

Linked Open Data

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Linked Data

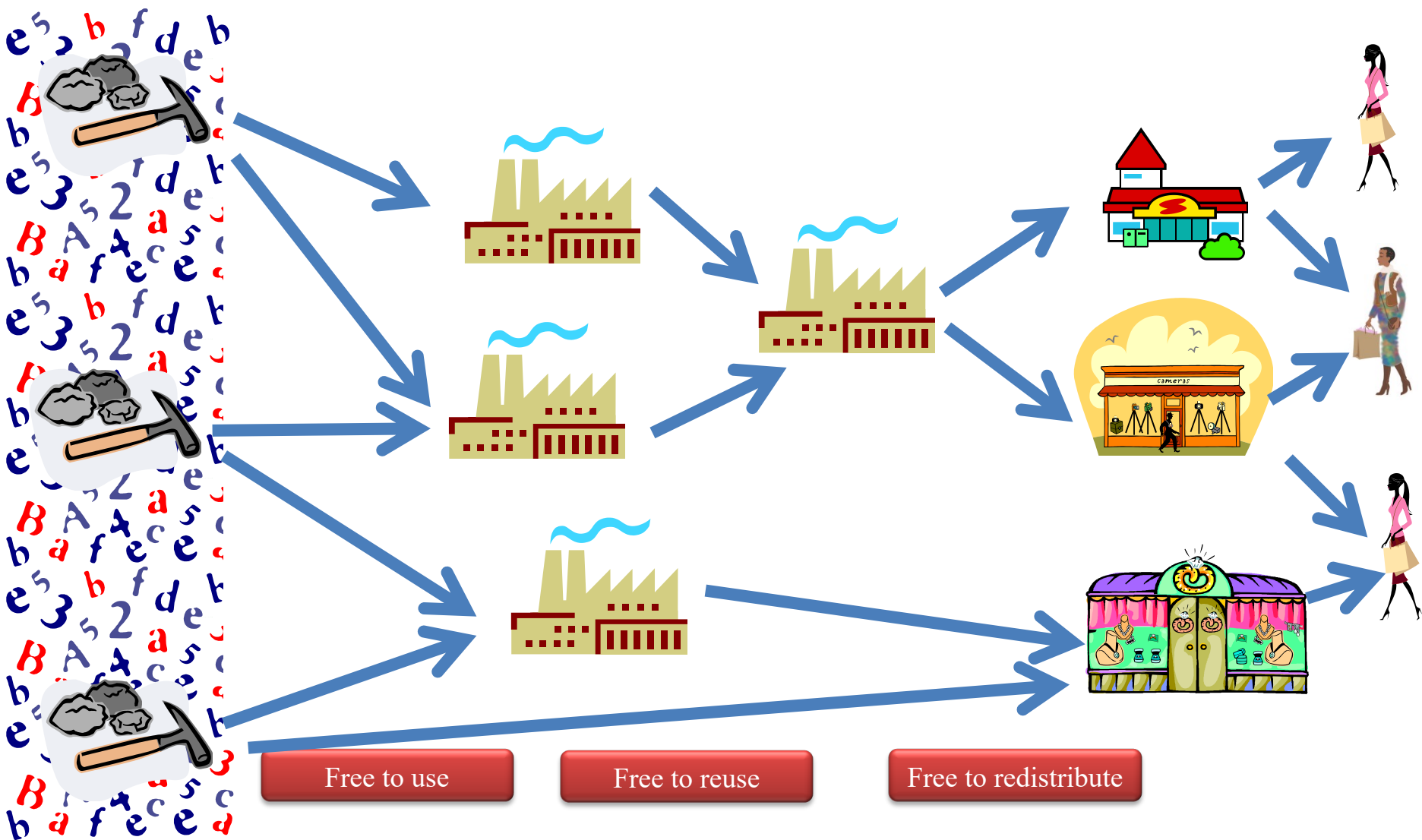
- From Open Data to Linked Open Data
- What is Linked Data?
- The State-of-the-Art of Linked Data
 - Linking Open Data (LOD)
- How to make Linked Data
 - Data translation from existing databases
 - Design Schema
- How to use Linked Data
 - Linked Data Browser
 - Linked Data Search Engine
 - Linked Data Applications

From Open Data to **Linked** Open Data

What is Open Data?

- Open Data is not just data which is available online!
- Open Data is
 - “A piece of data or content is open if anyone is free to **use, reuse,** and **redistribute** it — subject only, at most, to the requirement to attribute and/or share-alike.” <http://opendefinition.org/>

Data in society is a resource, not product

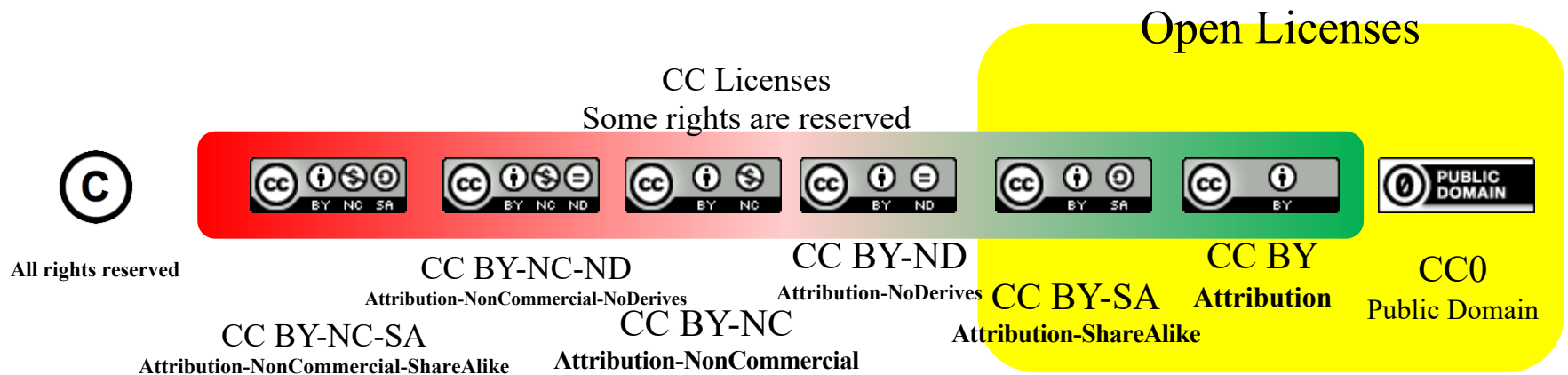


Requisites for Open Data


- Open License
- Machine-readable format

Open License

- License which allows information to use with the minimum requirements



Machine-readable Format

- Reusability
 - You can cut and paste a part of contents
- 
- Better formats for computer processing
 - Proprietary format: Some specific programs can process (specification is not open or restricted by patents ...)
 - Open format: Everyone can process (specification is open and patent free)
 - Linkable format: one can link data to the other if s/he likes



Five Star Open Data



Web data (whatever format) without an open license



make your stuff available on the Web (whatever format) under an open license



make it available as structured data (e.g., Excel instead of image scan of a table) so that it can be reused



use non-proprietary, open formats (e.g., CSV instead of Excel)



`http://data`

use URIs to identify things, so that people can point at your stuff and serve RDF from it



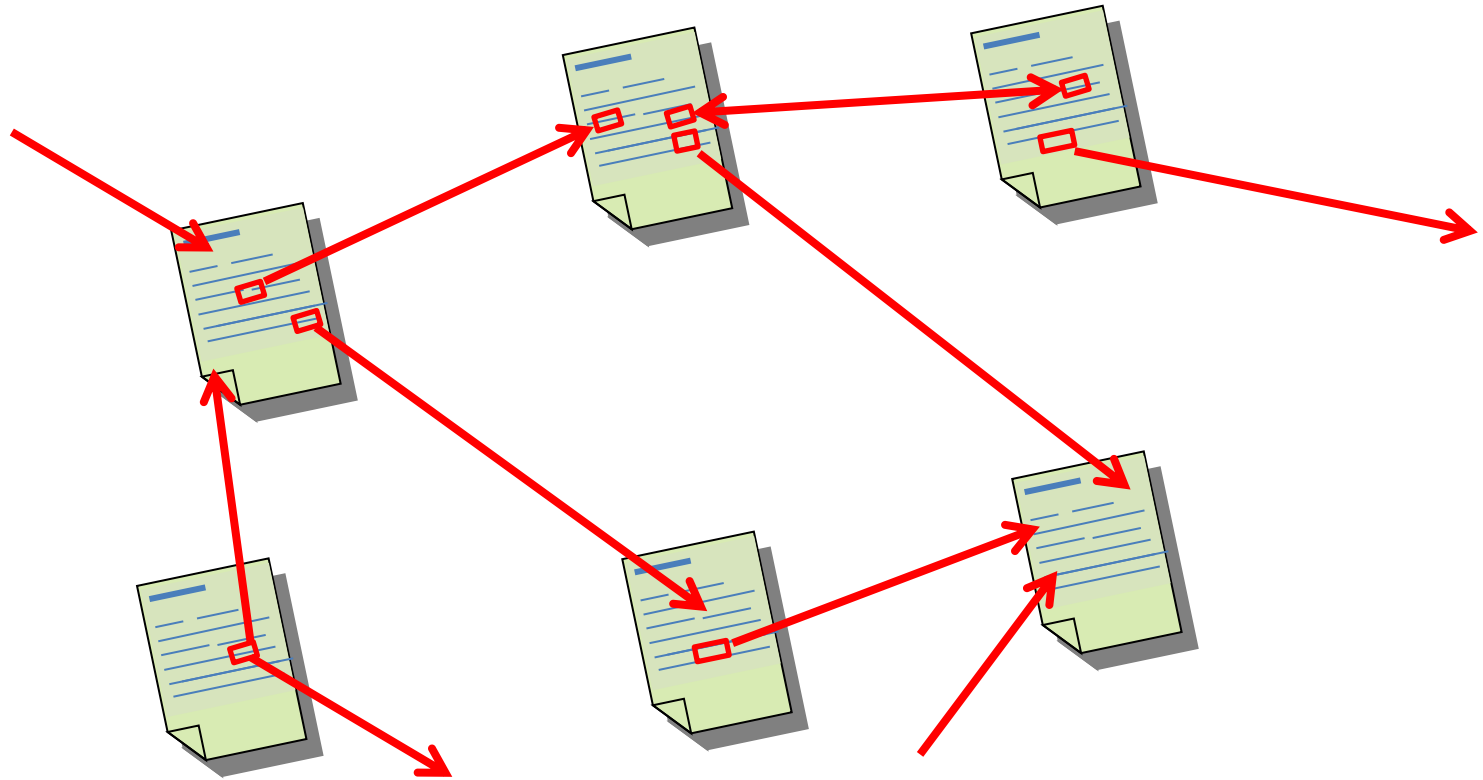
link your data to other data to provide context



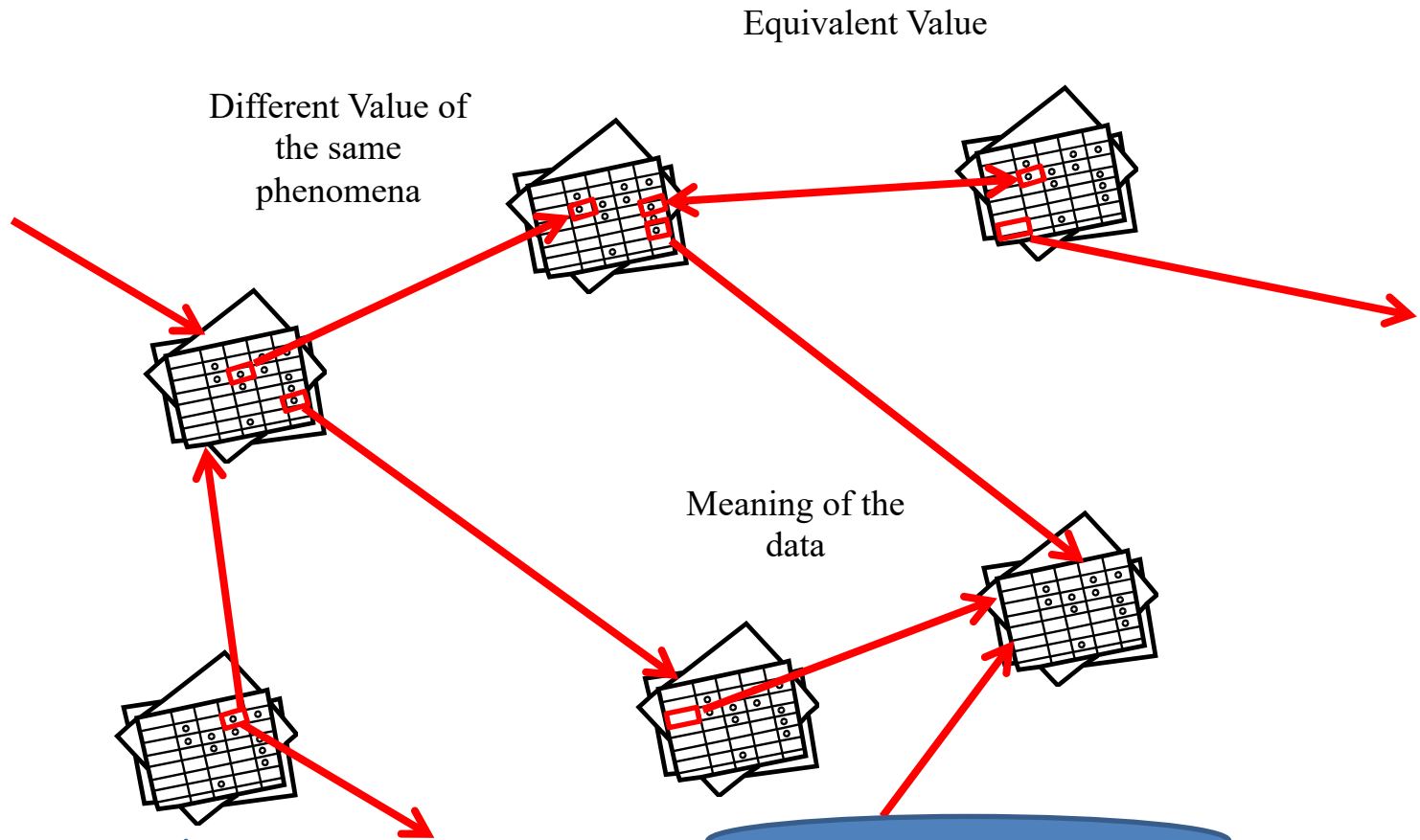
Linked Data

- Linked Data is “*Web of Data*”
 - Data published as RDF
 - Can refer from outside
- The four rules for Linked Data

