

CC7220-1

LA WEB DE DATOS

PRIMAVERA 2022

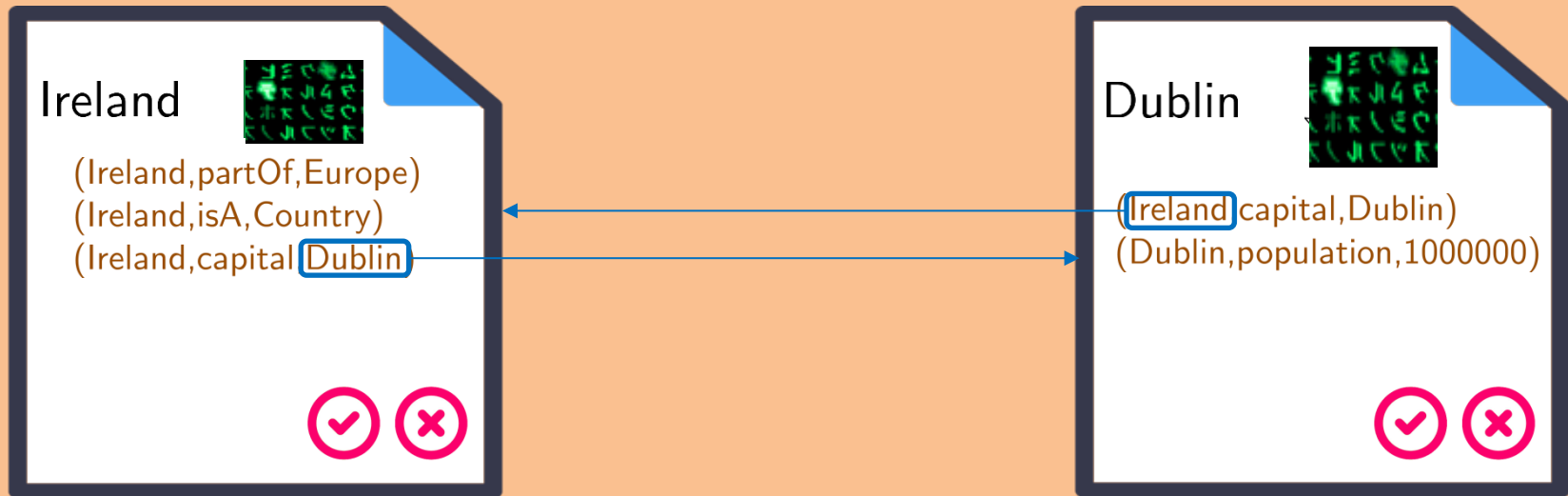
LECTURE 11: CONCLUSION

Aidan Hogan

aidhog@gmail.com

SEMANTIC WEB: DATA, LOGIC, QUERY, LINKS, VALIDATION

DATA:



LOGIC: $(b, \text{capital}, a) \rightarrow (a, \text{partOf}, b)$
 $(a, \text{partOf}, b), (b, \text{partOf}, c) \rightarrow (a, \text{partOf}, c)$

QUERY: $(x, \text{partOf}, y)?$

OUTPUT: $\{(x \mapsto \text{Ireland}, y \mapsto \text{Europe}),$
 $(x \mapsto \text{Dublin}, y \mapsto \text{Ireland}),$
 $(x \mapsto \text{Dublin}, y \mapsto \text{Europe})\}$





TAKING OFF



Main Page

Discussion

Read

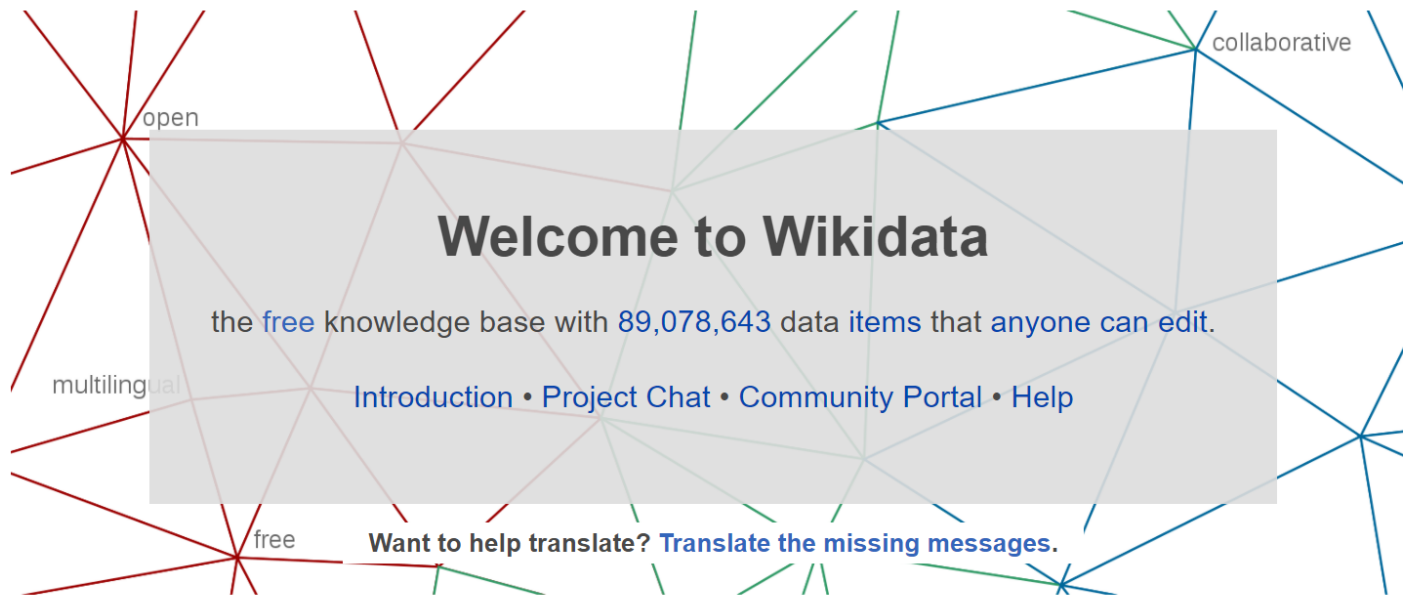
View source

View history

Search Wikidata



- Main page
- Community portal
- Project chat
- Create a new Item
- Create a new Lexeme
- Recent changes
- Random Item
- Query Service
- Nearby
- Help
- Donate
- Tools
- What links here
- Related changes
- Special pages



Welcome to Wikidata

the **free** knowledge base with **89,078,643** data items that anyone can edit.

