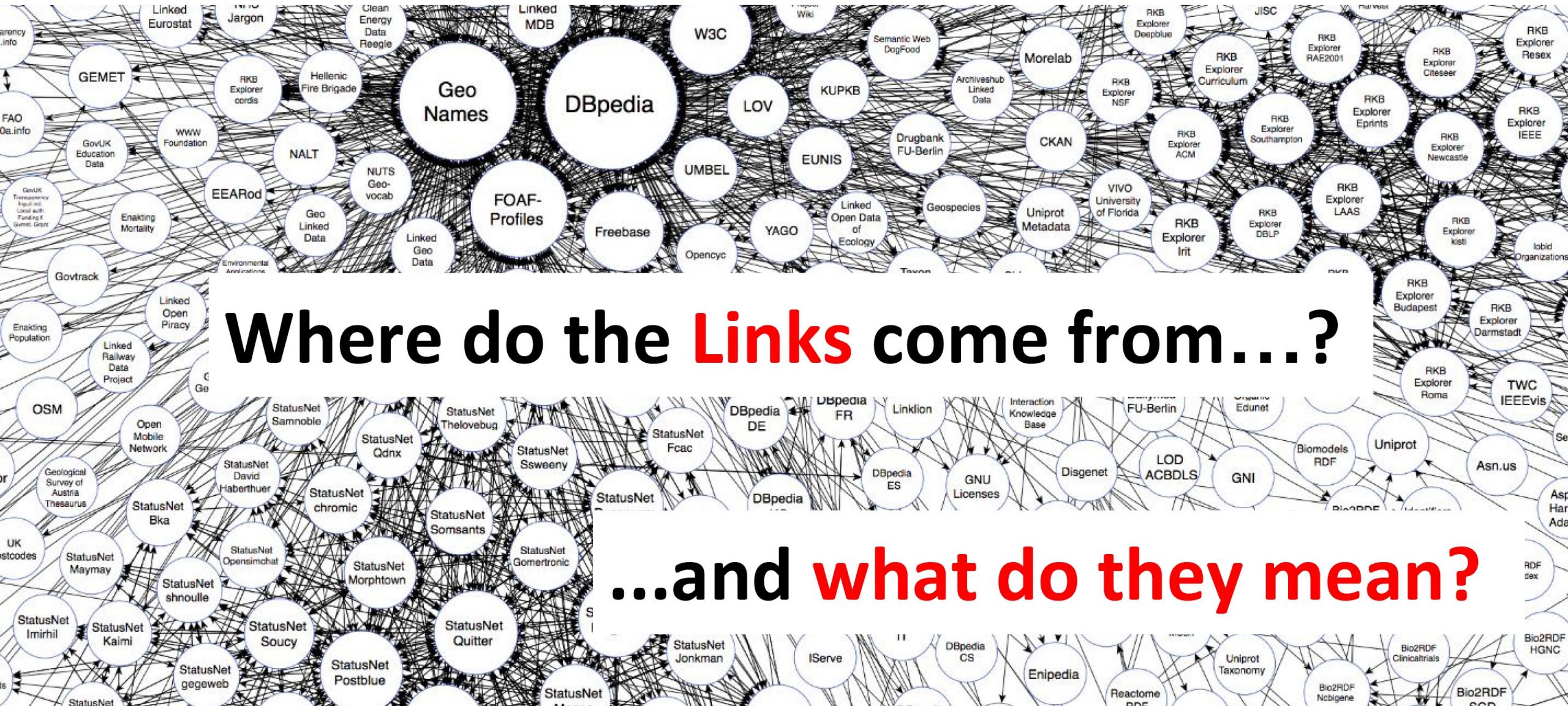


Linked Data and the Web of Data



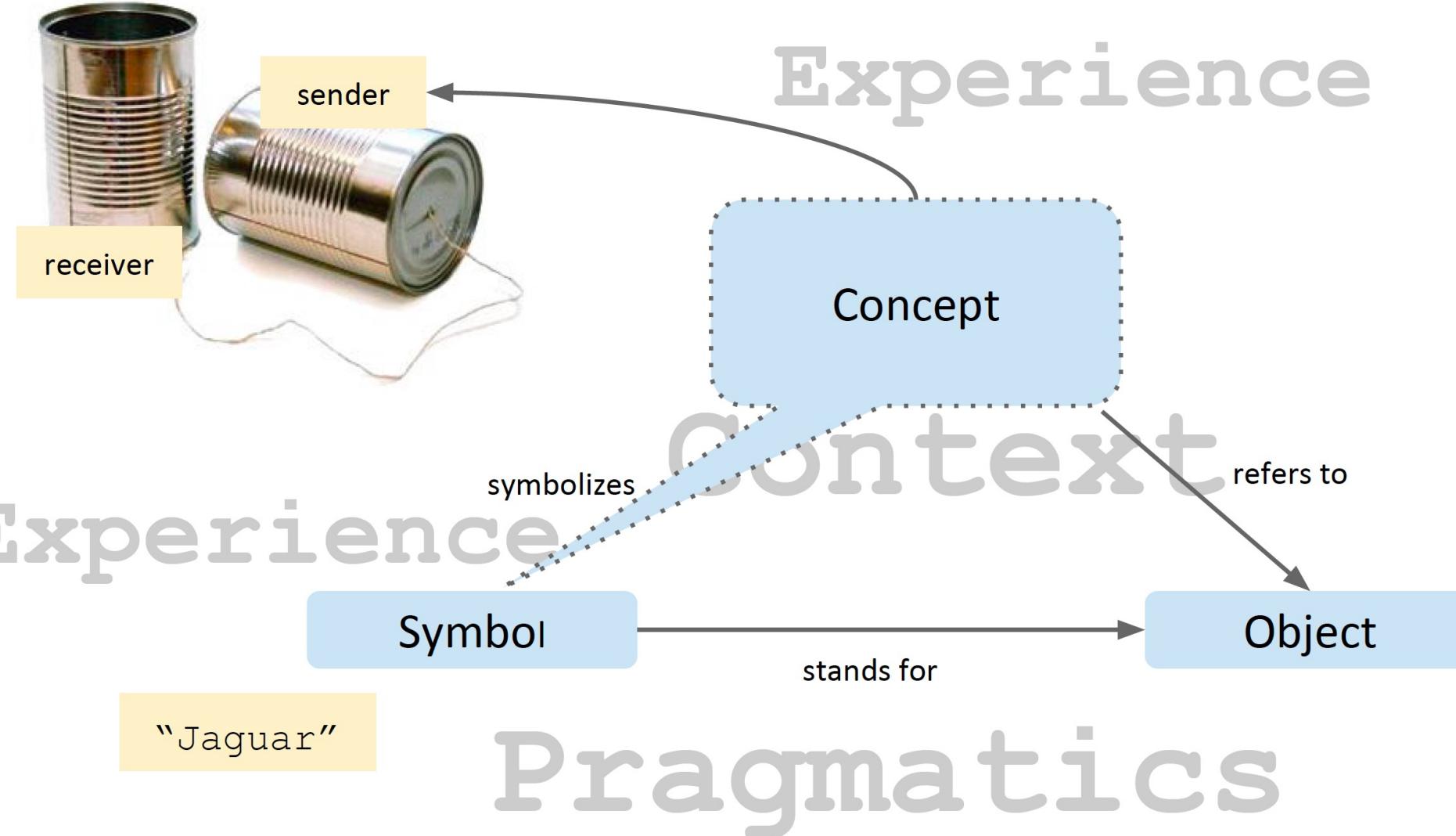
Meaning and Comprehension

- **Understanding** is the ability to grasp the meaning of information.
- Information is conveyed in a **message** using a **specific language**.
- Information is understood by the receiver of a message, if the receiver **interprets** the information **correctly**.

