

COMP6051/52

Social Networking Technologies

Web evolution and the Social

Semantic Web

Dr. Thanassis Tiropanis - tt2@ecs

Plan for sessions with TT

- Evolution of the Web as a network of networks
 - From the Web of documents to the Web of data and online social networks (OSN)
- The significance of OSN for business
- Analysis of OSN
 - As evolving networks
(Graph Theory)
 - As means for the spread of behaviour
(Game Theory)
(Network Dynamics)

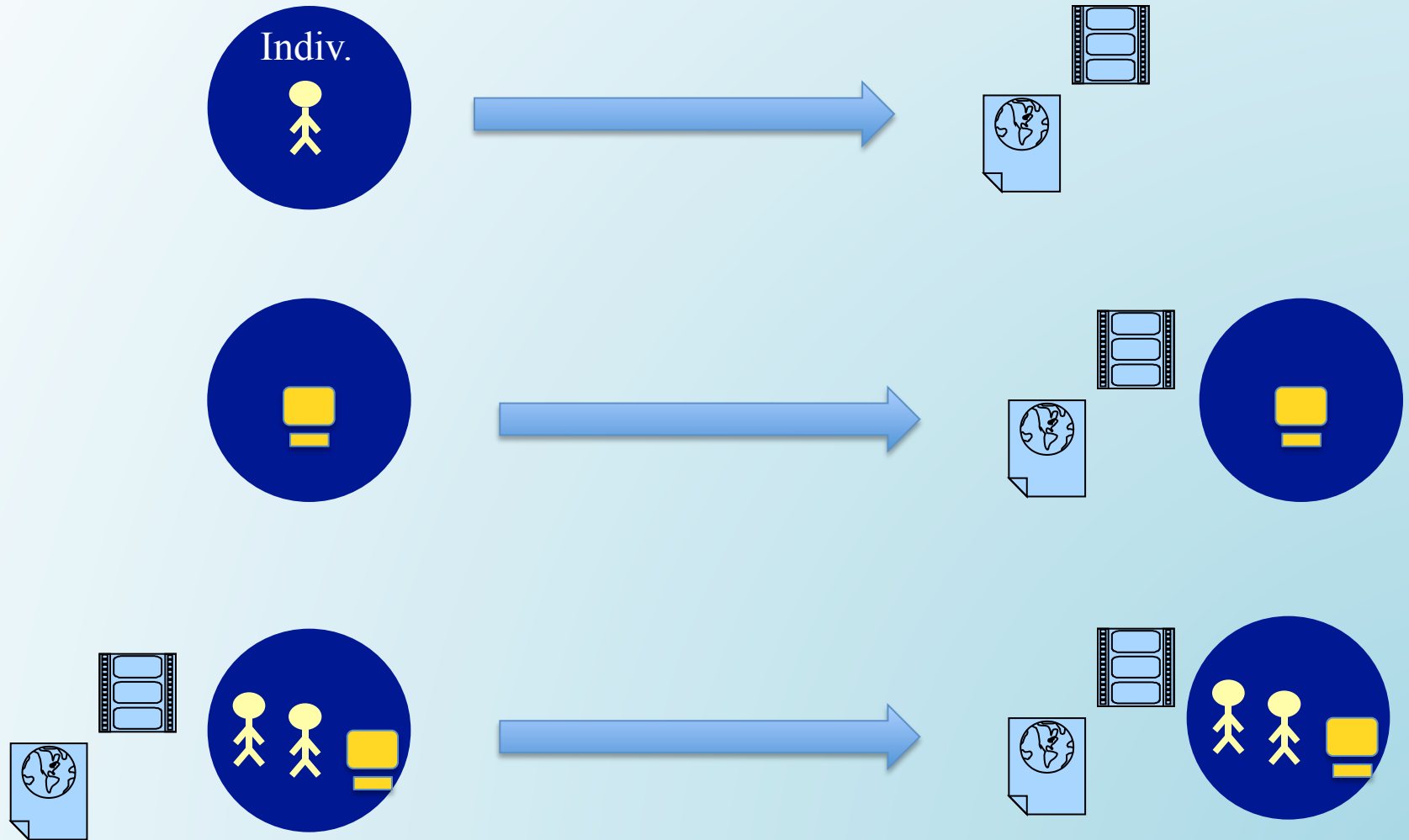
The narrative

- Web Evolution
- Semantic Web Technologies
 - The Web of data and the semantic Web are the next stage of Web evolution
 - What are the affordances of linked data/semantic Web technologies
- The Social Semantic Web
 - What is the social semantic Web vision?
 - How do online social networks relate to those affordances

The narrative

Web Evolution

Communication on the Web



Machine Processing – Interoperability – Integration?

Web Evolution – Stage 1

- The Web of Documents
 - Web 1.0; Read-only Web
- The Web experienced as a technological artefact
 - A network where the nodes are documents and the edges are links between documents
 - Information on the Web to be consumed by people
 - Search engines enabled users to discover documents
 - People's involvement as publishers of websites
 - E-commerce services

Web Evolution – Stage 2

- The Web of People
 - Web 2.0; Read-write Web
- The Web experienced as an artefact that includes people publishing and communicating on a large scale
 - A network where the nodes are people, documents, software and the edges are links between them
 - Information on the Web to be consumed by people or software
 - Recommender engines (and search engines) enabled people to discover people, documents and services
 - People contributing to the Web evolution en masse
 - Complex business models and advanced services

Web Evolution – Stage 3

- The Web of Data and Social Networks
 - Web 3.0; The Social Semantic Web
- The Web experienced as an artefact that includes people and documents and data linked together in social networks
 - A network where the nodes are people, datasets, documents, services and the edges are links between them
 - Structured data contributed and consumed by people and software
 - Enhanced discovery powered by online social networks
 - People contributing to the Web evolution by contributing datasets and applications via crowdsourcing
 - Social Machines where computers intermediate and people perform the creative tasks
 - The Web is increasingly becoming the reflection of human activity and innovative applications take advantage of online social networks and data

The narrative

Semantic Web Technologies

semantic web = web of (linked) data
= web 3.0?



Proposal for a Semantic Web

- Let's give "meaning" to the content on the Web and to all information added to it



- ... in this way, machines will be able to process Web resources on our behalf

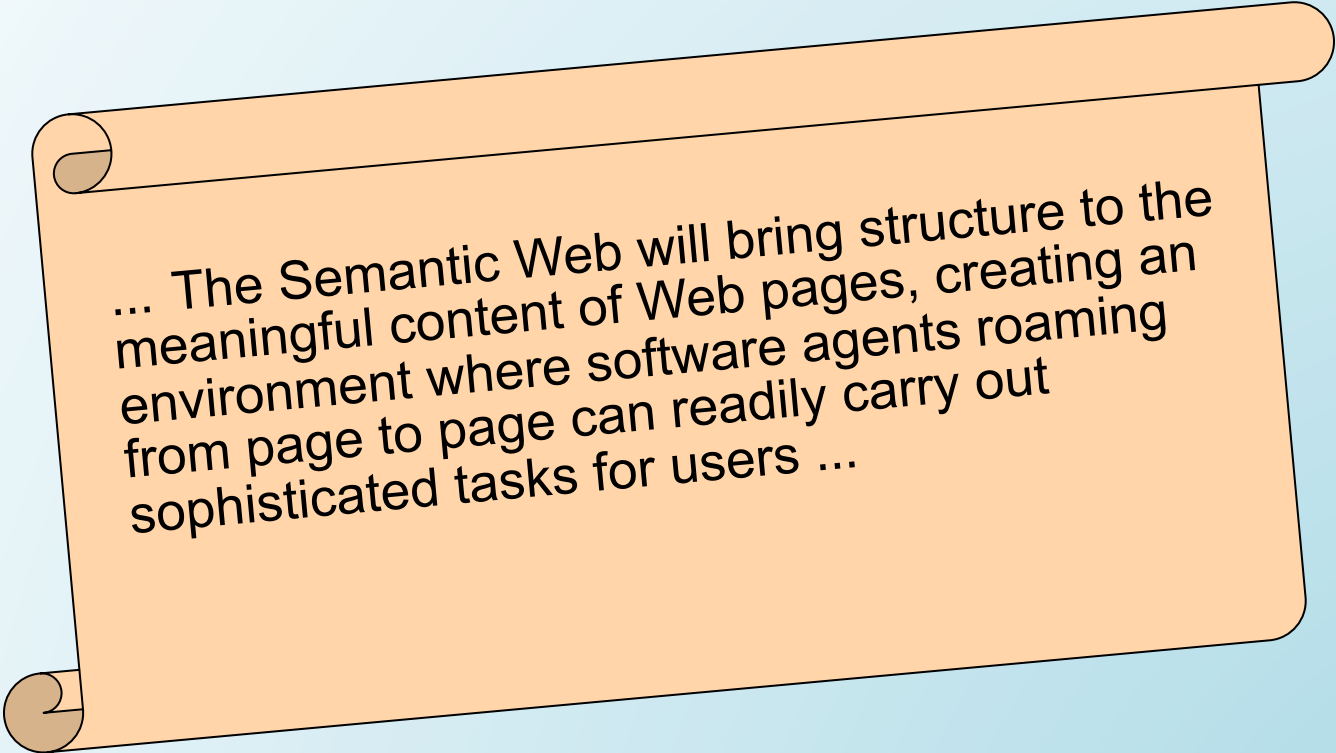


- ... and we can make existing services more "intelligent" or provide new services that can improve our everyday lives

From "*Information*" to "*Knowledge*"



Semantic Web Promise



... The Semantic Web will bring structure to the meaningful content of Web pages, creating an environment where software agents roaming from page to page can readily carry out sophisticated tasks for users ...

Semantic Web Vision

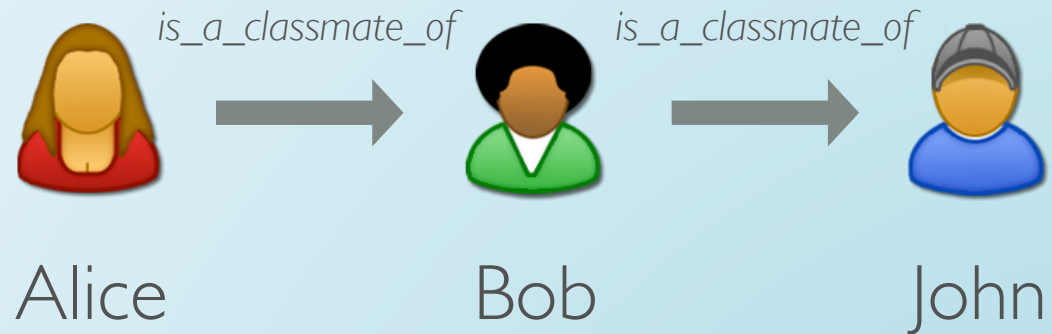
... The Semantic Web is a vision: the idea of having data on the Web defined and linked in such a way that it can be used by machines not just for display purposes, but for automation, integration and reuse of data across various applications ...