Web of Documents

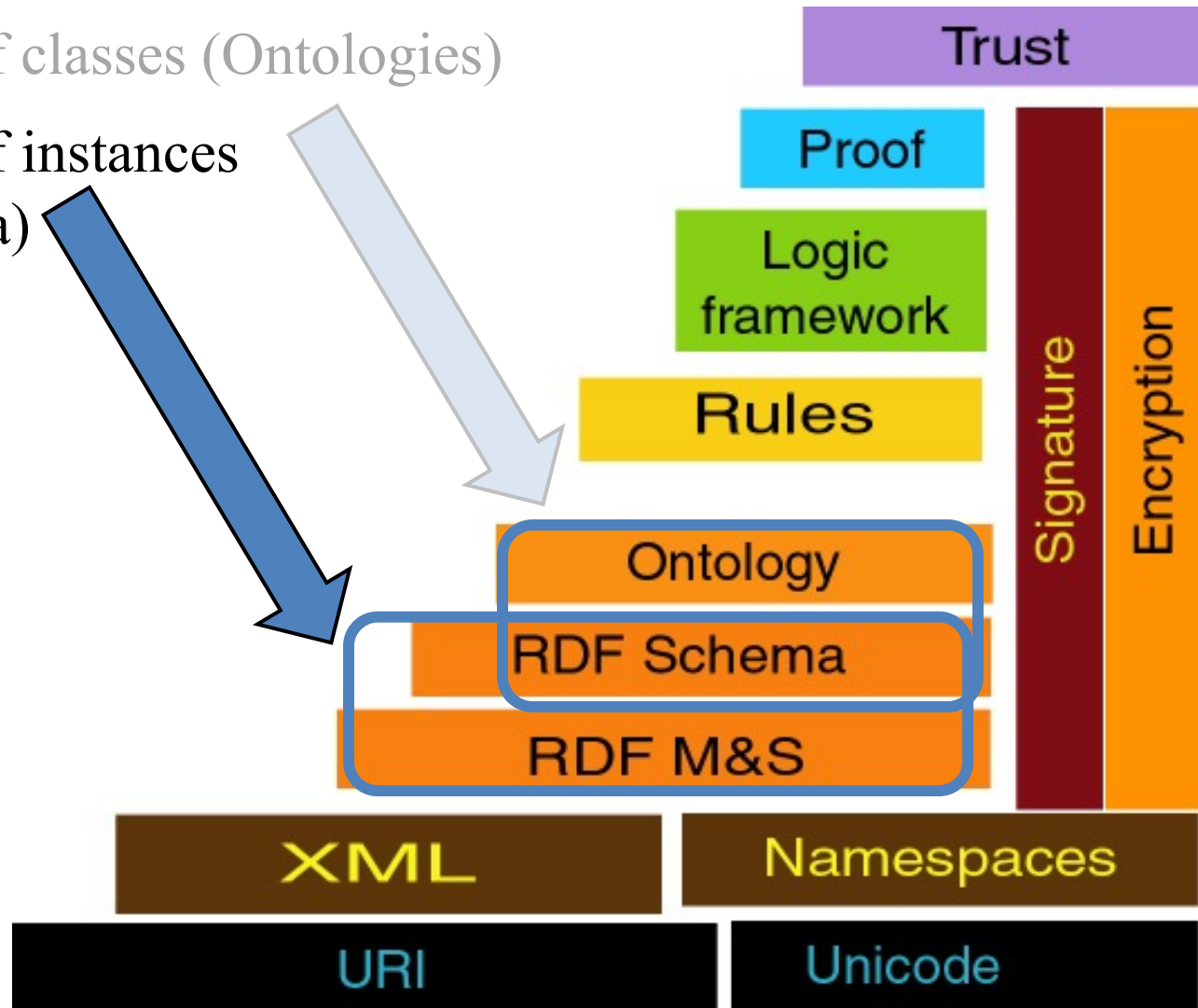


Web of Data



Architecture for the Semantic Web

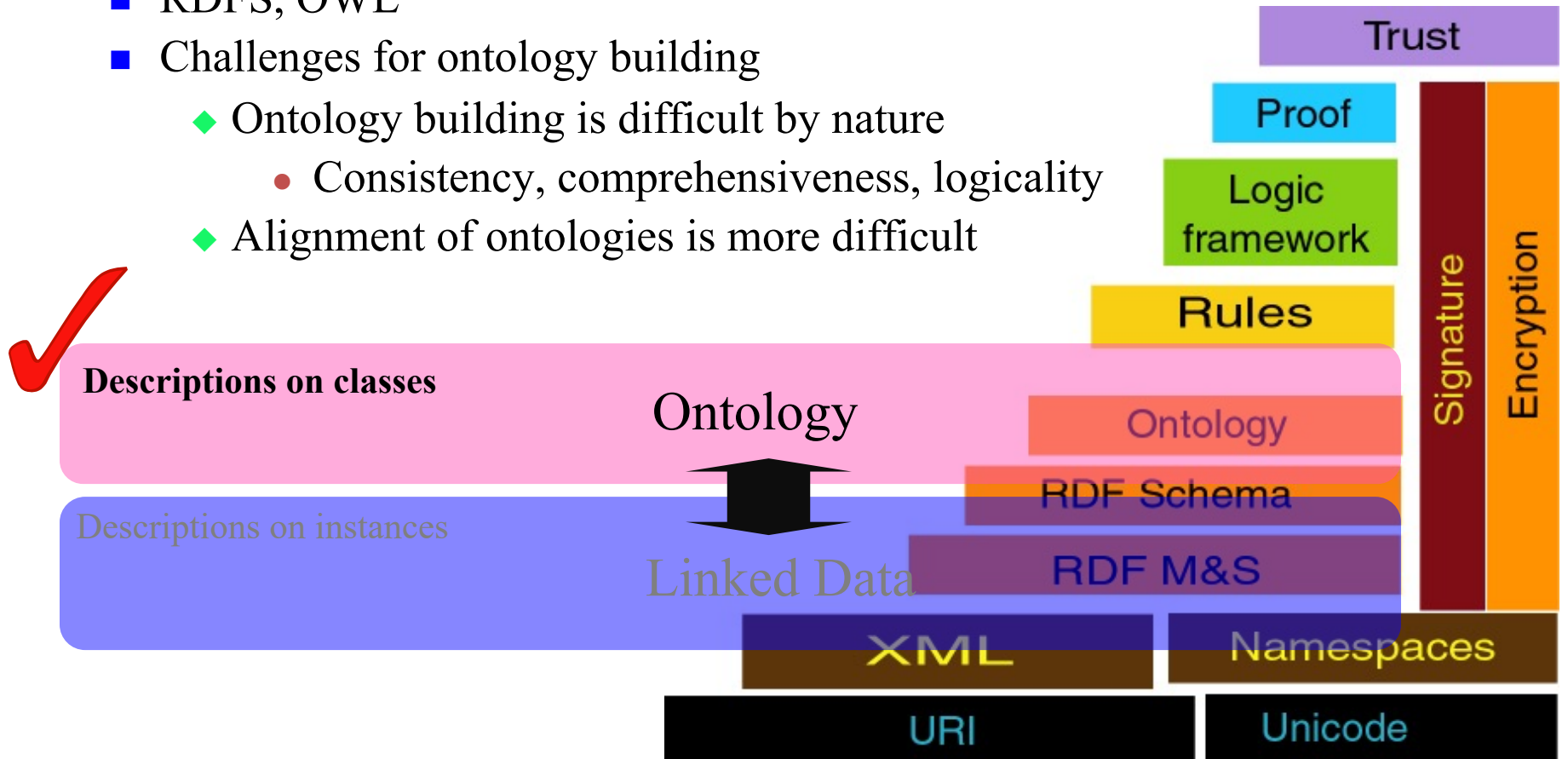
- The world of classes (Ontologies)
- The world of instances (Linked Data)



Tim Berners-Lee <http://www.w3.org/2002/Talks/09-lcs-sweb-tbl/>

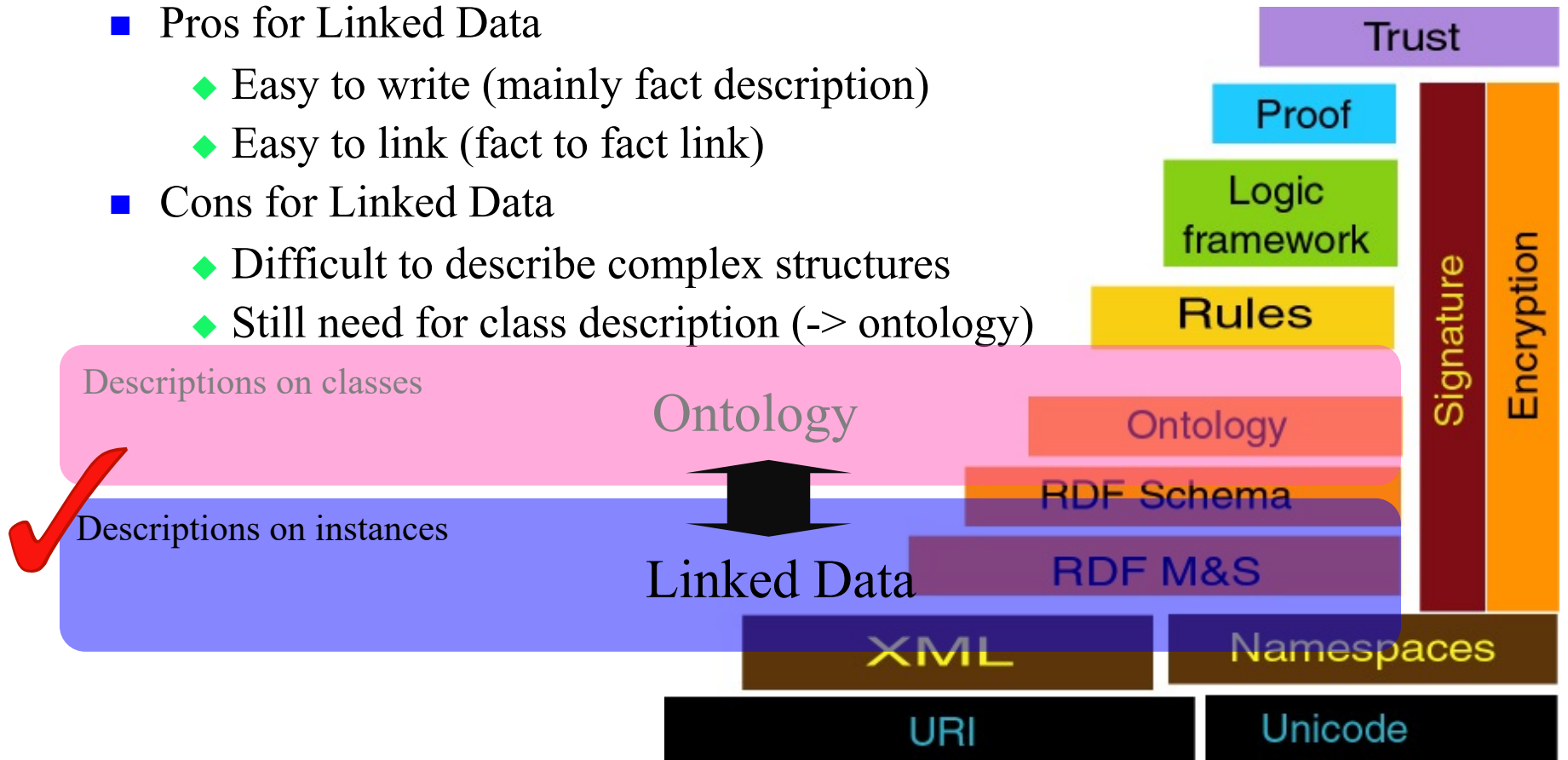
Layers of Semantic Web

- Ontology
 - Descriptions on classes
 - RDFS, OWL
 - Challenges for ontology building
 - ◆ Ontology building is difficult by nature
 - Consistency, comprehensiveness, logicity
 - ◆ Alignment of ontologies is more difficult



Layers of Semantic Web

- Linked Data
 - Descriptions on instances (individuals)
 - RDF + (RDFS, OWL)
 - Pros for Linked Data
 - ◆ Easy to write (mainly fact description)
 - ◆ Easy to link (fact to fact link)
 - Cons for Linked Data
 - ◆ Difficult to describe complex structures
 - ◆ Still need for class description (-> ontology)



Linked Data

- The four rules for Linked Data
 - Use URIs as names for things
 - ◆ Every thing becomes a resource in Internet
 - Use HTTP URIs so that people can look up those names.
 - ◆ Every resource becomes dereferenciable (responding something)
 - When someone looks up a URI, provide useful information, using the standards (RDF, SPARQL)
 - ◆ Every resource returns something in commonly understandable way.
 - Include links to other URIs. so that they can discover more things.
 - ◆ All things become a part of Web of Data

Description in Linked Data

- Use RDF(+RDFS, OWL)
 - Very Simple! : <Subject> <Predicate> <Object> .

<http://www-kasm.nii.ac.jp/~takeda#me> rdfs:type foaf:Person .

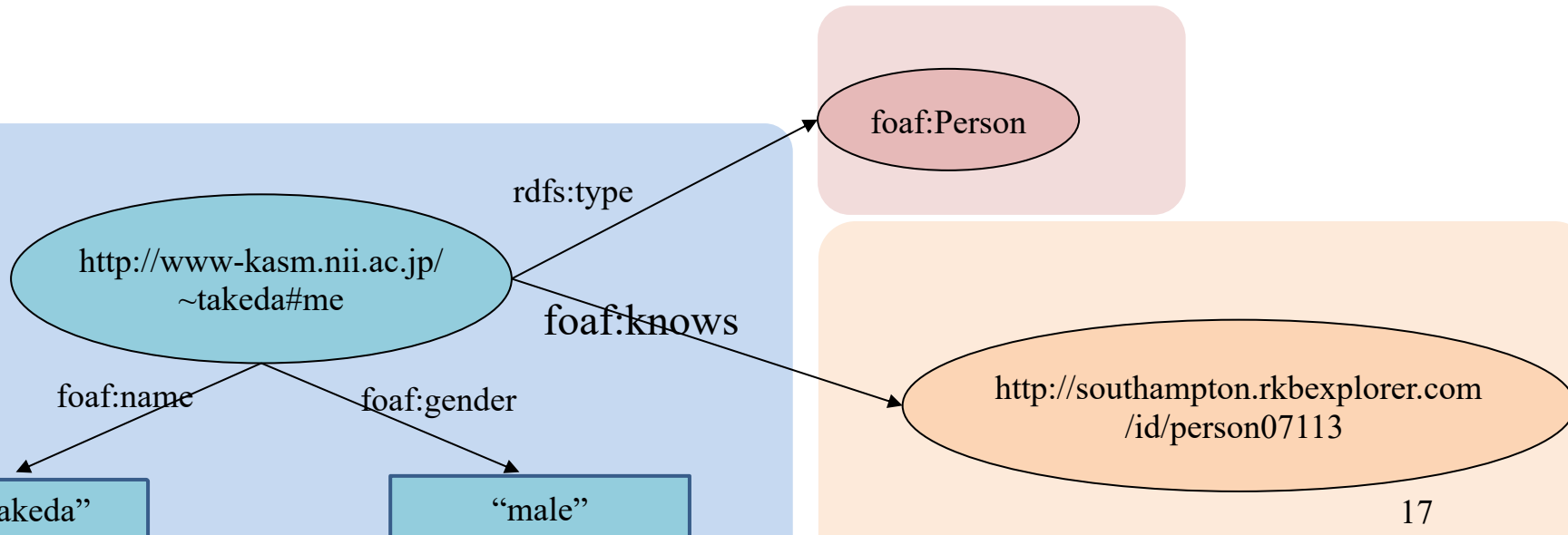
Turtle

<http://www-kasm.nii.ac.jp/~takeda#me> foaf:name "H. Takeda" .