[Introduction](#) • [Project Chat](#) • [Community Portal](#) • [Help](#)

Want to help translate? [Translate the missing messages.](#)

open

collaborative

multilingual

free

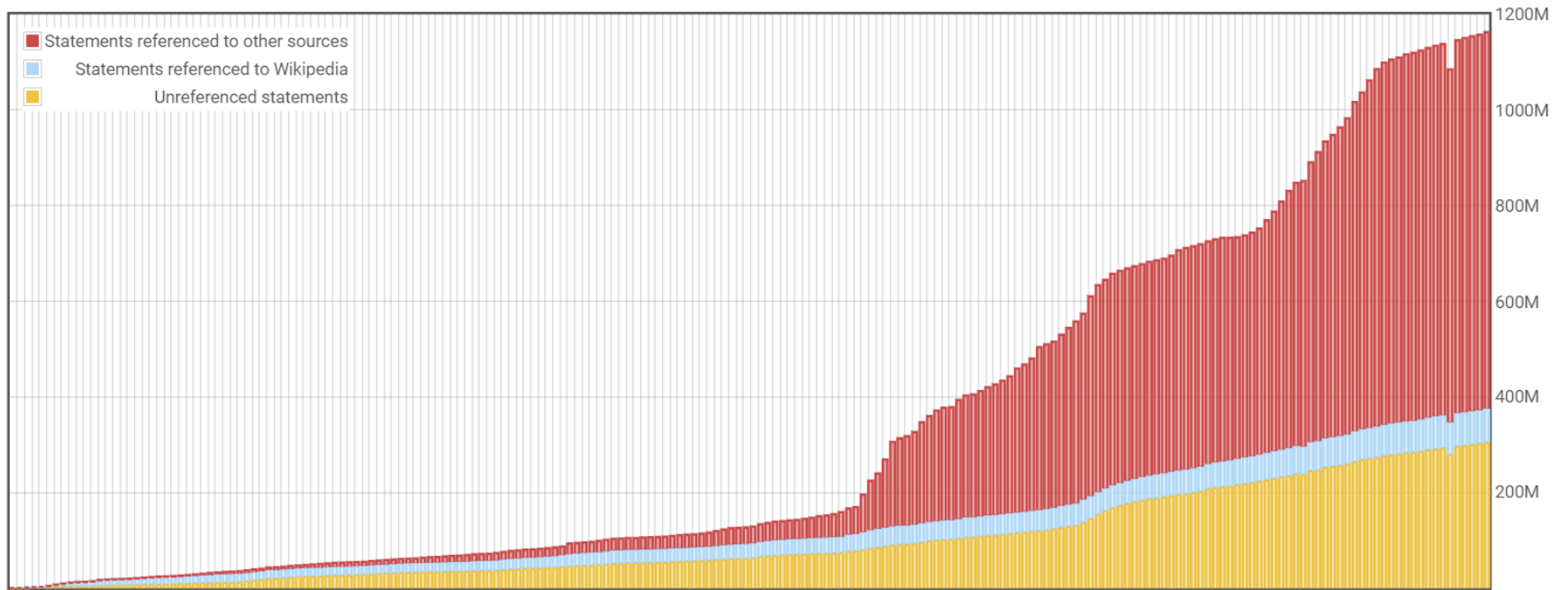


Welcome!



Learn about data

WIKIDATA



GOOGLE'S RICH SNIPPETS ...



The screenshot shows a Google search for "lemon meringue" in a browser window. The search results page displays "About 2,920,000 results (0.35 seconds)". Three rich snippets are visible, each featuring a small image of the pie, a title, a URL, a star rating, and a brief description of the recipe.

Grandma's Lemon Meringue Pie Recipe - Allrecipes.com
allrecipes.com/recipe/15093/grandmas-lemon-meringue-pie/ ▾
★★★★★ Rating: 4.6 - 1,625 reviews - 40 min - 298 cal
This pie is thickened with cornstarch and flour in addition to egg yolks, and contains no milk." ... To Make **Lemon** Filling: In a medium saucepan, whisk together 1 cup sugar, flour, cornstarch, and salt. Stir in water, **lemon** juice and **lemon** zest.

Ultimate lemon meringue pie | BBC Good Food
www.bbcgoodfood.com/recipes/3482/ultimate-lemon-meringue-pie ▾
★★★★★ Rating: 4.6 - 182 votes - 3 hr 15 min - 480 cal
For the pastry, put the flour, butter, icing sugar, egg yolk (save the white for the **meringue**) and 1 tbsp cold water into a food processor. ... While the pastry bakes, prepare the filling: mix the cornflour, sugar and **lemon** zest in a medium saucepan. ... Try some of our other lemony treats ...
Lemon meringue pie · Little lemon meringue pies · Ultimate meringue

Classic Lemon Meringue Pie recipe from Betty Crocker
www.bettycrocker.com/...lemon-meringue.../8f991b88-55b0-4740-b12c... ▾

On the right side of the page, there is a vertical sidebar with a large image of a lemon meringue pie and the text "Lemon meringue pie, usually se a crust usually lemon custard topping. Wikipi ▾".

GOOGLE'S KNOWLEDGE PANEL



The image shows a screenshot of a Google search for "sully prudhomme". The search results on the left include links to Wikipedia (English and Spanish), Biographical, and NNDB. On the right, a Knowledge Panel is displayed for Sully Prudhomme, featuring a grid of portraits, his name, profession (Poet), and a summary of his life and work. The panel also lists his birth and death dates, books, awards, and a section for "People also search for" with portraits of Leconte de Lisle, Theodor Mommsen, Frédéric Mistral, Paul Verlaine, and Gabriel Fauré.

Sully Prudhomme - Wikipedia, the free encyclopedia
https://en.wikipedia.org/wiki/Sully_Prudhomme
René François Armand (Sully) Prudhomme was a French poet and essayist. He was the first ever winner of the Nobel Prize in Literature in 1901. Born in Paris ...
Early life · Writing · Nobel Prize · Death

Sully Prudhomme - Wikipedia, la enciclopedia libre
https://es.wikipedia.org/wiki/Sully_Prudhomme · Translate this page
René François Armand (Sully) Prudhomme también conocido como Sully Prudhomme (París, Francia, 16 de marzo de 1839 - Châtenay-Malabry, Francia, 6 de ...

Sully Prudhomme - Biographical - Nobelprize.org
www.nobelprize.org/nobel_prizes/literature/laureates/1901/prudhomme-bio.html
Rene Francois Armand Prudhomme (1839-1907) was the son of a French shopkeeper. ... Sully Prudhomme was a member of the «Conference La Bruyère», ...

Sully Prudhomme - Nobelprize.org
https://www.nobelprize.org/nobel_prizes/literature/laureates/1901/
The Nobel Prize in Literature 1901 was awarded to Sully Prudhomme "in special recognition of his poetic composition, which gives evidence of lofty idealism, ...

Sully Prudhomme | French poet | Britannica.com
<https://www.britannica.com/biography/Sully-Prudhomme>
Sully Prudhomme, pseudonym of René-François-Armand Prudhomme (born March 16, 1839, Paris—died Sept. 7, 1907, Châtenay, France) French poet who ...

Sully Prudhomme - NNDB.com
www.nndb.com/people/297/000098003/
It was at this moment that the small circle of which Leconte de Lisle was the center were preparing the Parnasse, to which Sully Prudhomme contributed several ...

Sully Prudhomme | Definition of Sully Prudhomme by Merriam-Webster

Sully Prudhomme
Poet

René François Armand Prudhomme was a French poet and essayist. He was the first ever winner of the Nobel Prize in Literature in 1901.
[Wikipedia](#)

Born: March 16, 1839, Paris, France
Died: September 6, 1907, Châtenay-Malabry, France
Books: [Les vaines tendresses](#)
Awards: [Nobel Prize in Literature](#)

People also search for [View 10+ more](#)

Leconte de Lisle	Theodor Mommsen	Frédéric Mistral	Paul Verlaine	Gabriel Fauré

SCHEMA.ORG

YAHOO!

Google

 Microsoft

Yandex

Schema.org

Documentation

Schemas

About



Welcome to Schema.org

Schema.org is a collaborative, community activity with a mission to create, maintain, and promote schemas for structured data on the Internet, on web pages, in email messages, and beyond.