From the Semantic Web activity statement: <http://www.w3.org/2001/sw/Activity>

Ontologies & Knowledge Modelling

Ontology

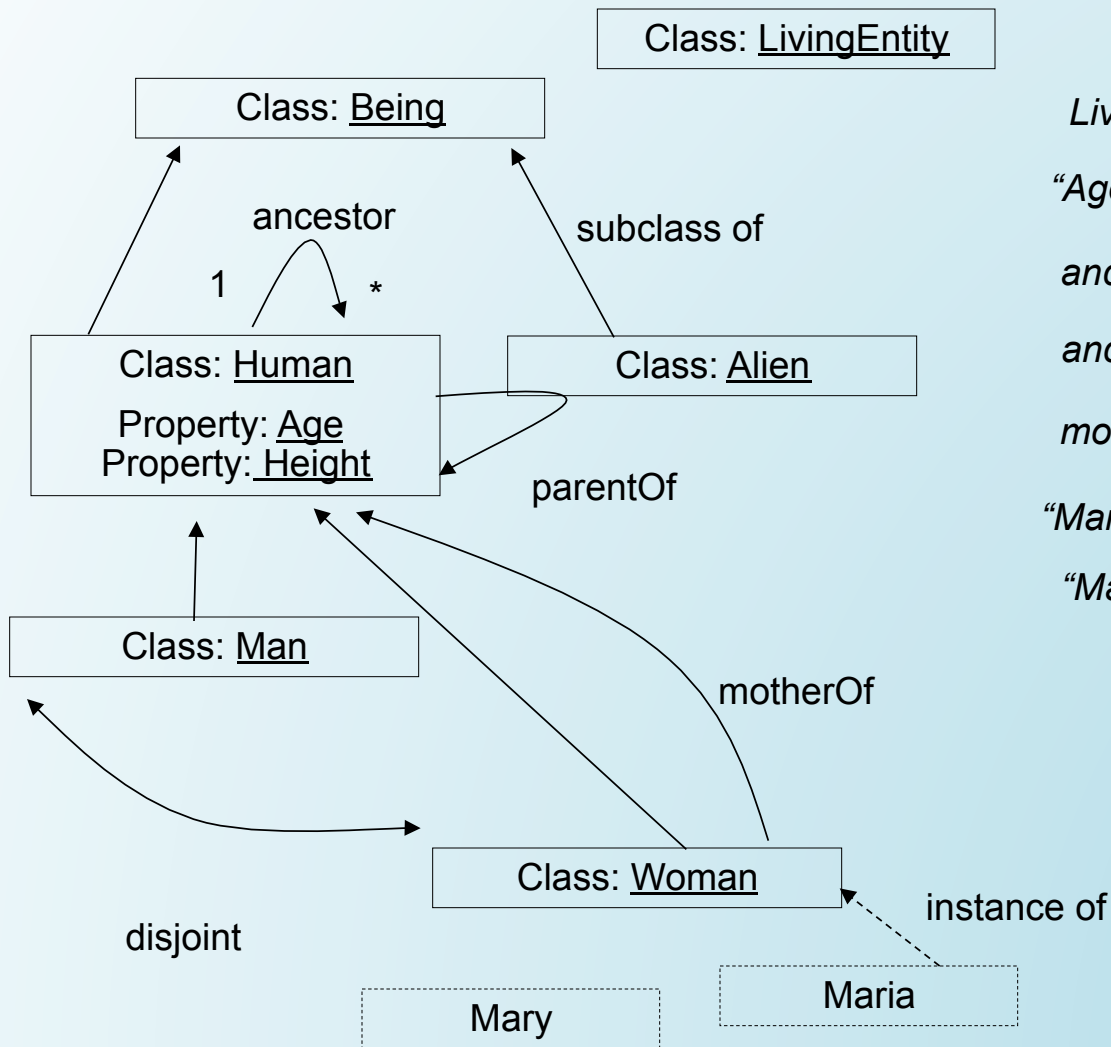
- Concepts
 - Student
 - Class
- Relationships
 - *attends*
 - *is_a_classmate_of*



Annotation

- Instances
 - Student: Alice, Bob, John
- Class: French

Ontology Example



LivingEntity is equivalent to Being

"Age" is unique property

ancestor inverse of descendant

ancestor is transitive property

motherOf is subproperty of parentOf

"Maria" Age 25

"Maria" is equivalent to "Mary"

RDF Statements

- Describing properties of Web resources using **statements**:

<subject> <predicate> <object>

or **<object> = <predicate>(<subject>)**

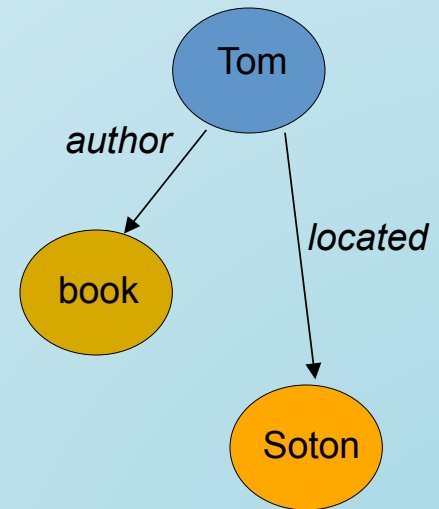
e.g.: **<Tom> <author> <book>**

- **<subject>**: resource
- **<predicate>**: resource property
- **<object>**: value of resource property

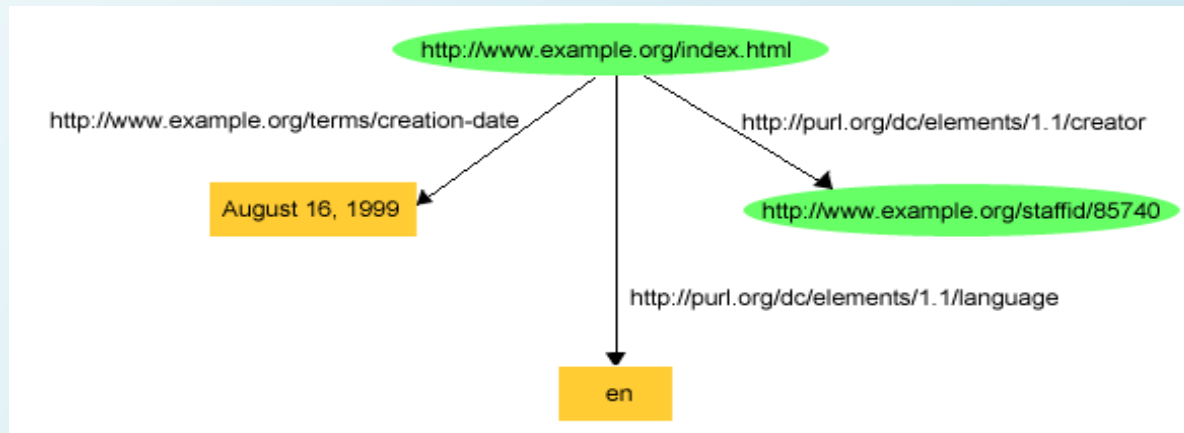
- URI use for: subject, predicate, object

But they can be abstract concepts

- No simple types
- XML use
- Further information: <http://www.w3.org/RDF/>



RDF Example



```
1. <?xml version="1.0"?>
2.   <rdf:RDF xmlns:rdf=http://www.w3.org/1999/02/22-rdf-syntax-ns#
3.     xmlns:dc=http://purl.org/dc/elements/1.1/
4.     xmlns:exterm="http://www.example.org/terms/">
5.     <rdf:Description rdf:about="http://www.example.org/index.html">
6.       <exterm:creation-date>August 16, 1999</exterm:creation-date>
7.     </rdf:Description>
8.     <rdf:Description rdf:about="http://www.example.org/index.html">
9.       <dc:language>en</dc:language>
10.    </rdf:Description>
11.  </rdf:RDF>
```

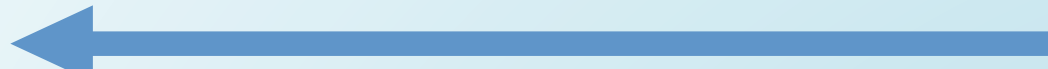
RDF and SPARQL

http://id.ecs.soton.ac.uk/interest/linked_data

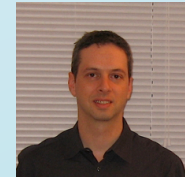
<http://id.ecs.soton.ac.uk/person/11208>



linked data

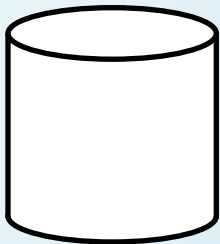


<http://rdf.ecs.soton.ac.uk/ontology/ecs#hasInterest>

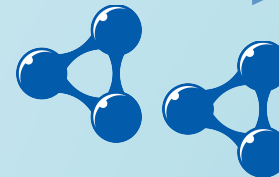
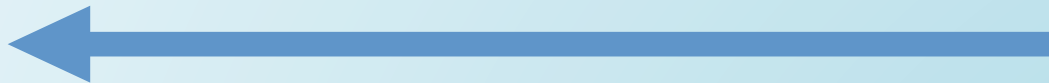