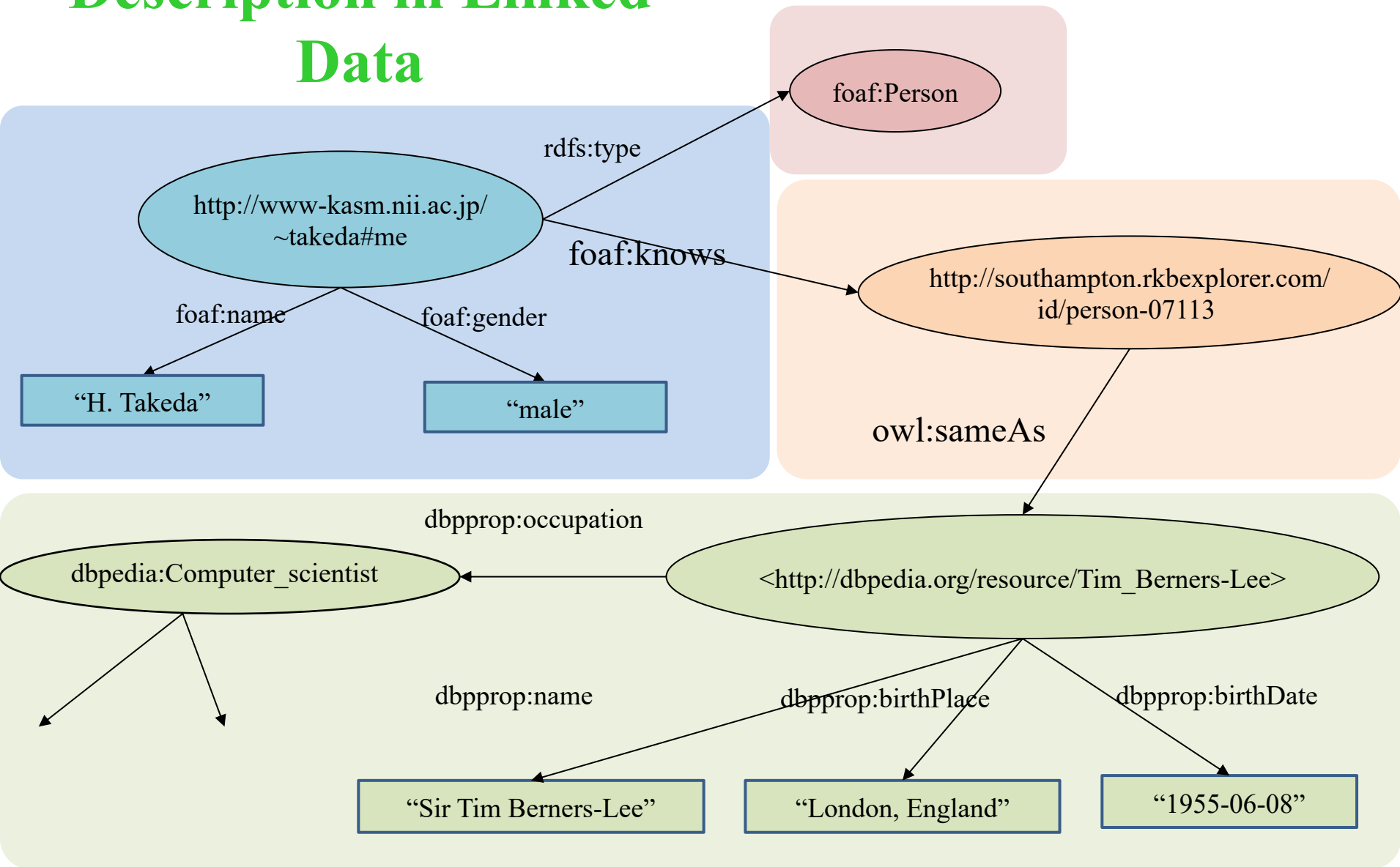
<http://www-kasm.nii.ac.jp/~takeda#me> foaf:gender "male" .

<http://www-kasm.nii.ac.jp/~takeda#me> foaf:knows

<http://southampton.rkbexplorer.com/id/person07113> .



Description in Linked Data

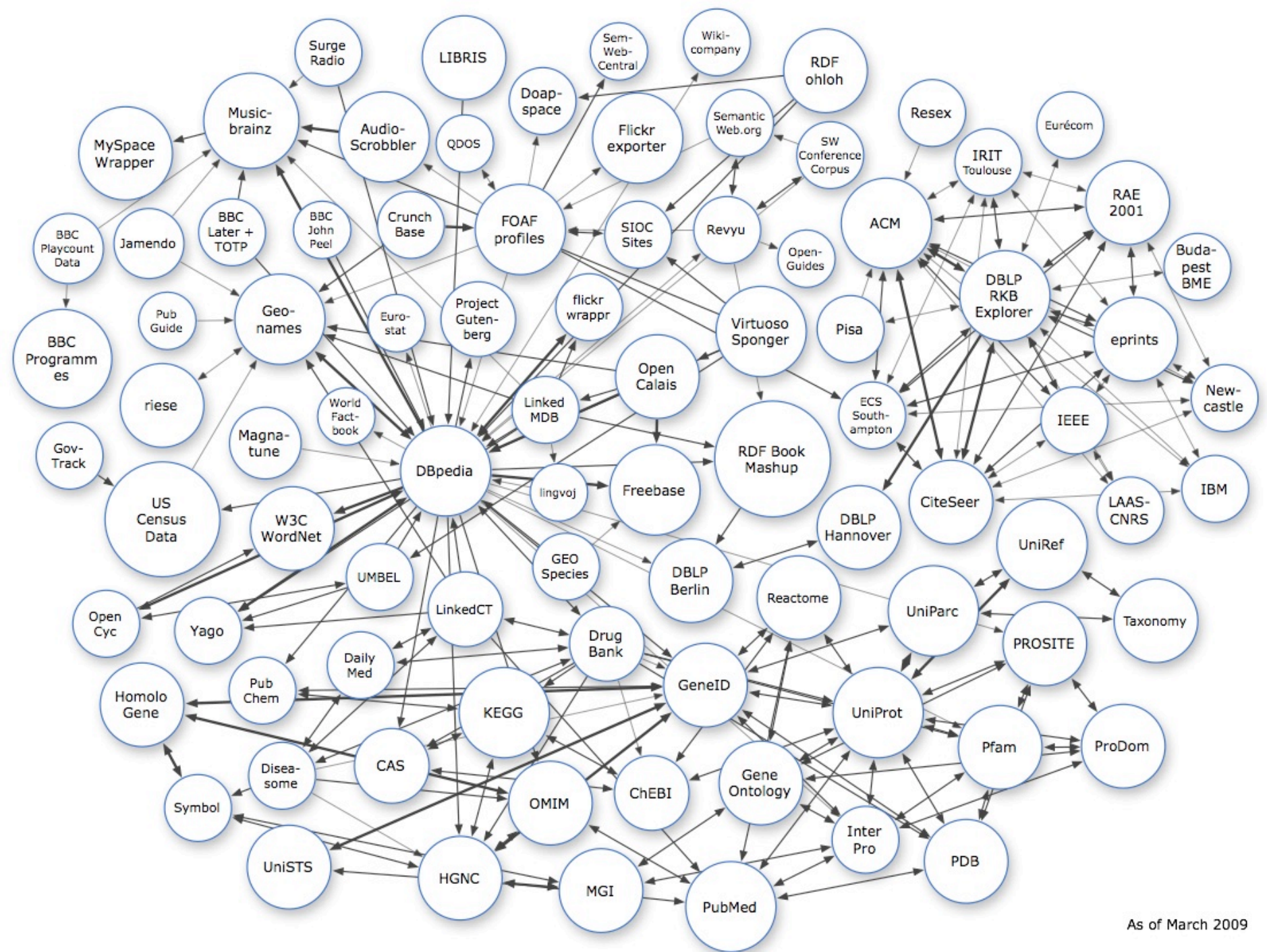


Linked Data

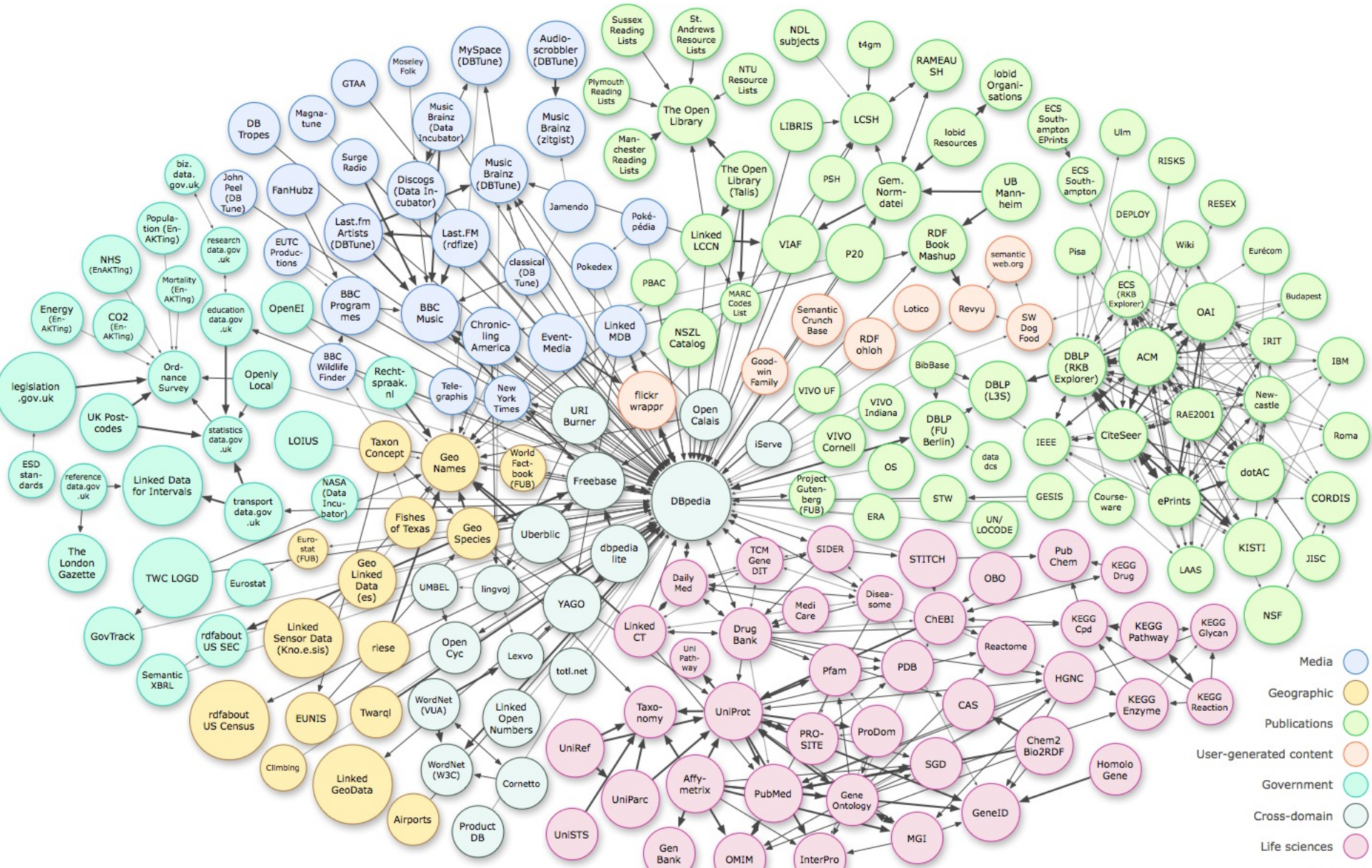
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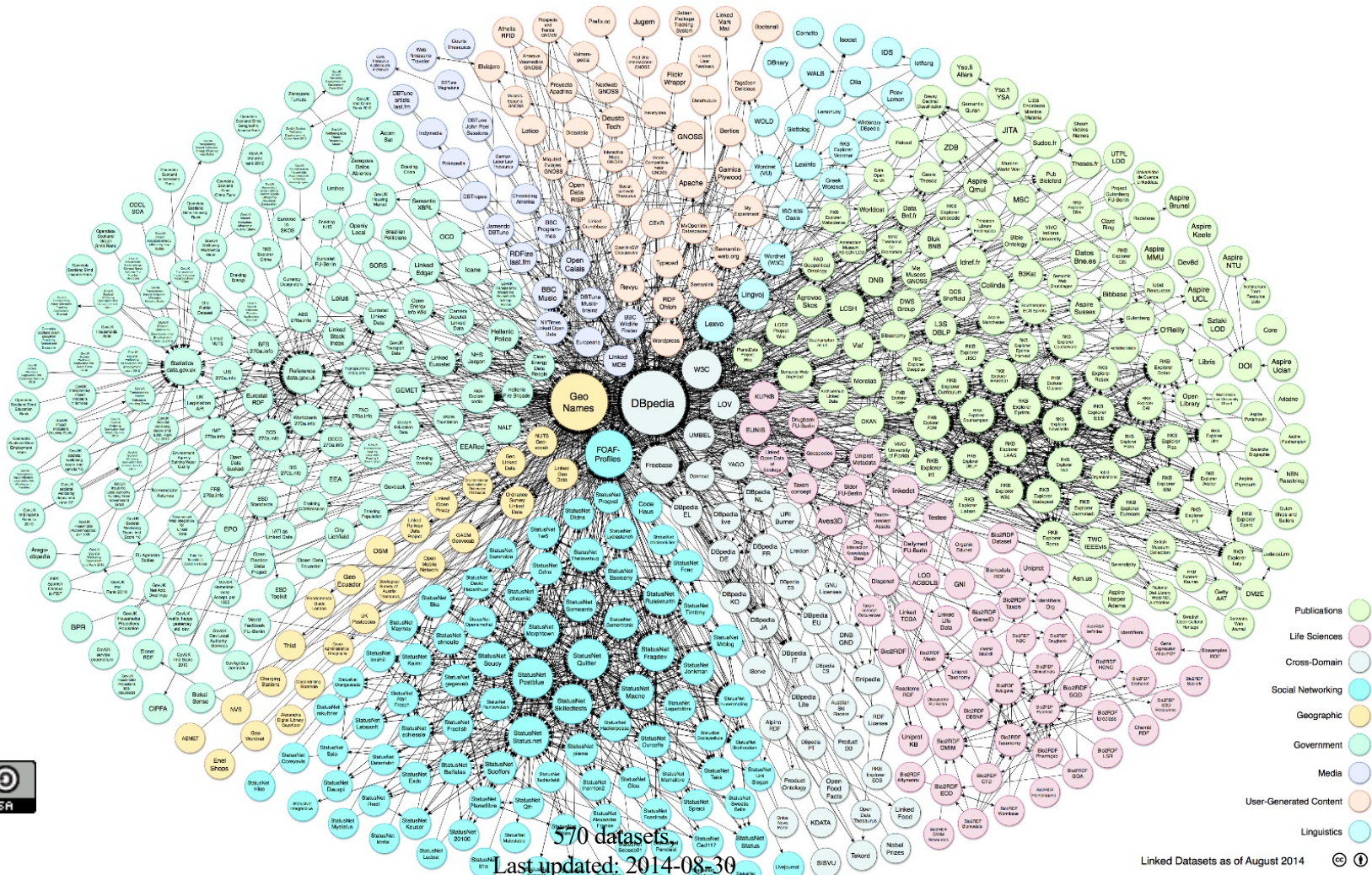
Linking Open Data (LOD)

- The project to collect published Linked Data
- Major Linked Data
- (Translated from the original resources)
 - Dbpedia (Wikipedia) 270 Million Triples
 - Geonames : Geo names and their latitudes and longitudes, 93 Million Triples
 - MusicBrainz : Music
 - WordNet : Dictionary
 - DBLP bibliography : Bibliography for technical papers. 28 Million Triples
 - US Census Data: 1 Billion Triples
- (Crawling)
 - FOAF (Friend Of A Friend)
- (Wrapper)
 - Flickr Wrapper

