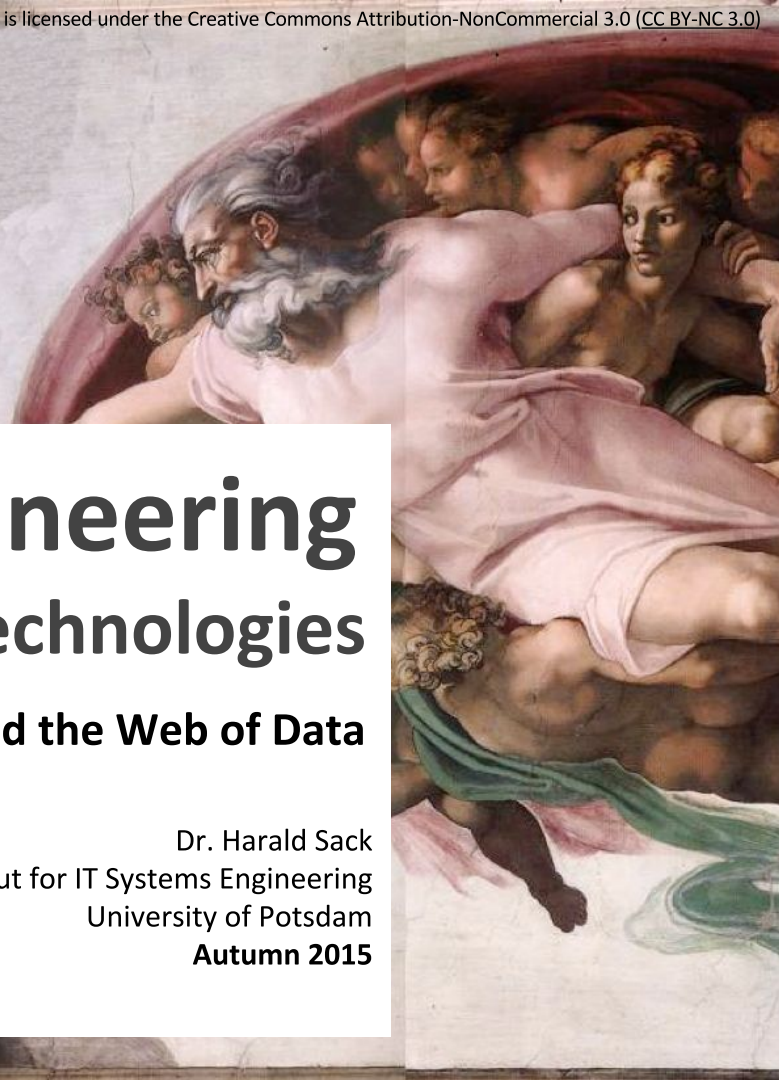
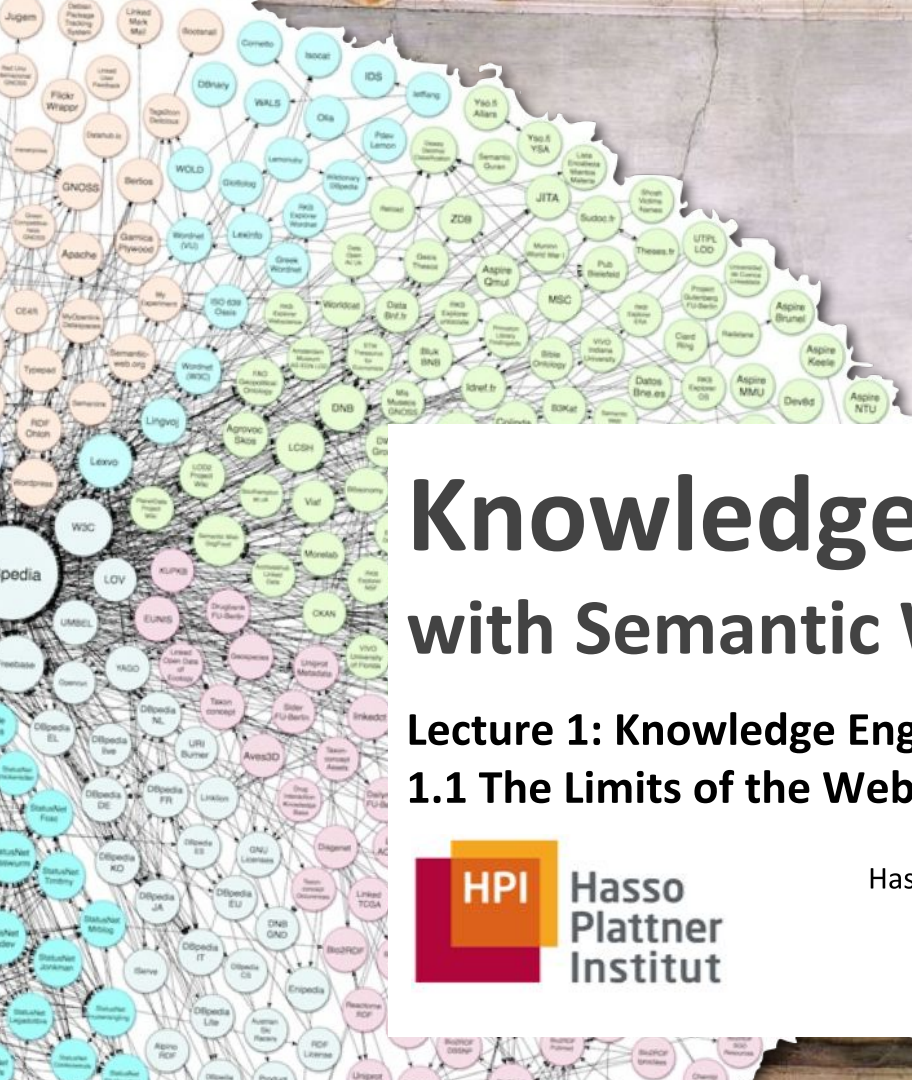