Schema.org vocabulary can be used with many different encodings, including RDFa, Microdata and JSON-LD. These vocabularies cover entities, relationships between entities and actions, and can easily be extended through a well-documented extension model. Over 10 million sites use Schema.org to markup their web pages and email messages. Many applications from Google, Microsoft, Pinterest, Yandex and others already use these vocabularies to power rich, extensible experiences.

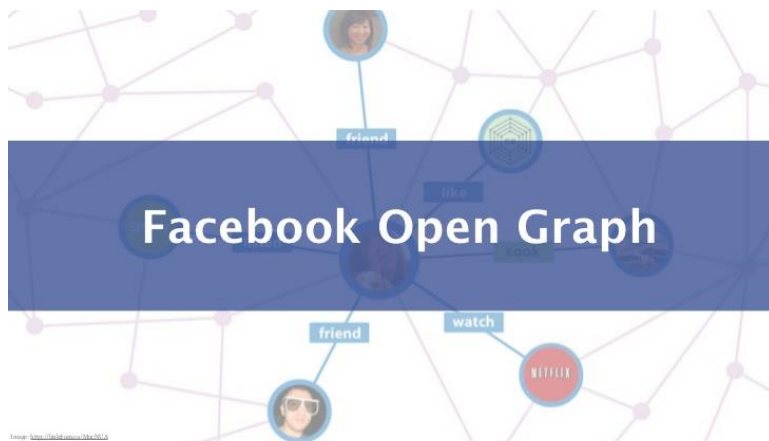
Founded by Google, Microsoft, Yahoo and Yandex, Schema.org vocabularies are developed by an open community process, using the public-schemaorg@w3.org mailing list and through [GitHub](#).

A shared vocabulary makes it easier for webmasters and developers to decide on a schema and get the maximum benefit for their efforts. It is in this spirit that the founders, together with the larger community have come together - to provide a shared collection of schemas.

We invite you to [get started!](#)

View our blog at blog.schema.org or see [release history](#) for version 11.01.

FACEBOOK'S OPEN GRAPH



IMDb

16 hrs · 🌐

The latest trailer for "Game of Thrones" is out, and contains so many fantastic details that we don't even know where to begin. Take a look: <http://imdb.to/1KXLPFJ>



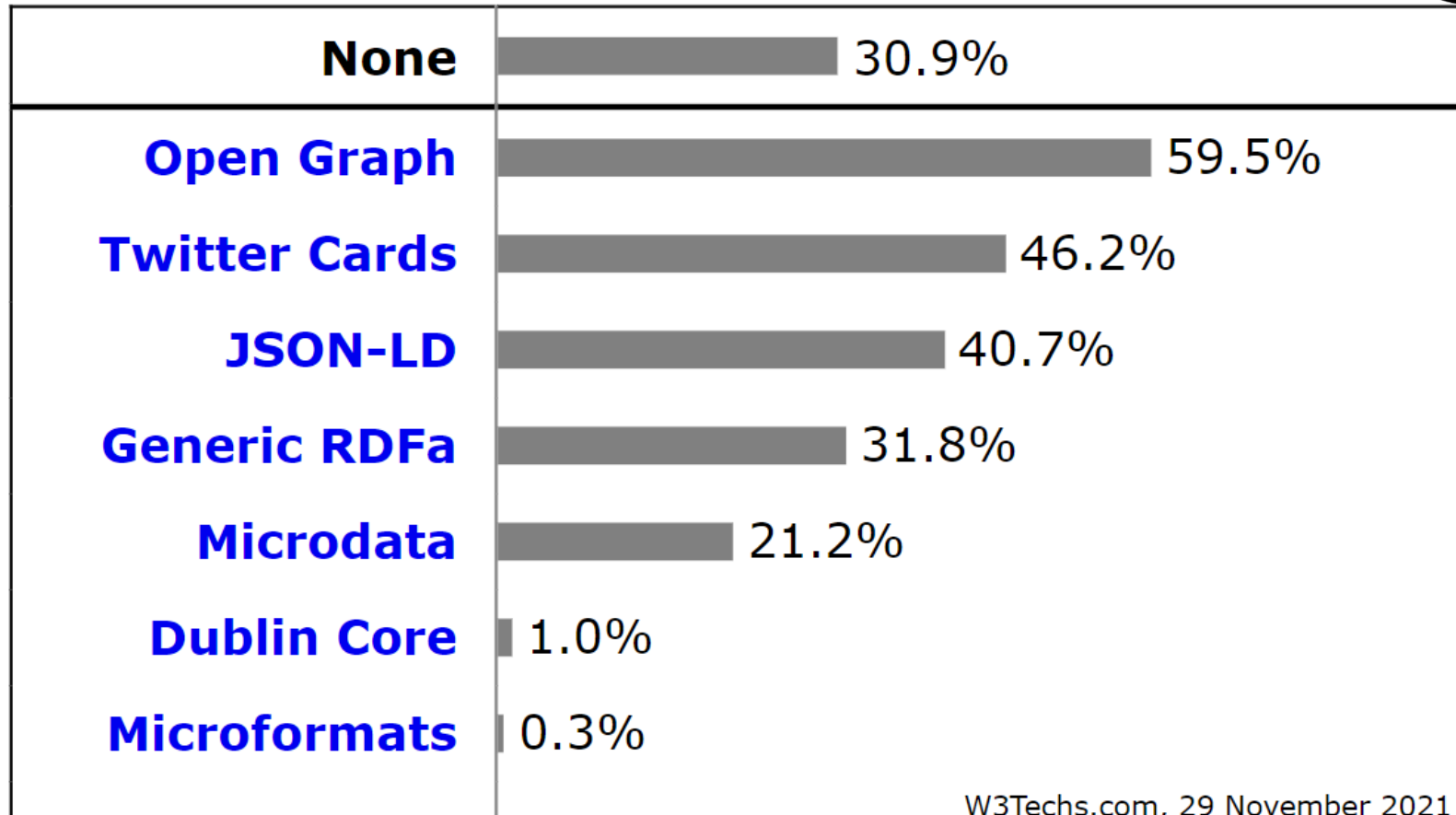
"Game of Thrones": The Wheel

"I'm not going to stop the wheel. I'm going to break the wheel."