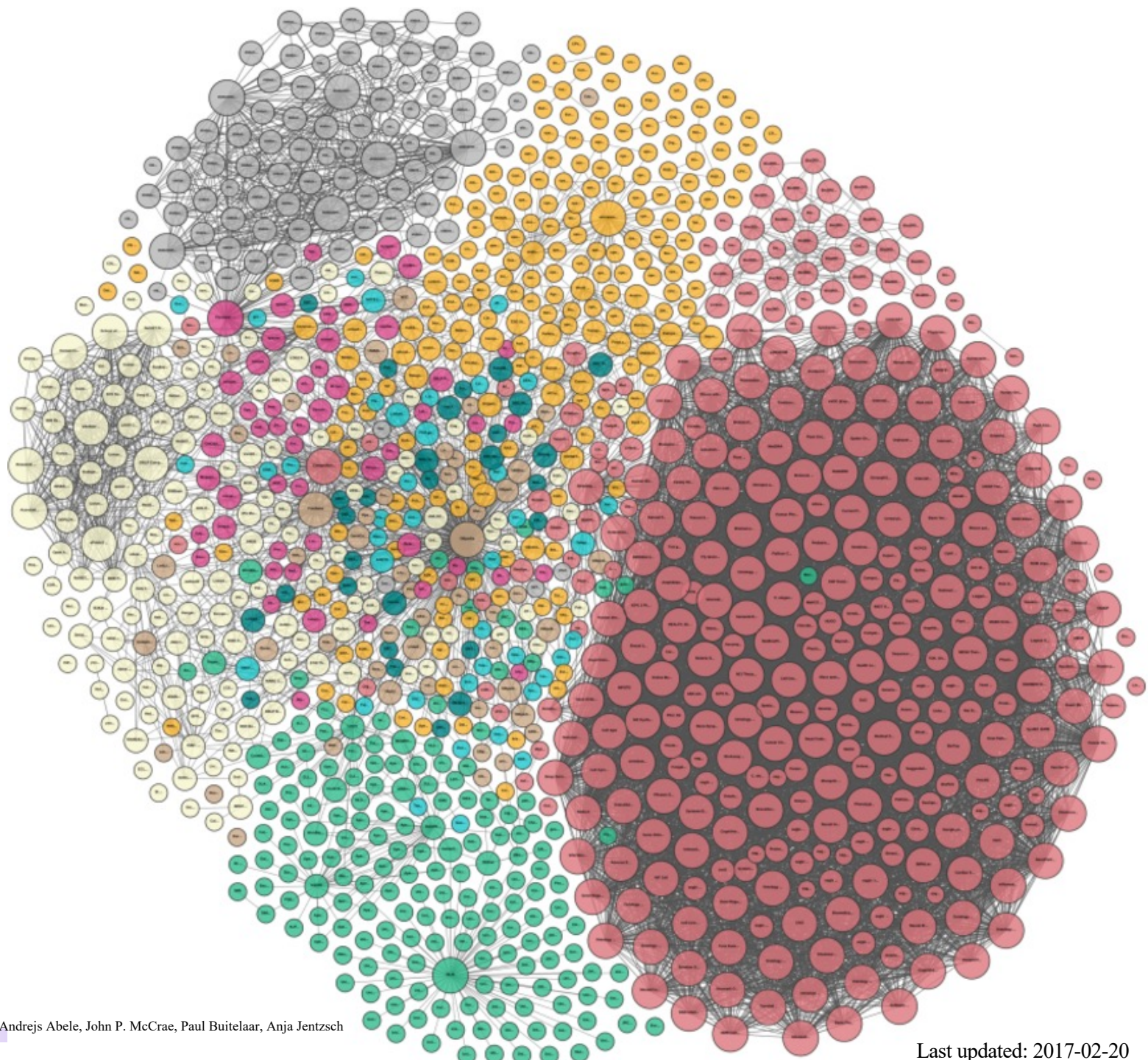


LOD Cloud (Linking Open Data)





Linking Open Data cloud diagram 2014, by Max Schmachtenberg, Christian Bizer, Anja Jentzsch and Richard Cyganiak. <http://lod-cloud.net/>



Legend

- Cross Domain
- Geography
- Government
- Life Sciences
- Linguistics
- Media
- Publications
- Social Networking
- User Generated
- Incoming Links
- Outgoing Links



東京都



<http://dbpedia.org/resource/Tokyo>

An Entity of Type: [city](#), from Named Graph: <http://dbpedia.org>, within Data Space: [dbpedia.org](#)

東京都(とうきょうと)は、日本の都道府県の一つであり、東京都区部、多摩地域、東京都島嶼部(伊豆笠原諸島を管轄しているため、日本最南端および最東端の都道府県でもある。

Property	Value
dbpedia-owl:PopulatedPlace/populationDensity	5847.0
dbpedia-owl:abstract	<ul style="list-style-type: none"> s 2010 Global Cities Index, In 2009 Tokyo was named the third Most Liveable City and the World's Most Die Präfektur Tokio (jap. 東京都, Tōkyō-to, engl. 1 der Präfekturen Japans und liegt größtenteils in der bevölkerungsreichste Präfektur Japans, aber mit Tokion prefektuuri on yksi Japanin prefektuureista miljoonalla asukkaallaan prefektuuri on Japanin väkilommaneksi pienin. 東京都(とうきょうと)は、日本の都道府県の一つで小笠原諸島を管轄する地方公共団体である。小の都道府県でもある。 東京都是日本一個地方行政區，與道、府、縣同屬豆群島、小笠原群島等地區；其中，東京都區部(即
dbpedia-owl:areaTotal	218708.00000.000000 (xsd:double)
dbpedia-owl:country	dbpedia:Japan
dbpedia-owl:leaderName	<ul style="list-style-type: none"> dbpedia:Shinjuku_Tokyo dbpedia:Shintarō_Jshihara
dbpedia-owl:leaderTitle	<ul style="list-style-type: none"> Capital Governor
dbpedia-owl:percentageOfAreaWater	1.000000 (xsd:float)
dbpedia-owl:populationDensity	5847.000000 (xsd:double)
dbpedia-owl:populationTotal	13010279 (xsd:integer)
dbpedia-owl:postalCode	JP-13
dbpedia-owl:thumbnail	http://upload.wikimedia.org/wikipedia/commons/
dbpedia-owl:wikiPageExternalLink	http://www.metro.tokyo.jp/ENGLISH/
dbpprop:aprHighC	18 (xsd:integer)
dbpprop:aprHumidity	62 (xsd:integer)
dbpprop:aprLowC	10 (xsd:integer)
dbpprop:aprMeanC	14 (xsd:integer)
dbpprop:aprPrecipitationDays	10 (xsd:integer)
dbpprop:aprPrecipitationMm	130 (xsd:integer)
dbpprop:aprSnowDays	0 (xsd:integer)
dbpprop:aprSun	164 (xsd:integer)
dbpprop:areaTotalKm	2187 (xsd:integer)
dbpprop:areaWaterPercent	1 (xsd:integer)
dbpprop:augHighC	30 (xsd:integer)
dbpprop:augHumidity	72 (xsd:integer)
dbpprop:augLowC	24 (xsd:integer)
dbpprop:augMeanC	27 (xsd:integer)
dbpprop:augPrecipitationDays	8 (xsd:integer)
dbpprop:augPrecipitationMm	155 (xsd:integer)
dbpprop:augSnowDays	0 (xsd:integer)

rdfs:type	<ul style="list-style-type: none"> owl:Thing dbpedia-owl:Place dbpedia-owl:City yago:CapitalsInAsia yago:PrefecturesOfJapan dbpedia-owl:PopulatedPlace dbpedia-owl:Settlement yago:HostCitiesOfTheSummerOlympicGames gml:Feature yago:GeoclassMeteorologicalStation yago:PopulatedCoastalPlacesInJapan yago:PopulatedPlacesEstablishedIn1457
rdfs:comment	s 2010 Global Cities Index, In 2009 Tokyo was named the world's most liveable city. 豆群島、小笠原群島等地區；其中，東京都區部(即都市定義下所指的「東京
rdfs:label	<ul style="list-style-type: none"> Tokyo Tokion prefektuuri 東京都 東京都
owl:sameAs	<ul style="list-style-type: none"> http://sws.geonames.org/1850147/ freebase:東京都 http://data.nytimes.com/56992597117380105501
geo:geometry	POINT(139.715 35.7006)
geolat	35.700554 (xsd:float)
geolong	139.714936 (xsd:float)
foaf:depiction	http://upload.wikimedia.org/wikipedia/commons/a/a6/Japan_Tokyo3.png
foaf:homepage	http://www.metro.tokyo.jp/ENGLISH/
foaf:name	<ul style="list-style-type: none"> Tokyo 東京 東京都 · Tokyo Metropolis
foaf:page	http://en.wikipedia.org/wiki/Tokyo
is dbpedia-owl:almaMater of	dbpedia:Anna_D_Little
is dbpedia-owl:billed of	<ul style="list-style-type: none"> dbpedia:Masato_Tanaka dbpedia:Sumie_Sakai dbpedia:Ayako_Hamada dbpedia:Magnum_Tokyo dbpedia:Kia_Stevens dbpedia:Akio_Sato_(wrestler) dbpedia:Yoshihiro_Tajiri dbpedia:Wataru_Inoue dbpedia:Ryan_Sakoda dbpedia:Kazuchika_Okada dbpedia:Bonzai_Kid dbpedia:Naofumi_Yamamoto
is dbpedia-owl:birthPlace of	<ul style="list-style-type: none"> dbpedia:Kiyoshi_Atsumi dbpedia:Okamoto_Kanoko dbpedia:Hideki_Yukawa dbpedia:Natsume_Sōseki dbpedia:Aya_Kamikawa dbpedia:Memoru_Oshii dbpedia:Hirokazu_Koreeda dbpedia:Seijun_Suzuki dbpedia:Empress_Teimei dbpedia:Ken_Ogata dbpedia:Arata_(actor) dbpedia:Ukyo_Katayama dbpedia:Kenji_Kawai dbpedia:Masayuki_Suo dbpedia:Machiko_Soga dbpedia:Junya_Sato



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 - Recent changes
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Toolbox

Print/export

Languages

- Acèh
- Afrikaans
- Alemannisch
- አማርኛ
- العربية
- Aragonés
- অসমীয়া
- Armãneasche
- Asturiano
- Aymar aru
- Azərbaycanca
- বাংলা
- Bahasa Banjar
- Bân-lâm-gú
- Беларуская
- Беларуская (тарашкевіц)
- Бориски

Article Discussion Read Edit View history Search

Tokyo

From Wikipedia, the free encyclopedia

Coordinates: 35° 42′ 2″ N 139° 42′ 54″ E﻿ / ﻿

For other uses, see Tokyo (disambiguation).

Tokyo (東京 *Tōkyō*[?], "Eastern Capital") – Japanese pronunciation: [toːkjoː], English pronunciation: /ˈtɔʊki.əʊ/; officially **Tokyo Metropolis** (東京都 *Tōkyō-to*[?]),^[2] is one of the 47 prefectures of Japan. It is located on the southeastern side of the main island Honshu and includes the Izu Islands and Ogasawara Islands. Tokyo Metropolis was formed in 1943 from the merger of the former Tokyo Prefecture (東京府 *Tōkyō-fu*[?]) and the city of Tokyo (東京市 *Tōkyō-shi*[?]). Tokyo is the capital of Japan, the center of the Greater Tokyo Area, and the largest metropolitan area of Japan. It is the seat of the Japanese government and the Imperial Palace, and the home of the Japanese Imperial Family.

The Tokyo Metropolitan government administers the twenty-three special wards of Tokyo (each governed as a city), which cover the area that was the city of Tokyo, as well as 39 municipalities in the western part of the prefecture and the two outlying island chains. The population of the special wards is over 8 million people, with the total population of the prefecture exceeding 13 million. The prefecture is part of the world's most populous metropolitan area with upwards of 35 million people and the world's largest metropolitan economy with a GDP of US\$1.479 trillion at purchasing power parity in 2008, ahead of New York City, which ranks second on the list.^[3]

Tokyo has been described as one of the three "command centers" for the world economy, along with New York City and London.^[4] This city is

Tokyo
東京

– Metropolis –

東京都 · Tokyo Metropolis



From top left: Nishi-Shinjuku, Tokyo Tower, Rainbow Bridge, Shibuya, National Diet Building



Seal



Symbol

are
relations
ins – Sister cities
hips

lly known as Edo, meaning name was changed to Tokyo + *kyō* (capital)) when it became sil in 1868, in line with the East including the word capital (‘京’) in :apital city.^[11] During the early ity was also called “Tōkei”, an ociation for the same Chinese enting “Tokyo”. Some surviving uments use the spelling ver, this pronunciation is now

History of Tokyo



Tokyo was originally a small fishing village named

Edo. It was first fortified by the Edo clan, in the late 12th century.

In 1457, Ōta Dōkan built Edo Castle. In 1590, Tokugawa Ieyasu made Edo his base and when he became shōgun in 1603, the town



Country	 Japan
Region	Kantō
Island	Honshu
Divisions	23 special wards, 26 cities, 1 district, & 4 subprefectures
Government	
– Type	Metropolis
– Governor	Shintarō Ishihara
– Capital	Shinjuku
Area (ranked 45th)	
– Metropolis	2,187.08 km ² (844.4 sq mi)
Population (1st)(1)	
– Metropolis	13,010,279 (April 1, 2,010)
– Density	5,847/km ² (15,143.7/sq mi)
– Metro	35,676,000
– 23 Wards	8,802,000 (2008 per Prefectural Government)
Demonym	Tokyoite
Time zone	Japan Standard Time (UTC+9)
ISO 3166-2	JP-13
Flower	Somei-Yoshino cherry blossom
Tree	Ginkgo tree (<i>Ginkgo biloba</i>)
Bird	Black-headed Gull (<i>Larus ridibundus</i>)
Website	metro.tokyo.jp (English)

Tokyo (Japan)

<http://data.nytimes.com/56992597117380105501>[About This Page](#)

geo:lat	35.6895265930799
geo:long	139.691677093506
nyt:associated_article_count	107
nyt:first_use	2004-09-19
nyt:latest_use	2010-03-03
nyt:number_of_variants	1
nyt:search_api_query	http://api.nytimes.com/svc/search/v1/article?query=+nytd_geo_facet%3A%5BTokyo+%28Japan%29%5D&rank=newest&fields=abstract,author,body,byline,classifiers_facet,column_facet,date,day_of_week_facet,des_facet,desk_facet,fee,geo_facet,lead_paragraph,material_type_facet,multimedia,nytd_byline,nytd_des_facet,nytd_geo_facet,nytd_lead_paragraph,nytd_org_facet,nytd_per_facet,nytd_section_facet,nytd_title,nytd_works_mentioned_facet,org_facet,page_facet,per_facet,publication_day,publication_month,publication_year,section_page_facet,small_image_height,small_image_url,small_image_width,source_facet,title,url,word_count,works_mentioned_facet
owl:sameAs	http://data.nytimes.com/tokyo_japan_geo
owl:sameAs	http://dbpedia.org/resource/Tokyo
owl:sameAs	http://rdf.freebase.com/ns/en.tokyo
owl:sameAs	http://sws.geonames.org/1850147/
rdf:type	http://www.w3.org/2004/02/skos/core#Concept
skos:inScheme	http://data.nytimes.com/elements/nytd_geo
skos:prefLabel - en	Tokyo (Japan)

<http://data.nytimes.com/56992597117380105501.rdf>

cc:attributionName	The New York Times Company
cc:attributionURL	http://data.nytimes.com/56992597117380105501
cc:license	http://creativecommons.org/licenses/by/3.0/us/
dc:creator	The New York Times Company
dcterms:created	2009-08-20
dcterms:modified	2010-06-22
dcterms:rightsHolder	The New York Times Company
foaf:primaryTopic	http://data.nytimes.com/56992597117380105501
nyt:mapping_strategy	http://data.nytimes.com/elements/manual

<http://sws.geonames.org/1850147/>

<sameAs>


interlinking the Web of Data

The Web of Data has many equivalent URIs.

This service helps you to find co-references between different data sets.

Enter a known URI, or use Sindice to search first.