Thanassis

SPARQL Query



SPARQL Endpoint



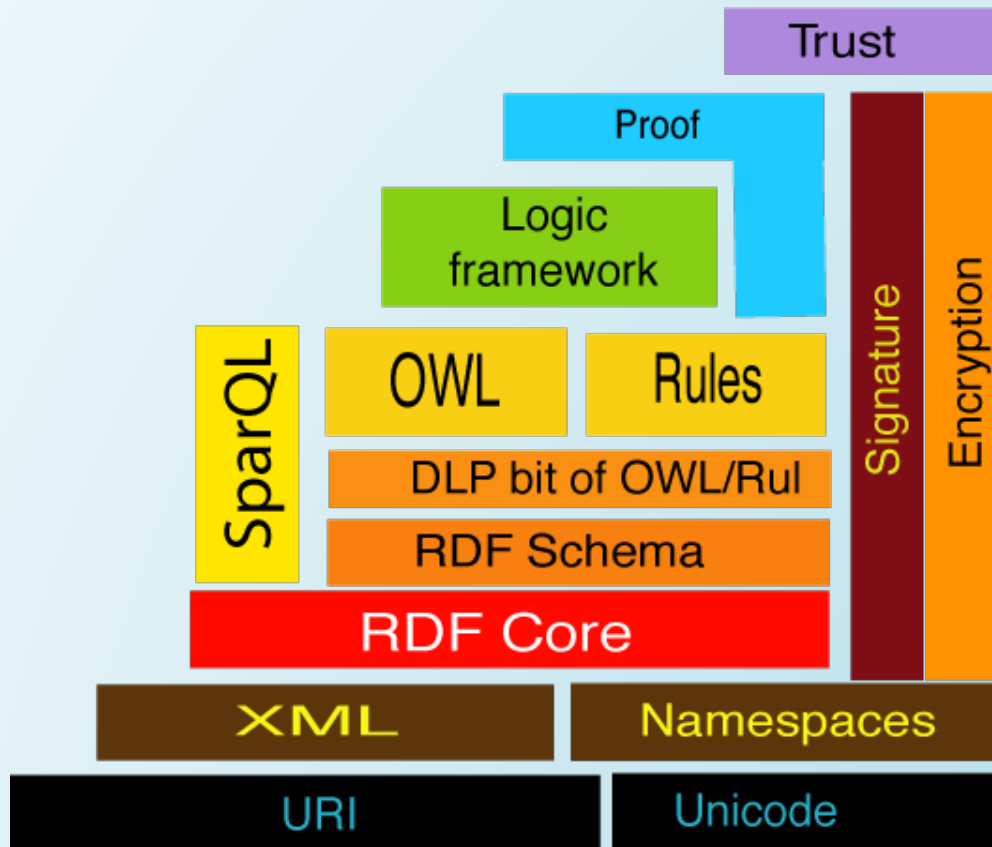
RDFa

- Embedding metadata in (X)HTML



On the left, what browsers see. On the right, what humans see. Can we bridge the gap so browsers see more of what we see?

the stack



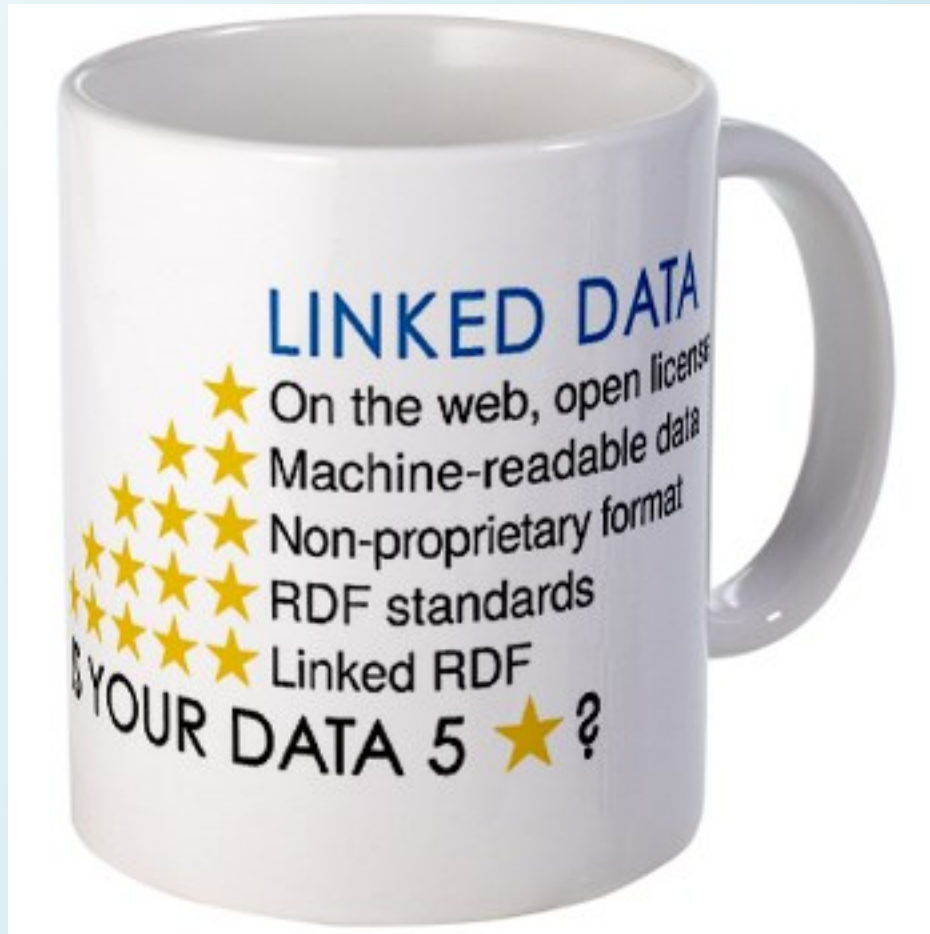
breadth vs. depth

- The value of semantic technologies on a large *scale* needs to be considered
 - In addition to the value of *reasoning* using ontologies
- Could we adopt a bottom-up approach starting from linked data which can be related to (layers of) ontologies later in the context of specific applications?
- Encouragement for community-agreed ontologies can be more effective and flexible

Linked Data

- A bottom-up approach to a Semantic Web
 - Priority on exposing data on the Web
 - Aiming for 5-star linked (open) data
- ★ Available on the web (whatever format), but with an open licence
- ★★ Available as machine-readable structured data (e.g. excel instead of image scan of a table)
- ★★★ as (2) plus non-proprietary format (e.g. CSV instead of excel)
- ★★★★ All the above plus, Use open standards from W3C (RDF and SPARQL) to identify things, so that people can point at your stuff
- ★★★★★ All the above, plus: Link your data to other people's data to provide context
- (<http://www.w3.org/DesignIssues/LinkedData.html>)

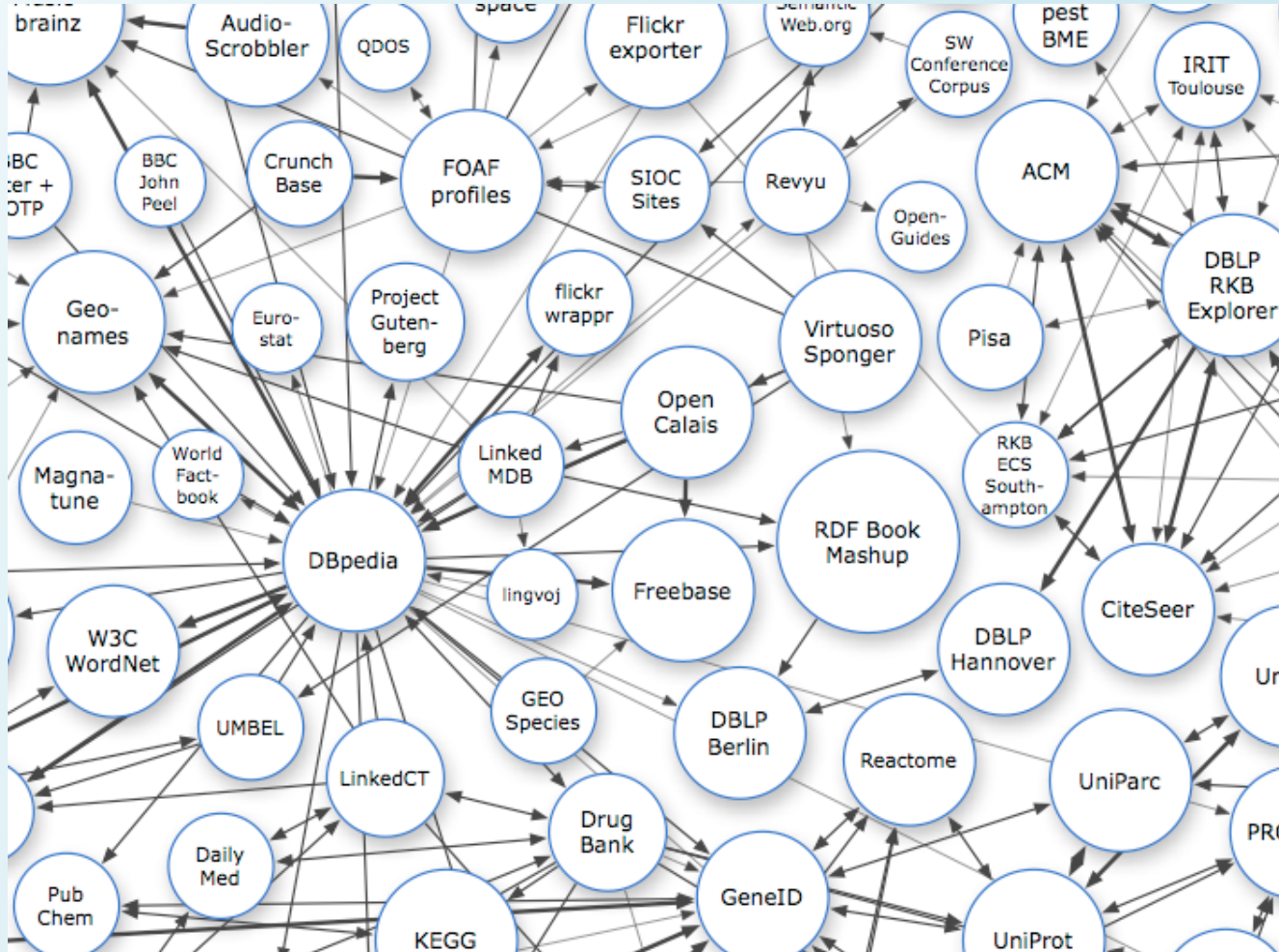
5-star linked data



Guidelines for Linked Data

- Use URIs as names for things
- Use HTTP URIs so that people can look up those names.
- When someone looks up a URI, provide useful information, using the standards (RDF*, SPARQL)
- Include links to other URIs, so that they can discover more things.