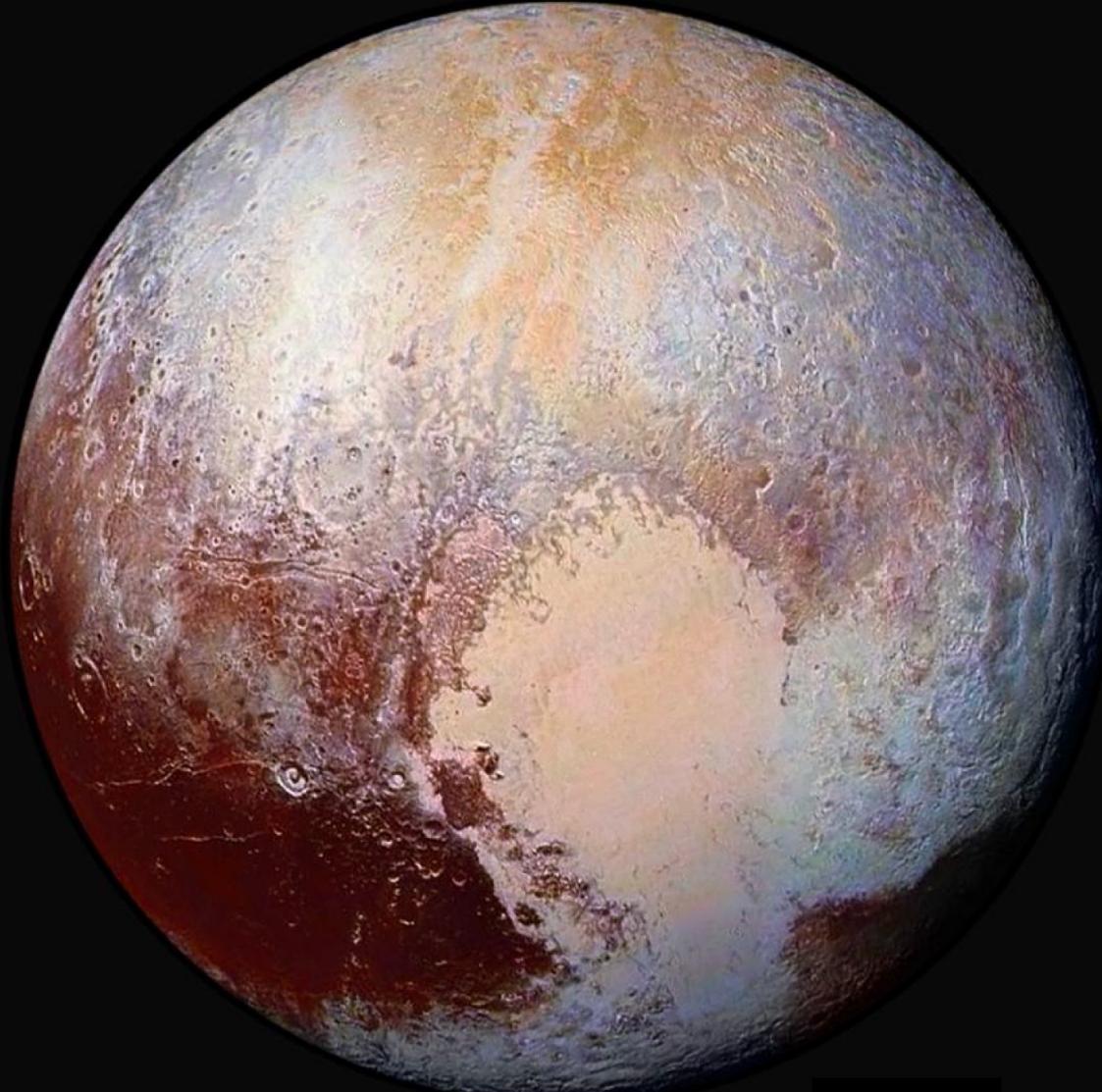
Successful Communication

- For **successful communication**,
 - information has to be correctly transmitted (**Syntax**)
 - the meaning (**Semantics**) of the transmitted information must be interpreted correctly (= **understanding**)
- **Understanding** depends on
 - the **context** of both sender and receiver and
 - the **pragmatics** of the sender
- **Context** of sender and receiver depend on
 - the **experience** (knowledge of the world) of both sender and receiver

