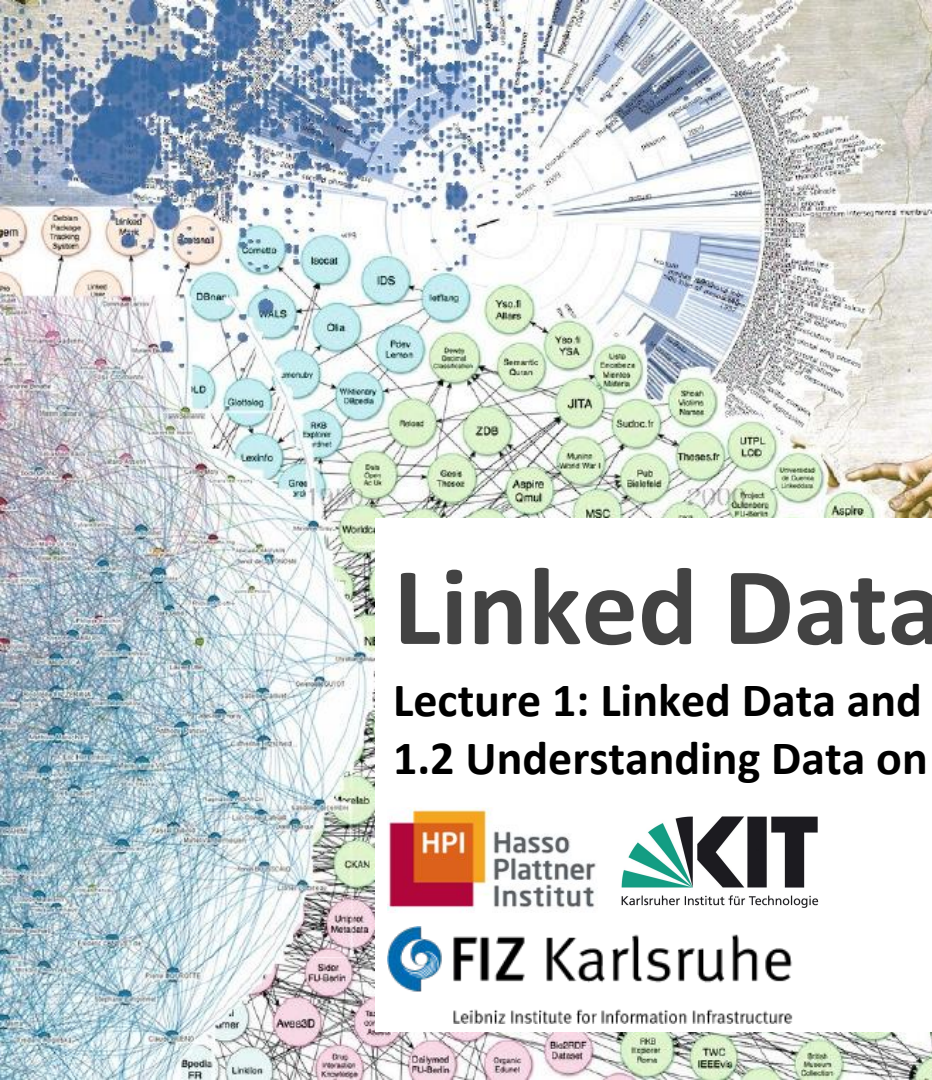




Linked Data Engineering

Lecture 1: Linked Data and the Web of Data

1.2 Understanding Data on the Web



Leibniz Institute for Information Infrastructure

Prof. Dr. Harald Sack
FIZ Karlsruhe

Leibniz Institute for Information Infrastructure
Karlsruhe Institute of Technology

