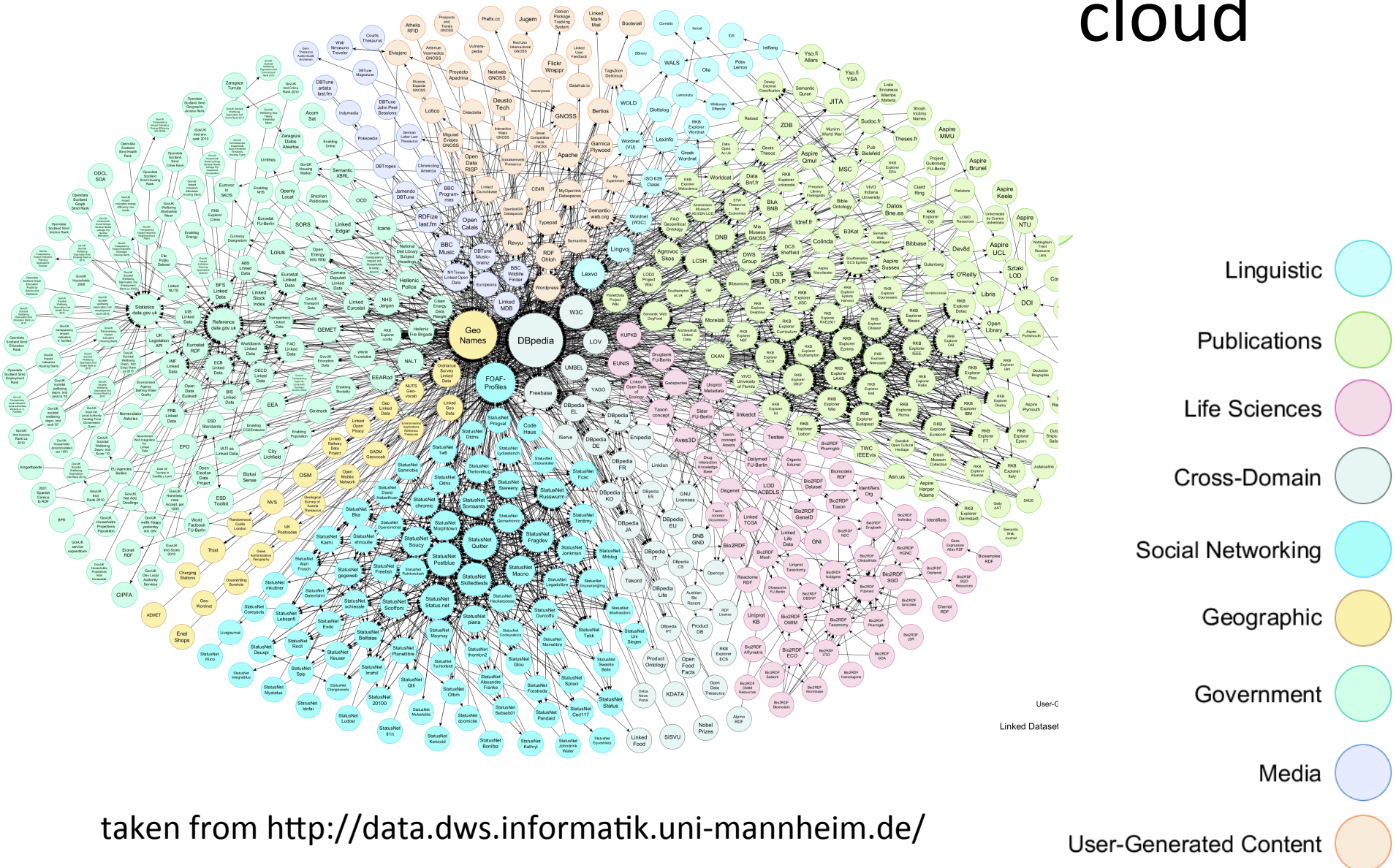


QwwwQ: Querying Wikipedia without writing queries

Massimiliano Battan and Marco Ronchetti
DISI, Università degli Studi di Trento
38123 Povo di Trento
Italy

Linked Open Data
more and more public admins join!