Knowledge Engineering with Semantic Web Technologies

Lecture 1: Knowledge Engineering and the Web of Data 1.1 The Limits of the Web



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Autumn 2015



J.C.R. Licklider
ARPA IPTO Director
(1962-1964)



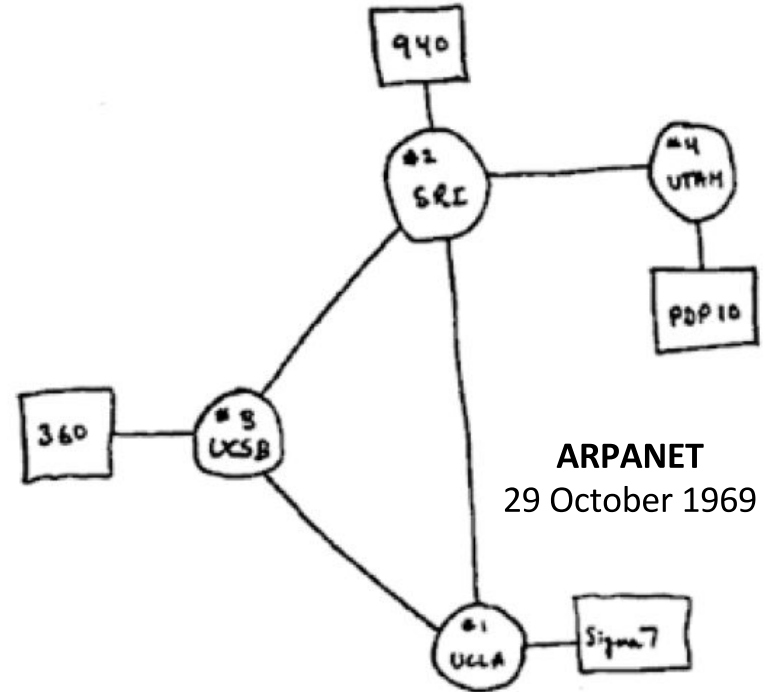
Robert Taylor
ARPA IPTO Director (1966-1969)



Larry Roberts
ARPA IPTO Chief Scientist
(1966-1973)

"[...] we are entering a technological age in which we will be able to interact with the richness of living information - not merely in the passive way that we have been accustomed to using books and libraries, but as active participants in an ongoing process, bringing something to it through our interaction with it, and not simply receiving something from it by our connection to it."

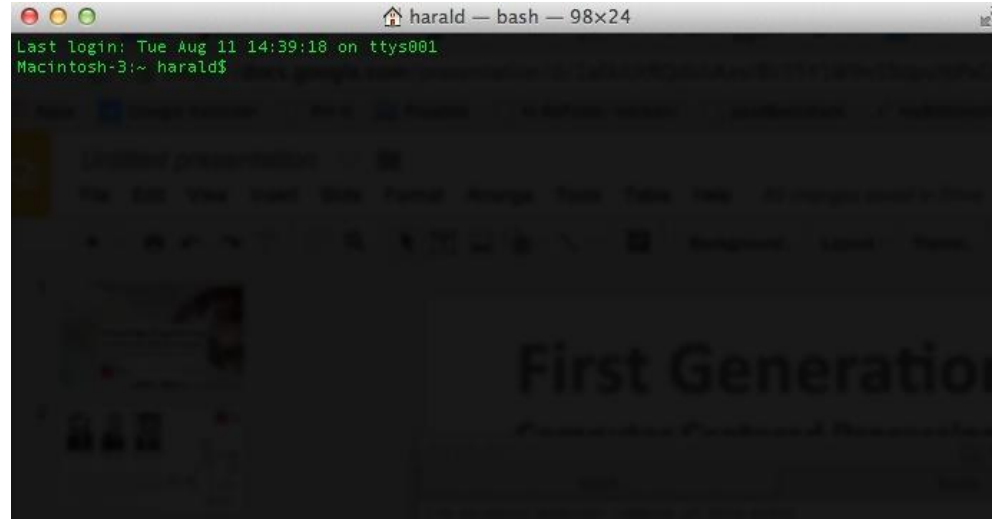
J.C.R. Licklider, Robert Taylor: [*"The Computer as a Communication Device"*](#).
Science and Technology 76, pp. 21-31 April 1968.