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HPI Hasso Plattner Institut



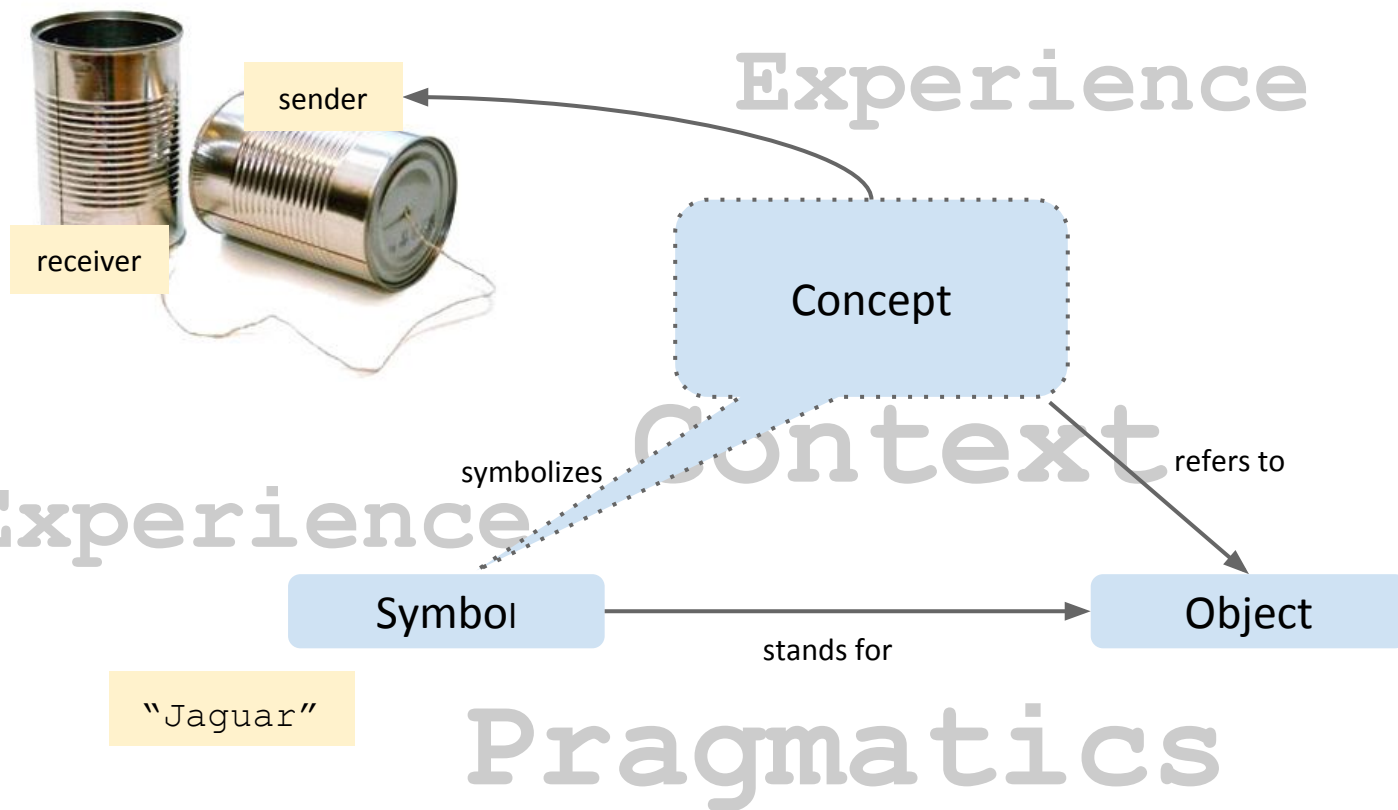
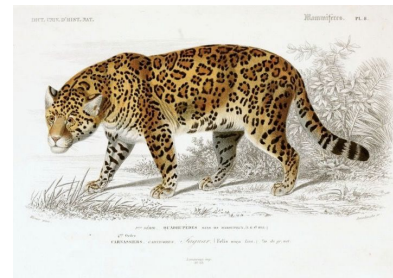
Meaning and Comprehension

- **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



Text: "Pluto"

Entity Mapping
Disambiguation

Pluto

a Disney cartoon character

Pluto

a Roman god

Pluto

a song by Björk

HMS Pluto

a ship

...