The LOD cloud



Sometimes, too much data = no data

Christian Wolmar, railway historian:

*"The huge **corruption** rate in the 19th century in USA railway administration **was facilitated by an excessive level of accountability**, where expense documentation for every single spike were collected".*

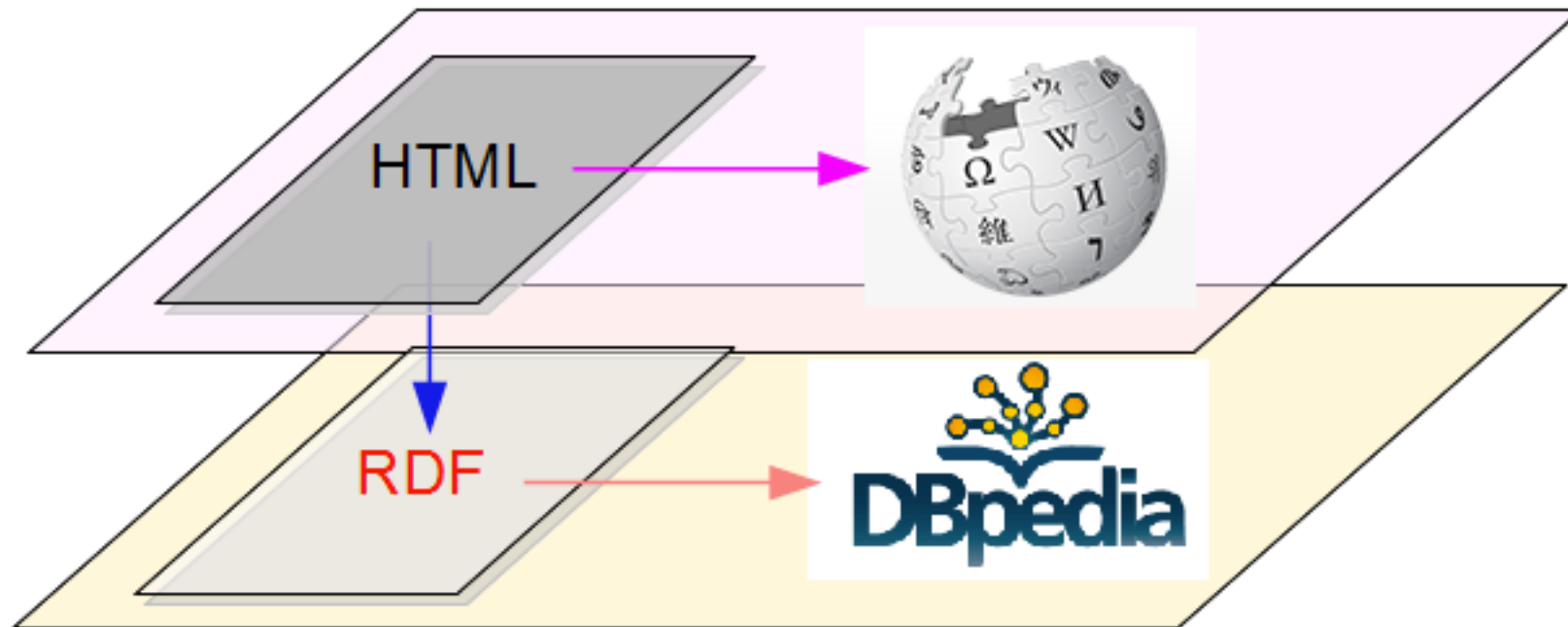
Data is only the first step...

- Data -> Information -> Knowledge
 - Data Mining, Search Engines, Recommendation...

Make sense of the data,
extract meaningful information
in simple and accessible way

user + data

DBPedia



S. Auer, and J. Lehmann, "What have Innsbruck and Leipzig in common? Extracting semantics from wiki content." 2007

S. Auer et al. "Dbpedia: A nucleus for a web of open data." 2007

A wikipedia page...

WIKIPEDIA

The Free Encyclopedia

Main page

Contents

Featured content

Current events

Random article

Donate to Wikipedia

Wikimedia Shop

Interaction

Help

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Community portal

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Special pages

Permanent link

Page information

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Cite this page

Print/export

Create a book

Download as PDF

Printable version

Languages

Deutsch

Français

Italiano

Magyar

Edit links

FS Class E.444

From Wikipedia, the free encyclopedia

The **FS E.444** is a class of [Italian railways electric locomotives](#). They were introduced in the course of the 1960 until 1975. Starting from 1995, all E.444s were upgraded as E.444R.

The locomotives are nicknamed *Tartaruga* (turtle).