Linked Data Cloud



SOURCE: <http://linkeddata.org/>

Data in the web of data

- Data
 - Extracted from content
 - Structured data from DB, etc
 - Originally available in linked data formats (e.g. RDF)
- Metadata
 - Extracted from resources
 - Existing metadata, enriched
 - Originally available in linked data formats (e.g. RDF)

Linked Data & Knowledge Organisation

- Knowledge repositories have flourished in the Web 2.0 era
- The knowledge organisation of repositories can be described semantically
 - Which can support information searching, linking and integration
- The knowledge organisation in Wikipedia is available in DBpedia

Southampton Uni @ wikipedia



[Main page](#)
[Contents](#)
[Featured content](#)
[Current events](#)
[Random article](#)
[Donate to Wikipedia](#)

Interaction
[Help](#)
[About Wikipedia](#)
[Community portal](#)
[Recent changes](#)
[Contact Wikipedia](#)

[Toolbox](#)
[Print/export](#)

Languages
[Afrikaans](#)
[العربية](#)
[Deutsch](#)
[Español](#)
[Esperanto](#)
[فارسی](#)
[Français](#)
[한국어](#)
[Italiano](#)
[日本語](#)
[پنجابی](#)
[Polski](#)
[Português](#)

Article [Talk](#)

[Read](#) [Edit](#) [View history](#)

Search

University of Southampton

From Wikipedia, the free encyclopedia
 (Redirected from [University of southampton](#))

Coordinates: 50.93463°N 1.39595°W﻿ / ﻿

Not to be confused with [Southampton Solent University](#).

The **University of Southampton** is a British public university located in the city of [Southampton](#), England, United Kingdom, a member of the [Russell Group](#). The origins of the university can be dated back to the founding of the Hartley Institution in 1862 by [Henry Robertson Hartley](#). In 1902, the Institution developed into the Hartley University College, with degrees awarded by the [University of London](#).^[4] On 29 April 1952, [HM Queen Elizabeth II](#) granted a Royal Charter to give the University of Southampton full [university](#) status. This was the first Royal Charter granted by HM Queen Elizabeth II on her accession to the throne.

The university is a member of the [Russell Group](#) of research universities and the [Worldwide Universities Network](#). It currently has over 17,000 undergraduate and 7,000 postgraduate students,^[3] making it the largest university by higher education students in the [South East](#) region. The main campus is located in the [Highfield](#) area of Southampton. Four other campuses are located throughout the city alongside the [School of Art](#) based in nearby [Winchester](#).

The university has a strong emphasis on research, having one of the highest proportions of income derived from research activities in Britain.^[5] Southampton is highly regarded as a centre for educational excellence, ranking nationally as a top 20 university in various tables,^{[6][7][8][9]} and regularly rated in the top 10 of the [National Student Survey](#).^[5]

Contents [hide]

- 1 History
 - 1.1 Hartley Institution
 - 1.2 University College
 - 1.3 University
 - 1.4 Research University
- 2 Campus
 - 2.1 Highfield Campus
 - 2.2 Avenue Campus
 - 2.3 National Oceanography Centre, Southampton

University of Southampton



Motto	Strenuis Ardua Cedunt <i>The Heights Yield to Endeavour</i>
Established	1952 - gained University status by Royal charter 1902 - University College 1862 - Hartley Institution
Type	Public
Endowment	£6.42 million (2008/09) ^[1]
Chancellor	Helen Alexander CBE ^[2]
Vice-Chancellor	Professor Don Nutbeam
Visitor	The Lord President of the Council <i>ex officio</i>
Admin. staff	Around 5,000
Students	24,735 ^[3]

Southampton Uni @ dbpedia

About: University of Southampton

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



The University of Southampton is a British public university located in the city of Southampton, England, United Kingdom, a member of the Russell Group. The origins of the university can be dated back to the founding of the Hartley Institution in 1862 by Henry Robertson Hartley. In 1902, the Institution developed into the Hartley University College, with degrees awarded by the University of London.

Property	Value
dbpedia-owl:abstract	<ul style="list-style-type: none"> The University of Southampton is a British public university located in the city of Southampton, England, United Kingdom, a member of the Russell Group. The origins of the university can be dated back to the founding of the Hartley Institution in 1862 by Henry Robertson Hartley. In 1902, the Institution developed into the Hartley University College, with degrees awarded by the University of London. On 29 April 1902, the Institution was granted a Royal Charter to give the University of Southampton full university status. This was the first Royal Charter granted to a university in the United Kingdom since the reign of Elizabeth II on her accession to the throne. The university is a member of the Russell Group of research universities and the Universities Network. It currently has over 17,000 undergraduate and 7,000 postgraduate students, making it the largest education provider in the South East region. The main campus is located in the Highfield area of Southampton. Four colleges are situated throughout the city alongside the School of Art based in nearby Winchester. The university has a strong emphasis on research, with the highest proportions of income derived from research activities in Britain. Southampton is highly regarded as a centre for research, ranking nationally as a top 20 university in various tables, and regularly rated in the top 10 of the National Student Survey.
dbpedia-owl:affiliation	<ul style="list-style-type: none"> dbpedia:Worldwide_Universities_Network dbpedia:European_University_Association dbpedia:Russell_Group dbpedia:Association_of_Commonwealth_Universities
dbpedia-owl:city	<ul style="list-style-type: none"> dbpedia:Southampton
dbpedia-owl:endowment	<ul style="list-style-type: none"> 6420000.0
dbpedia-owl:head	<ul style="list-style-type: none"> dbpedia:Lord_President_of_the_Council
dbpedia-owl:motto	<ul style="list-style-type: none"> The Heights Yield to Endeavour Strenuis Ardua Cedunt
dbpedia-owl:numberOfPostgraduateStudents	<ul style="list-style-type: none"> 7615 (xsd:integer)
dbpedia-owl:numberOfStudents	<ul style="list-style-type: none"> 24735 (xsd:integer)
dbpedia-owl:numberOfUndergraduateStudents	<ul style="list-style-type: none"> 17120 (xsd:integer)
dbpedia-owl:thumbnail	<ul style="list-style-type: none"> http://upload.wikimedia.org/wikipedia/commons/thumb/a/a7/University_of_Southampton_Logo.svg/200px-University_of_Southampton_Logo.svg
dbpedia-owl:type	<ul style="list-style-type: none"> dbpedia:Public_university
dbpedia-owl:viceChancellor	<ul style="list-style-type: none"> dbpedia:Don_Nutbeam
dbpedia-owl:wikiPageExternalLink	<ul style="list-style-type: none"> http://www.soton.ac.uk/ http://www.geodata.soton.ac.uk http://www.trg.soton.ac.uk http://www.orc.soton.ac.uk
dbpprop:affiliations	<ul style="list-style-type: none"> dbpedia:Russell_Group dbpedia:ELIA

“city” @dbpedia

About: <http://dbpedia.org/ontology/city>

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



Property	Value
http://dbpedia.org/meta/editlink	▪ http://mappings.dbpedia.org/index.php?title=OntologyProperty:City&action=edit
http://dbpedia.org/meta/revisionlink	▪ http://mappings.dbpedia.org/index.php?title=OntologyProperty:City&oldid=10871
dcterms:modified	▪ 2011-09-23 14:37:36.608 (xsd:date)
rdf:type	▪ owl:ObjectProperty
rdfs:label	▪ city ▪ ville ▪ πόλη
rdfs:range	▪ dbpedia-owl:City
owl:sameAs	▪ http://sw.opencyc.org/concept/Mx8Ngh4rY_nOYBt-QdiS5seAT9e7DQ-gaHR0cDovL2RicGVkaWEub3JnL29udG9sb2d5L2NpdHk

Browse using: [OpenLink Data Explorer](#) | [Zitgist Data Viewer](#) | [Marbles](#) | [DISCO](#) | [Tabulator](#) | [Raw Data in: CSV](#) | [RDF \(N-Triples N3/Turtle JSON XML \)](#) | [OData \(Atom JSON \)](#) | [About](#)



“city” @wikipedia



[Main page](#)
[Contents](#)
[Featured content](#)
[Current events](#)
[Random article](#)
[Donate to Wikipedia](#)

Interaction
[Help](#)
[About Wikipedia](#)
[Community portal](#)
[Recent changes](#)
[Contact Wikipedia](#)

[Toolbox](#)
[Print/export](#)

Languages
[Адыгэбзэ](#)
[Afrikaans](#)
[Alemannisch](#)
[አማርኛ](#)
[Ænglisc](#)
[Англис](#)
[العربية](#)
[Aragonés](#)
[ᠠᠷᠠᠮᠤᠯᠠᠭ](#)

Article [Talk](#)

Read [Edit](#) [View history](#)

Search



City

From Wikipedia, the free encyclopedia

For other uses, see [City \(disambiguation\)](#).

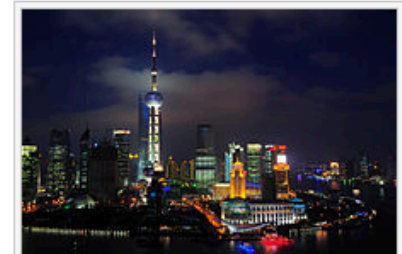
A **city** is a relatively large and permanent [settlement](#).^{[1][2]} Although there is no agreement on how a city is distinguished from a [town](#) within general [English language](#) meanings, many cities have a particular [administrative](#), [legal](#), or [historical](#) status based on local law.

For example, in the [U.S.](#) state of [Massachusetts](#) an article of incorporation approved by the local [state legislature](#) distinguishes a city government from a town. In the [United Kingdom](#) and parts of the [Commonwealth of Nations](#), a city is traditionally a settlement with a [royal charter](#).^[1] Historically, in Europe, a city was understood to be an urban settlement with a [cathedral](#).

Cities generally have complex systems for [sanitation](#), [utilities](#), land usage, [housing](#), and [transportation](#). The concentration of development greatly facilitates interaction between people and [businesses](#), benefiting both parties in the process. A big city or metropolis usually has associated [suburbs](#) and [exurbs](#). Such cities are usually associated with [metropolitan areas](#) and [urban areas](#), creating numerous business [commuters](#) traveling to urban centers for [employment](#). Once a city expands far enough to reach another city, this region can be deemed a [conurbation](#) or [megalopolis](#).

Contents [hide]

- 1 Origins
 - 1.1 Theories
 - 1.1.1 Agricultural primacy
 - 1.1.2 Urban primacy
 - 1.2 Causes of establishment
- 2 Geography
- 3 History
 - 3.1 Ancient times
 - 3.2 Middle Ages



Shanghai is the most populous [city proper](#) in the world.