IMDB.COM

Like · Comment · Share · Send · 👍 6,469 💬 395 ➦ 1,381

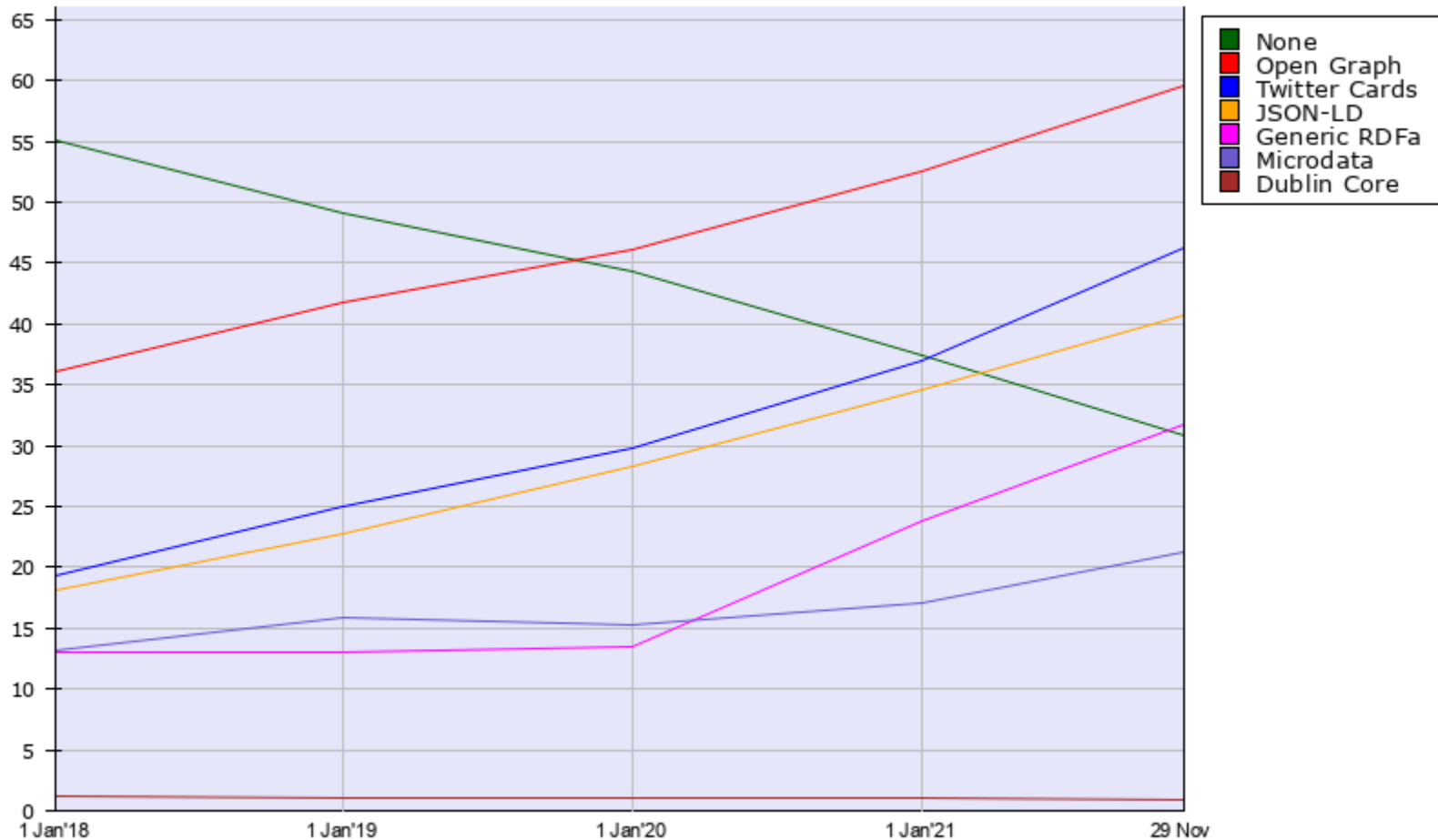
EMBEDDED STRUCTURED DATA



Percentages of websites using various structured data formats
Note: a website may use more than one structured data format

https://w3techs.com/technologies/overview/structured_data

EMBEDDED STRUCTURED DATA



Usage of structured data formats for websites, 29 Nov 2021, W3Techs.com

https://w3techs.com/technologies/history_overview/structured_data/all/y

GOOGLE'S KNOWLEDGE GRAPH



Google Knowledge Graph

Amazon Prime



Free UK Delivery by Amazon

FREE Delivery on orders over £10 for books or over £20 for other categories shipped by Amazon

Deals

Today's Deals

Department

Books

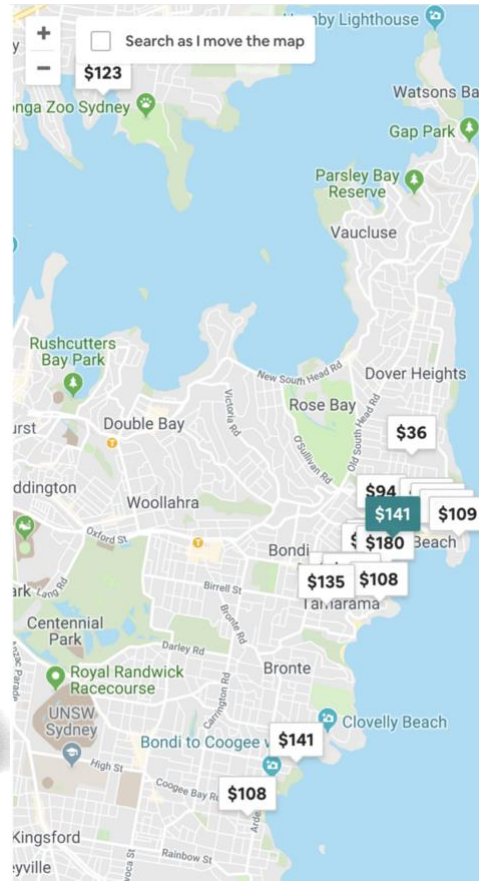
- Artificial Intelligence (A.I.)
- Beginner's Guide to Databases
- Managers' Guides to Computing
- Data Mining
- E-Business
- See more