Communication of Meaning



Understanding Data on the Web



PLUTO
Never Forget!
(1930–2006)

Understanding Data on the Web



Disambiguation

- solution of linguistic ambiguities

Text: "Pluto"



Pluto

Entity Mapping
Disambiguation

a Disney cartoon character

Pluto

a Roman god

Pluto

a song by Björk

HMS Pluto

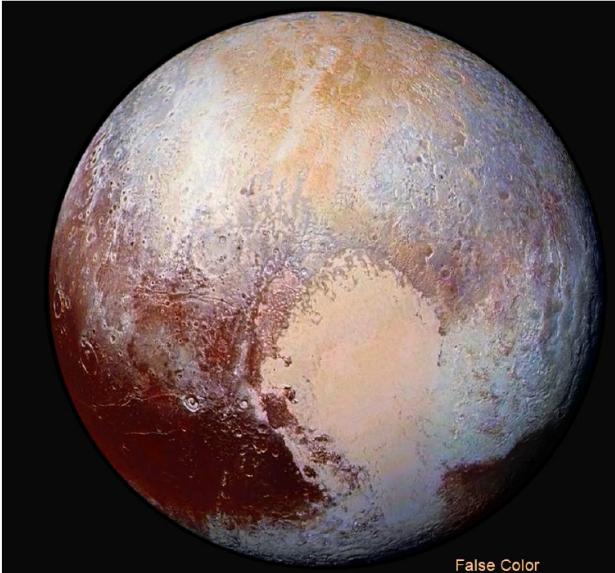
a ship

...