Tokyo, the most populous [metropolis](#) in the world

SPARQL queries on dbpedia

SPARQL Explorer for <http://dbpedia.org/sparql>

SPARQL:

```
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX dc: <http://purl.org/dc/elements/1.1/>
PREFIX : <http://dbpedia.org/resource/>
PREFIX dbpedia2: <http://dbpedia.org/property/>
PREFIX dbpedia: <http://dbpedia.org/>
PREFIX skos: <http://www.w3.org/2004/02/skos/core#>
```

```
PREFIX dbo: <http://dbpedia.org/ontology/>
```

```
SELECT ?name ?birth ?death ?person WHERE {
  ?person dbo:birthPlace :Berlin .
  ?person dbo:birthDate ?birth .
  ?person foaf:name ?name .
  ?person dbo:deathDate ?death .
  FILTER (?birth < "1900-01-01"^^xsd:date) .
}
```

Results:

SPARQL results:

name	birth	death	person
"Helene" Ellen Franz"@en	"1839-05-30"^^xsd:date	"1923-03-24"^^xsd:date	:Ellen_Franz ↗
()"@en	"1811-10-29"^^xsd:date	"1873-06-06"^^xsd:date	:Prince_Adalbert_of_Prussia_%281811%E2%80%931873%29 ↗
"(Carl Heinrich) Eduard Knoblauch Knoblauch"@en	"1801-09-25"^^xsd:date	"1865-05-29"^^xsd:date	:Eduard_Knoblauch ↗
"Achim von Arnim"@en	"1781-01-26"^^xsd:date	"1831-01-21"^^xsd:date	:Ludwig_Achim_von_Arnim ↗
"Adalbert Of Prussia"@en	"1811-10-29"^^xsd:date	"1873-06-06"^^xsd:date	:Prince_Adalbert_of_Prussia_%281811%E2%80%931873%29 ↗

Applications using dbpedia datasets

The screenshot displays the Information Workbench interface for the entity 'Berlin'. The central node is 'Berlin', which is connected to numerous properties and their corresponding values. The properties and values are as follows:

- States of Germany**: 3450889
- Capitals in Europe**: 3450889
- Host cities of the Summer Olympic Games**: 3450889
- German state capitals**: 3450889
- Members of the Hanseatic League**: 3450889
- City states**: 3450889
- States and territories established in 1237**: 3450889
- European Capitals of Culture**: 3450889
- Populated places established in the 13th century**: 3450889
- Germany**: 8.9185E8
- population total**: 3450889
- elevation (μ)**: 3450889
- country**: Germany
- area total (m2)**: 891850000
- leader title**: Governing Mayor
- leader**: Klaus Wowereit
- population as of**: 2010-09-30
- area code**: 030
- point**: 52.5005555555556, 13.3988888888889
- owl:Thing**: owl:Thing
- populated place**: populated place
- place**: place
- Place**: Place
- city**: city
- municipality**: municipality
- City**: City
- name**: Berlin
- lat**: 52.5005555555556
- DE_BE**: DE_BE
- has abstract**: the capital city of Germany and is one of the..
- leader party**: The Left (Germany)
- population metro**: 4429847
- postal code**: 10001-14199
- rdfs:comment**: 10001-14199
- feature**: _Feature

On the right side, there is a **Google Map** inset showing the location of Berlin in Germany. Below the map is an **Image** section with a small thumbnail icon.

The narrative

The Social Semantic Web

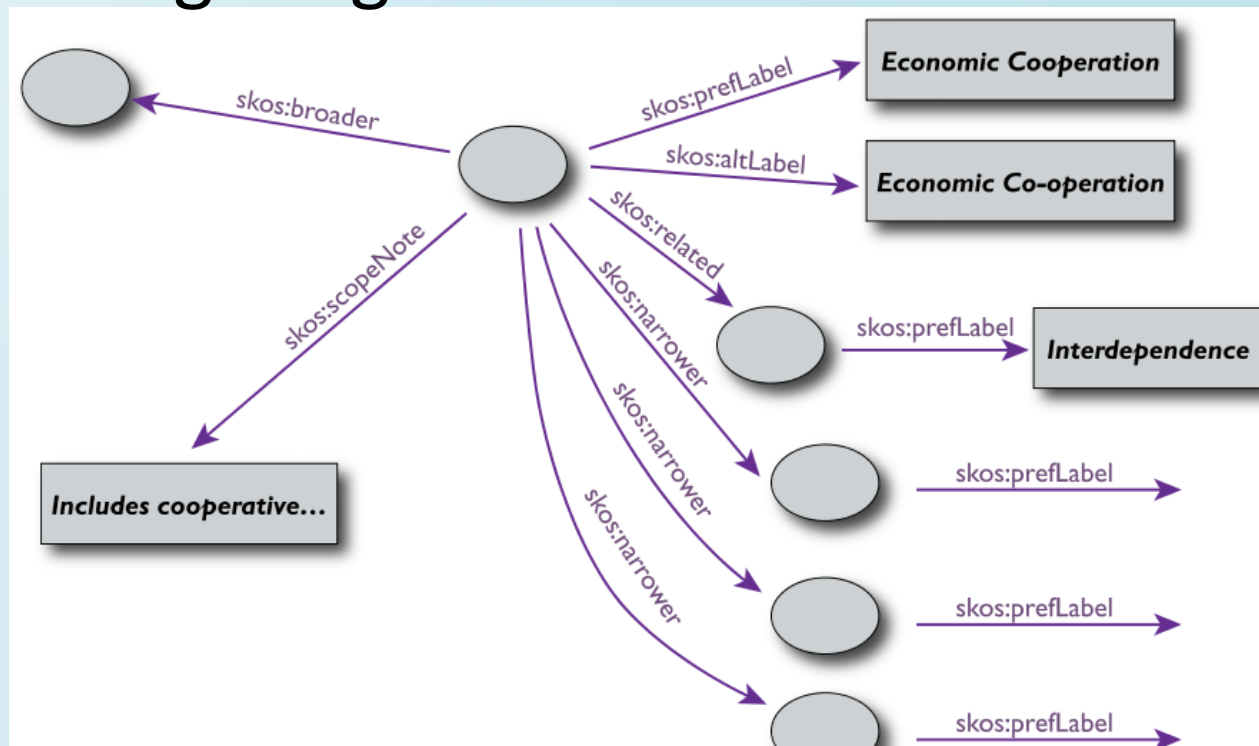
Discussion

- Are you aware of semantic Web technologies used in a social network? Which ones?
- How do semantic Web technologies add value to social networks?

Linked Data for Knowledge Organisation

SKOS example

- SKOS is an RDF-based vocabulary to describe knowledge organisation



DBpedia



[DBpedia Blog](#) | [Get Involved](#) | [Get Help](#)

The DBpedia Data Set

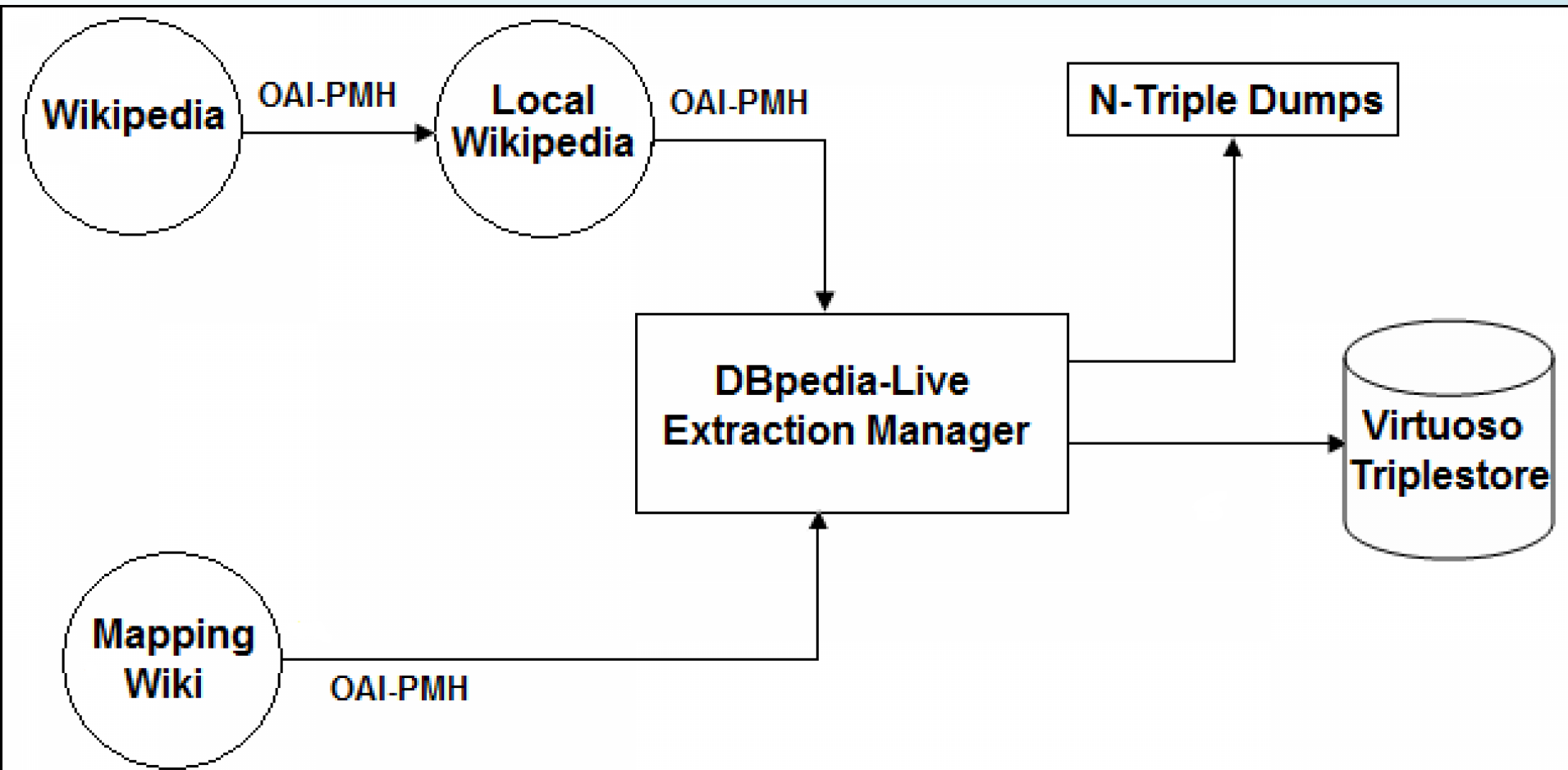
The DBpedia data set uses a large multi-domain ontology which has been derived from Wikipedia. The DBpedia data set currently describes 3.64 million “things” with over half a billion “facts” (July 2011).

