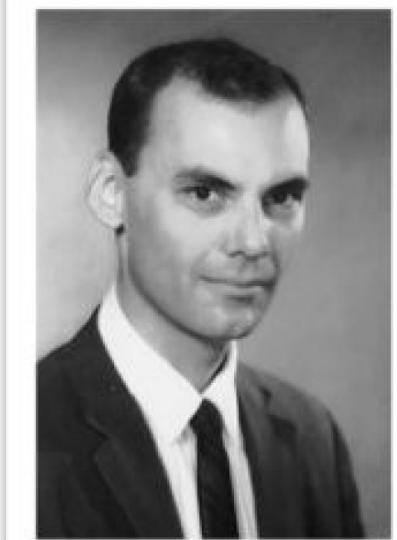




J.C.R. Licklider
ARPA IPTO Director
(1962-1964)



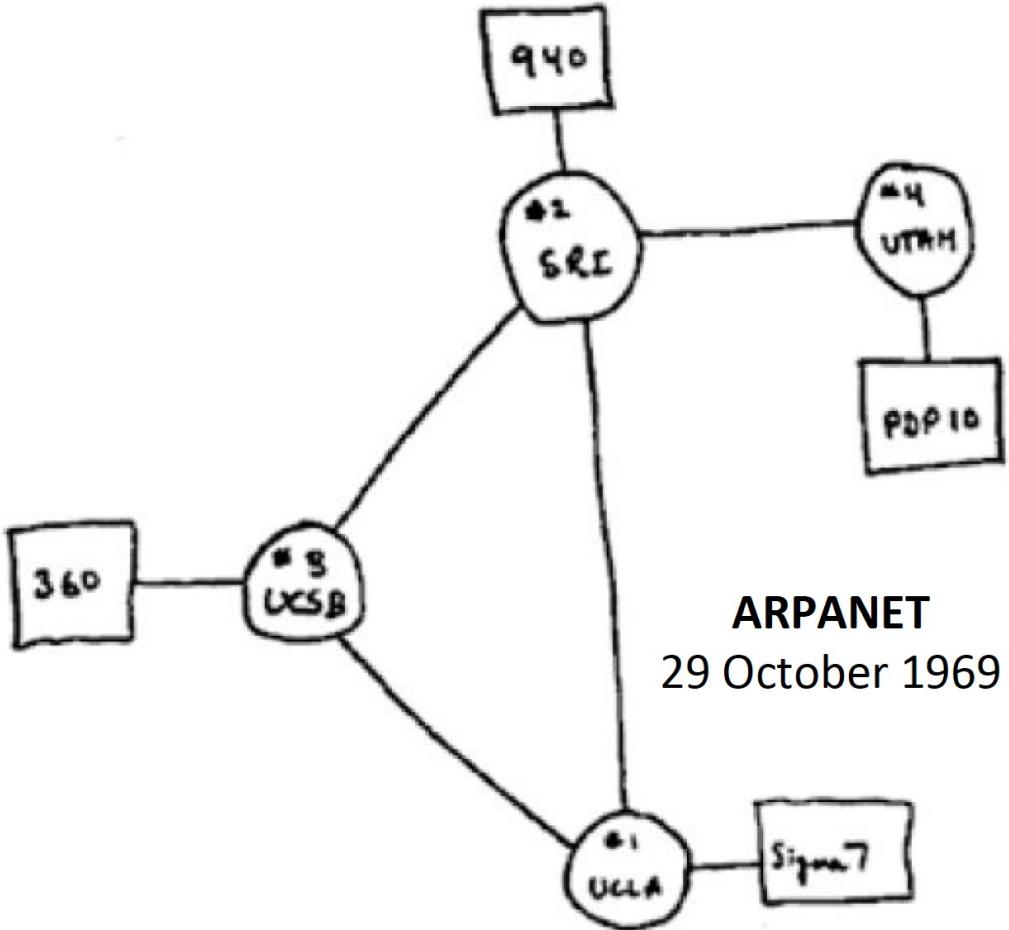
Robert Taylor
ARPA IPTO Director
(1966-1969)



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."

