

What are knowledge graphs, and why should you care?



Veronika Heimsbakk & Miriam Næss Jørstad



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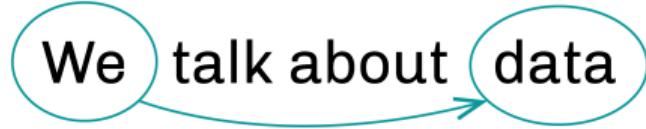
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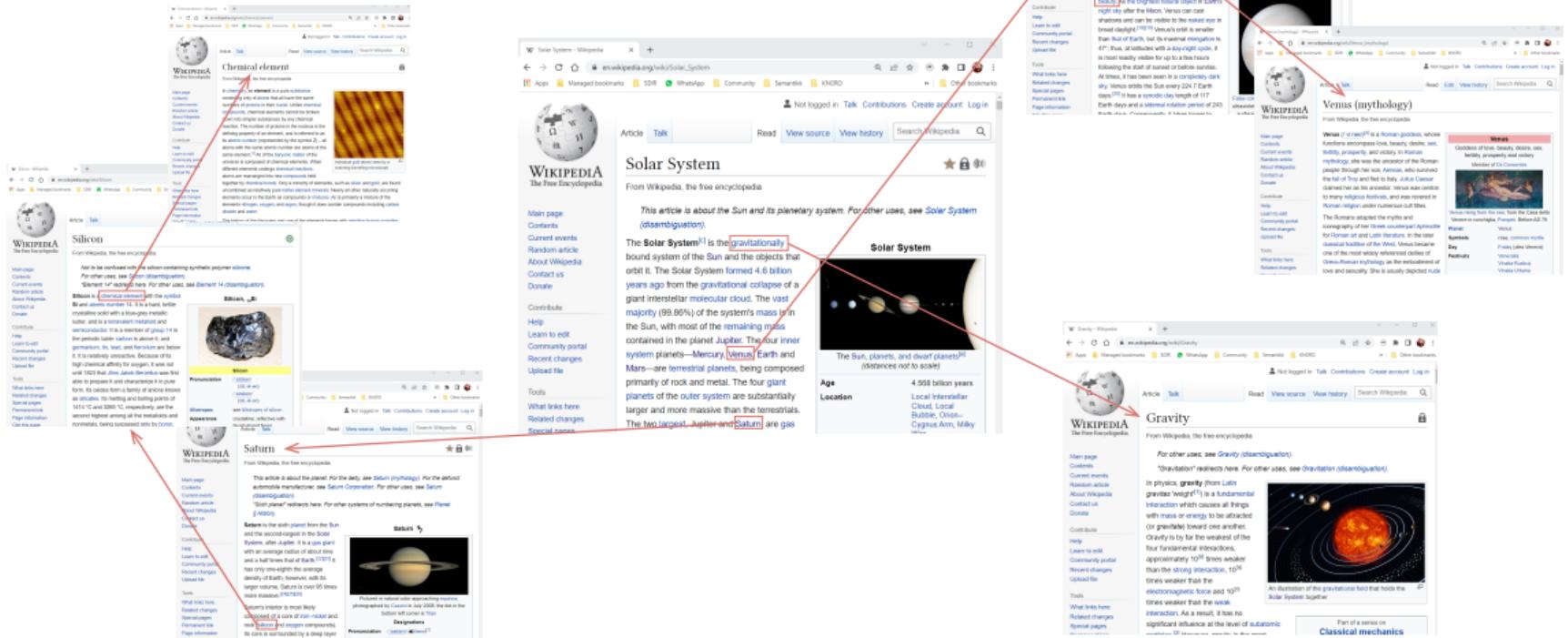
Observations