First Generation: The Internet

Computer Centered Processing

- How does the user get the information?



1. open terminal
2. connect to remote system
3. retrieve file system data from remote system
4. download file from remote to local system
5. read file on local system

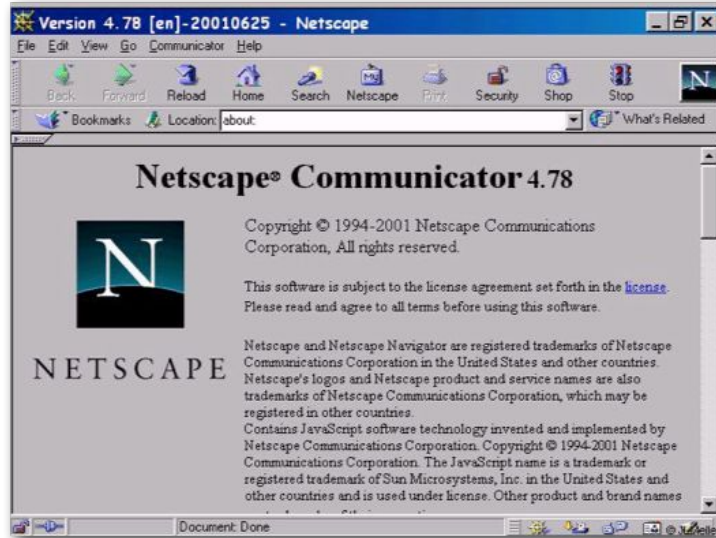
Problems

- information access requires expert knowledge and is expensive
- information retrieval is even more expensive

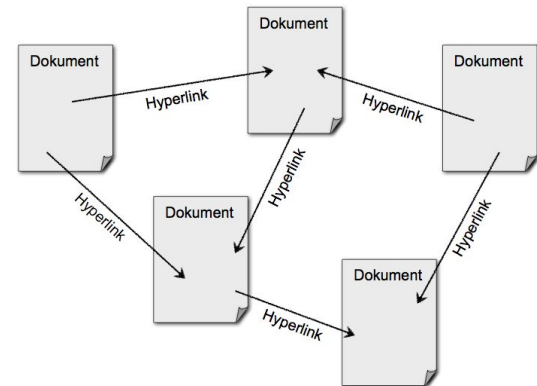
Second Generation: The Web

Document Centered Processing

- How does the user get the information?



1. open browser
2. load document
3. click on next hyperlink
4. ...