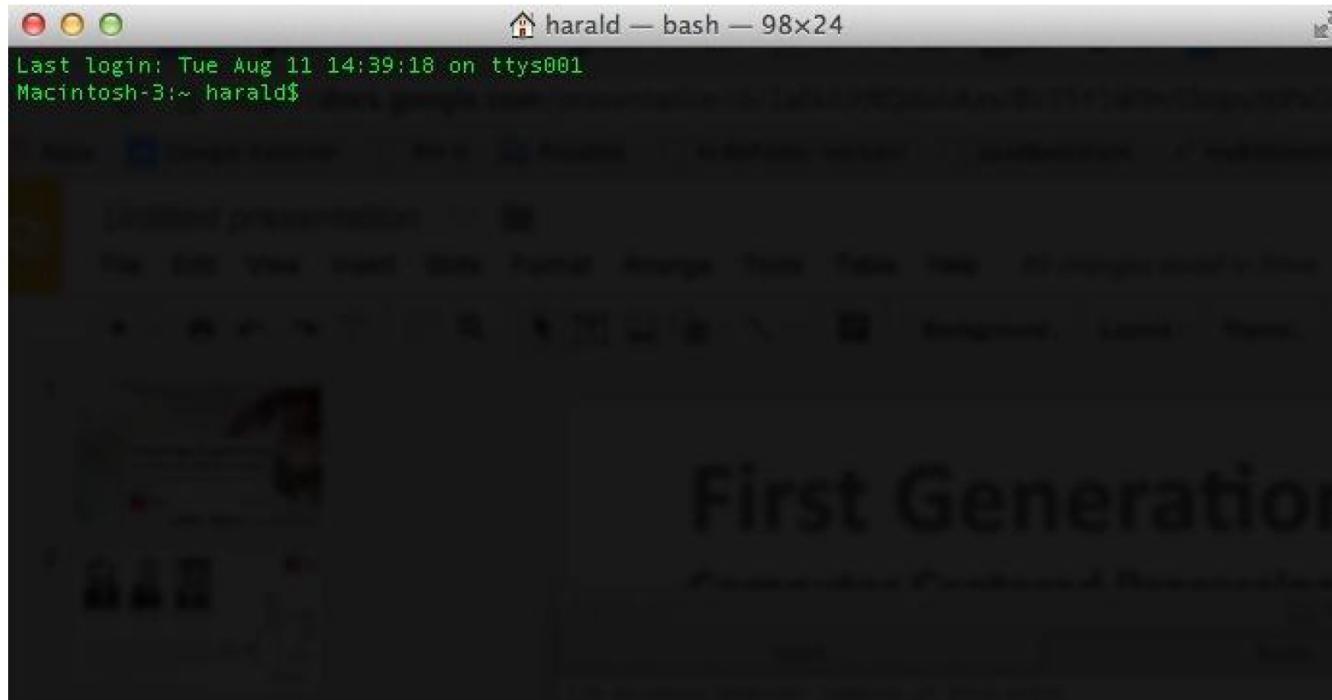
J.C.R. Licklider, Robert Taylor: ["The Computer as a Communication Device"](#).
Science and Technology 76, pp. 21-31 April 1968.