We think of data

Observations



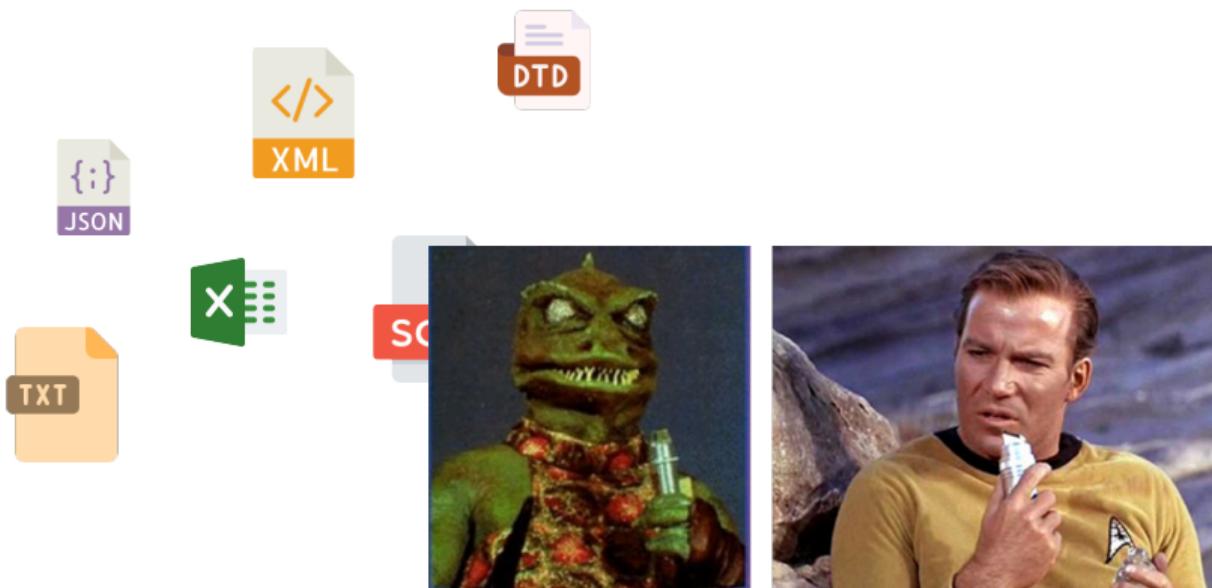
Linked Data



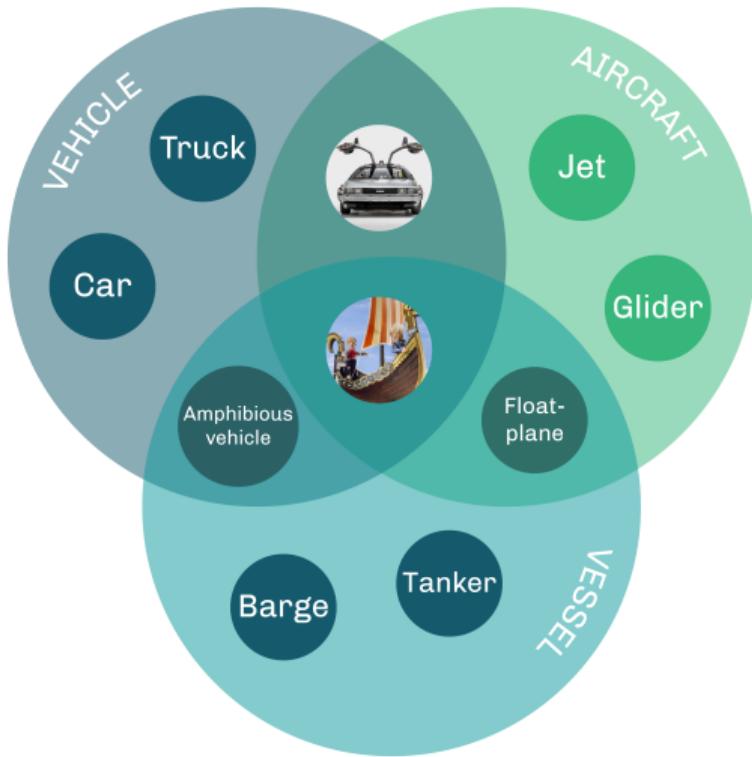
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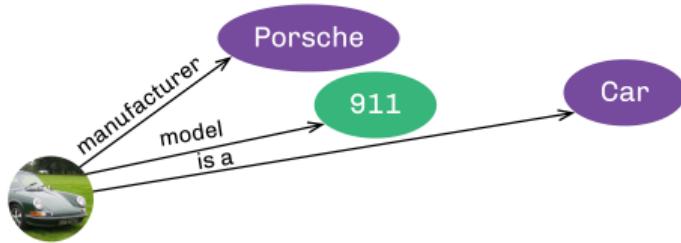
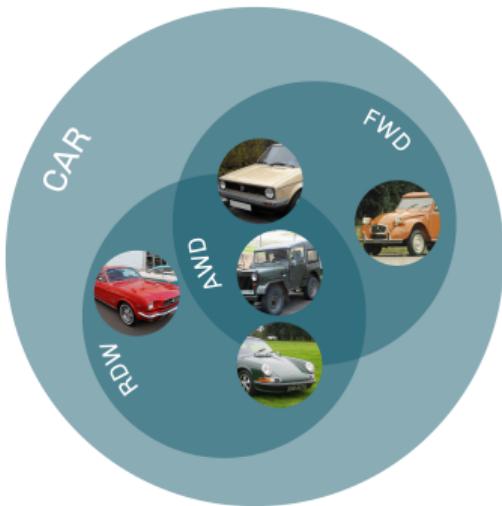
A Unifying Language