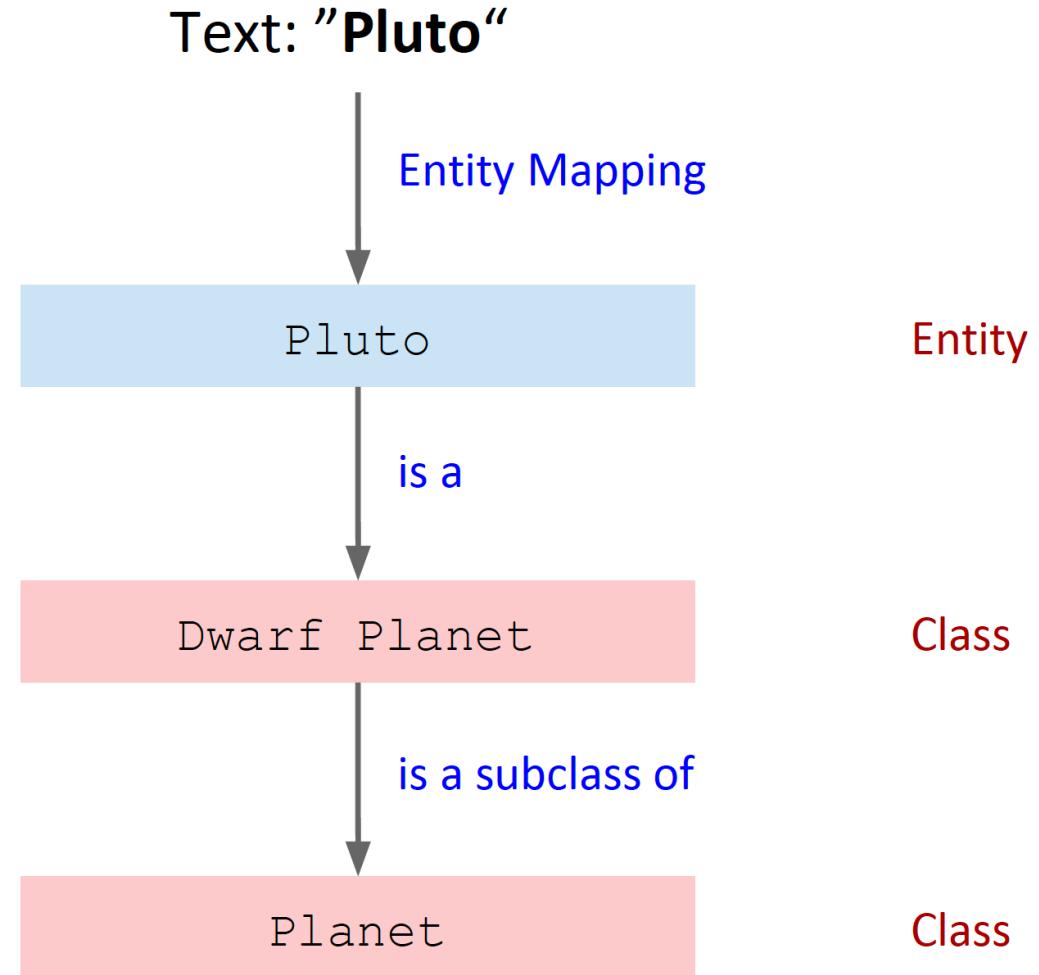
Pluto

a dwarf planet

Understanding Content on the Web



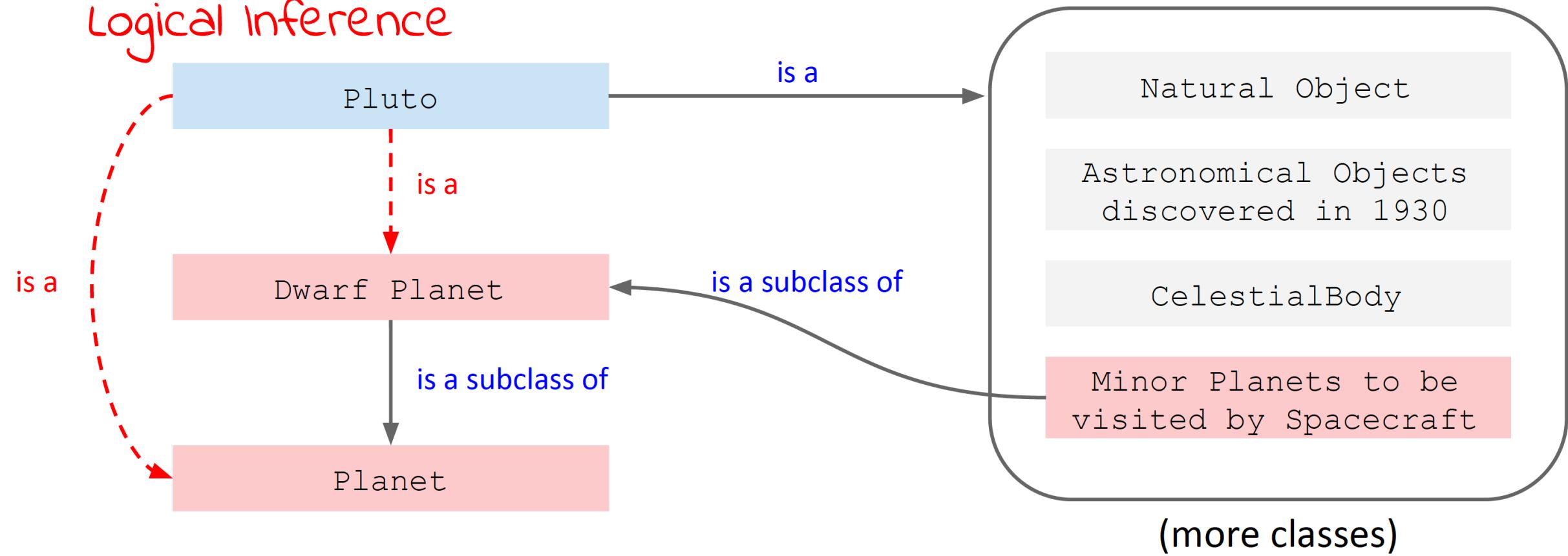
- The **Meaning (Semantics)** of entities and classes must be defined explicitly.