Contents

- 1 History
 - 1.1 E.444 standard
 - 1.2 E.444R
- 2 Footnotes
- 3 External links

History

E.444 standard

The E.444 locomotive was designed in the 1960s as the first Italian electric locomotive capable to reach 200 km/h (120 mph) (in that period first high-speed trains like the Japanese [Shinkansen](#) and the French [TGV](#) were appearing). Italian railways could boast fast trains like the [ETR 200](#), but they were getting old and the [Pendolino](#) project was just moving its first phases.

The first 4 prototypes, built at [Savigliano](#), made their debut in 1967-1968: their power output 3,000 kW (4,000 hp) was respectable for the time, but they proved unable to held the fast international services required for the new locomotive, and the bogies were limited to 180 km/h (110 mph). They proved anyway that Italian industry could produce locomotive capable of more than 200 km/h (120 mph)^[3] was registered on November 8, 1967 in the maiden trip Rome-Milan.

The series production saw the introduction of the more powerful T750 motors, which boosted the power to 4,200 kW (5,600 hp), while the boogies were upgraded for 200 km/h (120 mph). The frontal part was improved and made more aerodynamic. A characteristic livery with two blue stripes on a pale grey background was adopted. The first 50 units proved successful, and the [Ferrovie dello Stato](#) (FS) ordered 60 more to be built starting from 1972. 16 units were adapted for feeding at 1,5 kV DC. During 1974 two locomotives (units 056 and 057) were provided with a "shunt chopper" system (later the modifications applied

FS class E.444



An E.444 in Bari Centrale station in 1995.

Specifications

Power type	Electric
Build date	1965-1975
UIC classification	Bo-Bo
Wheel diameter	1.250 m (49.21 in)
Wheelbase	9.000 m (29 ft 6.3 in) between bogies 3.020 m (9 ft 10.9 in) between axles on each bogie
Length	16.840 m (55 ft 3.0 in)
Width	3.020 m (9 ft 10.9 in)
Height	4.300 m (14 ft 1.3 in)
Locomotive weight	83 t (82 long tons; 91 short tons)
Electric system(s)	3,000 V DC Catenary
Current collection method	Pantograph
Traction motors	DC series
Transmission	41/77 gear ratio
Top speed	200 km/h (120 mph)
Power output	4,272 kW (5,729 hp)
Tractive effort	201 kN (45,000 lb _f)
Safety systems	RSC4; SCMT
Career	
Railroad(s)	FS Trenitalia

DBPedia

From dbpedia.org/about:

"DBpedia allows you to **ask sophisticated queries against Wikipedia**, and to link the different data sets on the Web to Wikipedia data. We hope that this work will **make it easier** for the huge amount of **information in Wikipedia to be used in some new interesting ways**.

Furthermore, it might **inspire new mechanisms for navigating, linking, and improving the encyclopedia itself.**"

Querying DBPedia

Using RDF, you can formulate powerful queries

Which European countries have a capital with more than 3 million people in which flows a river longer than 300 km?

The problem:

How can a generic user express a query on
DBPedia?

S(he) needs to know the schema...

S(he) needs to know a query language...

Proposed solutions



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

OpenLink Virtuoso
RelFinder
Lodlive
gFacet
DBpedia Mobile
Faceted Wikipedia Search (FWS)

About / News

Applications

Use Cases

Datasets

Online Access

DBpedia Live

Downloads

Interlinking

Development

DBpedia Applications

This page lists a number of applications (in no particular order) to get you started using DBpedia:

Contents

- [Faceted Browsers](#)
- [User Applications](#)
- [Query Results Visualization](#)
- [URI Lookup Services](#)
- [Query Builders](#)
- [SPARQL query interfaces](#)
- [Browser enhancements](#)
- [Annotation and/or Information Extraction](#)
- [Natural Language Processing \(NLP\) Services](#)

<http://wiki.dbpedia.org/Applications>

isparql

running
queries

ISPARQL File Help Login

QBE Advanced Results

Graph Named Graphs (0)

<http://dbpedia.org> Clear

SPARQL Query -- Recent Queries -- -- Prefixes -- -- Template -- -- Statement Help --

```
select distinct ?Concept where {[] a ?Concept} LIMIT 100
```

Query options

Result size limit: rows Leave empty for server maximum setting.