Pluto

a dwarf planet

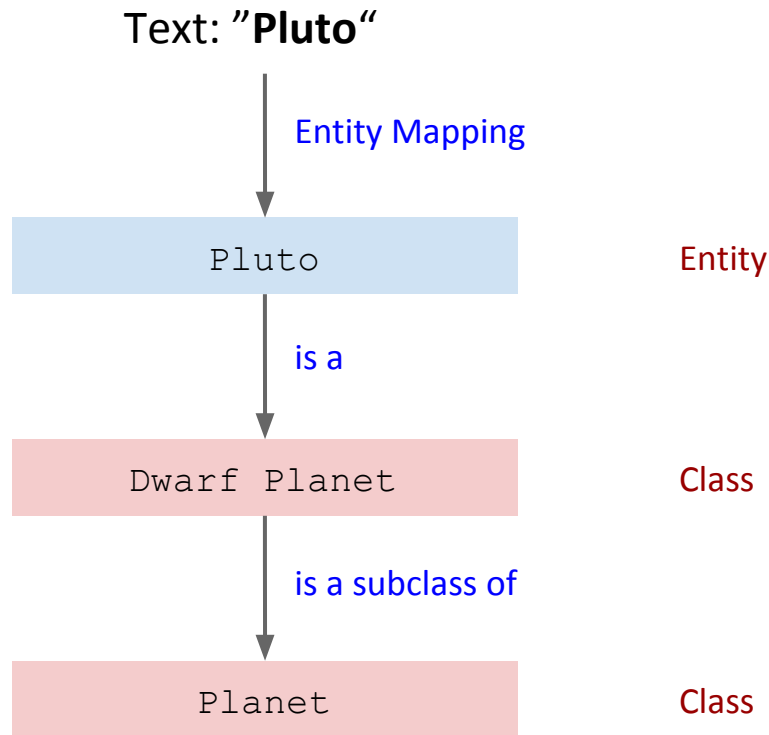
Disambiguation

- solution of linguistic ambiguities

Understanding Content on the Web



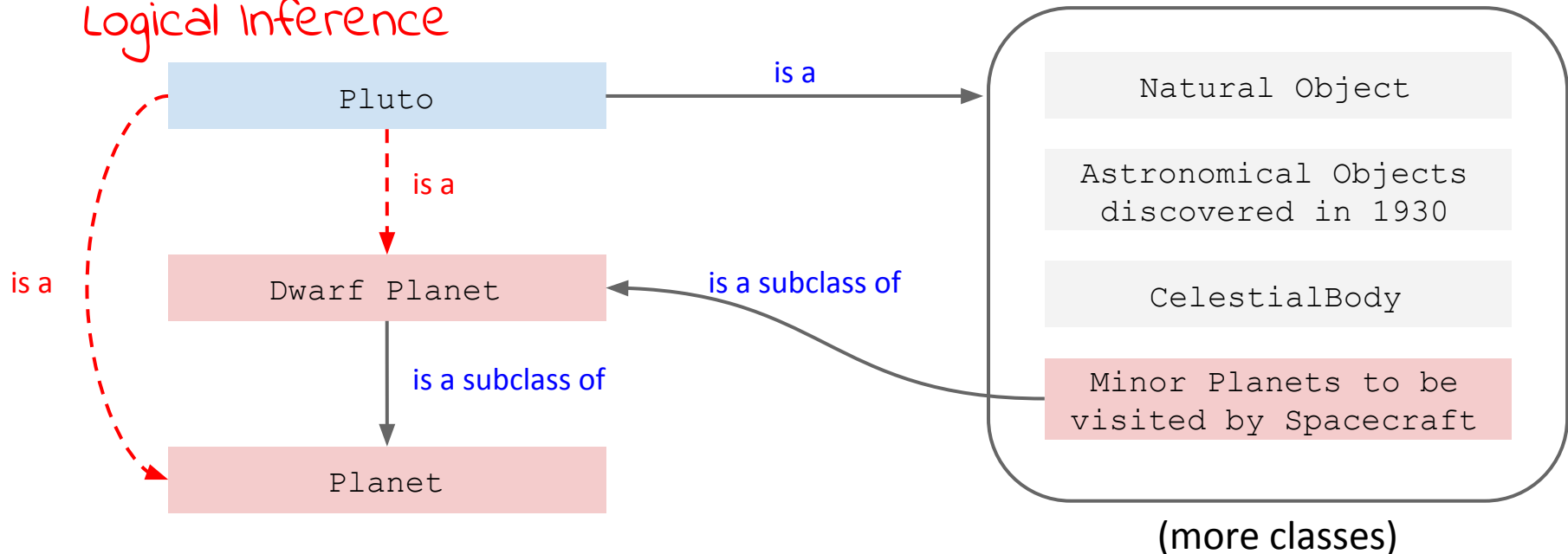
- The **Meaning (Semantics)** of entities and classes must be defined explicitly.