Understanding Content on the Web

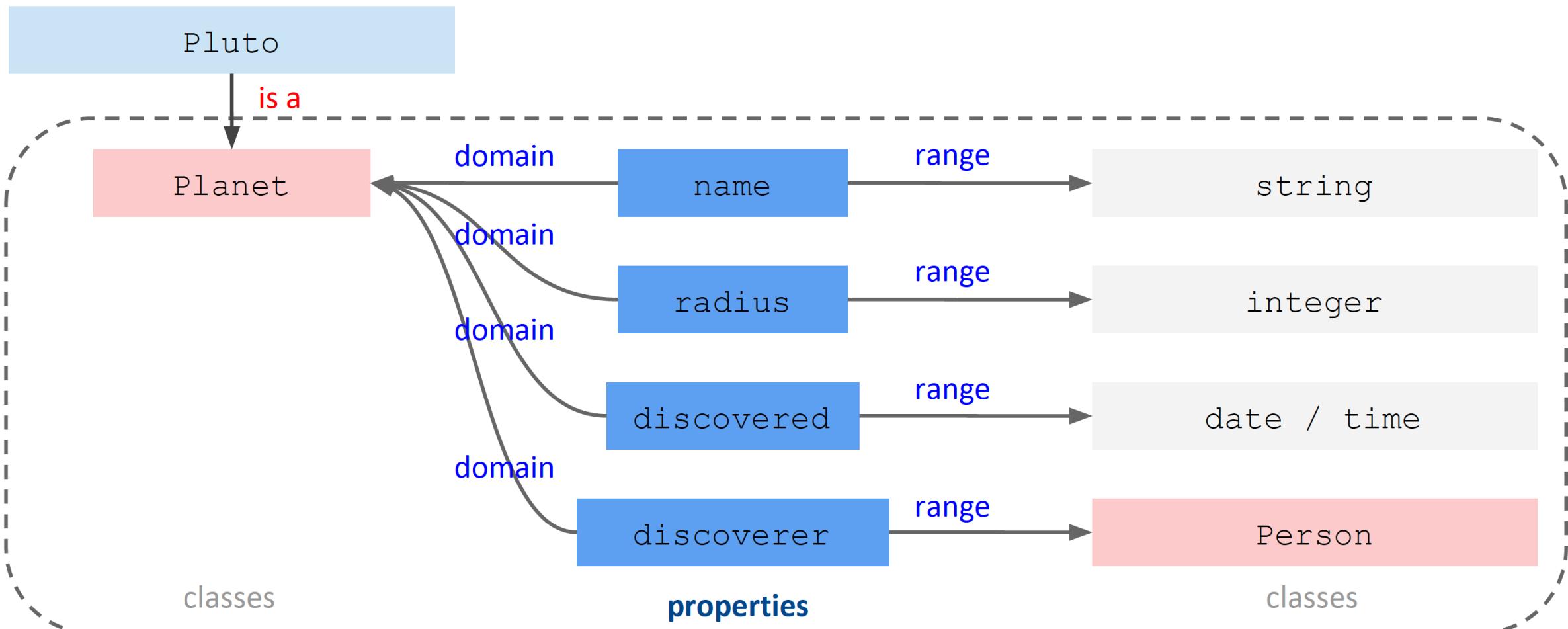
- The Meaning (Semantics) is expressed with the help of knowledge representations (Ontologies)

Logical Inference



Understanding Content on the Web

- The Meaning (Semantics) is expressed with the help of knowledge representations (Ontologies)



The Semantic Web - A Web of Data

- The meaning of information (Semantics) is made explicit by **formal (structured) and standardized knowledge representations (Ontologies)**.
- Thus it will be possible,
 - to process the meaning of information automatically
 - to relate and integrate heterogeneous data
 - to deduce implicit (not evident) information from existing (evident) information in an automated way
- The Semantic Web is kind of a **global database** that contains a **universal network of semantic propositions**.