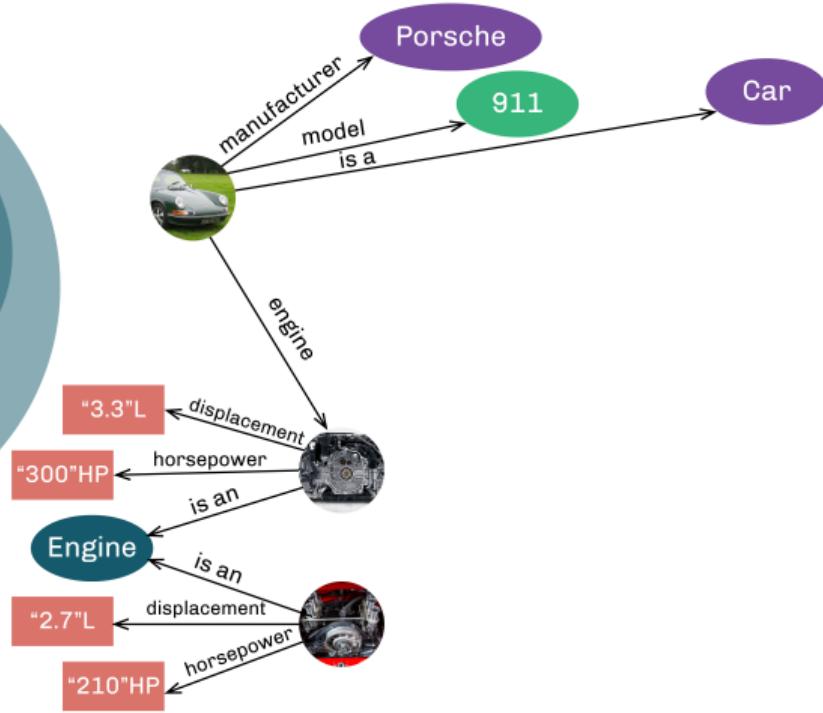
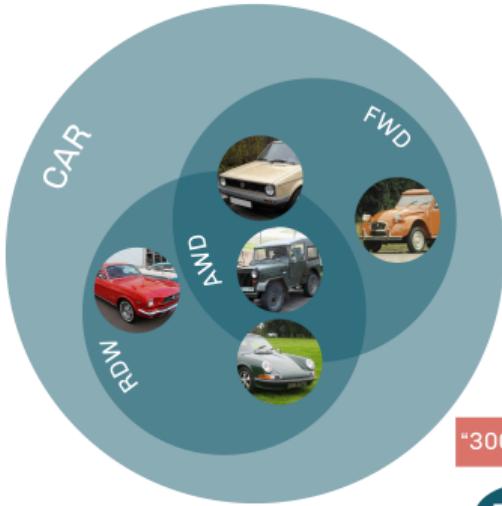


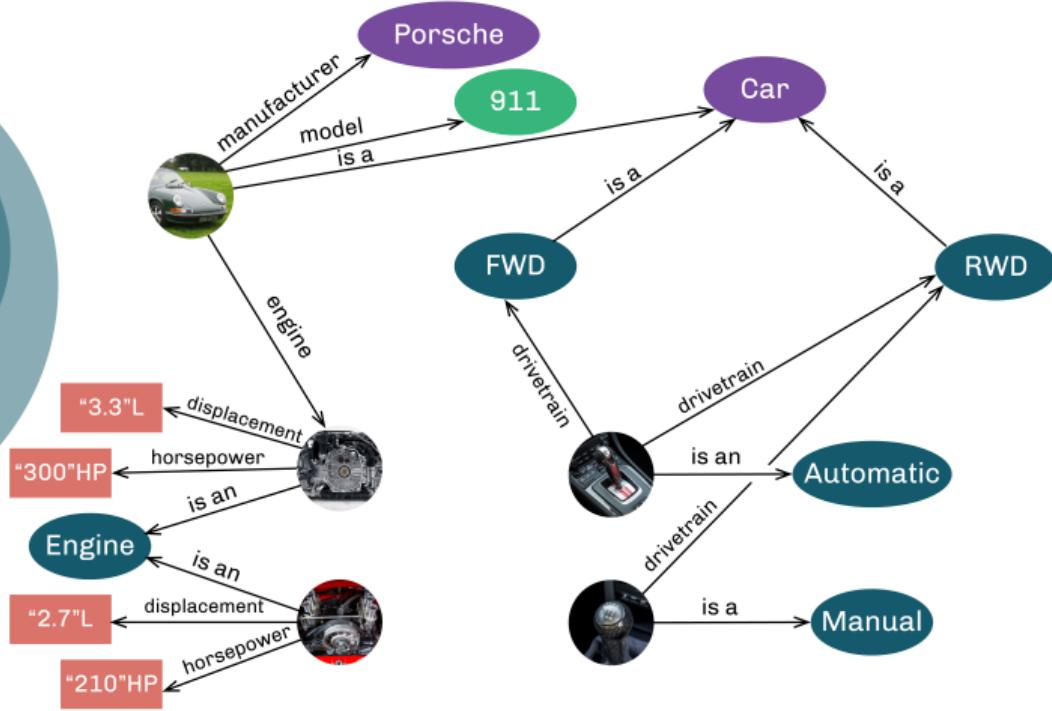
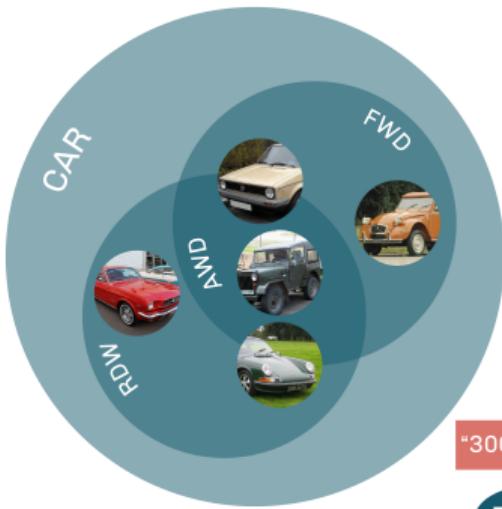
Accessible Semantics