<sameAs>



Equivalent URIs for <http://dbpedia.org/resource/TOKYO> -

1. <http://dbpedia.org/resource/Tokyo>
2. <http://dbpedia.org/resource/JP-13>
3. <http://dbpedia.org/resource/Oyata>
4. <http://dbpedia.org/resource/TOKYO>
5. <http://dbpedia.org/resource/ToKyo>
6. <http://dbpedia.org/resource/Tokei>
7. <http://dbpedia.org/resource/Tokeo>
8. <http://dbpedia.org/resource/Tokyo>
9. <http://dbpedia.org/resource/Toyko>
10. <http://dbpedia.org/resource/To-Kyo>
11. <http://dbpedia.org/resource/To-kyo>
12. http://dbpedia.org/resource/To_Kyo
13. http://dbpedia.org/resource/To_kyo
14. <http://dbpedia.org/resource/Toquio>
15. <http://dbpedia.org/resource/Toukyo>
16. <http://dbpedia.org/resource/Tohkyoh>
17. <http://dbpedia.org/resource/Tokyoto>
18. <http://dbpedia.org/resource/Tookioo>
19. <http://dbpedia.org/resource/Tookyoo>
20. <http://dbpedia.org/resource/Toukiou>
21. <http://dbpedia.org/resource/Toukyou>
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23. <http://dbpedia.org/resource/Tokyo-to>
24. <http://dbpedia.org/resource/Tonggyong>
25. <http://dbpedia.org/resource/Tongkyong>
26. <http://dbpedia.org/resource/Asia/Tokyo>
27. <http://dbpedia.org/resource/Donggyeong>
28. <http://dbpedia.org/resource/Tókió>

69. http://dbpedia.org/resource/Tokyo_Prefecture
70. http://dbpedia.org/resource/Tōkyō_Prefecture
71. <http://dbpedia.org/resource/東京都>
72. http://dbpedia.org/resource/Tokyo_Metropolitan_Prefecture
73. [http://dbpedia.org/resource/Dōngjīng_\(Japan\)](http://dbpedia.org/resource/Dōngjīng_(Japan))
74. <http://airports.dataincubator.org/regions/JP-13>
75. <http://bio2rdf.org/dbpedia:Tokyo>
76. http://data.nytimes.com/tokyo_japan_geo
77. <http://data.nytimes.com/56992597117380105501>
78. <http://linkedgeodata.org/triplify/node265018692>
79. <http://mpii.de/yago/resource/Tokyo>
80. <http://rdf.freebase.com/ns/en.tokyo>
81. <http://rdf.freebase.com/ns/guid.9202a8c04000641f80000000003b1b1>
82. <http://sw.opencyc.org/concept/Mx4rvVjkEpwpEbGdrcN5Y29ycA>
83. <http://sw.opencyc.org/concept/Mx4rvvBJwpEbGdrcN5Y29ycA>
84. <http://sw.opencyc.org/2008/06/10/concept/en/CityOfTokyoJapan>
85. <http://sw.opencyc.org/2009/04/07/concept/en/CityOfTokyoJapan>
86. http://sw.opencyc.org/2008/06/10/concept/en/Tokyo_PrefectureJapan
87. http://sw.opencyc.org/2009/04/07/concept/en/Tokyo_PrefectureJapan
88. <http://sw.opencyc.org/2008/06/10/concept/Mx4rvVjkEpwpEbGdrcN5Y29ycA>
89. <http://sw.opencyc.org/2008/06/10/concept/Mx4rvvBJwpEbGdrcN5Y29ycA>
90. <http://sw.opencyc.org/2009/04/07/concept/Mx4rvVjkEpwpEbGdrcN5Y29ycA>
91. <http://sw.opencyc.org/2009/04/07/concept/Mx4rvvBJwpEbGdrcN5Y29ycA>
92. <http://sws.geonames.org/1850147/>
93. <http://telegraphis.net/data/capitals/JP/Tokyo#Tokyo>

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- L

Schema in Linked Data

- Schema in Linked Data
 - Class in Knowledge Representation
 - Format of data
- Importance of schema sharing
 - Interoperability among different datasets
 - Generic Applications
- Schema Description Languages
 - RDFS
 - OWL
- Common Schemata
 - Dublin Core
 - FOAF (Friend-Of-A-Friend)
 - SKOS (Simple Knowledge Organization System)

Properties in RDF/RDFS

- `rdf:type` (<http://www.w3.org/1999/02/22-rdf-syntax-ns#type>)
 - Relation between class and instance
- `rdfs:subClassOf` (<http://www.w3.org/2000/01/rdf-schema#subClassOf>)
 - Generic/specific class relation
- `rdfs:subPropertyOf` (<http://www.w3.org/2000/01/rdf-schema#subPropertyOf>)
 - Generic/specific property relation

Usage of Common Vocabularies

Prefix	Namespace	Used by
dc	http://purl.org/dc/elements/1.1/	66 (31.88 %)
foaf	http://xmlns.com/foaf/0.1/	55 (26.57 %)
dcterms	http://purl.org/dc/terms/	38 (18.36 %)
skos	http://www.w3.org/2004/02/skos/core#	29 (14.01 %)
akt	http://www.aktors.org/ontology/portal#	17 (8.21 %)
geo	http://www.w3.org/2003/01/geo/wgs84_pos#	14 (6.76 %)
mo	http://purl.org/ontology/mo/	13 (6.28 %)
bibo	http://purl.org/ontology/bibo/	8 (3.86 %)
vcard	http://www.w3.org/2006/vcard/ns#	6 (2.90 %)
frbr	http://purl.org/vocab/frbr/core#	5 (2.42 %)
sioc	http://rdfs.org/sioc/ns#	4 (1.93 %)

(Simple) Dublin Core

- Idea from library community
- Manged by DCMI (Dublin Core Metadata Initiative)
- (Simple) Dublin Core
 - Just 15 elements
 - Simple is best
 - No value restriction
 - <http://purl.org/dc/elements/1.1/>
- 15 elements
 - Title
 - Creator
 - Subject
 - Description
 - Publisher
 - Contributor
 - Date
 - Type
 - Format
 - Identifier
 - Source
 - Language
 - Relation
 - Coverage
 - Rights

dc terms

- Qualified Dublin Core
 - Range and domain restriction
 - More precise vocabularies
 - ◆ Extension of simple dc

Properties	abstract , accessRights , accrualMethod , accrualPeriodicity , accrualPolicy , alternative , audience , available , bibliographicCitation , conformsTo , contributor , coverage , created , creator , date , dateAccepted , dateCopyrighted , dateSubmitted , description , educationLevel , extent , format , hasFormat , hasPart , hasVersion , identifier , instructionalMethod , isFormatOf , isPartOf , isReferencedBy , isReplacedBy , isRequiredBy , issued , isVersionOf , language , license , mediator , medium , modified , provenance , publisher , references , relation , replaces , requires , rights , rightsHolder , source , spatial , subject , tableOfContents , temporal , title , type , valid
Properties in the /elements/1.1/namespace	contributor , coverage , creator , date , description , format , identifier , language , publisher , relation , rights , source , subject , title , type
Vocabulary Encoding Schemes	DCMIType , DDC , IMT , LCC , LCSH , MESH , NLM , TGN , UDC
Syntax Encoding Schemes	Box , ISO3166 , ISO639-2 , ISO639-3 , Period , Point , RFC1766 , RFC3066 , RFC4646 , RFC5646 , URI , W3CDTF
Classes	Agent , AgentClass , BibliographicResource , FileFormat , Frequency , Jurisdiction , LicenseDocument , LinguisticSystem , Location , LocationPeriodOrJurisdiction , MediaType , MediaTypeOrExtent , MethodOfAccrual , MethodOfInstruction , PeriodOfTime , PhysicalMedium , PhysicalResource , Policy , ProvenanceStatement , RightsStatement , SizeOrDuration , Standard
DCMI Type Vocabulary	Collection , Dataset , Event , Image , InteractiveResource , MovingImage , PhysicalObject , Service , Software , Sound , StillImage , Text
Terms related to the DCMI Abstract Model	memberOf , VocabularyEncodingScheme

Dcterms	subPropertyOf	Domain	Range
contributor	dc:contributor	rdfs:Resource	dcterms:Agent
creator	dc:creator, dcterms:contributor	rdfs:Resource	dcterms:Agent
coverage	dc:coverage	rdfs:Resource	dcterms:LocationPeriodOr Jurisdiction
spatial	dc:coverage, dcterms:coverage	rdfs:Resource	dcterms:Location
Temporal	dc:coverage, dcterms:coverage	rdfs:Resource	dcterms:PeriodOfTime
Date	<u>dc:date</u>	<u>rdfs:Resource</u>	<u>rdfs:Literal</u>
Available	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
Created	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
dateAccepted	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
dateCopyrighted	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
dateSubmitted	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
Issued	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
Modified	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
Valid	dc:date, dcterms:date	rdfs:Resource	rdfs:Literal
description	dc:description	rdfs:Resource	rdfs:Resource
Abstract	dc:description, dcterms:description	rdfs:Resource	rdfs:Resource
tableOfContents	dc:description, dcterms:description	rdfs:Resource	rdfs:Resource
format	dc:format	rdfs:Resource	dcterms:MediaTypeOrExt ent
extent	dc:format, dcterms:format	rdfs:Resource	dcterms:SizeOrDuration
Medium	dc:format, dcterms:format	dcterms:PhysicalR esource	dcterms:PhysicalMedium
Identifier	dc:identifier	rdfs:Resource	rdfs:Literal
bibliographicCita tion	dc:identifier, dcterms:identifier	dcterms:Bibliogra phicResource	rdfs:Literal
Language	dc:language	rdfs:Resource	dcterms:LinguisticSystem
Publisher	dc:publisher	rdfs:Resource	dcterms:Agent
Relation	dc:relation	rdfs:Resource	rdfs:Resource
source	dc:source, dcterms:relation	rdfs:Resource	rdfs:Resource

Dcterms	subPropertyOf	Domain	Range
conformsTo	dc:relation, dcterms:relation	rdfs:Resource	dcterms:Standard
hasFormat	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
hasPart	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
hasVersion	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isFormatOf	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isPartOf	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isReferencedBy	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isReplacedBy	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isRequiredBy	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
isVersionOf	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
References	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
Replaces	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
Requires	dc:relation, dcterms:relation	rdfs:Resource	rdfs:Resource
Rights	dc:rights	rdfs:Resource	dcterms:RightsStatement
accessRights	dc:rights, dcterms:rights	rdfs:Resource	dcterms:RightsStatement
License	dc:rights, dcterms:rights	rdfs:Resource	dcterms:LicenseDocument
Subject	dc:subject	rdfs:Resource	rdfs:Resource
title	dc:title	rdfs:Resource	rdfs:Resource rdfs:Literal
alternative	dc:title, dcterms:title	rdfs:Resource	rdfs:Resource rdfs:Literal
type	dc:type	rdfs:Resource	rdfs:Class
audience		rdfs:Resource	dcterms:AgentClass
educationLevel	dcterms:audience	rdfs:Resource	dcterms:AgentClass
mediator	dcterms:audience	rdfs:Resource	dcterms:AgentClass
accrualMethod		dc:type:Collec tion	dcterms:MethodOfAccrual
accrualPeriodicity		dc:type:Collec tion	dcterms:Frequency
accrualPolicy		dc:type:Collec tion	dcterms:Policy
instructionalMethod		rdfs:Resource	dcterms:MethodOfInstructio n
provenance		rdfs:Resource	dcterms:ProvenanceState ment
rightsHolder		rdfs:Resource	dcterms:Agent



The Friend of a Friend (FOAF)

- Metadata for human relationship
 - But often used for schema for human description

Classes:

| Agent | Document | Group | Image | LabelProperty |
OnlineAccount | OnlineChatAccount |
OnlineEcommerceAccount | OnlineGamingAccount |
Organization | Person | PersonalProfileDocument | Project |

Properties:

| account | accountName | accountServiceHomepage | age |
aimChatID | based_near | birthday | currentProject |
depiction | depicts | dnaChecksum | familyName |
family_name | firstName | focus | fundedBy | geekcode |
gender | givenName | givename | holdsAccount |
homepage | icqChatID | img | interest | isPrimaryTopicOf |
jabberID | knows | lastName | logo | made | maker | mbox |
mbox_sha1sum | member | membershipClass | msnChatID |
myersBriggs | name | nick | openid | page | pastProject |
phone | plan | primaryTopic | publications |
schoolHomepage | sha1 | skypeID | status | surname | theme |
thumbnail | tipjar | title | topic | topic_interest | weblog |
workInfoHomepage | workplaceHomepage | yahooChatID |

```
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .  
@prefix foaf: <http://xmlns.com/foaf/0.1/> .  
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
```

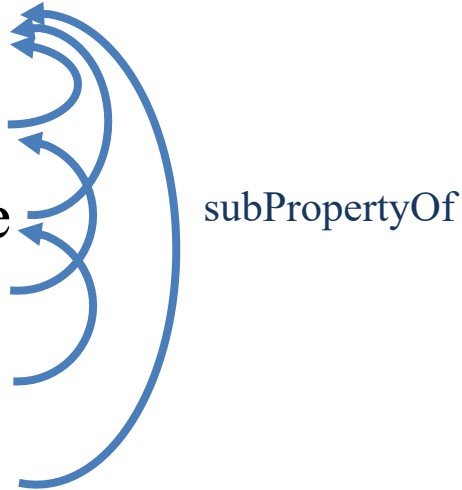
```
<#JW>  
  a foaf:Person ;  
  foaf:name "Jimmy Wales" ;  
  foaf:mbox <mailto:jwales@bomis.com> ;  
  foaf:homepage <http://www.jimmywales.com/> ;  
  foaf:nick "Jimbo" ;  
  foaf:depiction  
<http://www.jimmywales.com/aus_img_small.jpg> ;  
  foaf:interest <http://www.wikimedia.org> ;  
  foaf:knows [  
    a foaf:Person ;  
    foaf:name "Angela Beesley"  
  ] .  
<http://www.wikimedia.org>  
  rdfs:label "Wikipedia" .
```

SKOS (Simple Knowledge Organization System)

- Metadata for taxonomic knowledge
 - Hierarchy of concepts
 - ◆ Ex. Subject heading in library
 - ◆ Hierarchy is not equivalent to Class/Subclass relation
- W3C Recommendation 18 August 2009

SKOS (Simple Knowledge Organization System)

- SKOS Core (hierarchical concept structure)

- `skos:semanticRelation`
 - `skos:broaderTransitive`
 - `skos:narrowerTransitive`
 - `skos:broader`
 - `skos:narrower`
 - `skos:related`
 - `skos:preflabel`
 - `skos:altlabel`
 - `skos:hiddenlabel`
- 
- subPropertyOf

SKOS (Simple Knowledge Organization System)

- SKOS Mapping

- `skos:mappingRelation`
- `skos:closeMatch`
- `skos:exactMatch`
- `skos:broadMatch`
- `skos:narrowMatch`
- `skos:relatedMatch`



`subPropertyOf`

schema.org

- Established by Google, Yahoo, Microsoft, Yandex in 2011
- A collaborative activity to provide metadata structures on Web pages.
- Features of metadata structure by schema.org
 - Schemata for common objects
 - Community-based process to define schemata
 - ◆ 1087 schemata (May 16, 2019)
 - ◆ Layer: 1-9-194-359-311-203-10
 - Simple structure
 - Web-suitable format to represent schemata
 - ◆ Microdata
 - ◆ RDFa
 - ◆ JSON-LD

Schema.org schema hierarchy

Thing	
	Action
	CreativeWork
	Event
	Intangible
	MedicalEntity
	Organization
	Person
	Place
	Product

Thing			
	CreativeWork		
		3DModel	
		ArchiveComponent	
		Article	
			AdvertiserContentArticle
			NewsArticle
			AnalysisNewsArticle
			AskPublicNewsArticle
			BackgroundNewsArticle
			OpinionNewsArticle
			ReportageNewsArticle
			ReviewNewsArticle
			Report
			SatiricalArticle
			ScholarlyArticle
			MedicalScholarlyArticle
			SocialMediaPosting
			BlogPosting
			DiscussionForumPosting
			TechArticle
			APIReference

Layer: 1-9-194-359-311-203-10

schema.org: data type

Boolean		
	FALSE	
	TRUE	
DataType		
	Boolean	
	Date	
	DateTime	
	Number	
		Float
		Integer
	Text	
		CssSelectorType
		URL
		XPathType
	Time	
Date		
DateTime		
Number		
Text		
Time		

An example: "Thing"

Thing

Thing

The most generic type of item.