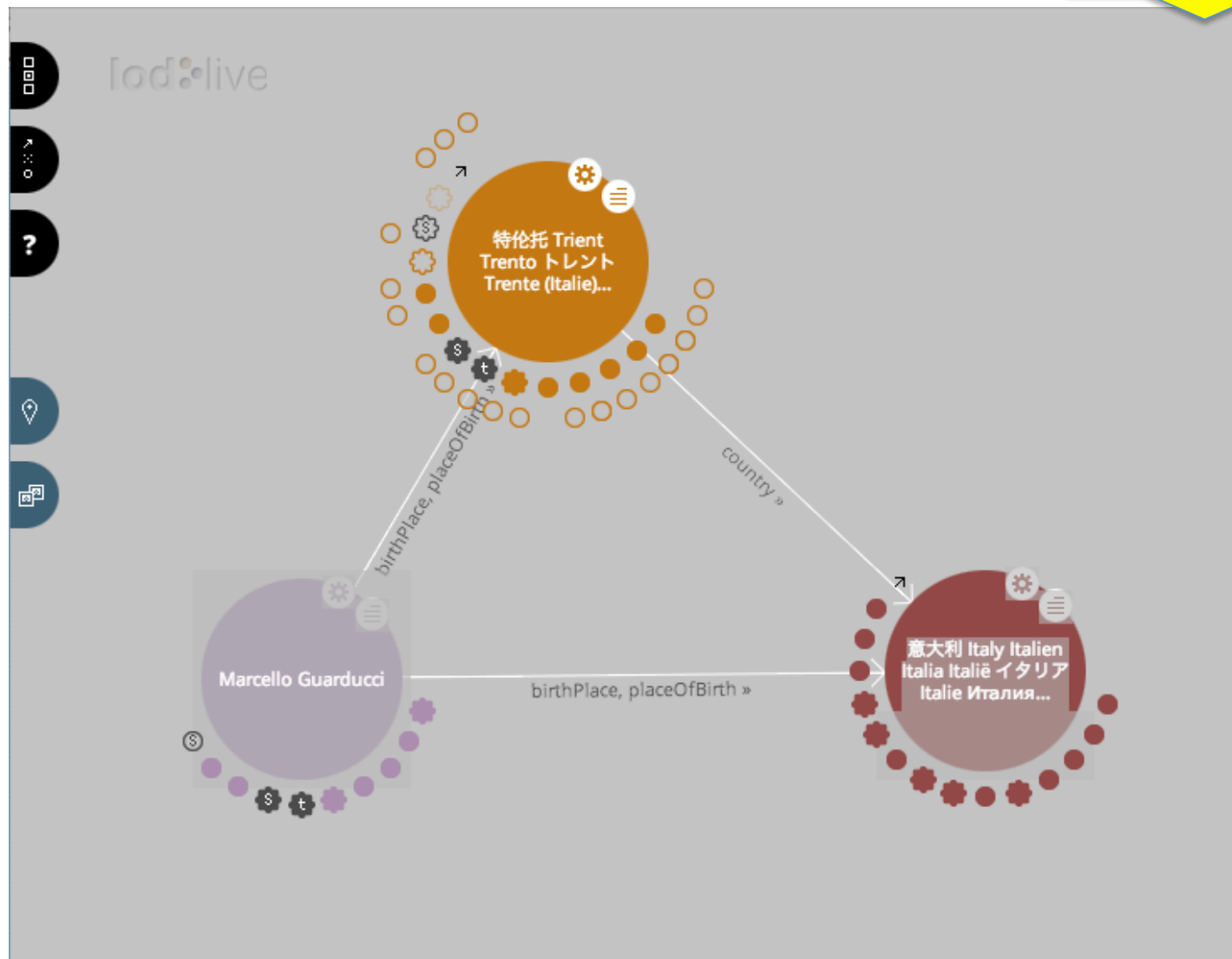
Query timeout: msec - leave blank for server default, or when not querying a Virtuoso endpoint.