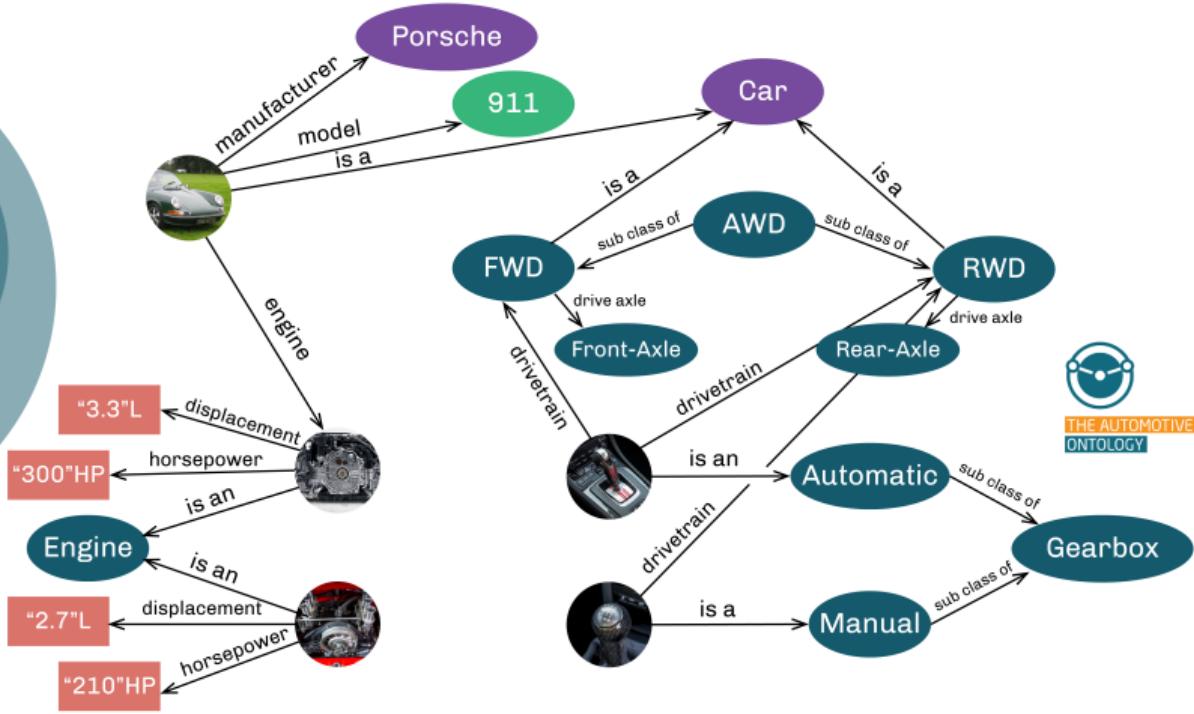
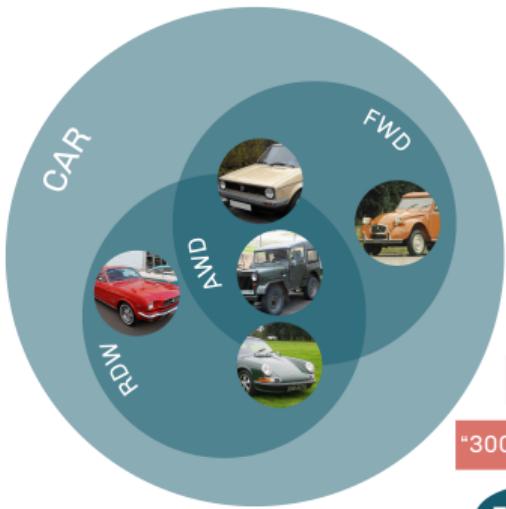