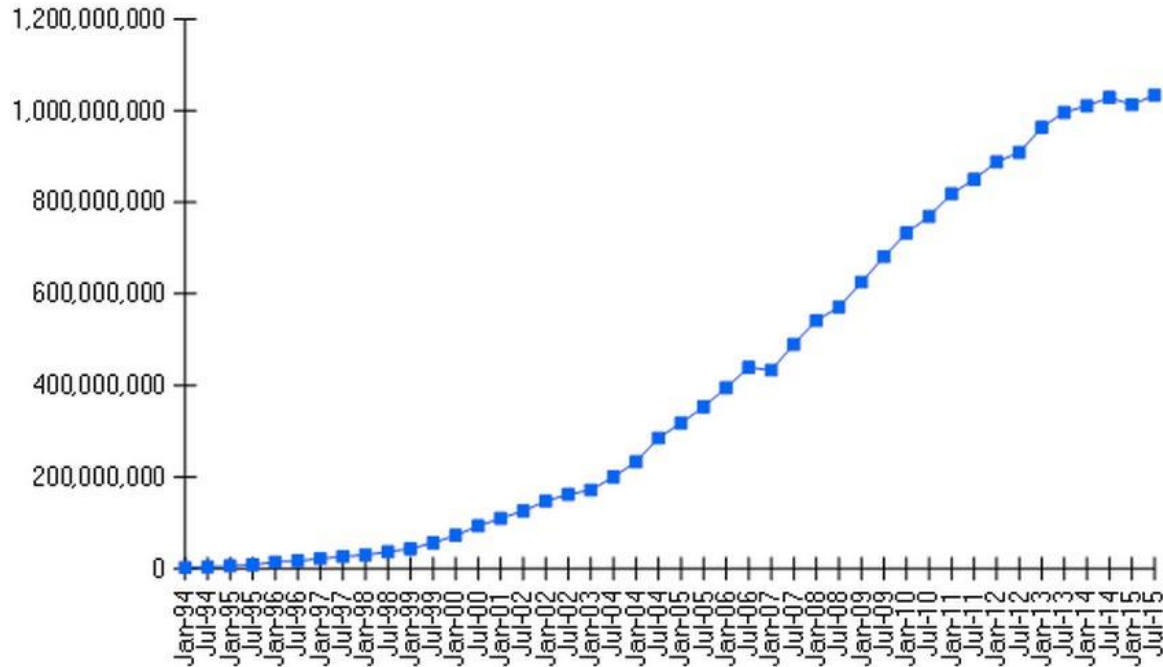


Advantages

- information access does not require expert knowledge
- information retrieval via search engines

