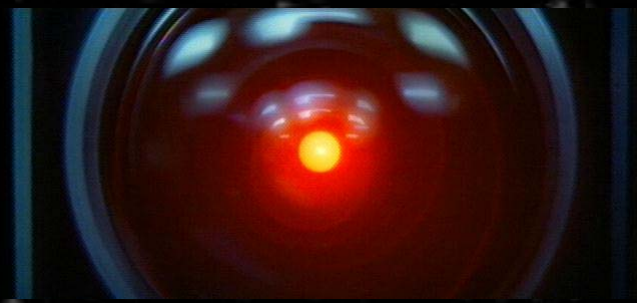
2001 - dreams and reality



Yet, some of the old dreams are in fact on the verge of coming true…
(well, to some extent …)

But the dimensions are different !

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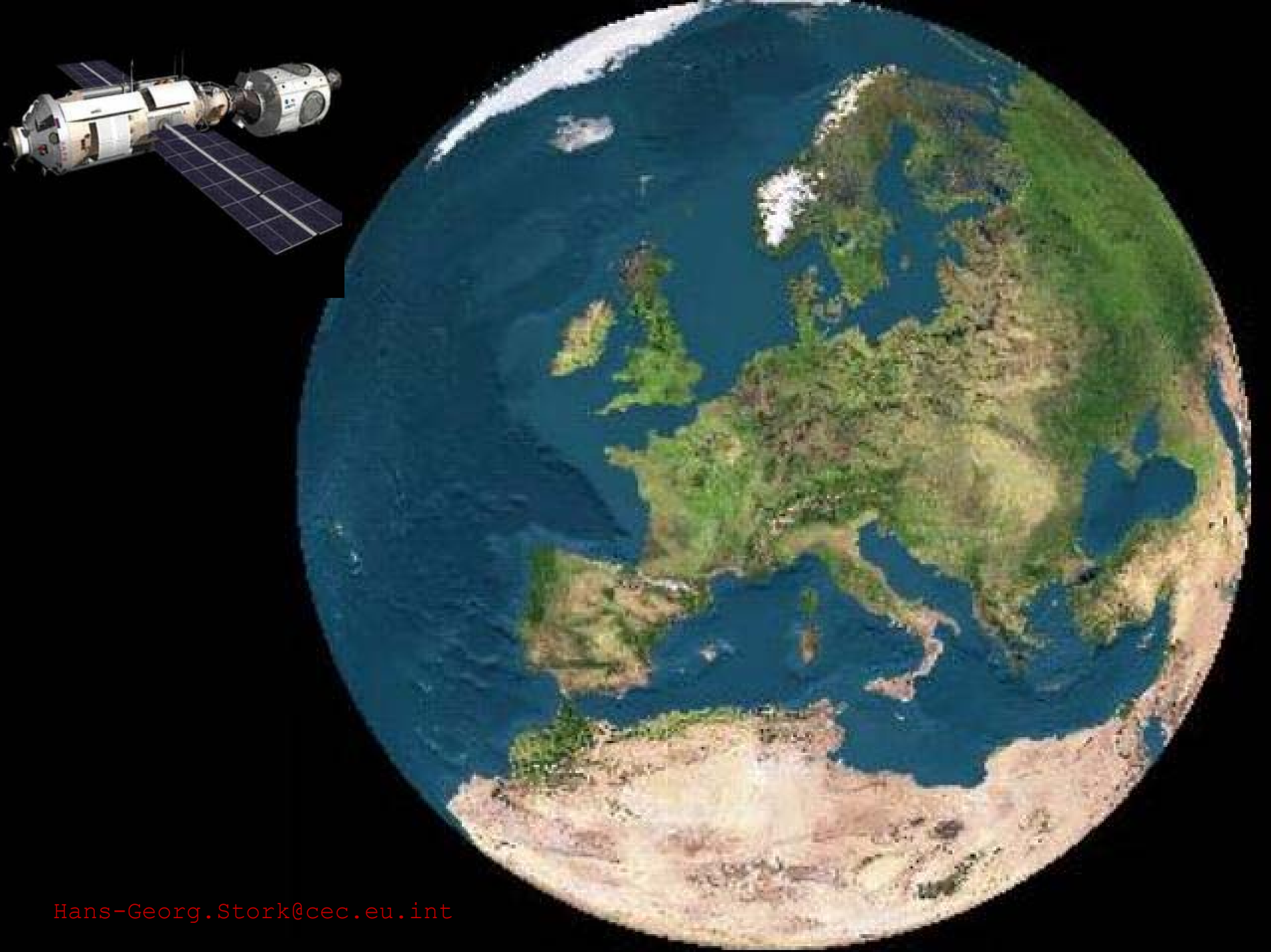