Kindle Store

- Information Technology
- Mathematical & Statistical
- See All 4 Departments

Avg. Customer Review

- ★★★★☆ & Up
- ★★★★☆ & Up
- ★★★★☆ & Up
- ★★★☆☆ & Up



Knowledge Graph

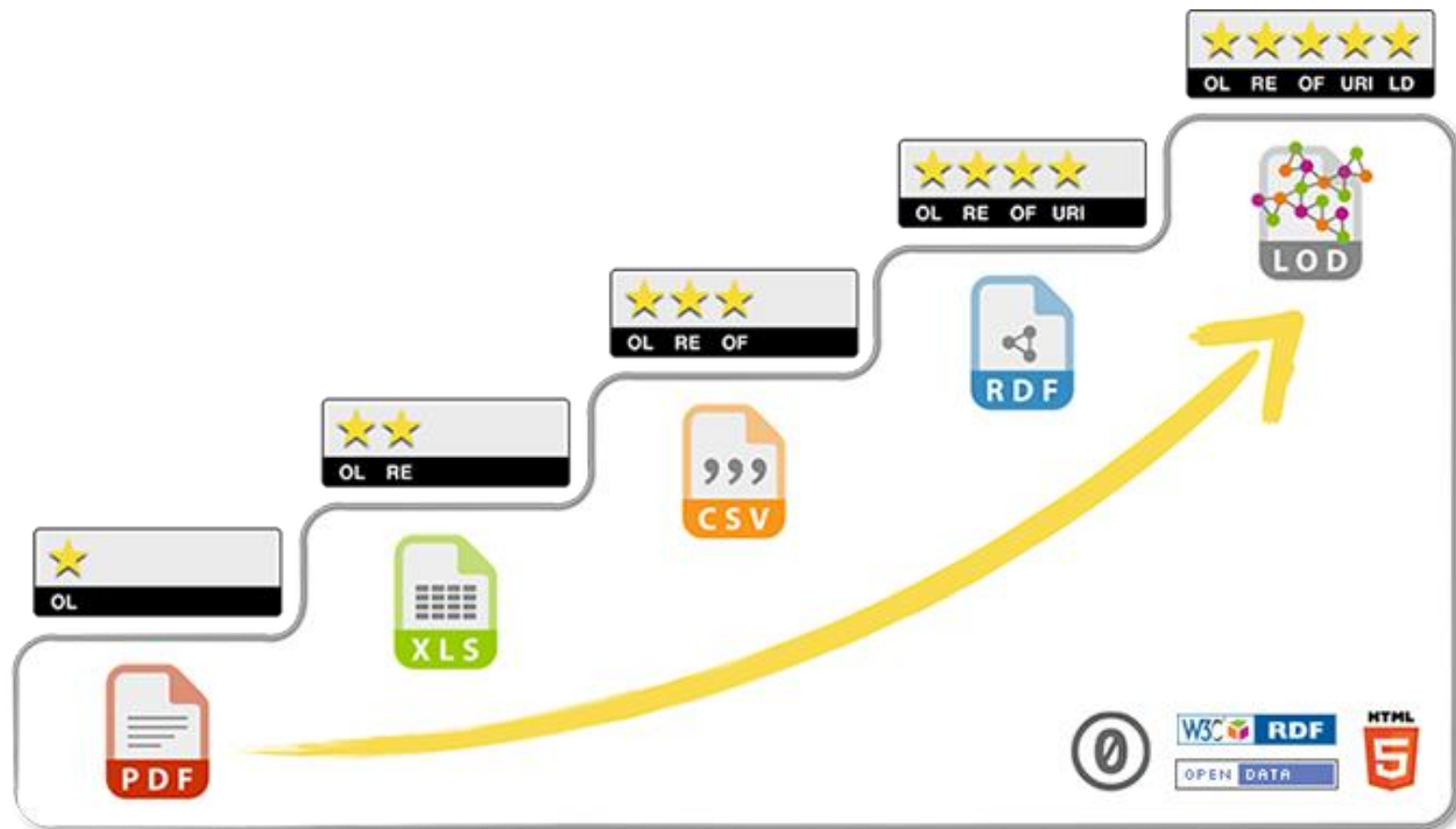


The Knowledge Graph is a knowledge base used by Google and its services to enhance its search engine's results with information gathered from a variety of sources. The information is presented to users in an infobox next to the search results.

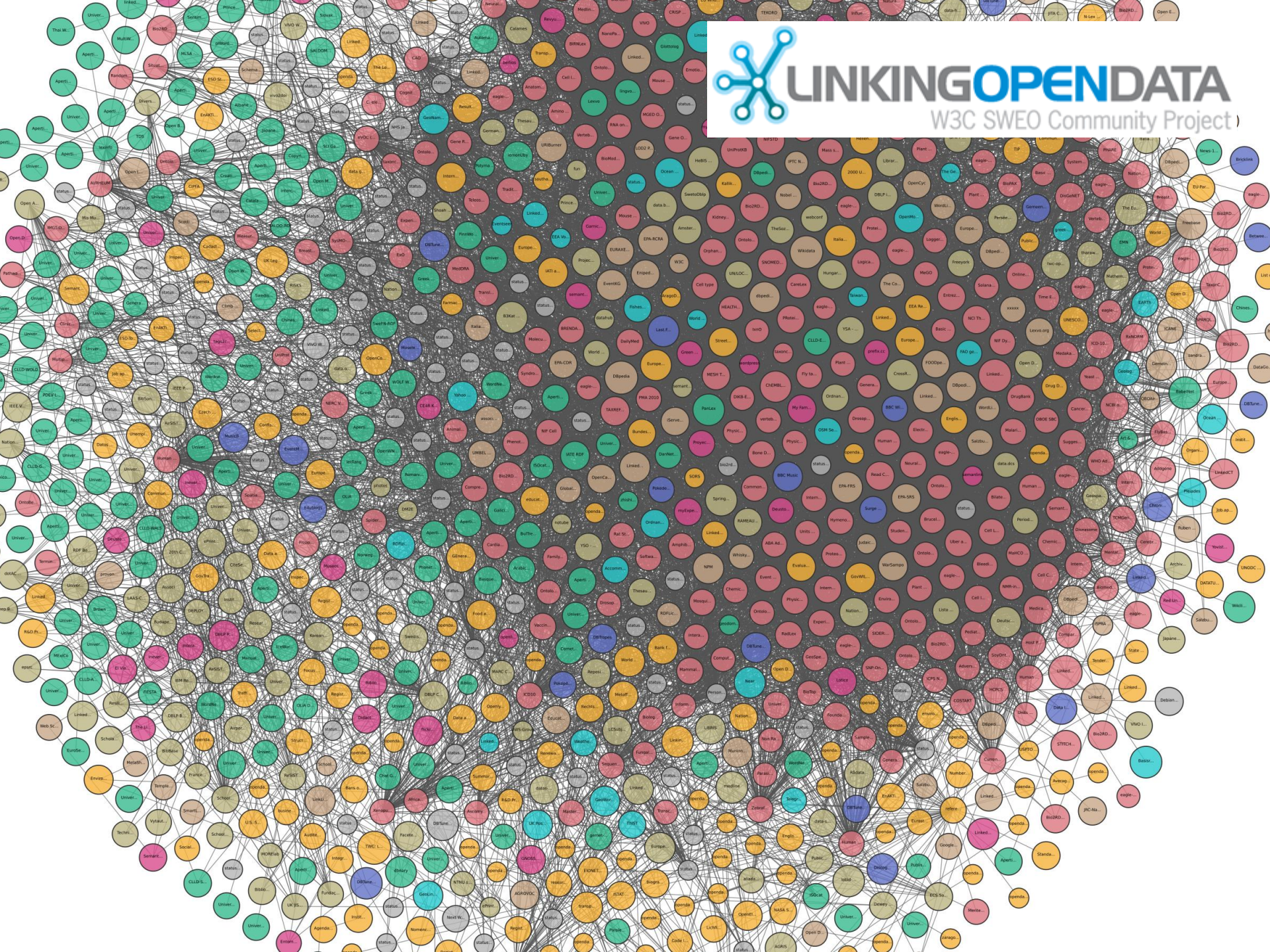
[Wikipedia](#)