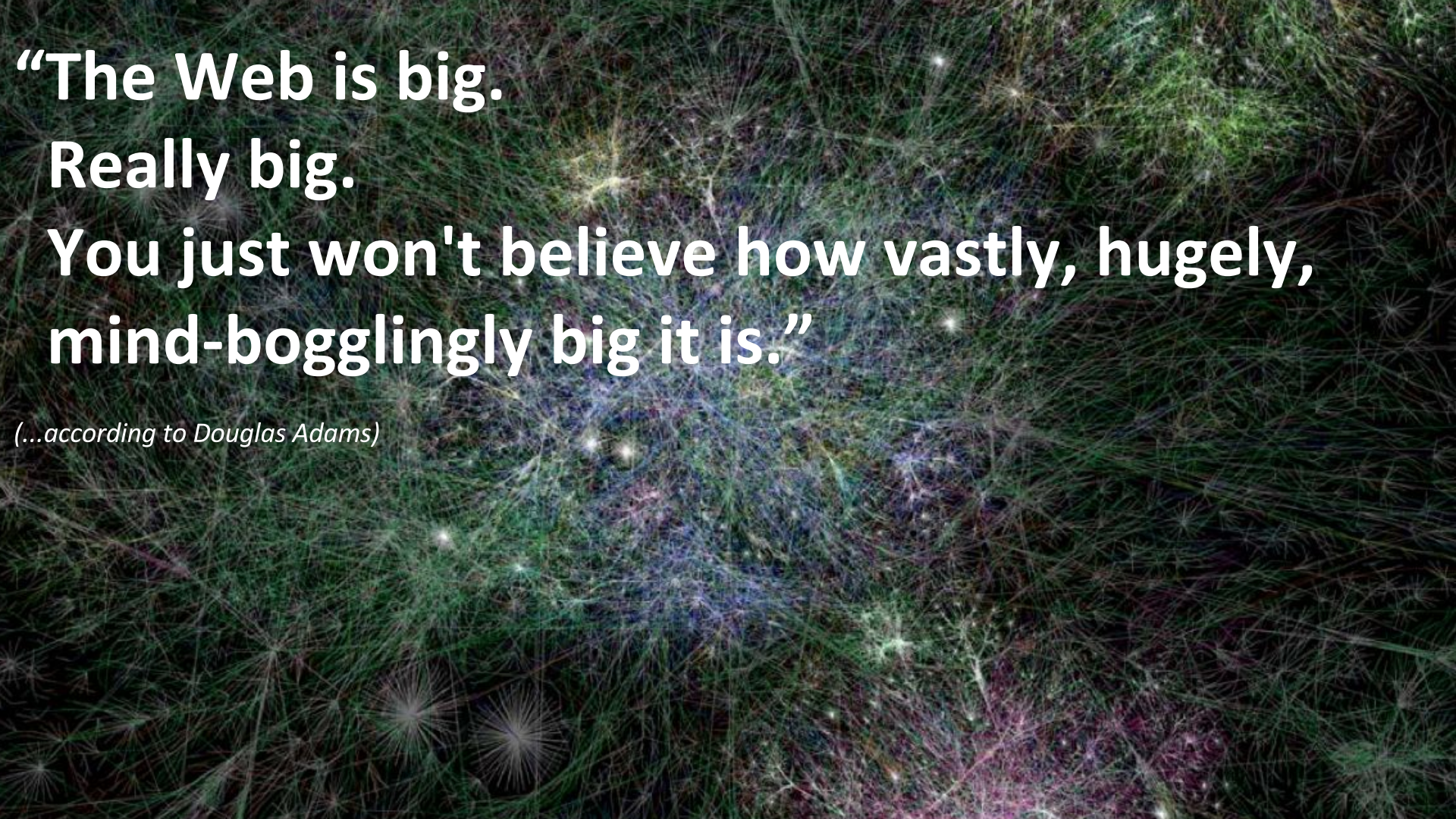
There seem to be no Limits of Growth

Internet Domain Survey Host Count



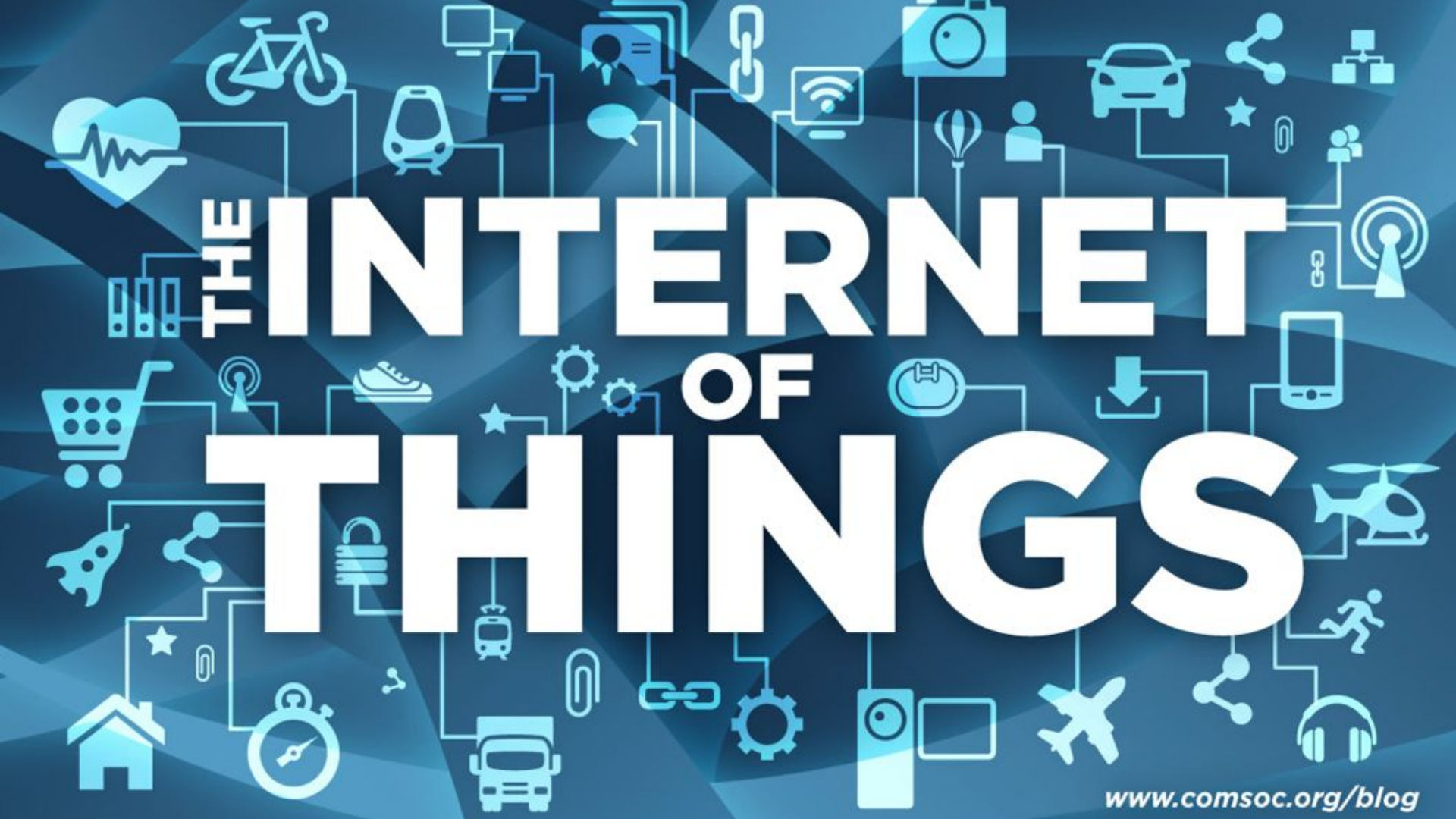
Source: Internet Systems Consortium (www.isc.org)

<http://www.isc.org/>
(update: 08/2015)



**“The Web is big.
Really big.
You just won't believe how vastly, hugely,
mind-bogglingly big it is.”**

(...according to Douglas Adams)



THE INTERNET OF THINGS

おすすめ番組

映画

- ▶ テレビジャパン・シネマシアター「火垂るの墓」＜英語字幕付き＞
- ▶ テレビジャパン・シネマシアター「ルパン三世」
- ▶ テレビジャパン・シネマシアター「謝罪の王様＜英語字幕付き＞」