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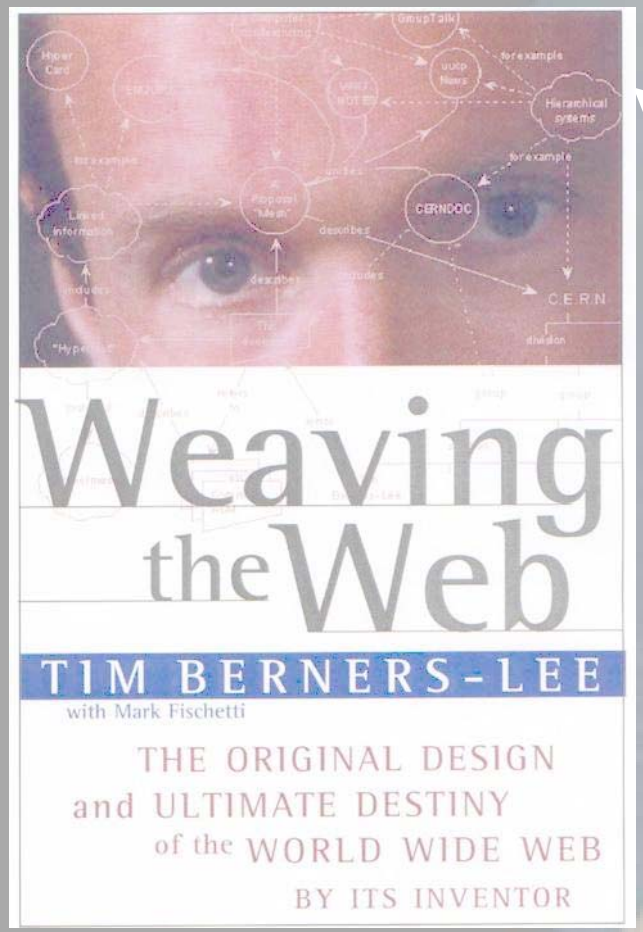

Computers are not huge isolated supermachines.

They are in business !

They can be big, but most are small; they are everywhere and they are interconnected.

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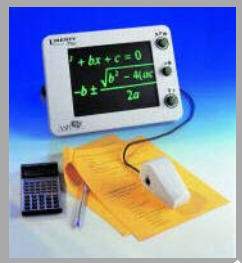
Weaving the Web … of the future



Computers communicate ...

… but do they “understand” what they tell each other ?

They don’t, unless ...

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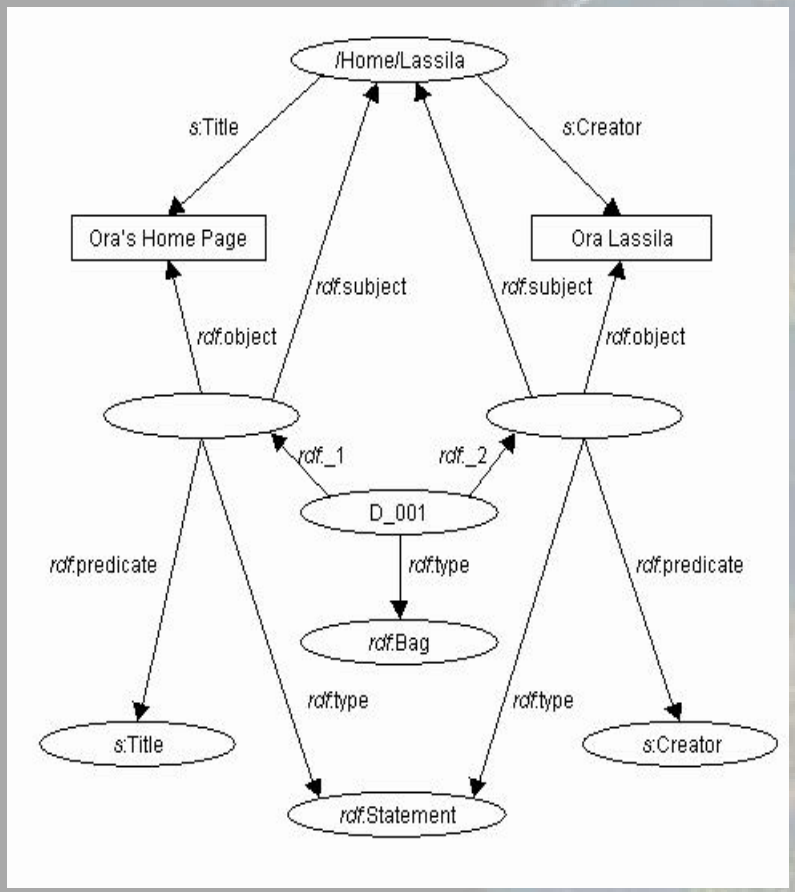

… they are told

… or told to learn

… the meaning of what they are talking about.