Contents

- [1. Background](#)
- [2. Content of the DBpedia Data Set](#)
- [3. Identifying “things”](#)
- [4. Describing “things”](#)
 - [4.1. Basic Information](#)
 - [4.2. Classifications](#)
 - [4.2.1. Wikipedia Categories](#)
 - [4.2.2. YAGO Classes](#)
 - [4.2.3. Wordnet](#)
 - [4.3. Infobox Data](#)
 - [4.3.1. Querying the Infobox Dataset](#)
 - [4.3.2. Querying the Infobox Ontology](#)
 - [4.4. External Links](#)
 - [4.4.1. FOAF Homepage](#)
 - [4.4.2. Owl:sameAs Links](#)
 - [4.5. Geo-Coordinates](#)
- [5. Provenance Meta-Data](#)
- [6. i18n Datasets](#)
- [7. iPopulator](#)

[About / News](#)
[Applications](#)
[Use Cases](#)
[Datasets](#)
[Online Access](#)
[DBpedia Live](#)
[Downloads](#)
[Interlinking](#)
[Development](#)
[Support](#)
[Publications](#)
[Credits](#)
[Contact / Imprint](#)

Dbpedia metadata extraction

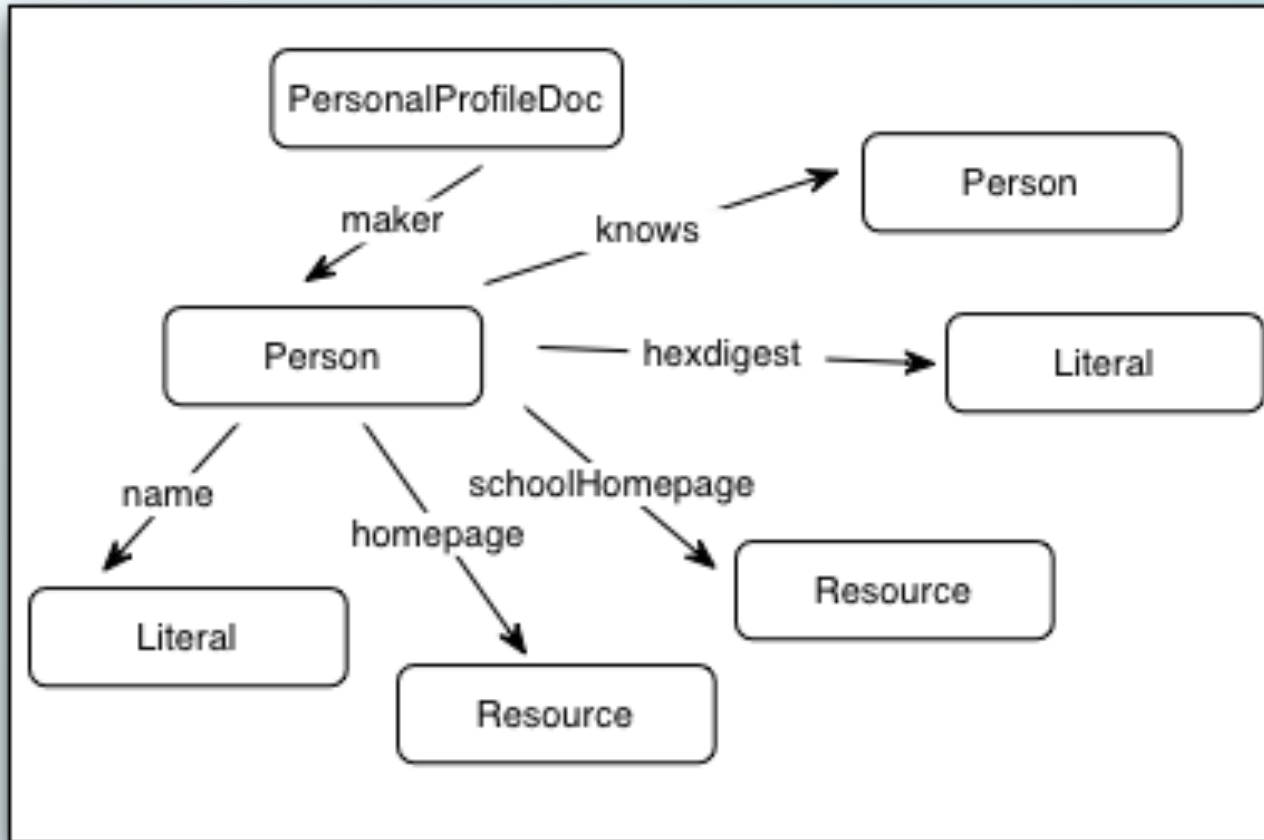


Linked Data for Social Relationships

FOAF

- Describing people
- Describing who knows whom
- A ‘vertical’ vocabulary (not domain specific)
- Provides for aggregation of information about people from different sources
- Can be integrated with other vocabularies such as SKOS and SIOC