[more...]

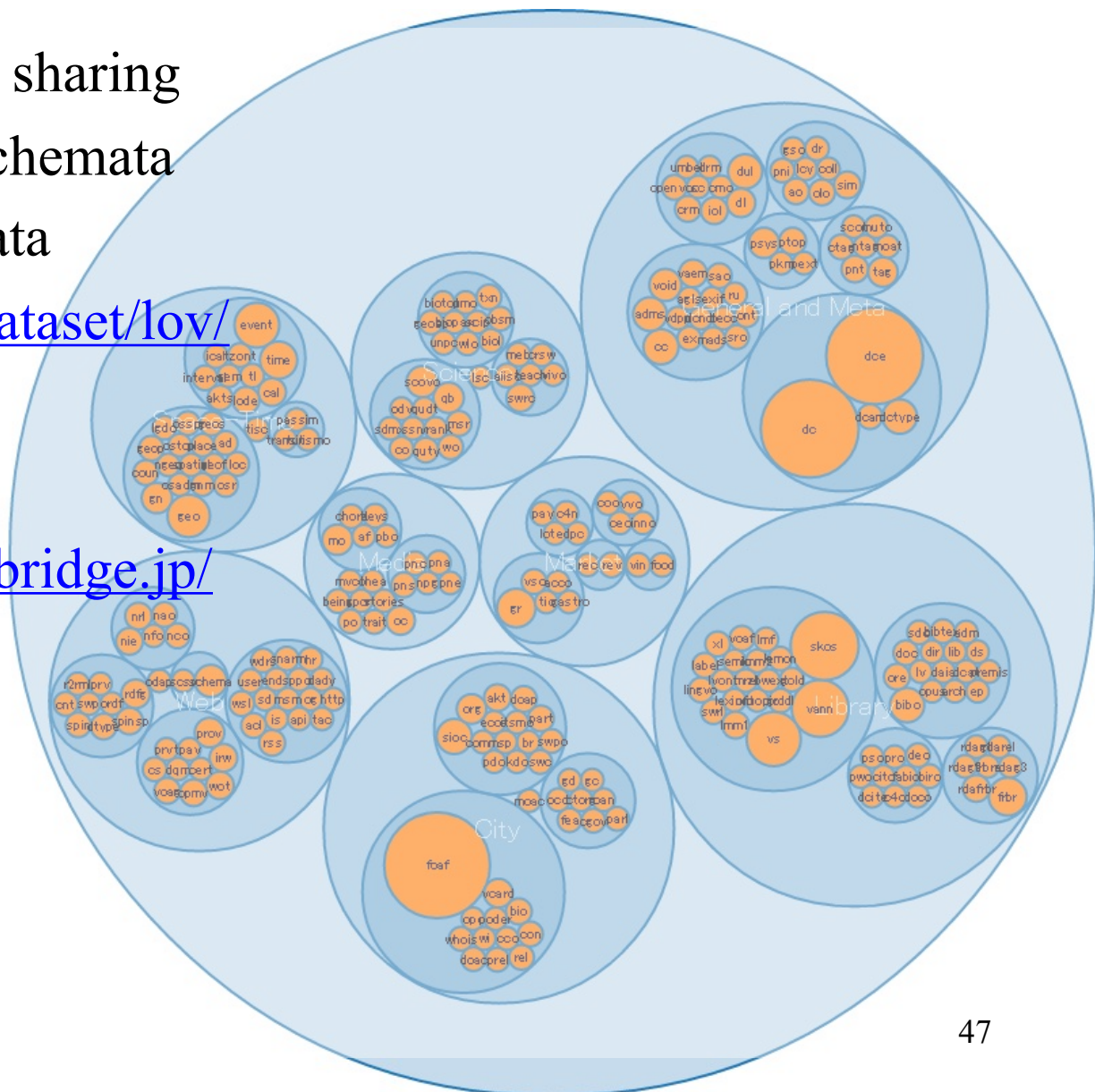
Property	Expected Type	Description
Properties from Thing		
additionalType	URL	An additional type for the item, typically used for adding more specific types from external vocabularies in microdata syntax. This is a relationship between something and a class that the thing is in. In RDFa syntax, it is better to use the native RDFa syntax – the 'typeof' attribute – for multiple types. Schema.org tools may have only weaker understanding of extra types, in particular those defined externally.
alternateName	Text	An alias for the item.
description	Text	A description of the item.
disambiguatingDescription	Text	A sub property of description. A short description of the item used to disambiguate from other, similar items. Information from other properties (in particular, name) may be necessary for the description to be useful for disambiguation.
identifier	PropertyValue or Text or URL	The identifier property represents any kind of identifier for any kind of Thing , such as ISBNs, GTIN codes, UUIDs etc. Schema.org provides dedicated properties for representing many of these, either as textual strings or as URL (URI) links. See background notes for more details.
image	ImageObject or URL	An image of the item. This can be a URL or a fully described ImageObject .
mainEntityOfPage	CreativeWork or URL	Indicates a page (or other CreativeWork) for which this thing is the main entity being described. See background notes for details. Inverse property: mainEntity .
name	Text	The name of the item.
potentialAction	Action	Indicates a potential Action, which describes an idealized action in which this thing would play an 'object' role.
sameAs	URL	URL of a reference Web page that unambiguously indicates the item's identity. E.g. the URL of the item's Wikipedia page, Wikidata entry, or official website.
subjectOf	CreativeWork or Event	A CreativeWork or Event about this Thing.. Inverse property: about .
url	URL	URL of the item.

Properties of Creative Work

Property	Expected Type
about	Thing
accessMode	Text
accessModeSufficient	Text
accessibilityAPI	Text
accessibilityControl	Text
accessibilityFeature	Text
accessibilityHazard	Text
accessibilitySummary	Text
accountablePerson	Person
aggregateRating	AggregateRating
alternativeHeadline	Text
associatedMedia	MediaObject
audience	Audience
audio	AudioObject or Clip
author	Organization or Person
award	Text
character	Person
citation	CreativeWork or Text
comment	Comment
commentCount	Integer
contentLocation	Place
contentRating	Rating or Text
contentReferenceTime	DateTime
contributor	Organization or Person
copyrightHolder	Organization or Person
copyrightYear	Number
correction	CorrectionComment or Text or URL
creator	Organization or Person
dateCreated	Date or DateTime
dateModified	Date or DateTime
datePublished	Date
discussionUrl	URL
editor	Person
educationalAlignment	AlignmentObject
educationalUse	Text
encoding	MediaObject
encodingFormat	Text or URL
exampleOfWork	CreativeWork
expires	Date
funder	Organization or Person
genre	Text or URL
hasPart	CreativeWork
headline	Text
inLanguage	Language or Text
interactionStatistic	InteractionCounter
interactivityType	Text
isAccessibleForFree	Boolean
isBasedOn	CreativeWork or Product or URL
isFamilyFriendly	Boolean
isPartOf	CreativeWork
keywords	Text
learningResourceType	Text
license	CreativeWork or URL
locationCreated	Place
mainEntity	Thing
material	Product or Text or URL
materialExtent	QuantitativeValue or Text
mentions	Thing
offers	Offer
position	Integer or Text
producer	Organization or Person
provider	Organization or Person
publication	PublicationEvent
publisher	Organization or Person
publisherImprint	Organization
publishingPrinciples	CreativeWork or URL
recordedAt	Event
releasedEvent	PublicationEvent
review	Review
schemaVersion	Text or URL
sdDatePublished	Date
sdLicense	CreativeWork or URL
sdPublisher	Organization or Person
sourceOrganization	Organization
spatial	Place
spatialCoverage	Place
sponsor	Organization or Person
temporal	DateTime or Text
temporalCoverage	DateTime or Text or URL
text	Text
thumbnailUrl	URL
timeRequired	Duration
translationOfWork	CreativeWork
translator	Organization or Person
typicalAgeRange	Text
version	Number or Text
video	Clip or VideoObject
workExample	CreativeWork
workTranslation	CreativeWork

Linked Open Vocabulary (LOV)

- Platform for schema sharing
 - Registration of schemata
 - Search of schemata
- <http://lov.okfn.org/dataset/lov/>
- MetaBridge (Japan)
 - <http://www.metabridge.jp/>



How to build Linked Data

- 1. Determine format -> Design schema
 - Search existing schemata
 - Use as is/Use some of properties/Add some properties
 - Publish the designed schema
- 2. Generate data according to the schema
 - Write one by one
 - Translate data from some other dataset
- 3. Publish data
 - ◆ Dump file
 - ◆ SPARQL Endpoint
 - ◆ dereferenceable

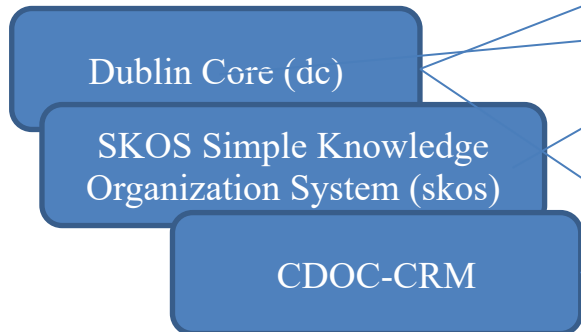
How to design schema

- 1. Determine unit of data
- 2. Determine items of a unit
- 3. Determine type of value for items:
 - Literal: String or number
 - Resource: link to other data

1. Search items in existing schemata
2. If not, design them now

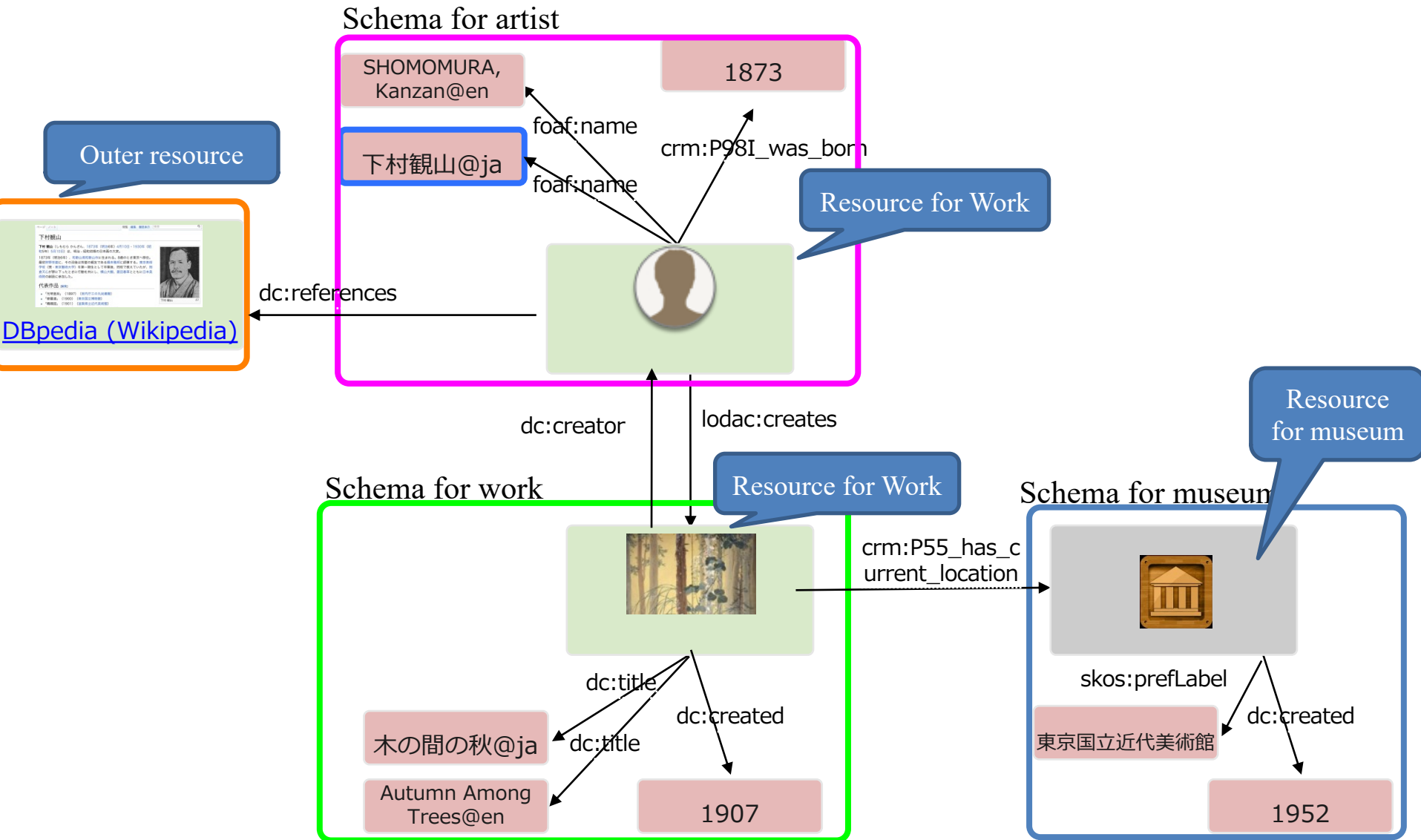
作日夕夕ルル、夕ピフll の相婦
作日夕夕ルル、夕ピフll の相婦

Title of work: Old Woman
Artist: Pablo Picasso
Created year: 1901
Genre: Oil on cardboard
Size: 67 x53.1 cm
Place: Philadelphia Museum of Art
...



lodac:Work	Property(一部項目省略)
Genre	lodac:genre
Type of Asset	lodac:culturalAssets
Creator	dc:creator / dc11:creator
Nationality	crm:P7_took_place_at
Title	dc:title / skos:prefLabel
Title in Japa..	dc:title @ja-hrkt / skos:altLabel
Title in English	dc:title @en / skos:altLabel
Depiction	crm:P62I_is_depicted_by
Insho	crm:P65_shows_visual_item
Number	crm:P57_has_number_of_parts
Collection	dc:isPartOf
Created year	dc:created
Estimated yealodac:	estimatedStartYear
Material	dc:medium / crm:P45_consists_of

Make links among resources



Generate Data

- Translate data from other existing datasets
 - From csv
 - ◆ Open refine
 - ◆ Linkdata.org
- On-the-fly translation from RDB
 - D2R