ドラマ

- ▶ ドラマ10「美女と男子」
- ▶ ドラマ「刑事7人」
- ▶ 戦後70年「一番電車が走った」
- ▶ 木曜時代劇「まんまこと～麻之助裁定帳～」
- ▶ ドラマ「100年目の恋」

ドキュメンタリー

- ▶ NHKスペシャル
- ▶ ザ・プレミアム 鈴木亮平 “絶景！ミステリー遺産” に挑む！アドリア海縦断・7日間の大冒険
- ▶ ザ・プレミアム 風雲！大歴史実験
- ▶ NHKスペシャル
- ▶ BS1スペシャル「戦火のマエストロ・近衛秀麿～ユダヤ人の命を救った音楽家～」
- ▶ 世界ふれあい街歩き
- ▶ 奇跡のレッスン～世界の最強コーチと子どもたち～

- what information is important and how do you know?
- what is news and what is commercial?
- what information is related by content?
- what does the information mean?

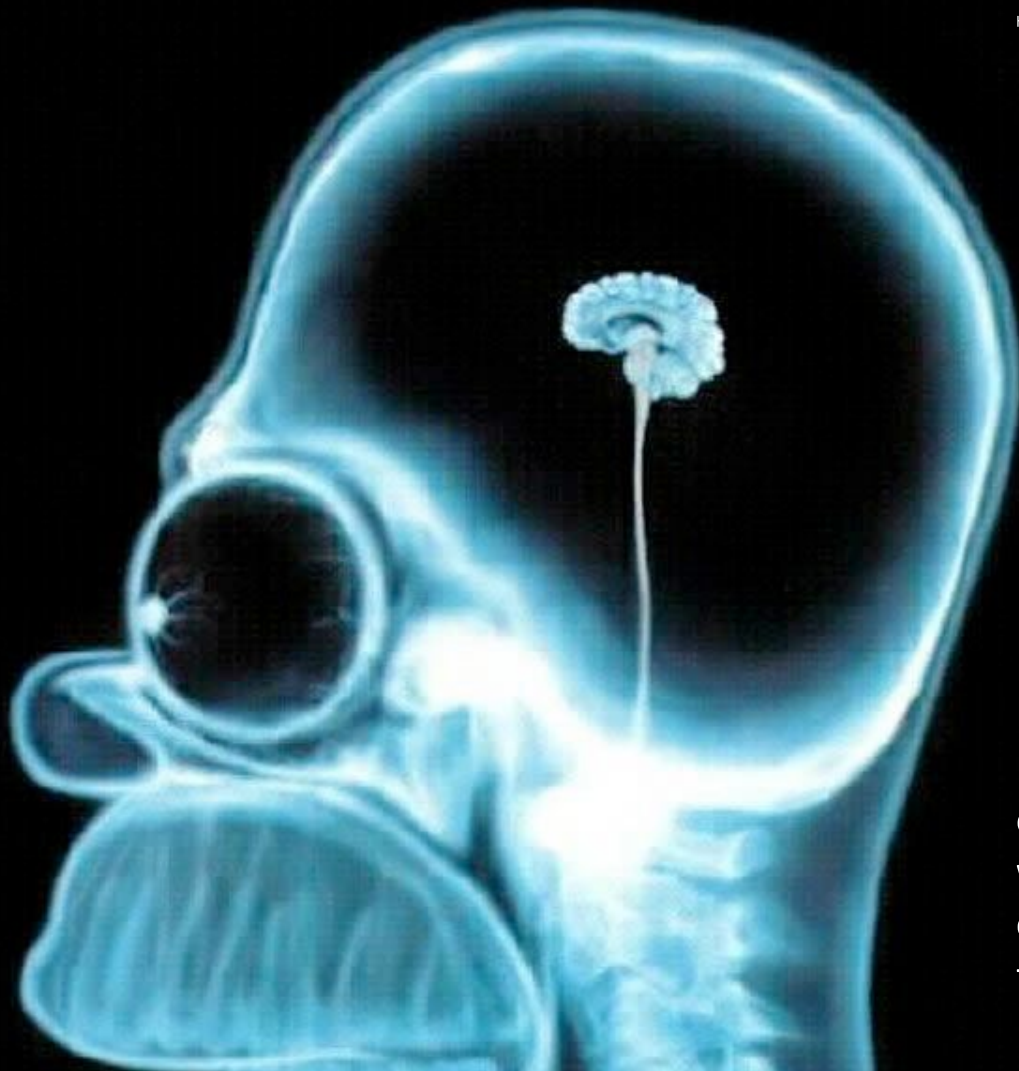
- ▶ よみがえりマイスター
- ▶ 夏のうまい旅祭り 妄想ニホン キッチンが走る！
- ▶ 新 クイズ面白ゼミナール