FOAF



FOAF Example

Thanassis Tiropanis

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:admin="http://webns.net/mvcb/"
  <foaf:PersonalProfileDocument rdf:about="]">
    <foaf:maker rdf:resource="#me"> <foaf:primaryTopic
rdf:resource="#me"> </foaf:primaryTopic>
    <admin:generatorAgent
rdf:resource="http://keg.cs.tsinghua.edu.cn/tj/cs/foaf_creator"> </admin:generato
rAgent>
    <admin:errorReportsTo
rdf:resource="mailto:jery.tang@gmail.com"> </admin:errorReportsTo>
  </foaf:PersonalProfileDocument>
  <foaf:Person rdf:ID="me">
    <foaf:name>Thanassis Tiropanis</foaf:name>
    <foaf:title>lecturer</foaf:title>
    <foaf:givenname>Thanassis</foaf:givenname>
    <foaf:family_name>Tiropanis</foaf:family_name>
    <foaf:mbox rdf:resource="mailto:tt2@ecs.soton.ac.uk"> </foaf:mbox>
```

[Download FOAF](#)

FOAF project

The image is a screenshot of the FOAF project website. At the top, there is a dark blue header with the text 'foaf project' in white. Below the header is a navigation bar with links for 'About', 'Documentation', 'Wiki', 'Community', and 'P'. The main content area has a light blue background. On the left, there is a quote: "two kinds of people in those who believe wo kinds of people in ind those who don't." followed by "chley, Benchley's Law n". Below this is the word "ntation". The main heading is "The Friend of a Friend (FOAF) project". The text below the heading describes the project as creating a Web of machine-readable pages describing people, the links between them and the things they create and do; it is a contribution to the linked information system known as the Web. FOAF defines an open, decentralized technology for connecting social Web sites, and the people they describe. [more...] The text continues: FOAF is part of a shift towards a Web where we can choose the sites and tools we like, without being cut off from friends who made different choices. FOAF lets you share and interconnect information from diverse sources, move it around, and use it in unexpected new ways. [more...] The final paragraph says: You can read about how it all works or create a FOAF file to upload. Less technical readers can learn about projects using FOAF. Or simply use some Web sites that publish FOAF for their users. [more...] On the right side, there are two sections: "News" with two bullet points, both starting with "something went wi", and "Discussion" with one bullet point: "Linked Literature, – Everything like a Graph".

Online communities

- Can involve a number of people identified differently in each one
- Can discuss a number of topics that are the same or related
- Can allow for discussions to be carried out across communities

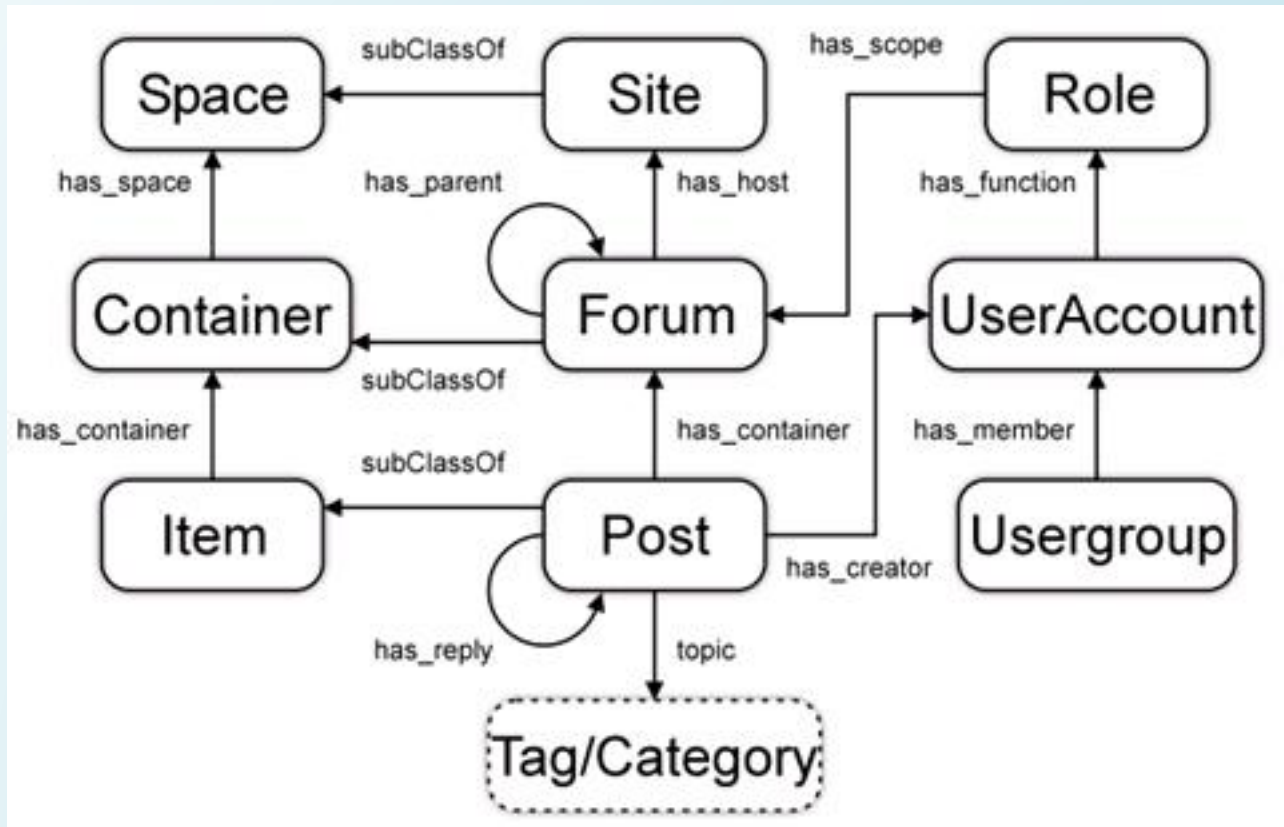
How do we bring all these together to enable knowledge discovery and collaboration?

- *expert finding*
- *following discussions and topics*

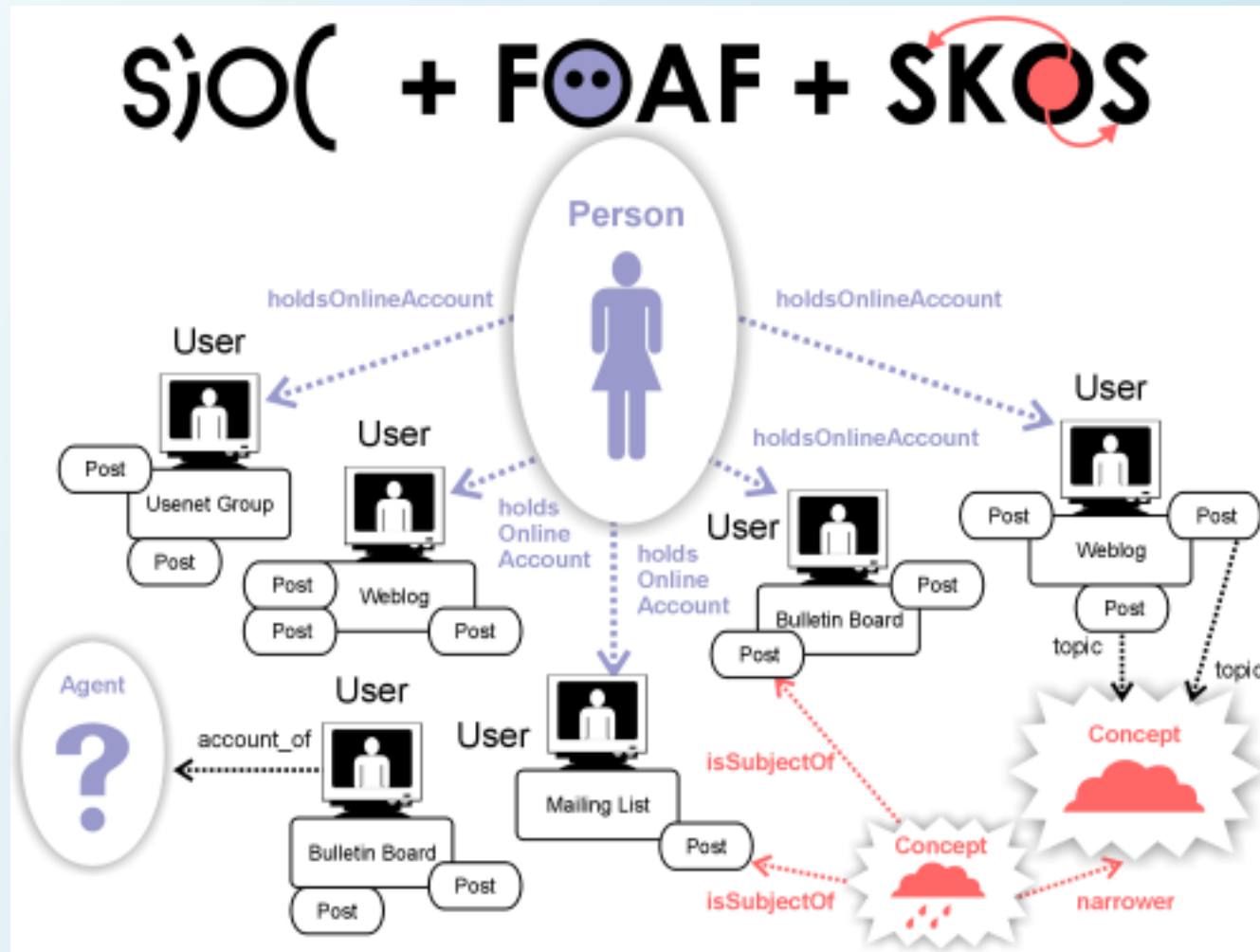
Inter-linking online communities

- Semantically-Interlinked Online Communities (SIOC)
 - An RDF-based schema for linking Community resources
 - Describing the structure and content of online for a and discussions
 - Describing the contribution of individuals
 - Possible combination with FOAF

SIOC Ontology



The SIOC project



Browsing SIOC info

SIOC Browser

About

Filtering

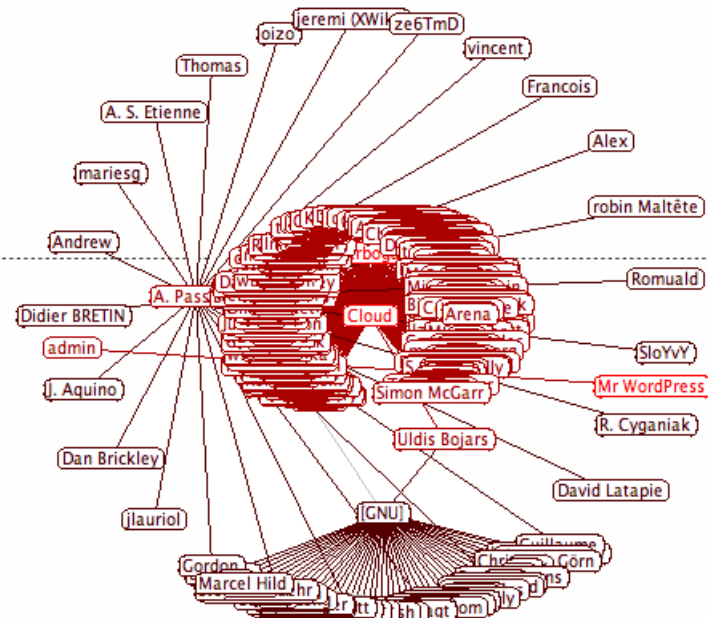
- [No filtering](#)
- [Posts created last month](#)
- [Posts created last week](#)

Query