LINKED OPEN DATA



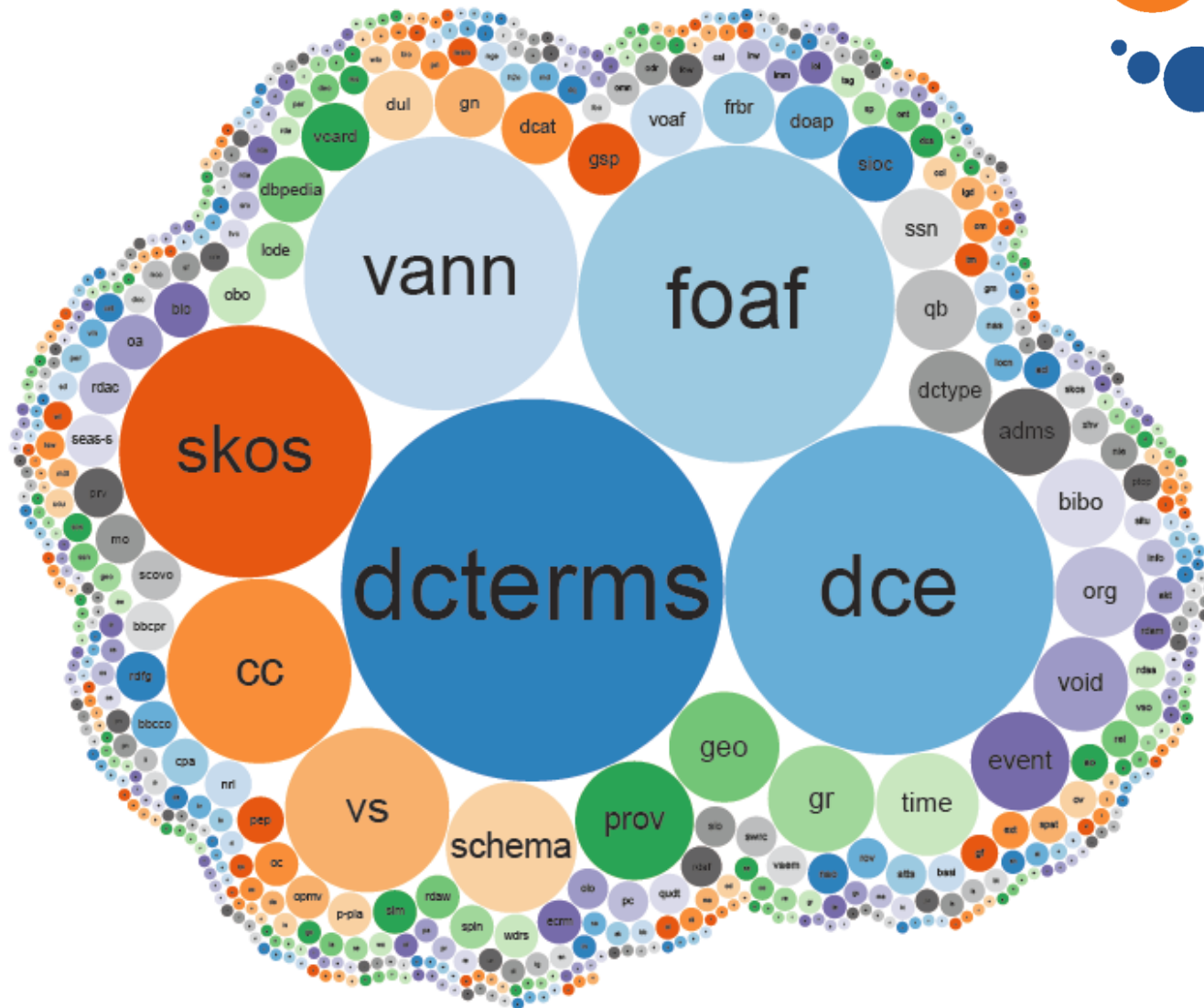
5-Star Linking Open Data Scheme



LINKING OPENDATA

W3C SWEO Community Project

LINKED OPEN VOCABULARIES



From <https://lov.linkeddata.es/>

BIOMEDICAL ONTOLOGIES



The Open Biological and Biomedical Ontology (OBO) Foundry

Community development of interoperable ontologies for the biological sciences

bfo	Basic Formal Ontology 	The upper level ontology upon which OBO Foundry ontologies are built. Detail								
chebi	Chemical Entities of Biological Interest 	A structured classification of molecular entities of biological interest focusing on 'small' chemical compounds. Detail								
doid	Human Disease Ontology 	An ontology for describing the classification of human diseases organized by etiology. Detail								
go	Gene Ontology 	An ontology for describing the function of genes and gene products Detail								
obi	Ontology for Biomedical Investigations 	An integrated ontology for the description of life-science and clinical investigations Detail								
pato	Phenotype And Trait Ontology 	An ontology of phenotypic qualities (properties, attributes or characteristics) Detail								
po	Plant Ontology 	The Plant Ontology is a structured vocabulary and database resource that links plant anatomy, morphology and growth and development to plant genomics data. Detail								

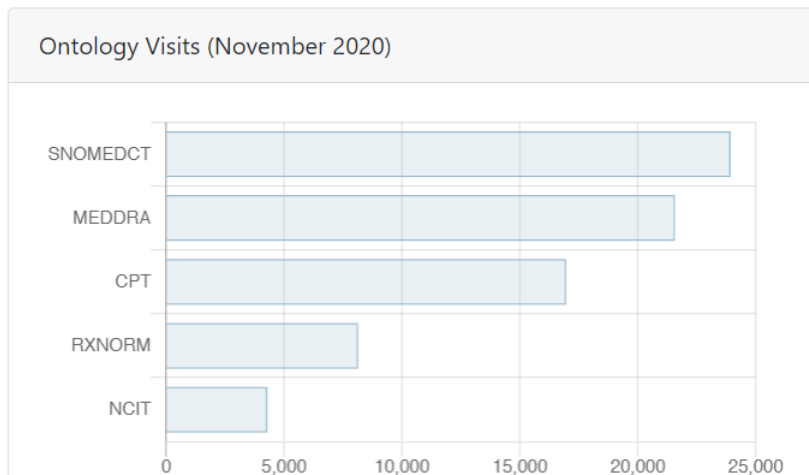
Welcome to BioPortal, the world's most comprehensive repository of biomedical ontologies

Search for a class

[Advanced Search](#)

Find an ontology

[Browse Ontologies](#) ▾



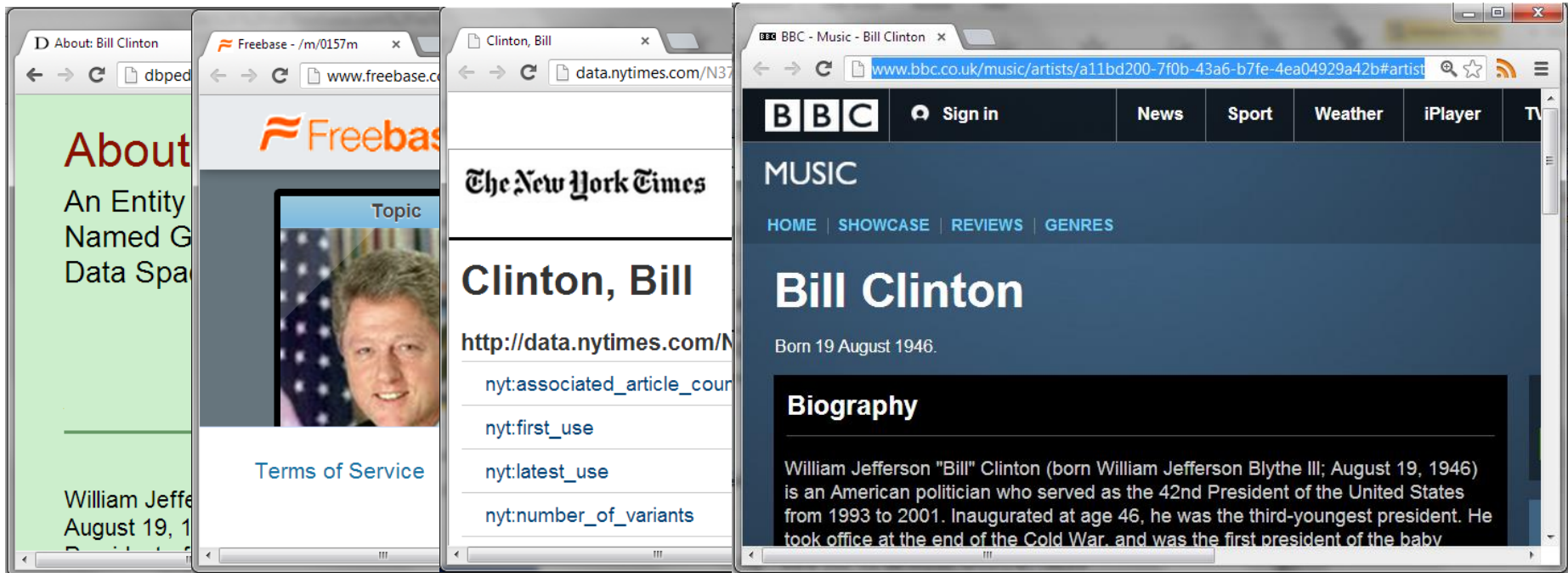
BioPortal Statistics

Ontologies	912
Classes	12,108,726
Properties	36,286
Mappings	111,130,779

A dark green, monochromatic landscape. A path leads from the bottom center towards the top center, flanked by dense foliage and trees. In the foreground, a large, gnarled tree with many thin branches is prominent. The overall atmosphere is misty and ethereal.