音楽

- ▶ NHKスペシャル

音楽

- ▶ SONGS



Humans have
contextual knowledge,
world knowledge and
experience
to solve the problem

The (Document) Web is for Humans

überschneiden sich thematisch. Hilf mit, die Artikel besser voneinander abzugrenzen oder zu vereinigen. Beteilige dich dazu an der [/wiki/Wikipedia:Redundanz/M%C3%A4rz_2009#Klassifikator .28Informatik.29](/wiki/Wikipedia:Redundanz/M%C3%A4rz_2009#Klassifikator_.28Informatik.29)

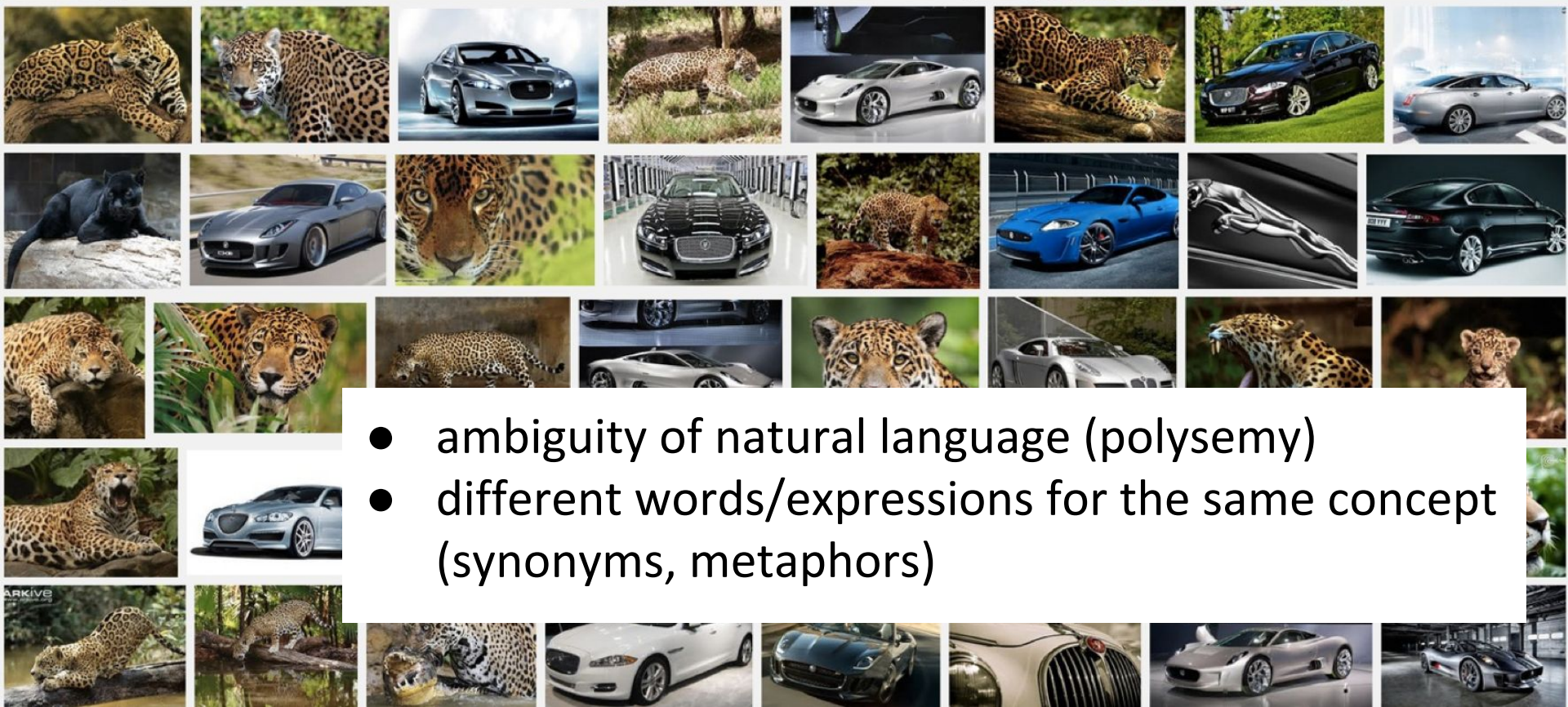
- The Web is based on the markup language HTML
- HTML describes
 - how information is **presented**
 - how information is linked
 - but **not**, what the information means

Klassifikator (Informatik) sortiert Dokumente in Klassen ein. Diese Methodik kommt vor allem im [Webmining](/wiki/Webmining "Webmining") zum Einsatz.