```
PREFIX sioc: <http://rdfs.org/sioc/ns#>
PREFIX foaf: <http://xmlns.com/foaf/0.1/>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX dc: <http://purl.org/dc/elements/1.1/>
PREFIX dcterms: <http://purl.org/dc/terms/>
SELECT DISTINCT ?author_name ?author_sha1 ?replier_name ?replier_sha1
WHERE {
  ?_post sioc:has_reply ?_reply .
  ?_post foaf:maker ?_author .
  ?_reply foaf:maker ?_replier .
  ?_author foaf:name ?author_name .
  ?_author foaf:mbox_sha1sum ?author_sha1 .
  ?_replier foaf:name ?replier_name .
  ?_replier foaf:mbox_sha1sum ?replier_sha1 .
}
```

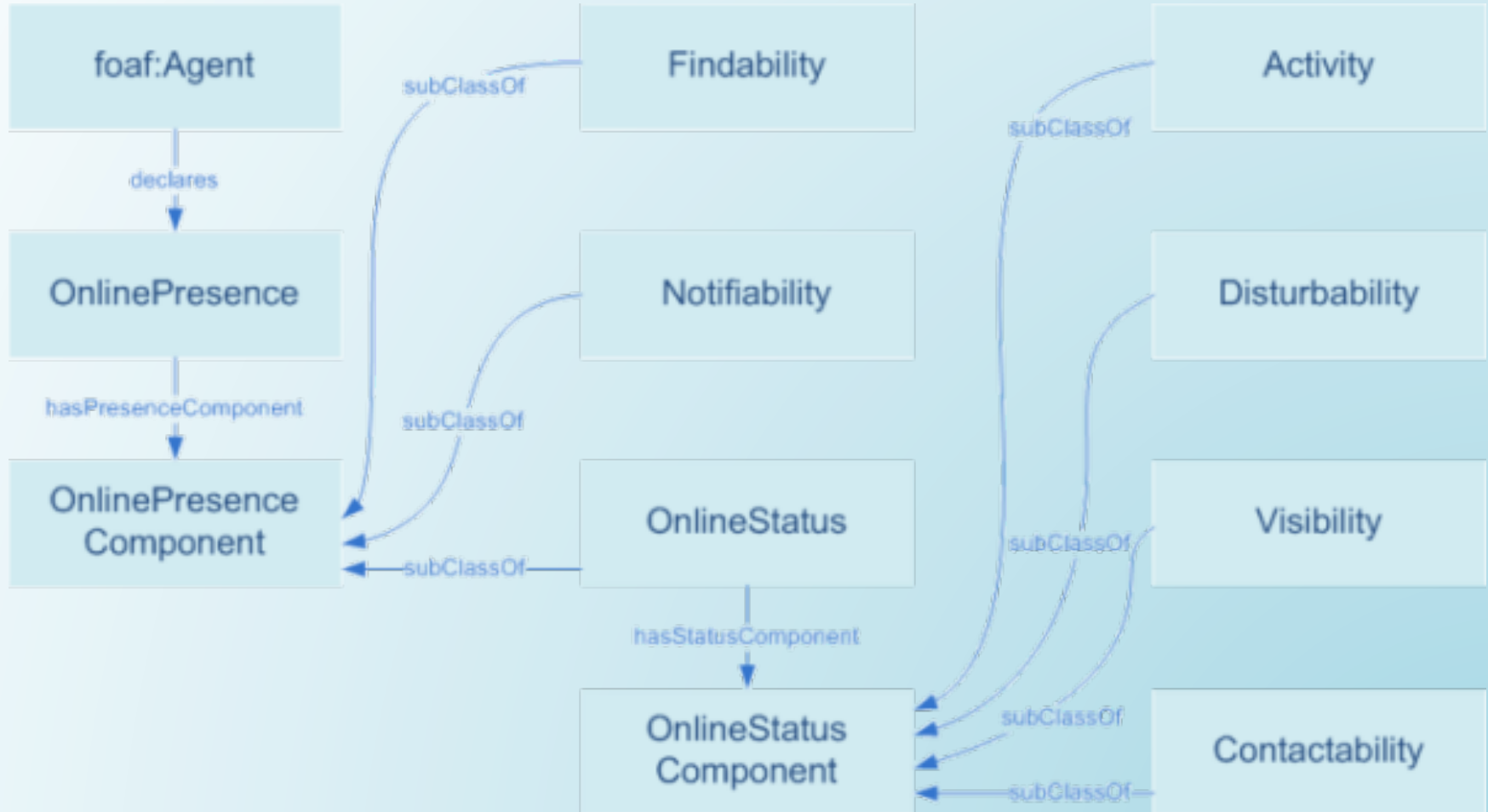
Results

[Force](#) | [Radial](#)



Source: sioc-project.org

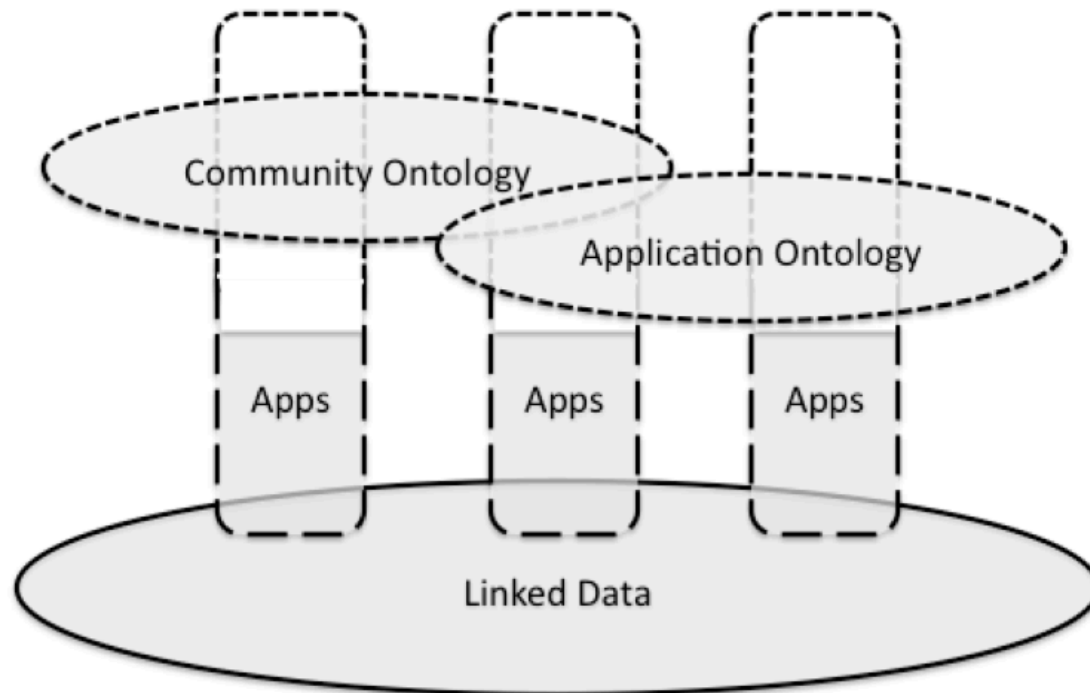
OPO-Online Presence Ontology



Bottom up evolution on linked data – HE

STAGE 2: Ontology-based applications
 (Ontology building, mapping linked data, applications)
ArnetMiner

STAGE 3: Pedagogy-aware reasoning
 (Collaborative ontology building, pedagogy in reasoning)
Compendium, Debategraph

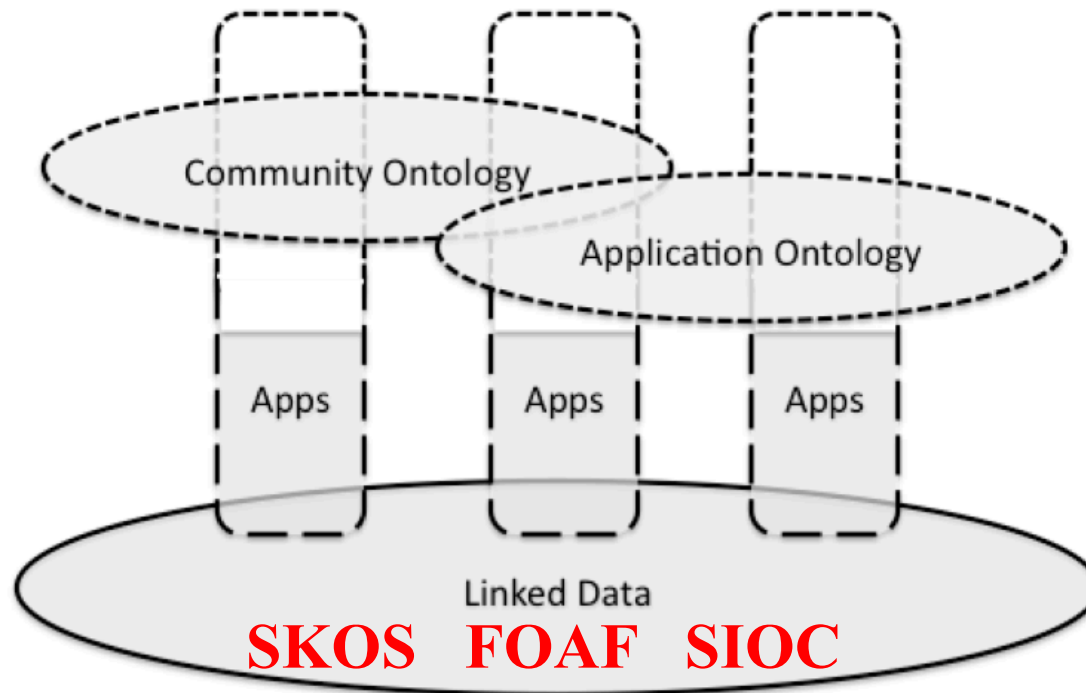


STAGE 1: Linked Data Field
 (Triple stores, SPARQL endpoints, RDF)
RDFisers, TALIS, Virtuoso, Collibra, dbpedia.org, freebase.com

Bottom up evolution on linked data – OSN

STAGE 2: Ontology-based applications
 (Ontology building, mapping linked data, applications)
ArnetMiner

STAGE 3: Pedagogy-aware reasoning
 (Collaborative ontology building, pedagogy in reasoning)
Compendium, Debategraph



STAGE 1: Linked Data Field
 (Triple stores, SPARQL endpoints, RDF)
RDFisers, TALIS, Virtuoso, Collibra, dbpedia.org, freebase.com

A Social Semantic Web

Affordances

- Interoperation
- Meaningful data aggregation
- Leveraging the 'wisdom of the crowds' to make associations between data sources
- Collective Intelligence
- Information spaces for individuals and communities
- Better searching and matching of resources and individuals
- Leveraging Collective Intelligence

A Social Semantic Web

Challenges

- Exemplar applications to establish the value of exposing linked open data
- Safeguarding security and privacy (information triangulation risks)
- Consistent (re)use of identifiers (URIs)
- Large scale information dissemination and aggregation mechanisms

Monetization of social graph data?

Business models using Open Social Graphs is an open question

Google code Search
e.g. "adwords" or "open source"

★ **Social Graph API (Deprecated)** Home Docs FAQ Forum Te

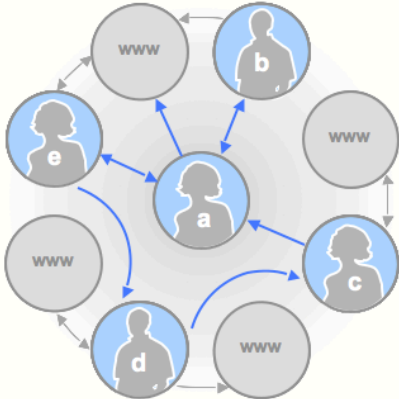
Warning: The Social Graph API has been officially deprecated as of January 20, 2012 and will be fully retired on April 20, 2012. For more information, please see [the announcement](#).

Build critical mass on your website

With so many websites to join, users must decide where to invest significant time in adding their same connections over and over. For developers, this means it is difficult to build successful web applications that hinge upon a critical mass of users for content and interaction. With the Social Graph API, developers can now utilize public connections their users have already created in other web services. It makes information about public connections between people easily available and useful.

Only public data

The API returns web addresses of public pages and publicly declared connections between them. The API cannot access non-public information, such as private profile pages or websites accessible to a limited group of friends.

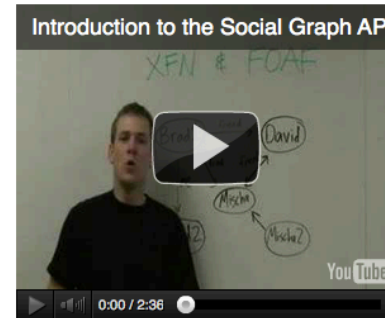


The diagram illustrates a social graph with five user nodes labeled 'a', 'b', 'c', 'd', and 'e', and several 'www' nodes representing web pages. Node 'a' is the central hub, connected to 'b', 'c', 'd', and 'e'. Node 'b' is connected to 'a' and 'www'. Node 'c' is connected to 'a' and 'www'. Node 'd' is connected to 'a' and 'www'. Node 'e' is connected to 'a' and 'www'. The 'www' nodes are also interconnected, forming a web of public pages.

How do I start?

1. Learn more [about the Social Graph](#)
2. Review the [API Documentation](#)
3. Try out the [Example Applications](#)

Video Introduction



Based on open standards

We currently index the public Web for [XHTML Friends Network](#) (XFN), [Friend of a Friend](#) (FOAF) markup and other publicly declared connections. By supporting open Web standards for describing connections between people, web sites can add to the social infrastructure of the web.

Lessons learned

- Understanding the evolution of the Web leading to the Social Semantic Web
 - Understanding of the Semantic Web and Linked Data vision and how Ontologies, RDF and SPARQL are related to it.
 - Understanding of the affordances and challenges of a Social Semantic Web.
 - The relationship of SKOS, FOAF and SIOC to the Social Semantic Web.
-
- Hall, W., Tiropanis, T. (2012) Web Evolution and Web Science. Computer Networks. Elsevier. <http://eprints.soton.ac.uk/343770/>
 - Breslin, J. G., Passant, A., Decker, S. (2010) The Social Semantic Web. Springer. <http://socialsemanticweb.net/>
 - Antoniou, G., Harmelen, F. v. (2008) A Semantic Web Primer, 2nd Edition. The MIT Press. <http://www.ics.forth.gr/isl/swprimer/>
 - Allemang, D., Hendler, J. (2008) Semantic Web for the Working Ontologist . Morgan Kaufmann. <http://workingontologist.org/>