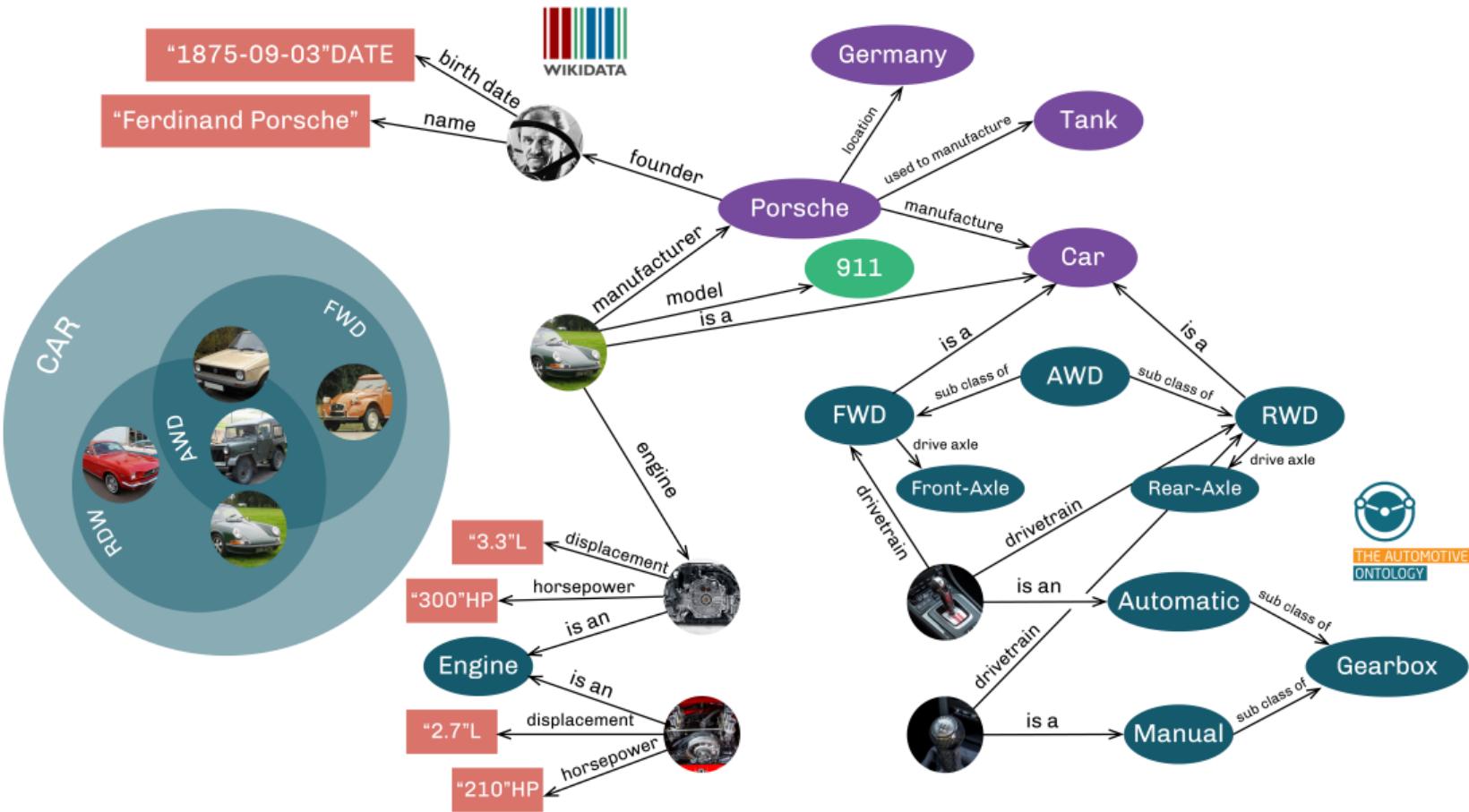
Accessible Semantics

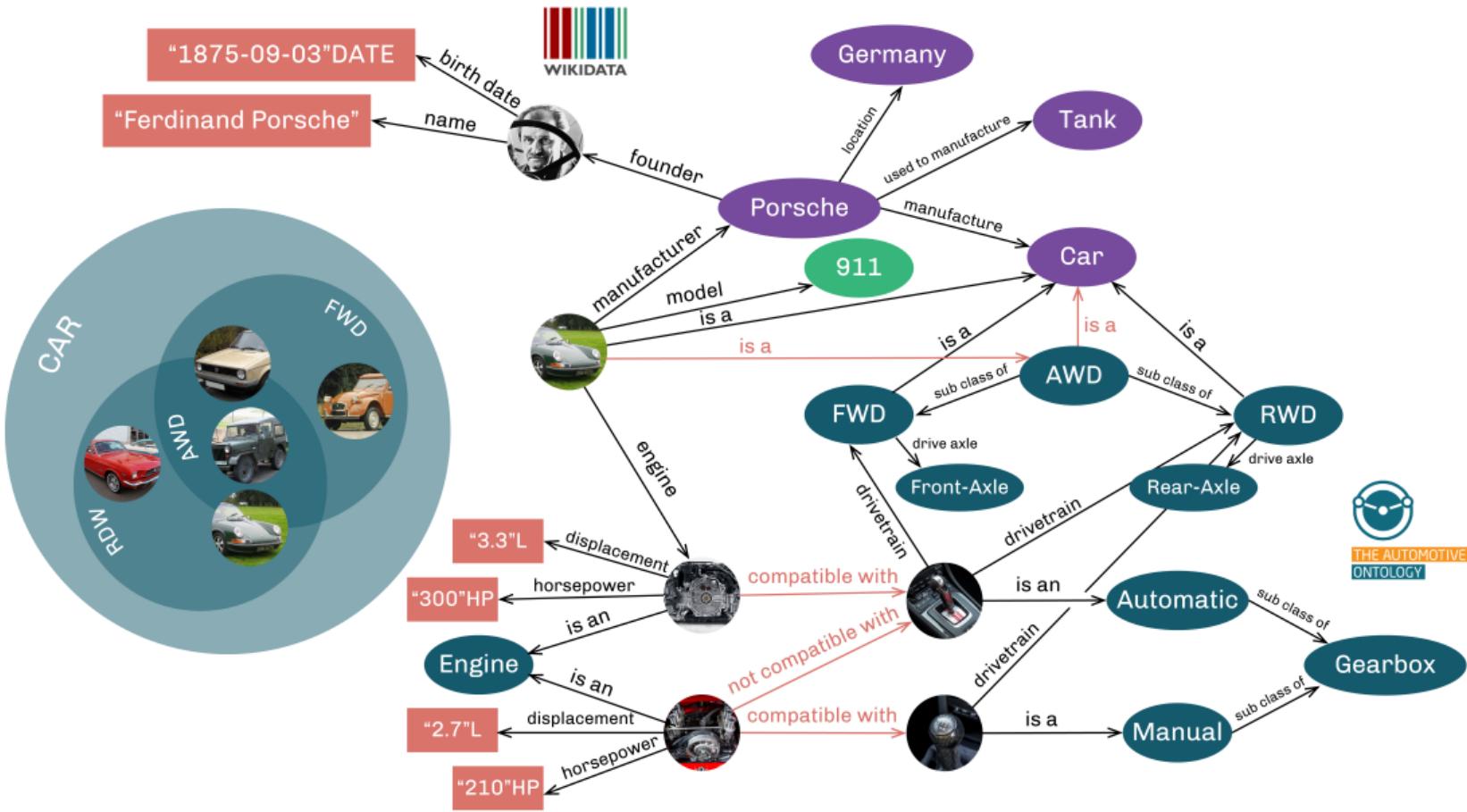








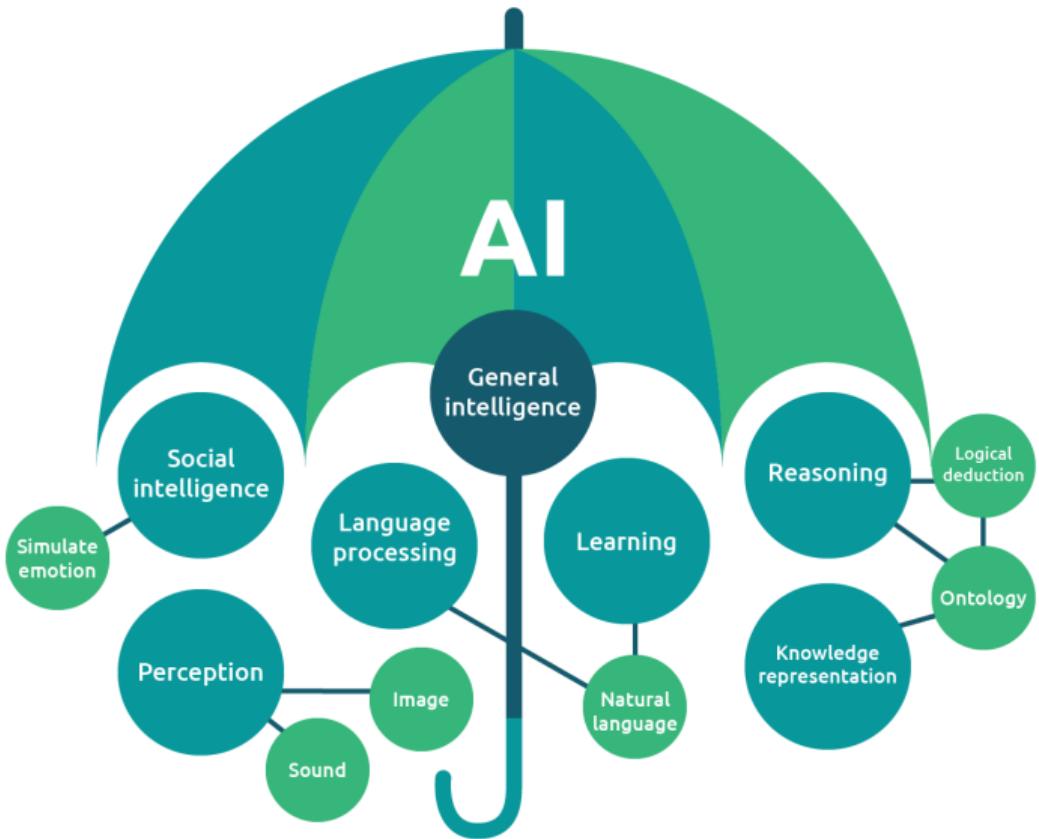




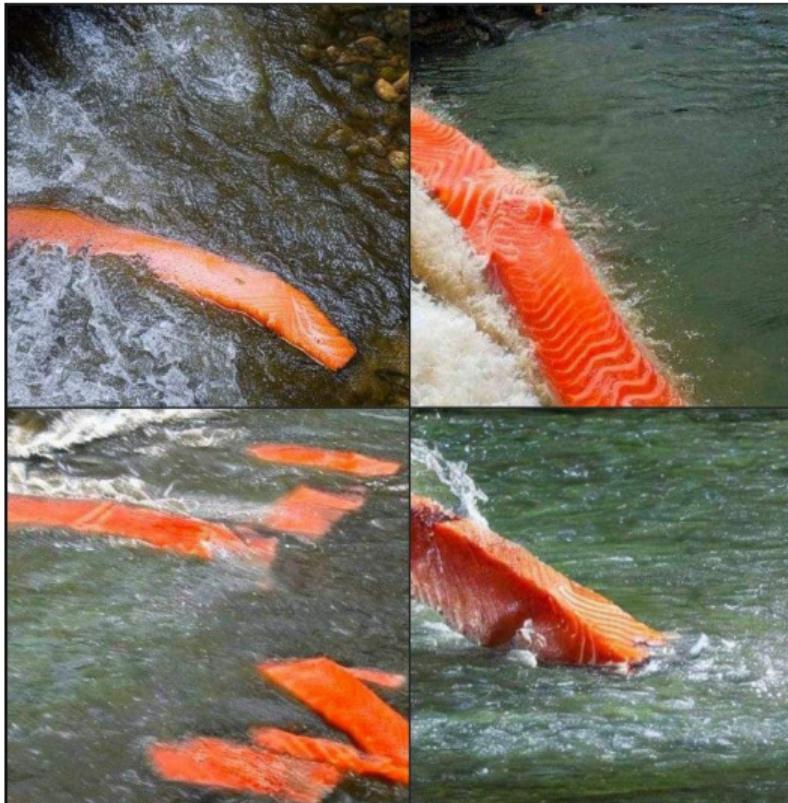
A Unifying Logical Language

- > We need to talk about data, and the *meaning* of data.