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

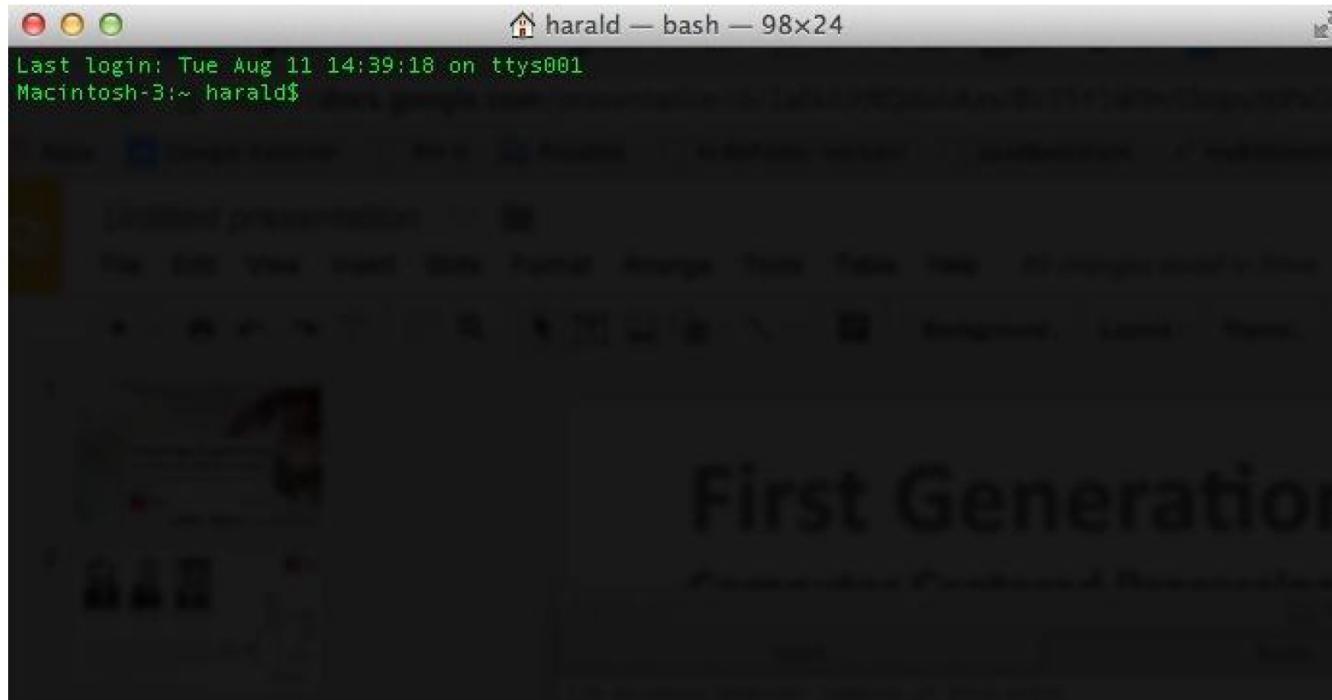
Problems

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

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Third Generation: The Web of Data

Data Centered Processing

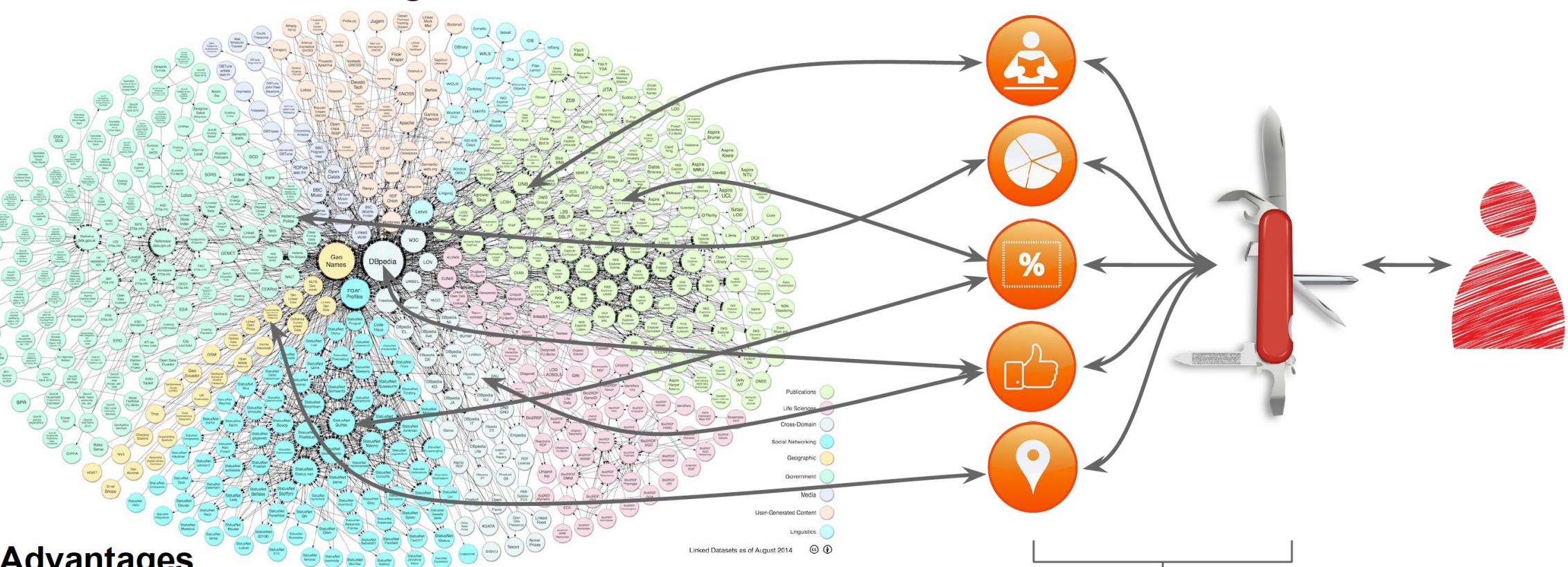
- The **Web of Data** is an upgrade of the Web of Documents
- It's the Web as a huge decentralised database (knowledge base) of **machine-accessible data**