To unleash the full potential of networked resources these resources have to have clearly defined

SEMANTICS.

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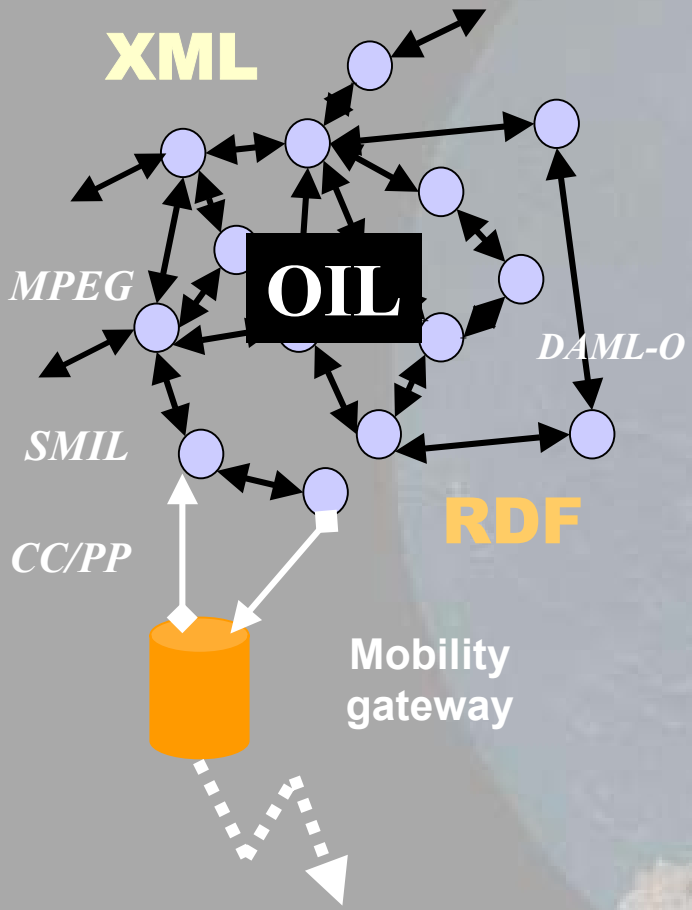
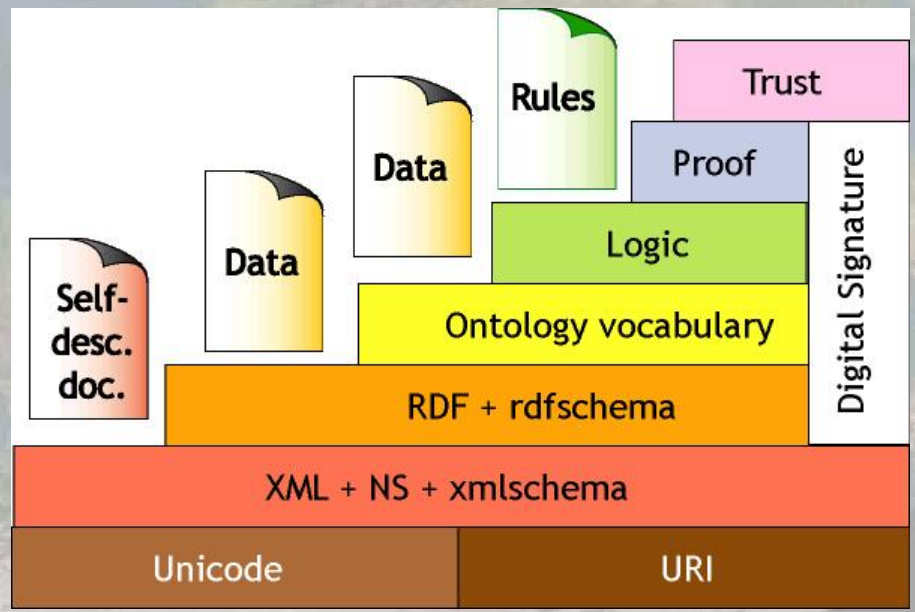