Understanding Content on the Web

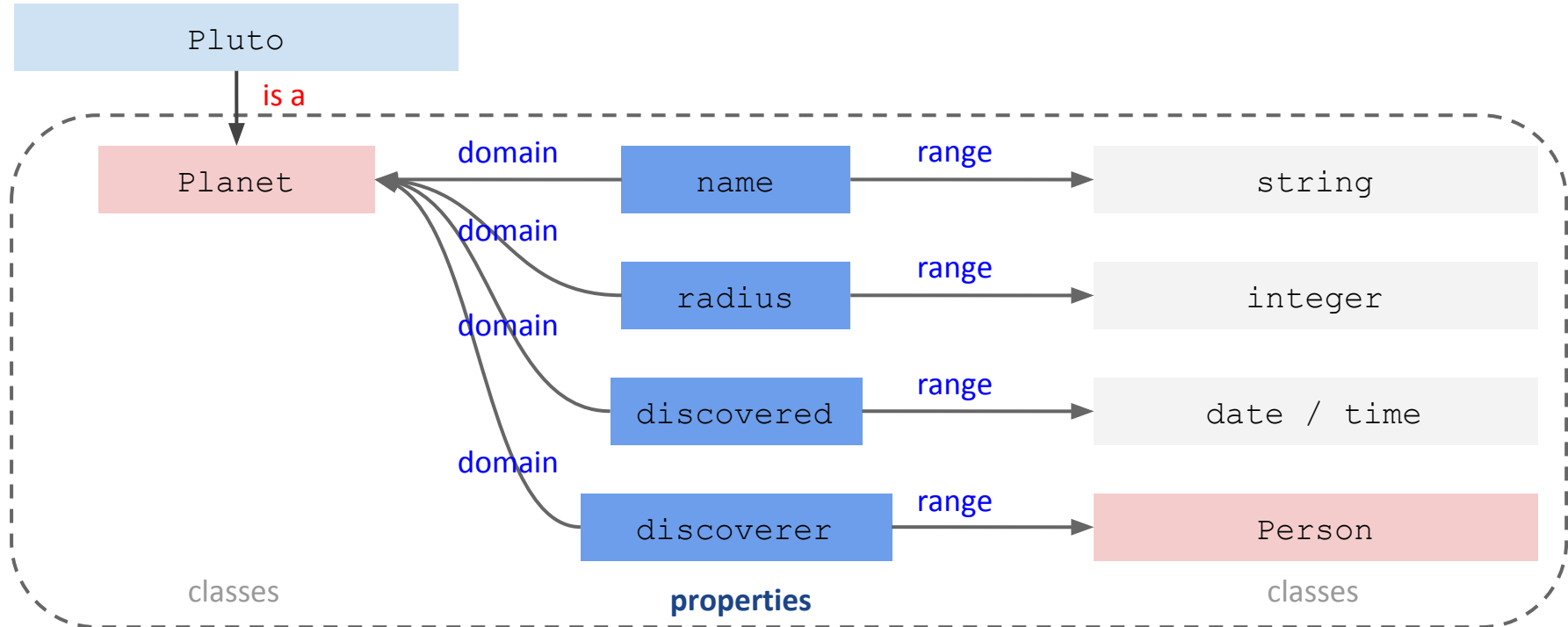
- The Meaning (Semantics) is expressed with the help of knowledge representations (**Ontologies**)