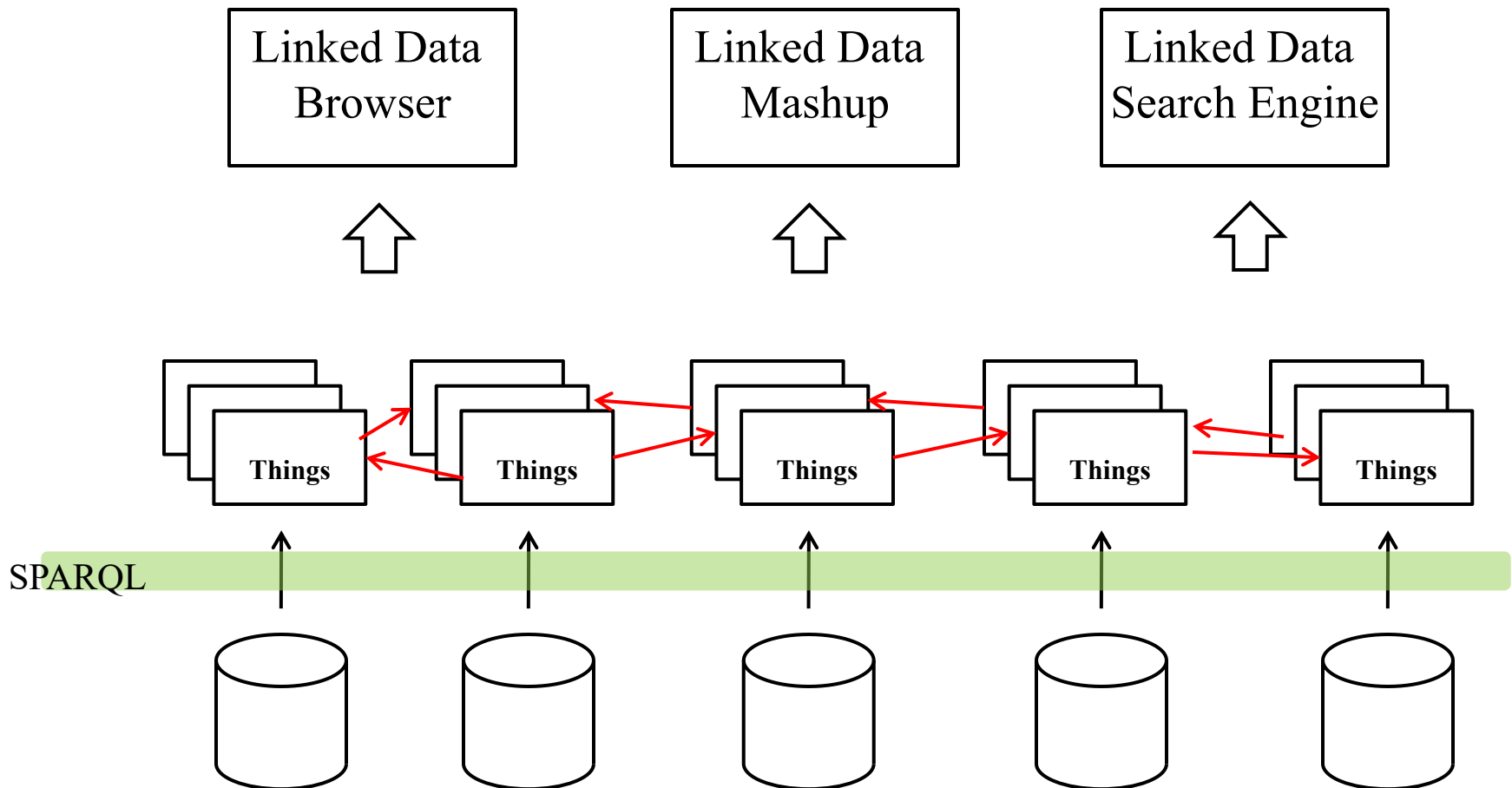
Publish Data

- Dump file
 - Make RDF data files available online
- SPARQL Endpoint
 - Flexible API
- Dereferenceable
 - Return data about URI

Linked Data

- What is Linked Data?
- The State-of-the-Art of Linked Data
 - Linking Open Data (LOD)
- How to make Linked Data
 - Data translation from existing databases
 - Design Schema
- How to use Linked Data
 - Linked Data Browser
 - Linked Data Search Engine
 - Linked Data Applications
- How to use RDF
 - RDFa
 - SPARQL

How to use Linked Data



Linked Data

- What is Linked Data?
- The State-of-the-Art of Linked Data
 - Linking Open Data (LOD)
- How to use Linked Data
 - **Linked Data Browser**
 - Linked Data Search Engine
 - Linked Data Applications
- How to use RDF
 - RDFa
 - SPARQL

Linked Data Browser

- Browse linked data just as browsing web pages
 - Show RDF data
 - Prompt links to follow
- System/Service
 - Mables
 - ◆ Display data by following links
 - Tabulator
 - ◆ Firefox plugin/online
 - ◆ Adding information in a single page

LODLIVE



Hokuriku region
منطقة هوكوريكو
Hokuriku Región...

This menu item is represented by an orange circle with a gear icon, a list icon, and a search icon. It is surrounded by a decorative ring of smaller orange circles and icons.



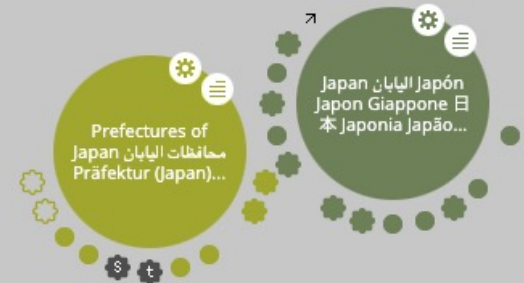
List of regions of Japan
مناطق اليابان
Regionen Japans...

This menu item is represented by a yellow circle with a gear icon, a list icon, and a search icon. It is surrounded by a decorative ring of smaller yellow circles and icons.



Tokyo طوكيو
Präfektur Tokio 東
京都 Tóquio Токио

This menu item is represented by a purple circle with a gear icon, a list icon, and a search icon. It is surrounded by a decorative ring of smaller purple circles and icons. A tooltip with navigation icons is visible above the circle.



Prefectures of Japan
محافظة اليابان
Präfektur (Japan)...

Japan اليابان Japón
Japon Giappone 日
本 Japonia Japão...

These two menu items are represented by green circles with gear, list, and search icons, surrounded by decorative rings of smaller green circles and icons. The 'Japan' item has a tooltip with navigation icons above it.






Japan Standard Time
توقيت اليابان
Huso horario...

This menu item is represented by a teal circle with a gear icon, a list icon, and a search icon. It is surrounded by a decorative ring of smaller teal circles and icons.

http://dbpedia.org/resource/Beijing_Capital_International
<http://dbpedia.org/class/yago/Airport102692232>

Beijing Capital International Airport

Airport

- type**
- Thing 
 - <http://dbpedia.org/ontology/Thing>
 - Feature 
 - <http://dbpedia.org/ontology/Feature>
 - <http://dbpedia.org/ontology/Thing>
 - <http://dbpedia.org/ontology/Thing>
 - Airport 
 - <http://dbpedia.org/class/yago/Airport102692232>
 - <http://dbpedia.org/class/yago/Airport102692232>
 - <http://dbpedia.org/class/yago/Airport102692232>






- name**
- Beijing Capital International Airport
 - www.bcia.com.cn


- Homepage**
- <http://www.bcia.com.cn>

- seeAlso**
- <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>
 - <http://dbpedia.org/data/yago/Airport102692232>












- page**
- http://en.wikipedia.org/wiki/Beijing_Capital_International_Airport

- label**
- 北京首都国际机场
 - Airport International

- seeAlso**
- http://dbpedia.org/data/yago/Air_Base 
 - http://dbpedia.org/data/yago/Airport%2C_Viqra 
 - http://dbpedia.org/data/yago/orlu_Airport 
 - http://dbpedia.org/data/yago/%C3%85re_%C3%96stersund_Airport 
 - http://dbpedia.org/data/yago/%C3%84ngelholm-Helsingborg_Airport 
 - <http://dbpedia.org/data/yago/%C3%84rna> 
 - http://dbpedia.org/data/yago/%27Eua_Airport 
 - http://dbpedia.org/data/yago/%C3%87ar%C5%9Famba_Airport 
 - http://dbpedia.org/data/yago/%C3%87ardak_Airport 
 - http://dbpedia.org/data/yago/%C3%87anakkale_Airport 

- label**
- airport 
 - aerodrome 
 - airdrome 
 - drome 

- subClassOf**
- Airfield 

- is subClassOf of**
- <http://dbpedia.org/class/yago/AirportsInEstonia> 
 - <http://dbpedia.org/class/yago/AirportsInSweden> 
 - <http://dbpedia.org/class/yago/AirportsInSicily> 
 - <http://dbpedia.org/class/yago/AirportsInBeijing> 
 - <http://dbpedia.org/class/yago/AirportsInHongKong> 
 - <http://dbpedia.org/class/yago/ArtificialIslandAirports> 
 - <http://dbpedia.org/class/yago/AirportsInItaly> 
 - <http://dbpedia.org/class/yago/AirportsInDelaware> 
 - <http://dbpedia.org/class/yago/AirportsInSouthAfrica> 
 - <http://dbpedia.org/class/yago/AirportsInTurkey> 
 - <http://dbpedia.org/class/yago/AirportsInCalifornia> 

Tabulator

<http://dig.csail.mit.edu/2005/ajar/release/tabulator/0.7/tab.html>

URI: <http://www.w3.org>

URI: <http://www.w3.org>

URI: <http://www.w3.org>

Add to Outliner [Help](#)

This is release 0.8 of the Tabulator Project. The [live development trunk](#) is also available.

This is release 0.8 of the Tabulator Project. The [live development trunk](#) is also available.

- ▶ [The tabulator project](#) ×
- ▶ [Decentralised Information Group](#) ×

World Wide Web Consortium

title W3C (large: includes all specs and groups)

type ▶ [SocialEntity](#)

label W3C

seeAlso ▶ [W3C Groups](#)

▶ [W3C Standards](#)

part ▶ [Interaction](#)

▶ [Technology](#)

▶ [Ubiquitous](#)

▶ [Web Accessibility](#)

▶ [Incubator](#)


homepage ▶ <http://www.w3.org/>

logo 

name World Wide Web Consortium

is primary topic of ▶ [World Wide Web](#)

▶ [W3C groups \(Member-only\)](#)

▶ [W3C roadmap data \(old\)](#) 

▶ [Life Sciences demo data: G](#)

- ▶ [The tabulator project](#) ×
- ▶ [Decentralised Information Group](#) ×

World Wide Web Consortium

title W3C (large: includes all specs and groups)

type ▶ [SocialEntity](#)

request

type

comment

isDefinedBy

label

subClassOf

disjointWith

term status

is mentioned by

is used by

e.g.

is range class

is disjoint

label W3C

seeAlso ▶ [W3C](#)

▶ [W3C](#)

part ▶ [Interaction](#)

▶ [Technology](#)

▶ [Ubiquitous](#)

▶ [Web Accessibility](#)

▶ [Incubator](#)

- ▶ [The tabulator project](#) ×

- ▶ [Decentralised Information Group](#) ×

World Wide Web Consortium

title W3C (large: includes all specs and groups)

type ▶ [SocialEntity](#)


Organization

request ▶ Request for <http://xmlns.com/foaf/0.1/Organization>

type ▶ [Class](#)

▶ [Class](#)

comment An organization.

isDefinedBy ▶ [Friend of a Friend \(FOAF\) vocabulary](#) 

label Organization

Agent

request ▶ Request for <http://xmlns.com/foaf/0.1/Agent>


type ▶ [Class](#)

▶ [Class](#)

comment An agent (eg. person, group, software or physical object).

label Agent

subClassOf ▶ <http://xmlns.com/wordnet/1.6/Agent-3> 

disjointWith ▶ [Document](#) 

term status unstable

is used by ▶ [This Session](#)

is domain of ▶ [AIM chat ID](#) 

▶ [birthday](#) 

▶ [gender](#) 

▶ [holds account](#) 

▶ [ICQ chat ID](#) 

▶ [jabber ID](#) 

▶ [made](#) 

Find all

[Table](#) [Map](#) [Calendar](#)

Select queries to display:

Linked Data

- What is Linked Data?
- The State-of-the-Art of Linked Data
 - Linking Open Data (LOD)
- How to use Linked Data
 - Linked Data Browser
 - **Linked Data Search Engine**
 - Linked Data Applications
- How to use RDF
 - RDFa
 - SPARQL

Linked Data Search Engine

- Google search with schema.org
- Google Dataset Search

Linked Data

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 - SPARQL

How to use Linked Data

- Semantic Data Mash-up Applications
 - SemaPlorer
 - ◆ <http://btc.isweb.uni-koblenz.de/>
 - Dbpedia Mobile
 - ◆ <http://wiki.dbpedia.org/DBpediaMobile>
 - Bio2RDF
 - ◆ <http://bio2rdf.org/>



DBpedia Mobile



Review of Brandenburg Gate, by tom

type	http://purl.org/stuff/rev#Review ★ ★
label	Review of Brandenburg Gate, by tom ★
http://purl.org/stuff/rev#text	The Brandenburg Gate makes a pretty impressive and imposing monument as you approach down Unter den Linden. For many people the gate will be imprinted on the brain from images of the day the Berlin wall fell, and the history bound up in this place is tangible. Just being able to walk through it freely is a fairly mindblowing experience. Not to be missed if you're in Berlin. ★ ★
http://purl.org/stuff/rev#reviewer	http://revvu.com/people/tom ★ ★
http://purl.org/stuff/rev#rating	★ ★ ★ ★ ★ ★ ★ ★
http://purl.org/stuff/rev#minRating	1 ★ ★
http://purl.org/stuff/rev#maxRating	
http://purl.org/stuff/rev#createdOn	2008-08-18T08:29:41-07:00 ★ ★
primary topic	Brandenburg Gate (also at dbpedia.org) ★
is has Review of	Brandenburg Gate (also at revvu.com) ★ ★ ★
is made of	http://revvu.com/people/tom ★

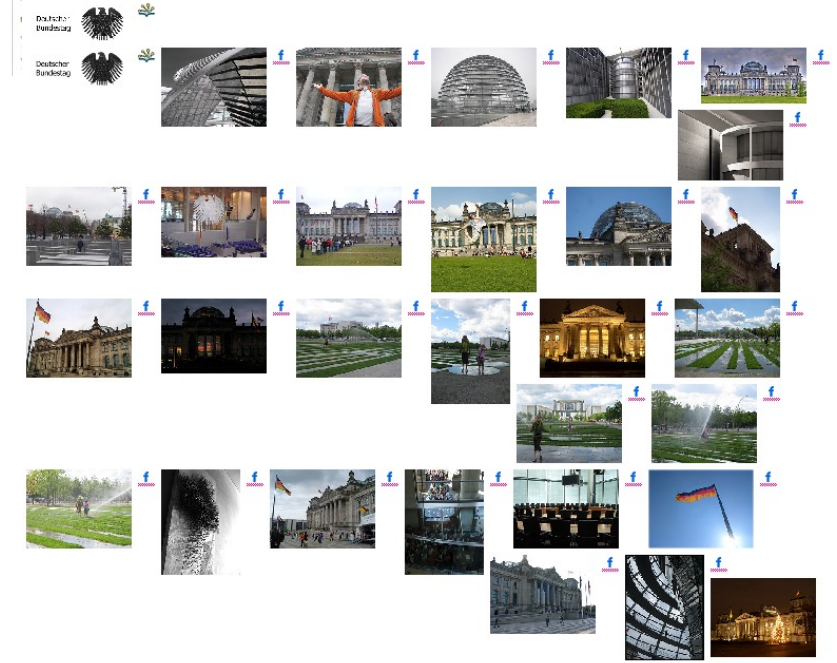
Sources

- http://dbpedia.org/data/Brandenburg_Gate redirect (303), retrieved Sat, 18 Oct 2008 17:41:46 GMT (clear)
- <http://api.sindice.com/v2/search?page=1&q=http%3A%2F%2Frevvu.com%2Freviews%...> success (200), retrieved Tue, 18 Nov 2008 09:17:59 GMT (clear)
- <http://revvu.com/reviews/0195bf4c6e69897c8156822281bef8a497c52e30/about/trf> success (200), retrieved Tue, 18 Nov 2008 09:10:10 GMT (clear)