► Sponger

► Query Metadata

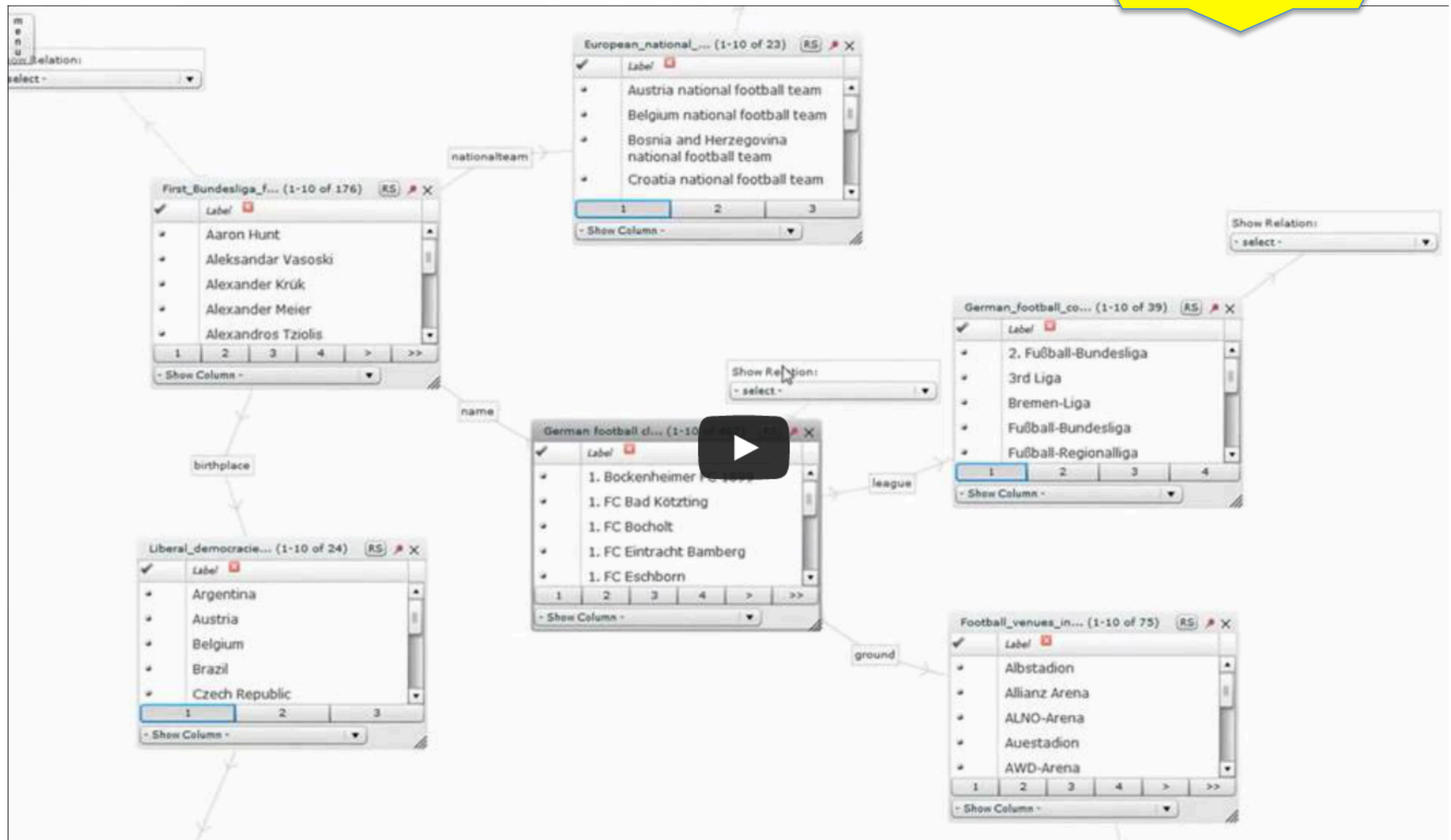
lodlive

linked data
browsers



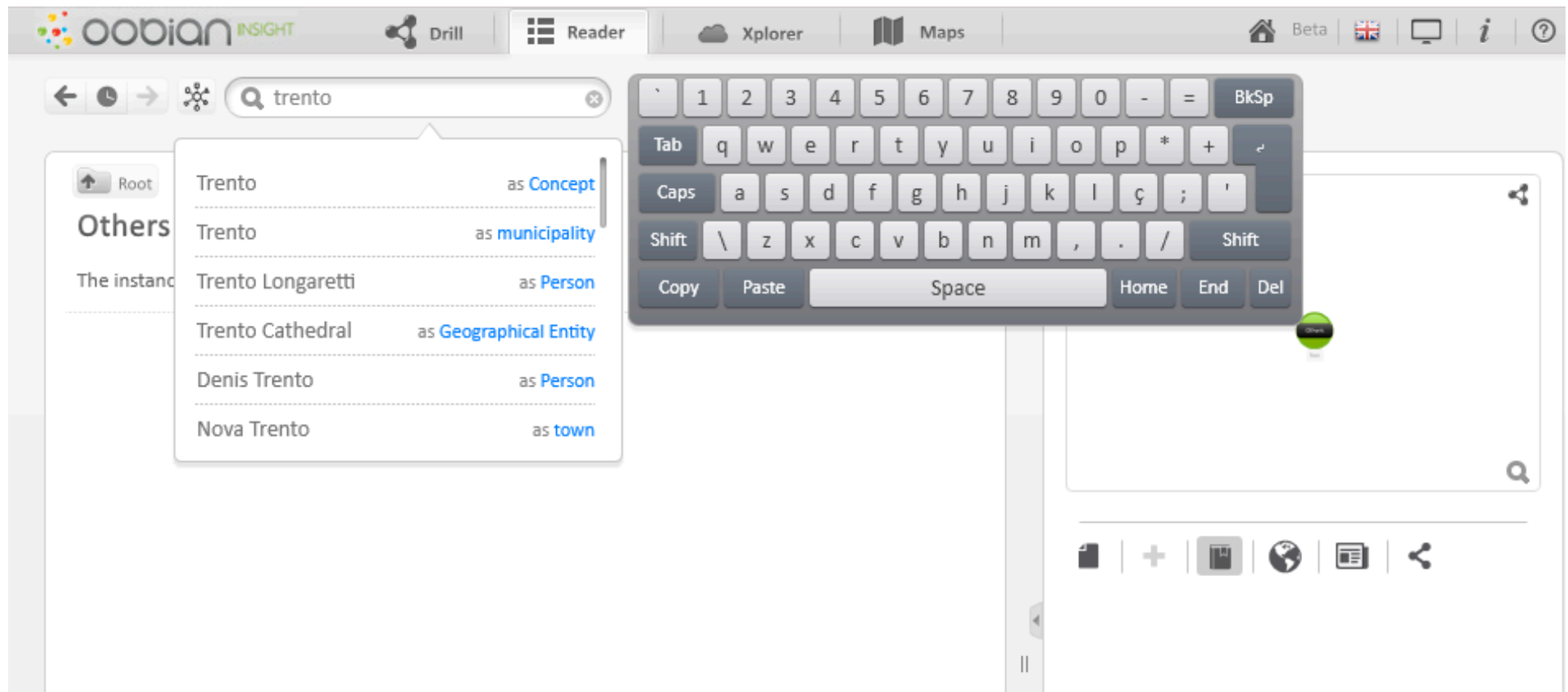
gfacet

exploring data
and relations



oobian

focusing on
instances



oobian

← 🕒 → ⚙️ 🔍

↑ municipality

Trento

Trento is an Italian city located in the Adige River valley in Trentino-Alto Adige/Südtirol. It is the capital of Trentino. In the 16th century the city was the location of the Council of Trent. Trento is a major educational, scientific, financial and political centre in Trentino-Alto Adige/Südtirol and Northern Italy in general.

URI

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

area code

0461

area total (m2)

1.579E8

elevation (μ)

190.0

grss:point

46.06666666666667 11.11666666666667

Ver Relacionados

What do we really need?

Get closer to the final user!

Our proposal: QwwwQ

Get me something like this!

- Query by example
- Zloof 1975, relational data model

TYPE	ITEM	COLOR	SIZE
	Pen	Green	
	Lipstick	Red	
	Pen	Blue	
	Pen	Red	

ITEM=P.PEN COLOR=RED -> {Lipstick, Pen}

ITEM=PEN COLOR=P.RED -> {Green, Red, Blue }

Get me something like this!

User starts from a wikipedia page, and invokes a Chrome plug-in


- Infobox provides the schema
- User selects the variables of interest
- Add filtering and based on wikipedia categories, add ordering on parameters

Query on Berlin

Infobox: Infobox German state

Ask me!





<input checked="" type="checkbox"/>	population	> 5000000
<input type="checkbox"/>	pop_date	= 2013-12-01
<input type="checkbox"/>	elevation	= 34
<input type="checkbox"/>	population_demonym	= Berliner
<input type="checkbox"/>	GDP	= 109.2
<input type="checkbox"/>	GDP_year	= 2013
<input type="checkbox"/>	Website	= http://www.berlin.de/internat
<input type="checkbox"/>	leader_title	= Governing Mayor
<input type="checkbox"/>	leader	= Klaus Wowereit
<input checked="" type="checkbox"/>	leader_party	= SPD
<input type="checkbox"/>	ruling_party1	= SPD