„The web of **human-readable document** is being merged with a web of **machine understandable data**. The potential of the mixture of humans and machines working together and communication through the web could be immense.“

Third Generation: The Web of Data

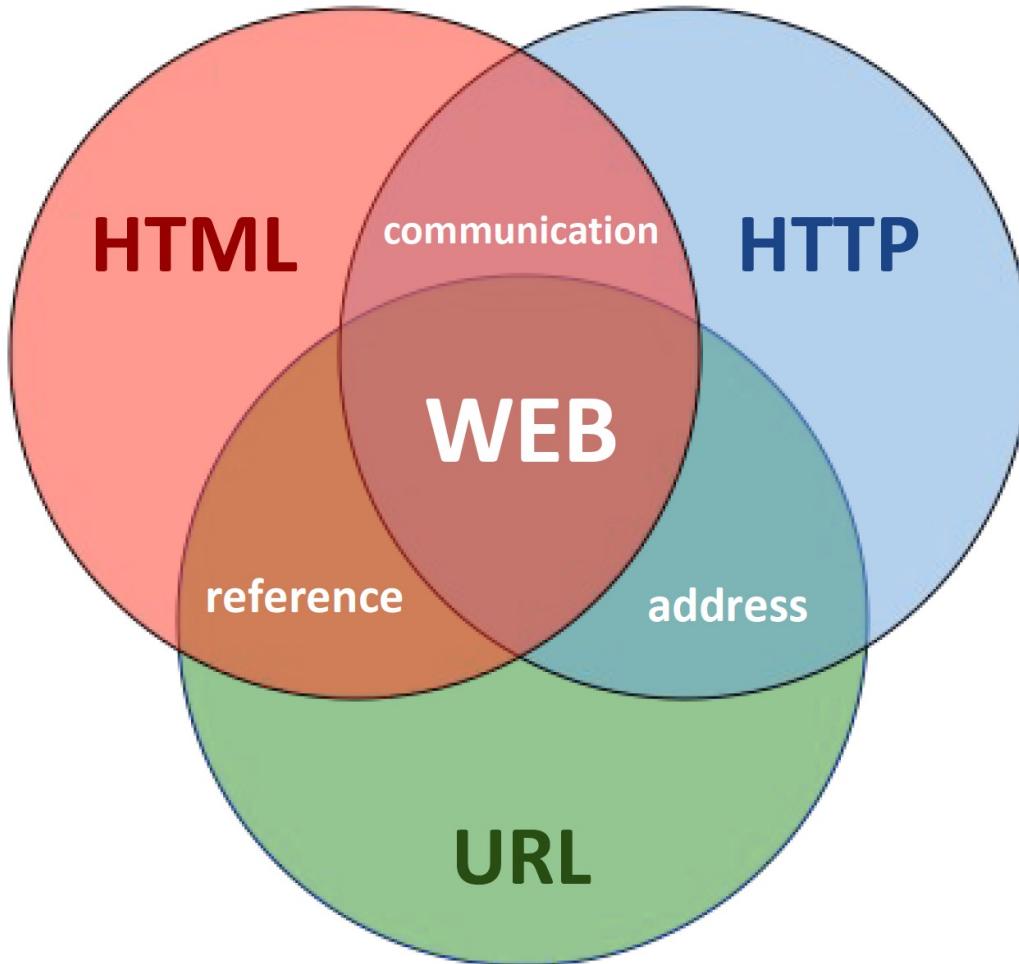
Data Centered Processing

- How does the user get the information?