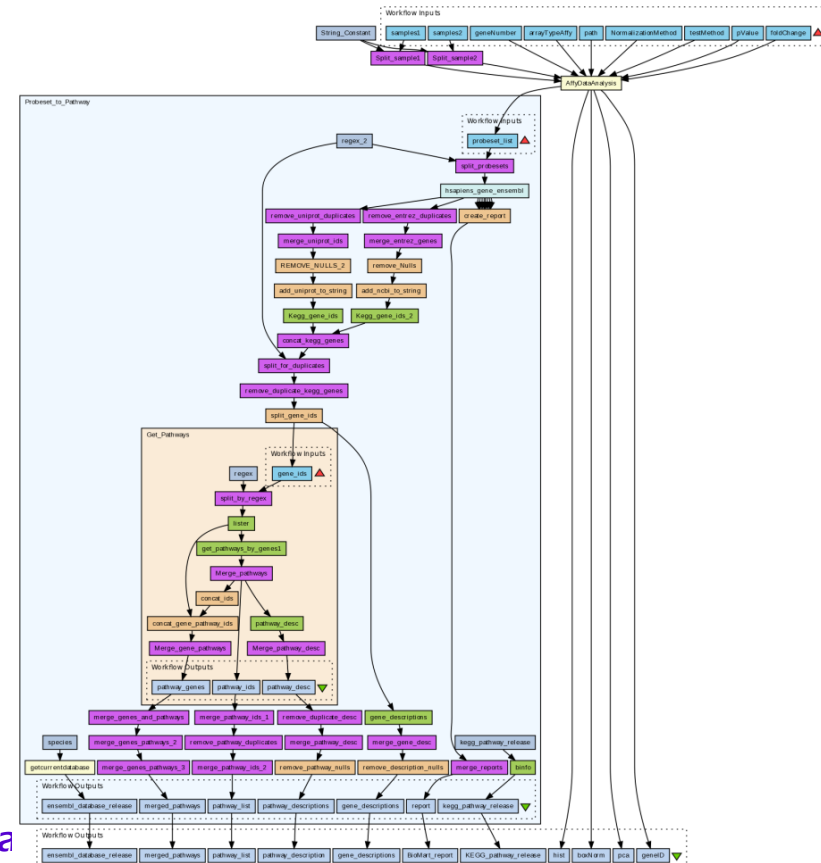
Brandenburg Gate

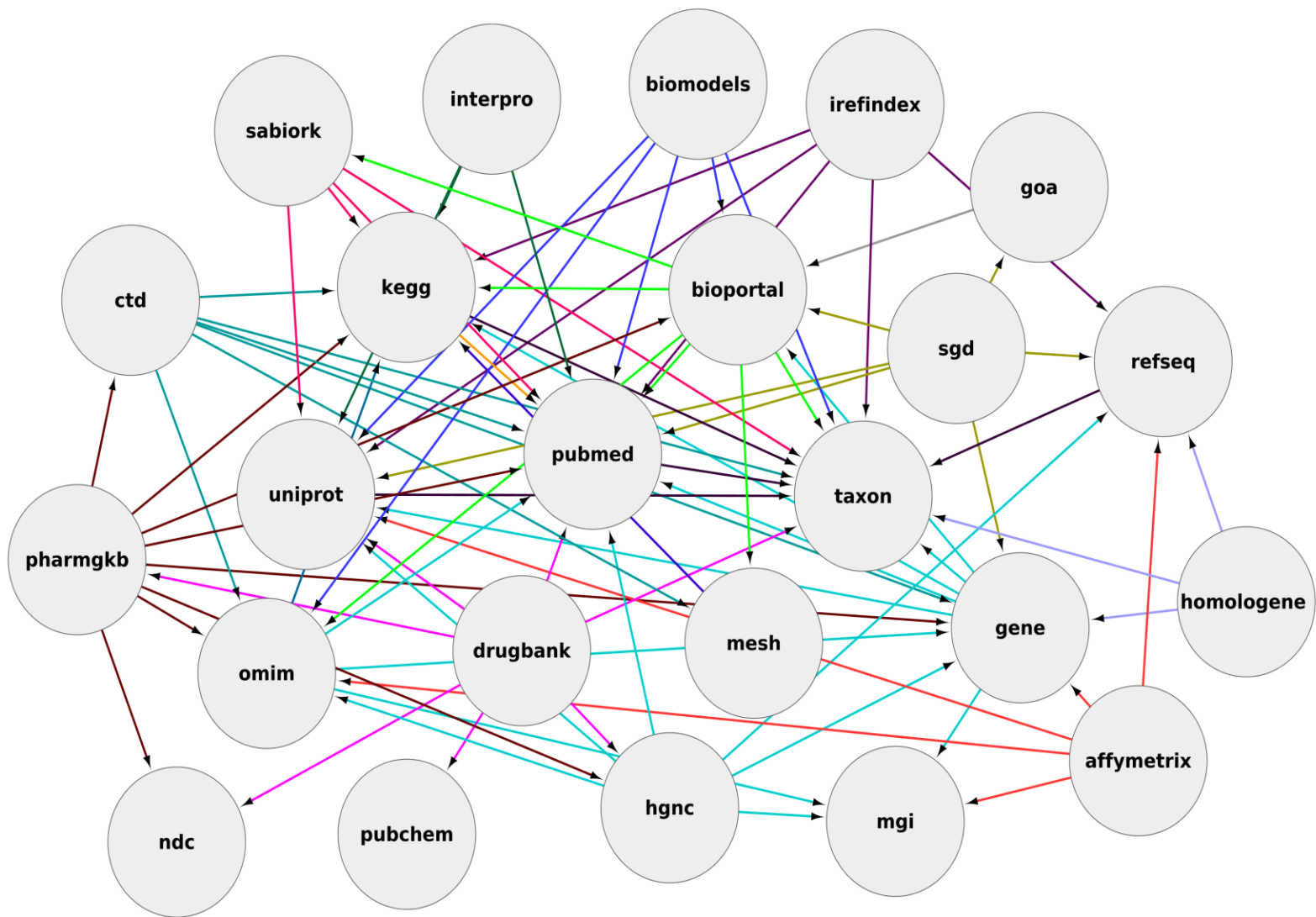
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seeAlso	DBpedia Mobile User Graph for Christian Becker 🔍 http://dbpedia.org/data/Brandenburg_Gate 🔍 http://revvu.com/tags/berlin/about/trf 🔍 Brandenburg Gate ★ ★ http://en.wikipedia.org/wiki/Brandenburg_Gate ★ ★ ★
is seeAlso of	Brandenburg Gate ★ ★
http://www.georss.org/georss/point	52.5162722222 13.3777222222 ★ ★ ★
label	Porte de Brandebourg ★ ★ ★ 勃兰登堡门 ★ ★ ★ Brandenburger Tor ★ ★ ★ ブランデンブルク門 ★ ★ ★ 勃蘭登堡門 ★ ★ ★



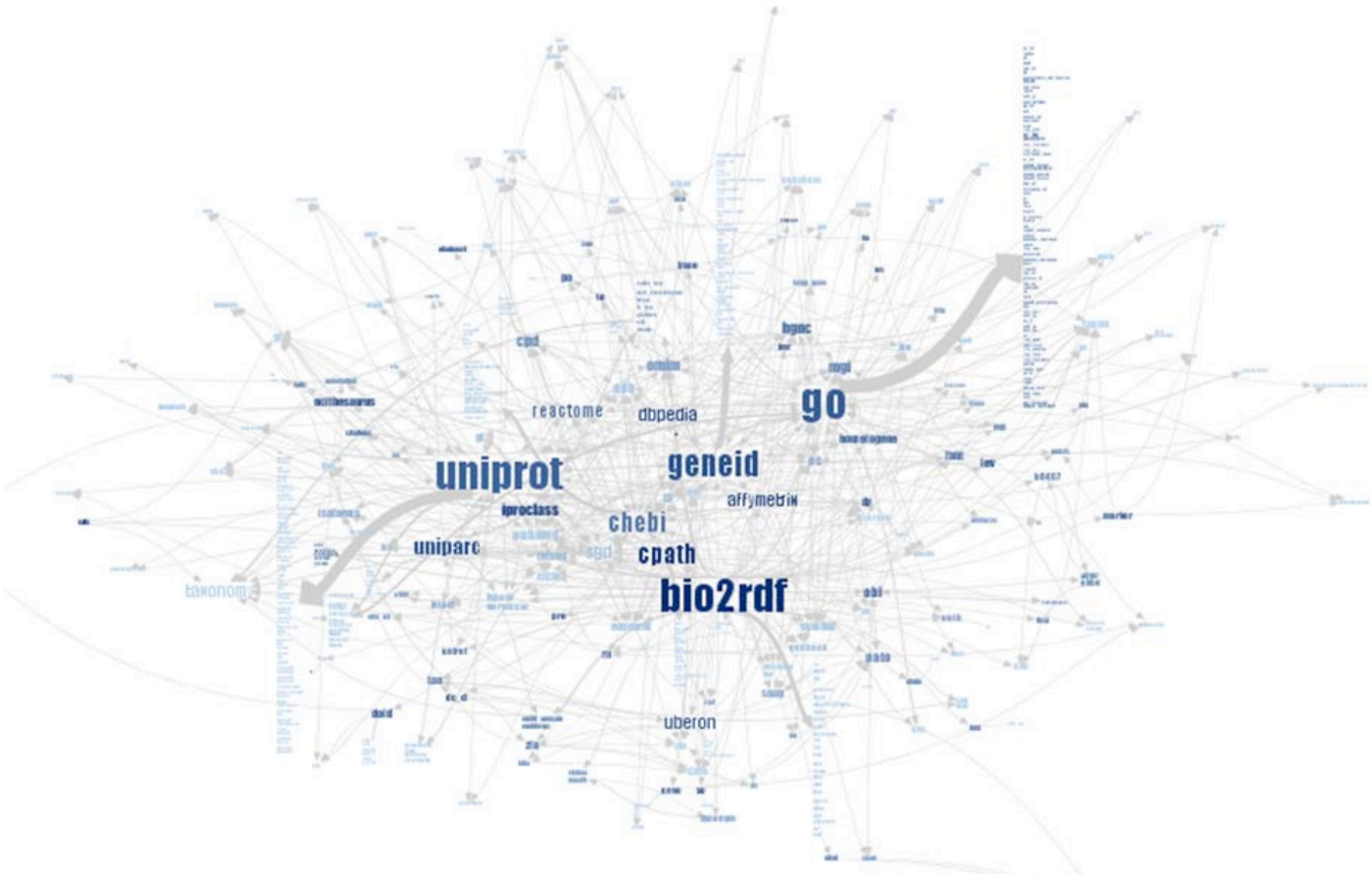
Bio2RDF

- Bio2RDF is an open source framework to produce and provide biological linked data that uses simple conventions on the emerging semantic web
- Bio2RDF reduces the time and effort involved in data integration so that you can get to doing science
- 19 datasets;
1,010,758,291 triples





Bio2RDF



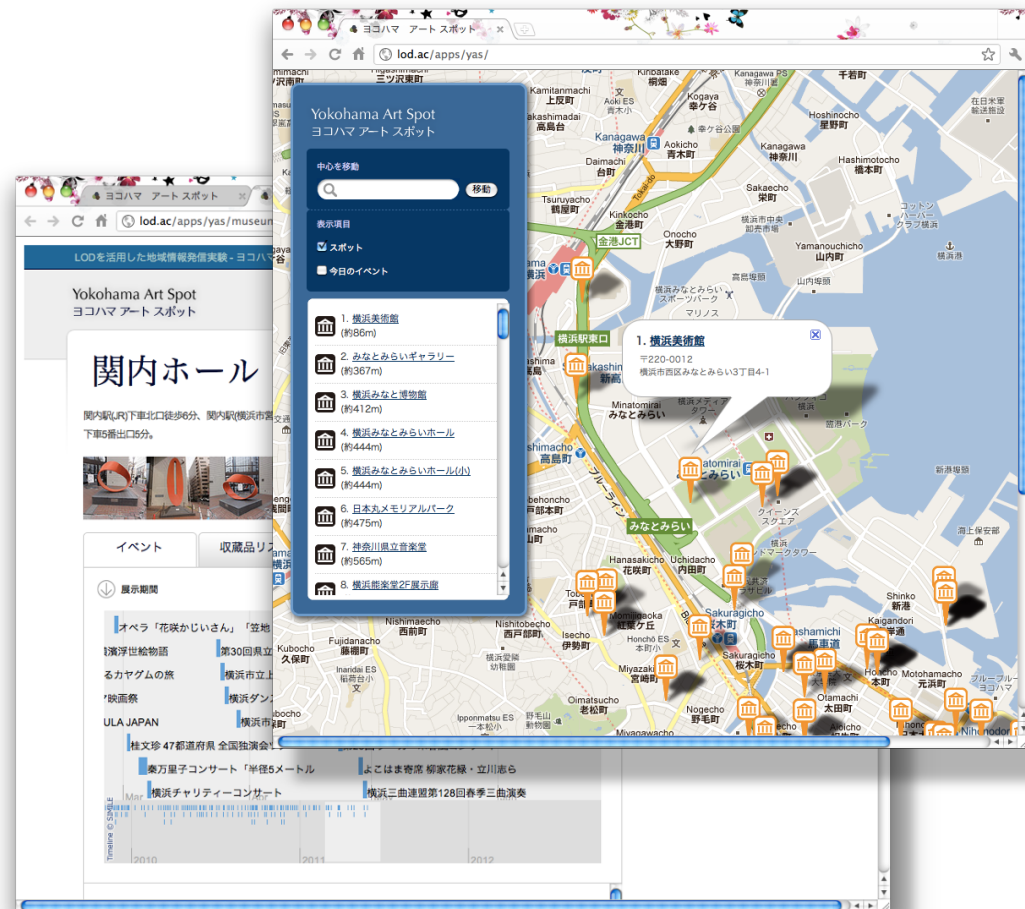
Use

Yokohama Art Spot

LODAC Museum × Yokohama Art LOD × PinQA

- Application using museum and local data
- Data related to art in Yokohama
 - ◆ Collections
 - ◆ Events
 - ◆ Q&A

<http://lod.ac/apps/yas/>



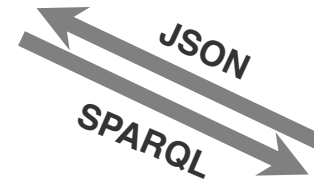
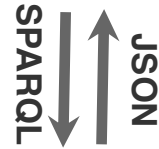
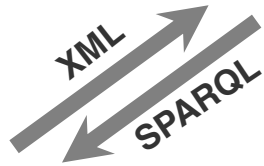
Use

System Architecture

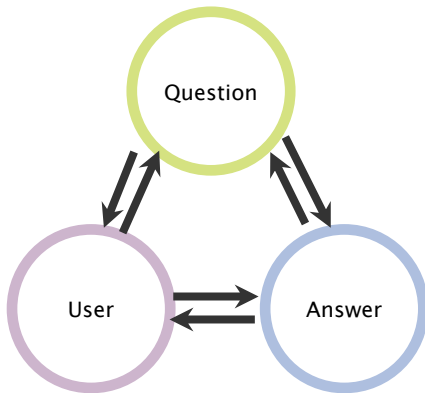


- ▶ Python + SPARQLWrapper
- ▶ Geolocation

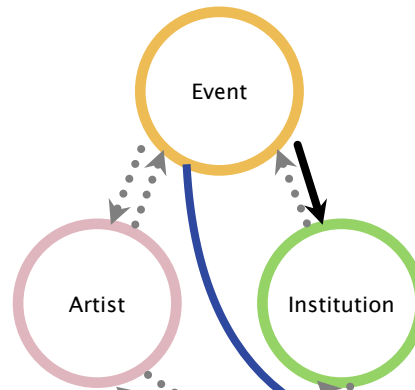
Yokohama Art Spot



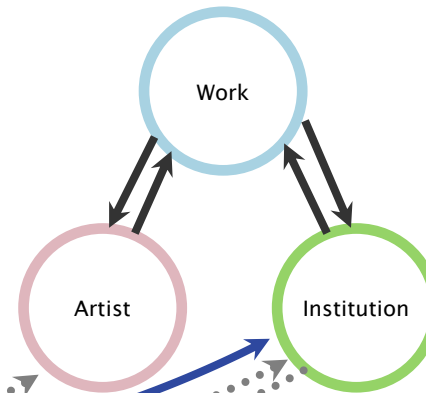
PinQA



Yokohama Art LOD



LODAC Museum



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Summary

- Data and Web
 - Great Potential!
- Linked Data - *Exploit the power of Web* –
 - Simple Structure: URI and RDF
 - Truly distributed data management
 - Easy to link to each other