Location within [European Union](#) and [Germany](#)
Coordinates: [52°31'N 13°23'E](#)

Country	Germany
Government	<ul style="list-style-type: none"> Governing Mayor Michael Müller (SPD) Governing parties SPD / CDU Votes in Bundesrat 4 (of 69)
Area	<ul style="list-style-type: none"> City 891.85 km² (344.35 sq mi)
Elevation	34 m (112 ft)
Population (December 2014) ^[1]	<ul style="list-style-type: none"> City 3,562,166 Density 4,000/km² (10,000/sq mi)
Demonym(s)	Berliner
Time zone	CET (UTC+1)
Summer (DST)	CEST (UTC+2)
Postal code(s)	10115–14199
Area code(s)	030
ISO 3166 code	DE-BE
Vehicle registration	B^[2]
GDP/ Nominal	€117.2 billion (2014) ^[3]
GDP per capita	€31,500 (2014)
NUTS Region	DE3
Website	berlin.de

Something found! Your results (2):

Name	DBpedia page	Wikipedia page	population
Lower Saxony			7977000
North Rhine-Westphalia			17920000

Output: DBPedia page, Wikipedia page











Get me something like this!

User starts from a wikipedia page, and invokes a Chrome plug-in

- Infobox provides the schema
- User selects the variables of interest
- Add filtering and based on wikipedia categories, add ordering on parameters

Queen Elizabeth I, House=House of Tudor, Religion=anything

Something found! Your results (5):

✓	Name	DBpedia page	Wikipedia page	Religion
✓	Arthur, Prince of Wales			Catholic_Church
✓	Edward VI of England			Church_of_England
✓	Elizabeth I of England			Anglicanism
✓	Mary I of England			Catholic_Church
✓	Mary Tudor, Queen of France			Catholic_Church







Similarity class <http://dbpedia.org/ontology>

Filter by a Wikipedia category 16th-century women

Order By Religion

Advanced research

Something found! Your results (3):

✓	Name	DBpedia page	Wikipedia page	Religion
✓	Elizabeth I of England			Anglicanism
✓	Mary Tudor, Queen of France			Catholic_Church
✓	Mary I of England			Catholic_Church

exportable to csv, pdf

How many UK defunct political parties have green among their colors?

Infobox: Infobox political party

Ask me!

<input checked="" type="checkbox"/>	Country	= the United Kingdom
<input type="checkbox"/>	Name	= Social Democratic Party
<input type="checkbox"/>	Logo	= center 200px SDP logo
<input type="checkbox"/>	founded	> 1951
<input type="checkbox"/>	dissolved	= 1990-05-01
<input type="checkbox"/>	Ideology	= Social democracy
<input type="checkbox"/>	predecessor	= Social Democratic Party (1981)
<input type="checkbox"/>	successor	= Social Democratic Party (1990)
<input checked="" type="checkbox"/>	colours	Co Green

Settings ⚙

Include current page in the result

☒

Max. results

9950

Similarity class

http://dbpedia.org/ontology

Filter by a Wikipedia category



Defunct political parties in 1

Order By

Choose an optional order

Advanced research

Something found! Your results (1):

✓	Name	DBpedia page	Wikipedia page	colours	
✓	Islamic Party of Britain			Green	

Implementation

- core library:
 - wikipedia parser module (local copy of wp)
 - sparql query builder
- restful web services
 - callable via Ajax
- client code:
 - AngularJS
- browser embedding
 - Google Chrome extension

Problems

- mostly wikipedia-related:
 - Wikipedia is **not complete, nor fully correct**
 - **presence** of infoboxes
 - Berlin is a town or a state?
 - Infoboxes have "**lack of standard**" problems:
 - terminology, units, or even comments
 - lists in infoboxes
 - Wikipedia **categorization**
 - incomplete: Berlin is not in the category of "University towns in Germany"
 - not even an acyclic graph!

people are good at collaborative writing,
not at collaborative creating categorizations

Get me something like Aprilia...

Infobox: Azienda

Ask me!