Information
aggregation & filtering

The Architecture of the Web

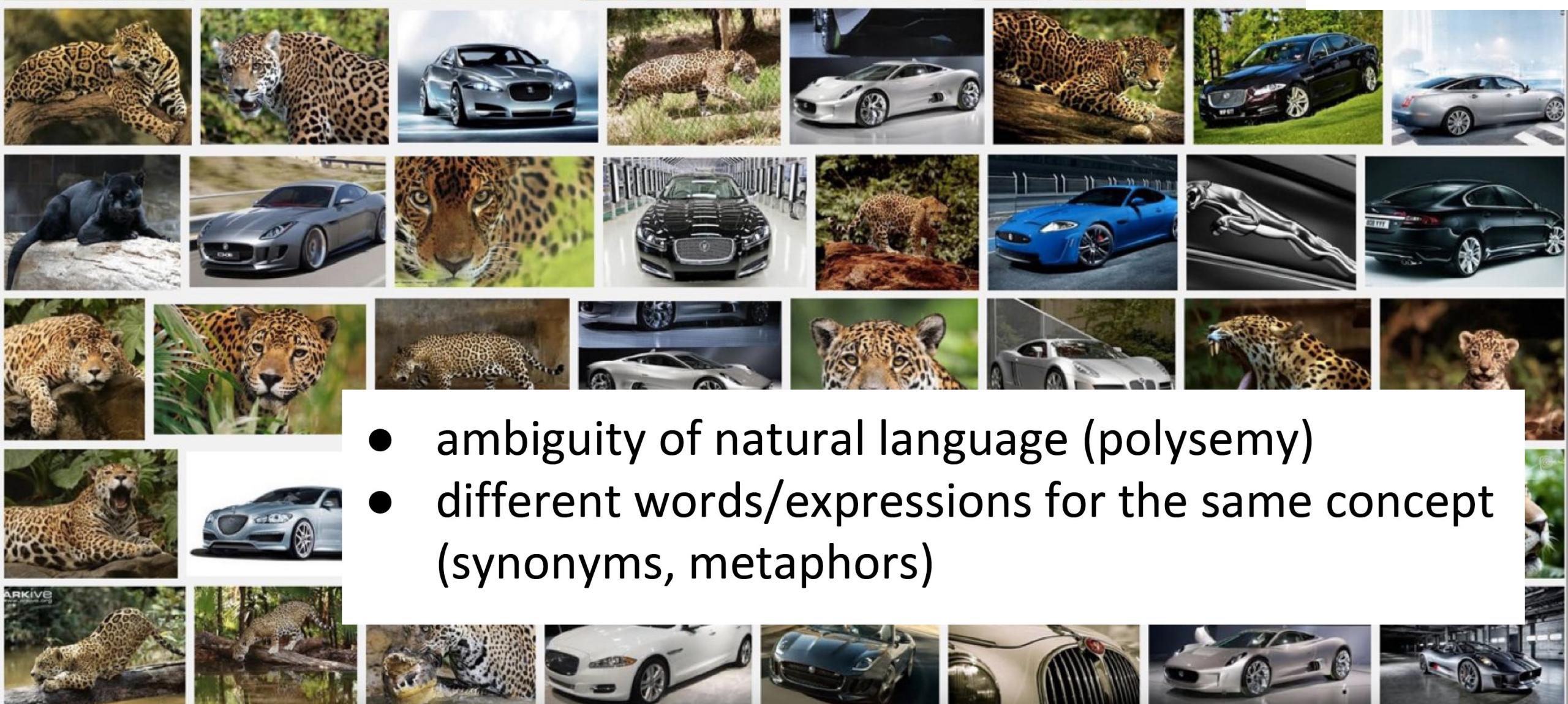


1. Identification (URI) & address (**URL**)
e.g. `http://hpi.de`
2. Communication / protocol (**HTTP**)
`GET /index HTTP/2`
`Host: hpi.de`
3. Representation language (**HTML**)
Tabea works at
`HPI.`

The (Document) Web is for Humans

- 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

The Information Retrieval Dilemma



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

JEII



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



A close-up, slightly blurred image of a computer screen displaying a URL starting with "http://www...". The text is in a dark blue font against a light blue background, with a white rectangular highlight around the "http://" part.

In the (traditional) Web there is no explicit semantics