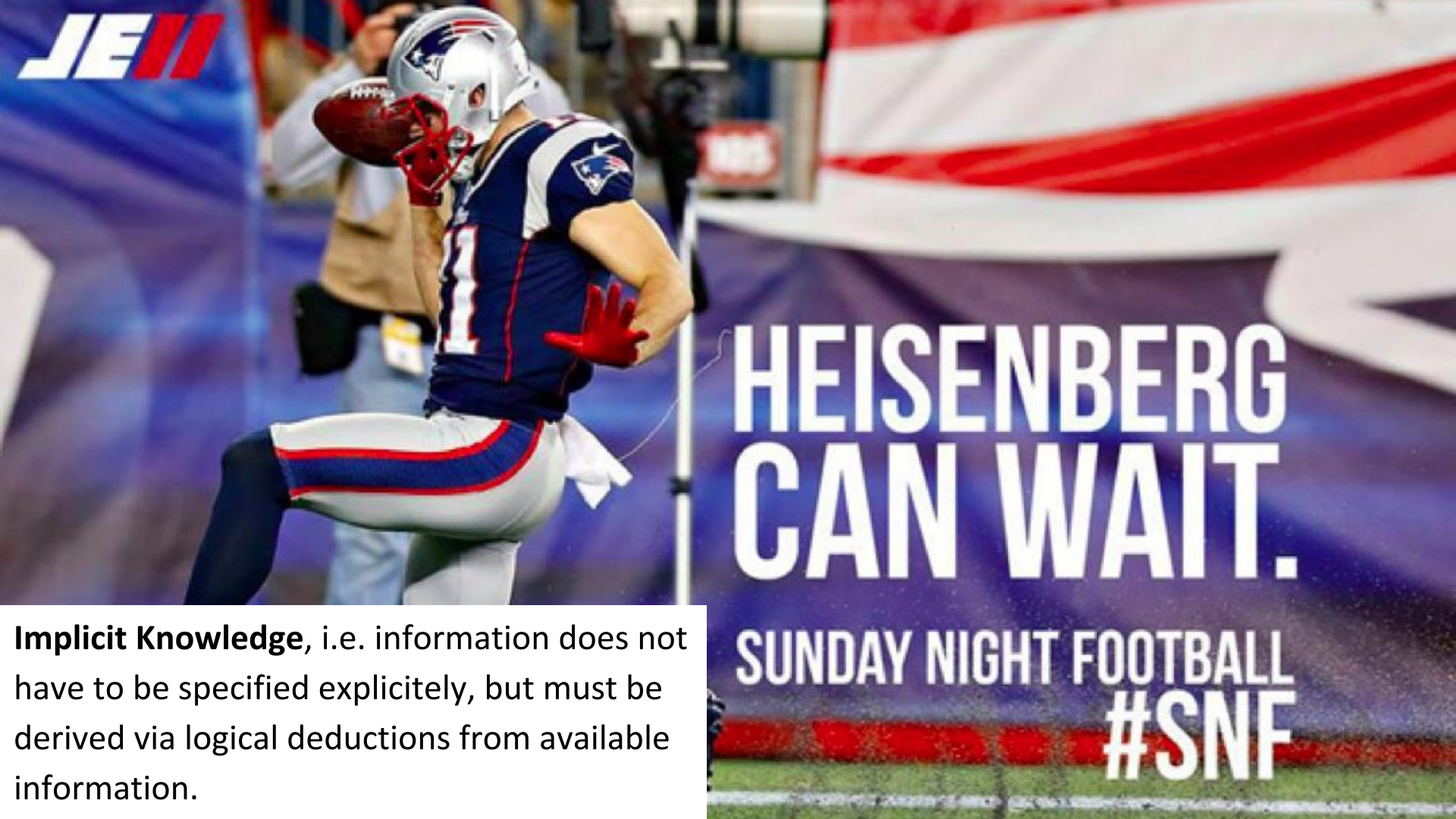
Webmining

toc

The Information Retrieval Dilemma



- ambiguity of natural language (polysemy)
- different words/expressions for the same concept (synonyms, metaphors)

A photograph of Tom Brady in a New England Patriots uniform, captured in the middle of a kicking motion. He is wearing a silver helmet with the Patriots logo, a blue jersey with the number 12, and white pants with blue and red stripes. He is holding a football in his right hand and has his left leg extended forward. The background is a blurred stadium setting with a large American flag visible on the right.

JE

**HEISENBERG
CAN WAIT.**

**SUNDAY NIGHT FOOTBALL
#SNF**

Implicit Knowledge, i.e. information does not have to be specified explicitly, but must be derived via logical deductions from available information.

WHAT IS THE MEANING?

Next: 02 - The Importance of Meaning

OpenHPI - Course Knowledge Engineering with Semantic Web Technologies

Lecture 1: Knowledge Engineering and the Web of Data