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

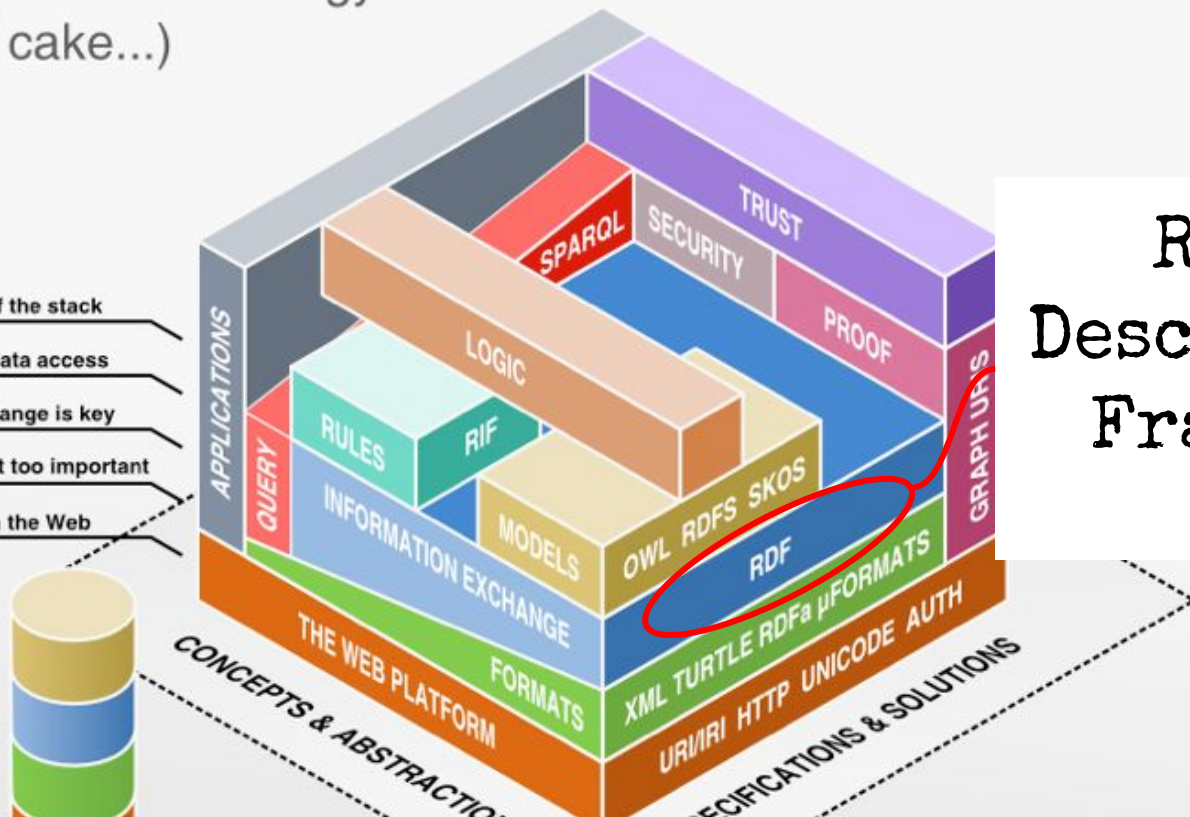
Querying allows fine-grained data access

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

OpenHPI - Course Linked Data Engineering - Lecture 1: Linked Data and the Web of Data