- > To think about data in graph is intuitive and natural.
- > We move logic from the application layer to the data layer.
- > Accessible semantics + graph-based representation.

We need to move from *data* to *knowledge* in a way **both** humans and machines can interpret.



Importance of Knowledge



Predictive models are bound to the information they're trained on.
They do not reason over facts.

But knowledge graphs do!



In a world with huge amount of content,
knowledge becomes valuable.

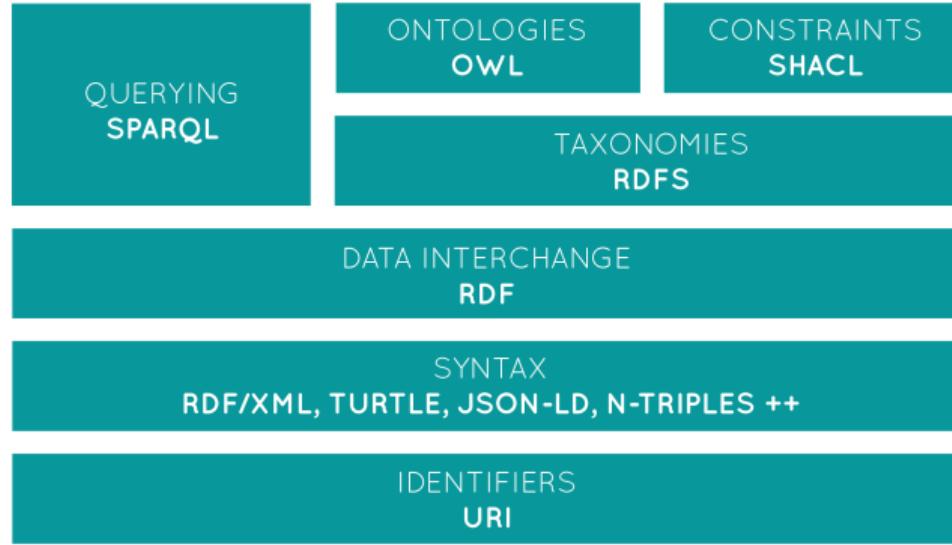
— Denny Vrandečić, Knowledge Graph Conference 2023