ONGOING RESEARCH

INTEGRATING DIVERSE DATA



http://dbpedia.org/resource/Bill_Clinton

http://rdf.freebase.com/ns/en.bill_clinton

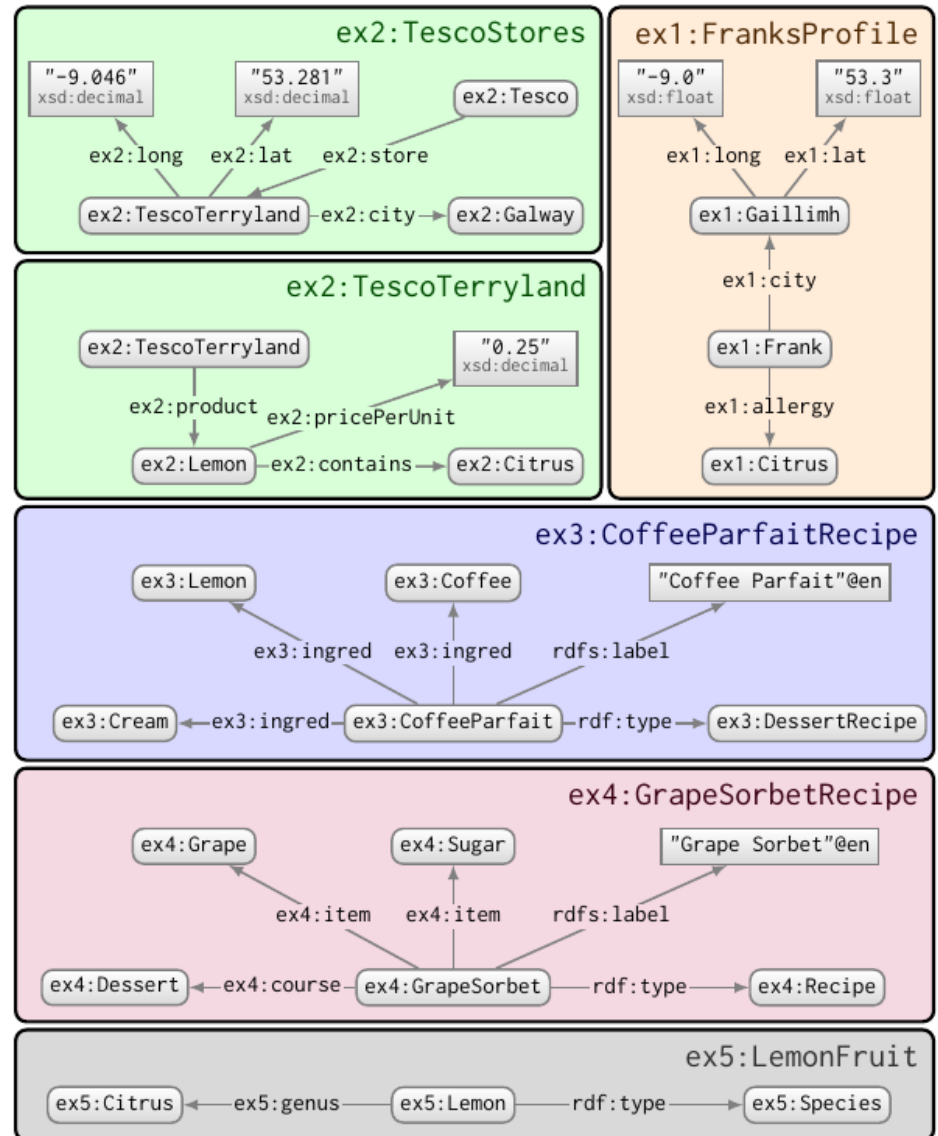
http://data.nytimes.com/clinton_bill_per

[http://www.bbc.co.uk/music/artists/...](http://www.bbc.co.uk/music/artists/)

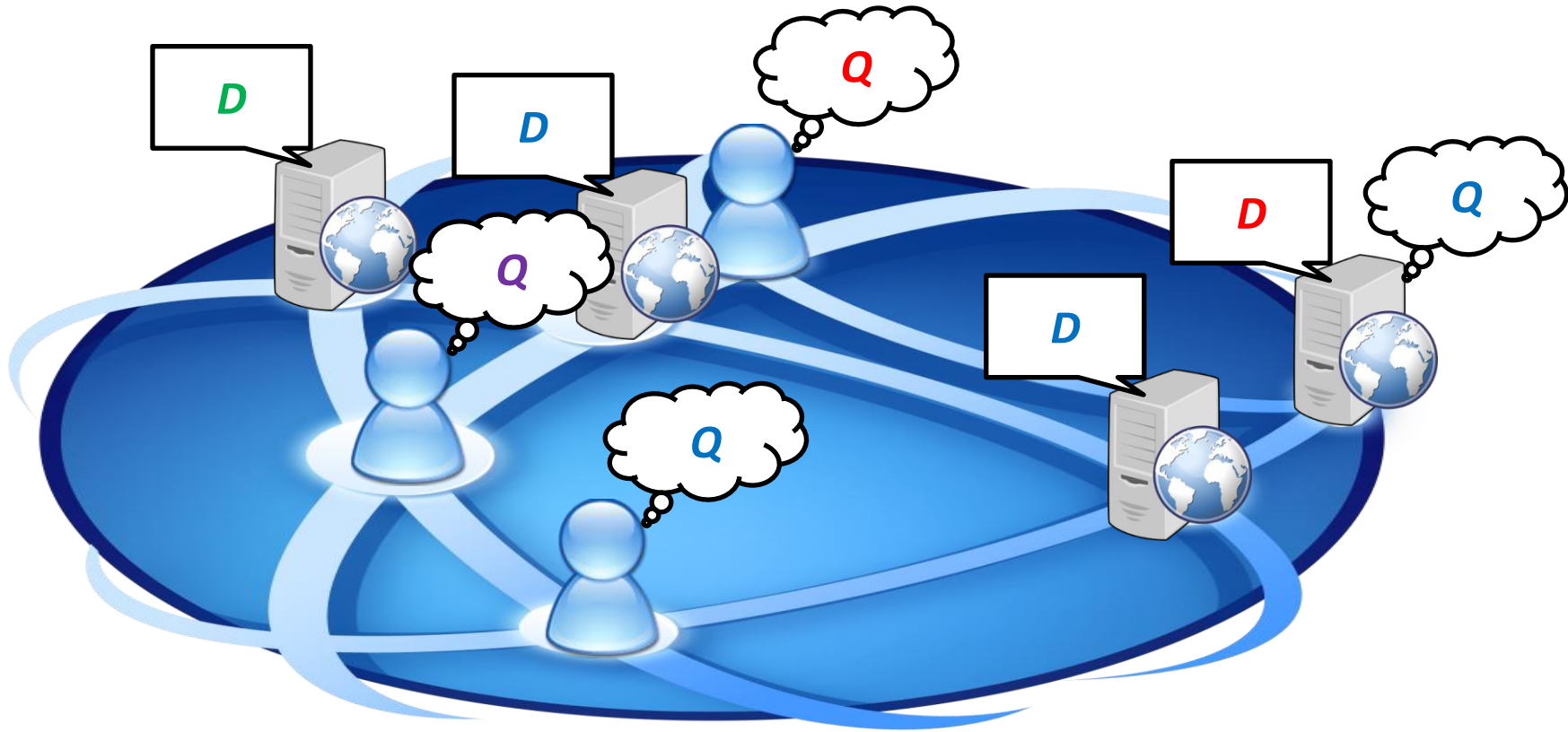
How can we integrate data using different identifiers from different sources?