The Semantic Web - A Web of Data



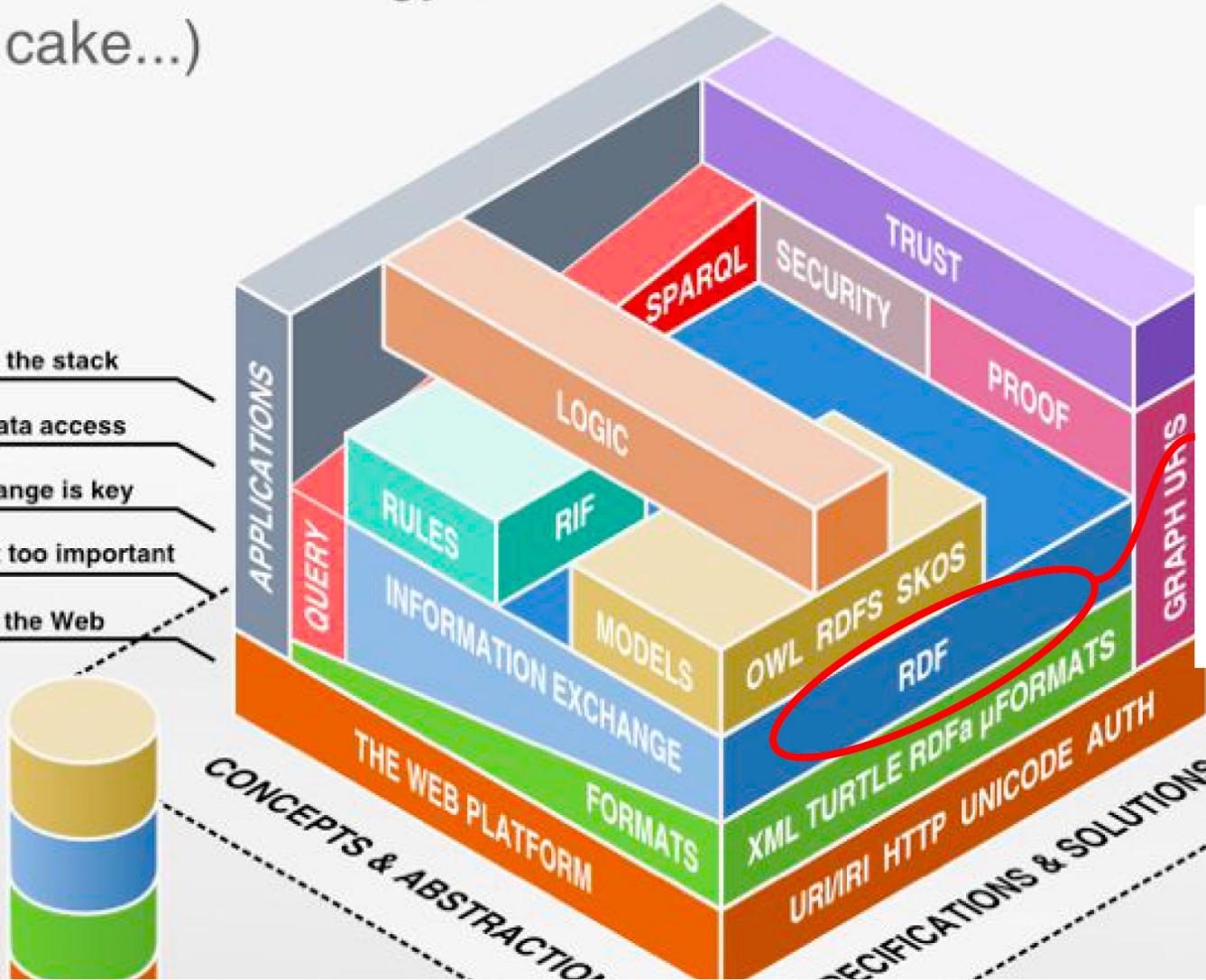
„The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation“

Tim Berners-Lee, James Hendler, Ora Lassila: [The Semantic Web](#), Scientific American, 284(5), pp. 34-43(2001)

- The meaning of information (Semantics) is made explicit by **formal (structured) and standardized knowledge representations (Ontologies)**.

The Semantic Web Technology Stack (not a piece of cake...)

- Most apps use only a subset of the stack
- Querying allows fine-grained data access
- Standardized information exchange is key
- Formats are necessary, but not too important
- The Semantic Web is based on the Web
- Linked Data uses a small selection of technologies



Resource Description Framework (RDF)

Next: 03 - Towards a Universal Data Representation