⌚ <https://www.youtube.com/watch?v=WqYBx2gB6vA>

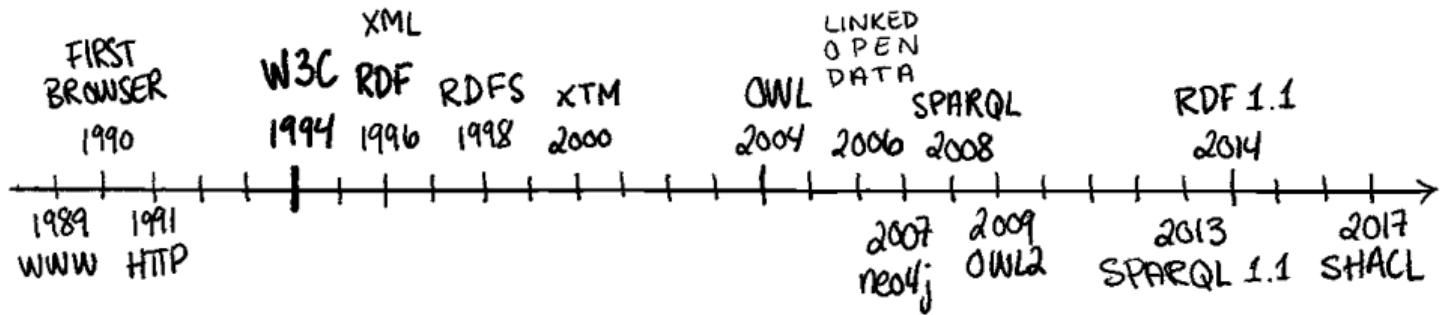
So how the heck do we achieve *knowledge*?



*Explicit specification of a conceptualization.
The study of existence, categories and relations between what is.
Formal names and definitions of entities, properties and relations.*



TIMELINE OF GRAPH ON THE WEB

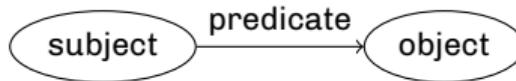


Knowledge Graph

Think about data as a *directed graph*, and that all *things* has a relation to other things.



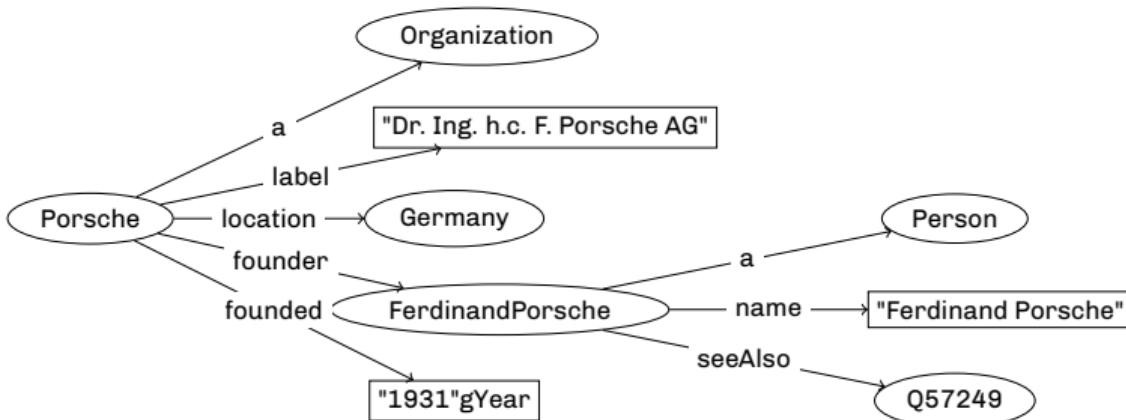
- › Data described as **triples**.
- › A triple is also called a **fact** or a **statement**.
- › The elements of a triple are called **resources**.



- › Use **Uniform Resource Identifiers** (URI) as global unique identifiers for resources.

```
<http://example.org/Porsche>
  <http://example.org/location> <http://example.org/Germany> .
```

```
@prefix ex: <http://example.org/> .  
  
ex:Porsche ex:location ex:Germany ;  
    ex:founder ex:FerdinandPorsche ;  
    ex:founded "1931"^^xsd:gYear .
```

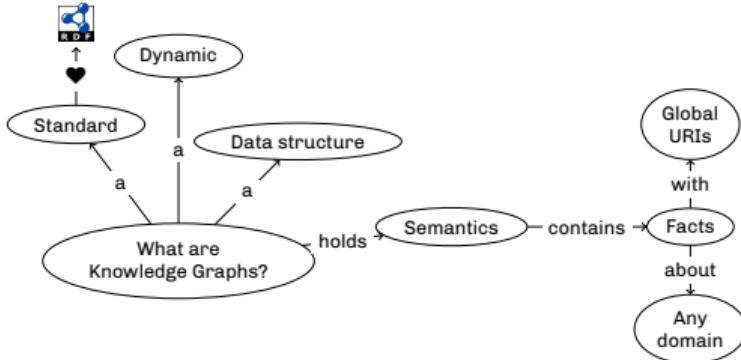


```

ex:Porsche rdf:type foaf:Organization ;
            rdfs:label "Dr. Ing. h.c. F. Porsche AG" ;
            ex:location ex:Germany ;
            ex:founder ex:FerdinandPorsche ;
            ex:founded "1931"^^xsd:gYear .
  
```

```

ex:FerdinandPorsche rdf:type foaf:Person ;
                      foaf:name "Ferdinand Porsche" ;
                      rdfs:seeAlso wd:Q57249 .
  
```



INFER NEW INSIGHT!

NO JOINS!

Knowledge



Break down the silos!



Reduce application code