INTEGRATING DIVERSE VOCABULARIES

How can we integrate and write queries against Linked Data using different vocabularies?



DECENTRALISED QUERYING



How can we enable decentralised querying over multiple decentralised datasets?

VERACITY

The screenshot shows a web browser window with the address bar displaying www.enkivillage.com/moon-landing-hoax.html. The page title is "Moon Landing Hoax". Below the title, there are navigation icons and statistics: "Society & Culture", "27K+", and "375". The main content area contains a paragraph of text:

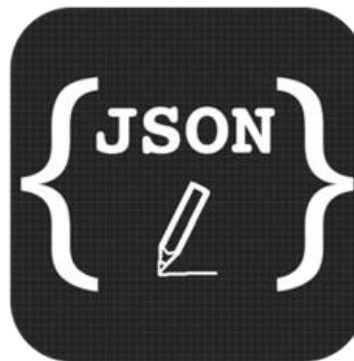
"That's one small step for [a] man, one giant leap for mankind." So said Neil Armstrong on that momentous occasion on July 21, 1969 when he stepped onto the surface of the moon for the very first time...supposedly. Does anyone else find it strange that decades before the internet, nanotechnology and cloning, NASA were able to build a rocket that could not only land on the moon, but live broadcast the event to 600 million people? Was the moon landing fake?

Below this text is a section titled "Top 8 Examples Proving the Moon Landing Was a Hoax". The first example is partially visible, starting with "The 60's was a decade where technology was only just figuring out how to develop".

How can we deal with incorrect or malicious data and/or ontologies on the Semantic Web?

LEGACY DATA

How can we "import" more legacy data into the Semantic Web?



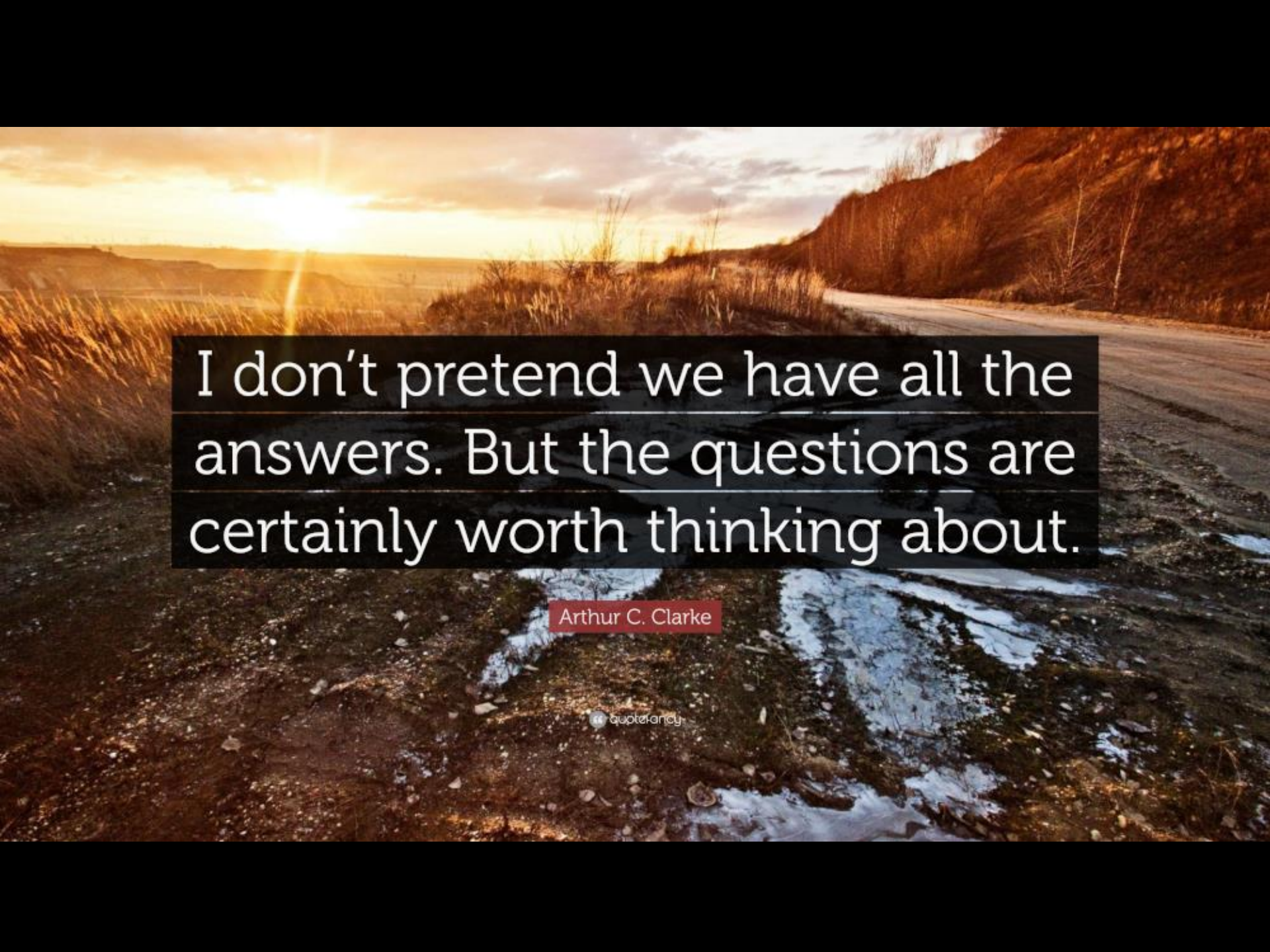
USABILITY

```
PREFIX geo: <http://www.opengis.net/ont/geosparql#>
PREFIX lgdo: <http://linkedgeodata.org/ontology/>
PREFIX geom: <http://geovocab.org/geometry#>
PREFIX bif: <bif:>

SELECT ?country ?geometry ?label WHERE {
  SERVICE <http://linkedgeodata.org/sparql> {
    ?s geom:geometry [ geo:asWKT ?geometry ] ;
    a lgdo:Embassy ;
    lgdo:country ?code ;
    rdfs:label ?label .
  }
  FILTER(bif:st_intersects(?geometry, bif:st_point(-70.6693,-33.4489), 10))
}
?country wdt:P297 ?code ;
  wdt:P30 wd:Q48 . # continent: Asia
}
```

What kinds of interfaces can help non-expert users to better interact with the Semantic Web?





I don't pretend we have all the answers. But the questions are certainly worth thinking about.

Arthur C. Clarke

quotation

ONGOING RESEARCH IN CHILE



THAT'S ALL FOLKS ...



QUESTIONS?