Formal languages are the stepping stones to the ‘Semantic Web’



Tim Berners-Lee, 2000

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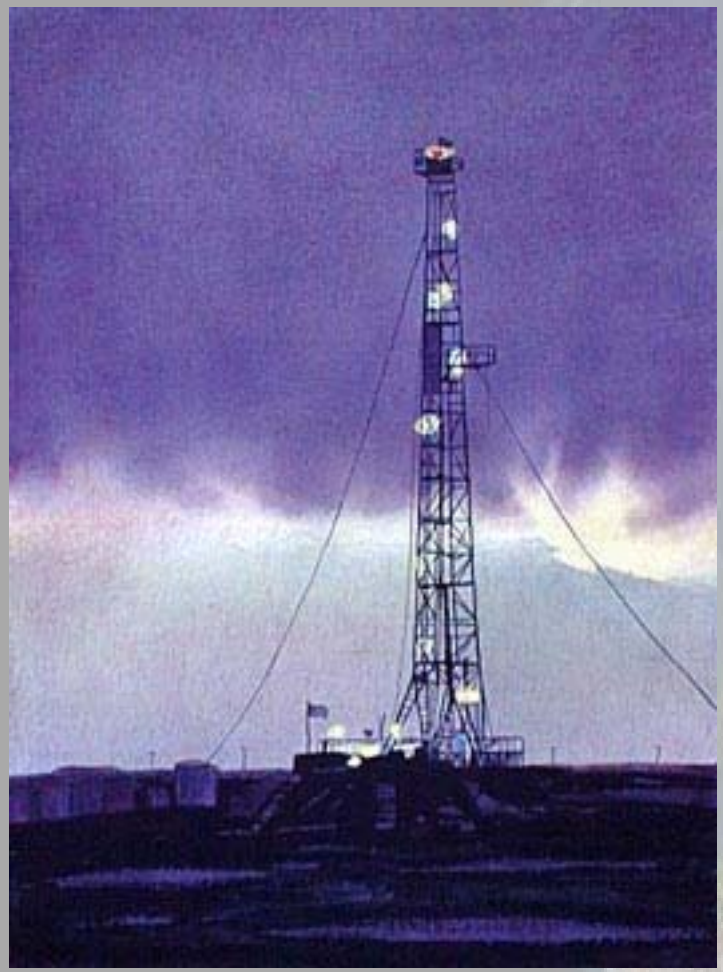

Another view of OIL, the Ontology Inference Layer

Conjecture:

In an **adaptive** and **open**, **collaborative** and **automated**, **multimedia** and **pervasive**, **trustable** Semantic Web …

populated by content and context “aware” systems and appliances ...

content **semantics** must be grounded in well defined reference **ontologies**

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Semantics:

… the **meaning** of things

… to be **aware** of the meaning of things …

to know …

… the ‘Semantic Web’ …

… a Web of Knowledge ??

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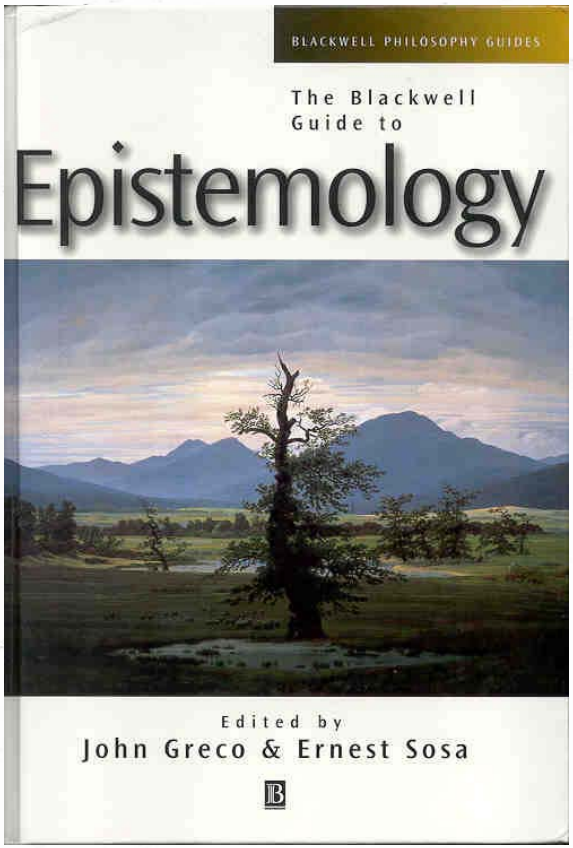


But what kind of knowledge ?

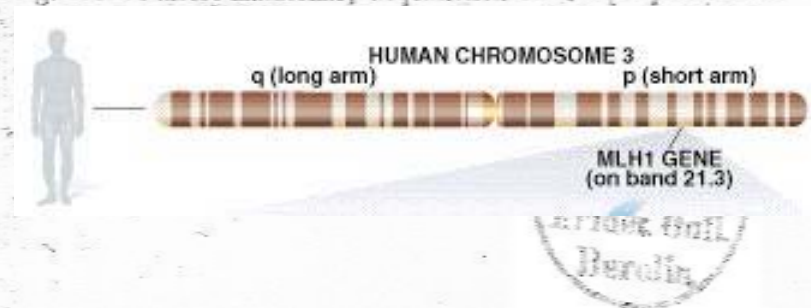
$E = mc^2$?

$e^{i\pi} + 1 = 0$?

1066 - Battle of Hastings ?

Client X prefers product Y ?

… a rose by any other name would smell as sweet …



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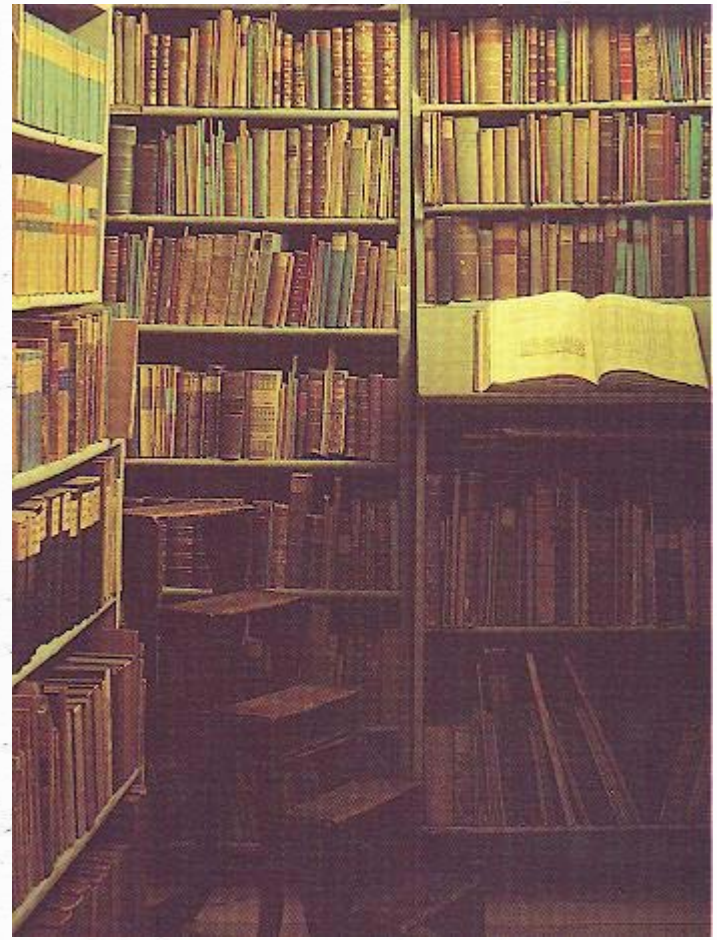

If we wanted to bring a HAL-like being into existence, what are the millions of things that should be used to prime HAL's knowledge pump?

How should they be represented inside the machine so that it can use them efficiently to deduce further conclusions when needed, just as we would?

Who will do the actual entering of all that data?

Douglas B. Lenat

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An Allegory with Venus and Cupid
probably 1540-50
BRONZINO (1503 - 1572)

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The challenge of knowledge extraction from multimedia documents:

It should indeed be done automatically and with great care.

Machines must learn to make the difference.

HAL technologies (and more, of course) may help !

(HAL = Heuristic Algorithmic Learner)

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The ultimate challenge (so far !):

to have machines ground themselves in the real world and have them share with us, via a Semantic Web, the knowledge they acquire.

But remember Isaac Asimov's robot commandments (and the fate of USSS *Discovery*):

- a robot must not injure a human being;
- a robot must obey orders of a human being, but not one that would violate the first principle;

…and the Joy-Kurzweil controversy which may not be so off the wall after all ...

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