<input type="checkbox"/>	nome	= Aprilia
<input type="checkbox"/>	logo	= Aprilialogo.png
<input type="checkbox"/>	data_fondazione	= 1945
<input type="checkbox"/>	luogo_fondazione	= Noale
<input type="checkbox"/>	fondatori	= Alberto Beggio
<input type="checkbox"/>	nazione	= ITA
<input type="checkbox"/>	sede	= Noale
<input type="checkbox"/>	filiali	= Scorzè
<input checked="" type="checkbox"/>	gruppo	= Piaggio
<input type="checkbox"/>	persone_chiave	= Roberto Colaninno
<input type="checkbox"/>	industria	= Motoveicoli
<input type="checkbox"/>	prodotti	= Scooter
<input type="checkbox"/>	slogan	= #be a racer
<input type="checkbox"/>	sito	= www.aprilia.com

Settings

Include current page in the result

Max. results











Similarity class

Filter by a Wikipedia category

Order By

Advanced research

Something found! Your results (5):

Name	DBpedia page	Wikipedia page
✓ Aprilia (azienda)		
✓ Derbi		
✓ Gilera		
✓ Moto Guzzi		
✓ Moto Laverda		

Infobox: Azienda

Ask me!

<input type="checkbox"/>	nome	= Aprilia
<input type="checkbox"/>	logo	= Aprilialogo.png
<input type="checkbox"/>	data_fondazione	= 1945
<input type="checkbox"/>	luogo_fondazione	= Noale
<input type="checkbox"/>	fondatori	= Alberto Beggio
<input type="checkbox"/>	nazione	= ITA
<input type="checkbox"/>	sede	= Noale
<input type="checkbox"/>	filiali	= Scorzè
<input type="checkbox"/>	gruppo	= Piaggio
<input checked="" type="checkbox"/>	industria	= Motoveicoli
<input type="checkbox"/>	persone_chiave	= Roberto Colaninno
<input type="checkbox"/>	prodotti	= Scooter
<input type="checkbox"/>	slogan	= #be a racer
<input type="checkbox"/>	sito	= www.aprilia.com

Settings

Include current page in the result

Max. results

Similarity class

Filter by a Wikipedia category

Order By

Advanced research

Something found! Your results (5):

Name	DBpedia page	Wikipedia page
✓ Aprilia (azienda)		
✓ FTR Moto		
✓ Harris Performance Products		
✓ Kymco		
✓ Suter Racing Technology		

Inconsistencies..

Gilera & C. SpA



GILERA®

Stato	 Italia
Tipo	Società per azioni
Fondazione	1909 a Milano in Corso XXII Marzo
Sede principale	Pontedera
Gruppo	Piaggio
Settore	Casa motociclistica
Prodotti	motocicli
Slogan	«Ivata dal desiderio»
Sito web	www.it.gilera.com

Modifica dati su Wikidata • Manuale

Aprilia



Stato	 Italia
Fondazione	1945 a Noale
Fondata da	Alberto Beggio
Sede principale	Noale
Gruppo	Piaggio
Filiali	Scorzè
Persone chiave	Roberto Colaninno (presidente)
Settore	Motoveicoli
Prodotti	Motociclette Scooter
Slogan	«#be a racer»
Sito web	www.aprilia.com/

Modifica dati su Wikidata • Manuale

Which Italian F1 drivers became World Champions?

Ask me!

☐ name

☐ image

☐ caption

☐ birth_place

☒ nationality

☐ Years

☐ Team(s)

☐ 2012 Team

☐ 2012 Car number

☐ Races

☒ Championships

☐ First race

☐ First win

☐ Last win

☐ Last race

= Michael Schumacher

= Michael Schumacher-I'm the man .

= Michael Schumacher in

= Italy

= Italian

= -, -

= Ferrari

= Mercedes

= 7

=

> 0

= 1991 Belgian Grand Prix

= 1992 Belgian Grand Prix

= 2006 Chinese Grand Prix

= 2012 Brazilian Grand Prix

Include current page in the result

☒

Max. results

9950

Similarity class

<http://dbpedia.org/ontology/FormulaOne>

Filter by a Wikipedia category

Choose a category

Order By







Choose an optional order

Infobox: Navboxes

Infobox: Persondata

Advanced research

Something found! Your results (3):

Name	DBpedia page	Wikipedia page	Championships
Alberto Ascari			2
Cosimo Aldo Cannone			2
Giuseppe Farina			1

Answer present in wikipedia

Spotted a wikipedia error!

<input type="checkbox"/>	name	<input type="text" value="Cosimo Aldo Cannone"/>
<input type="checkbox"/>	image	<input type="text" value="Principe_Cosimo.jpg"/>
<input type="checkbox"/>	caption	<input type="text" value="Prince Cosimo of Macedonia"/>
<input checked="" type="checkbox"/>	nationality	<input type="text" value="Italian"/>
<input type="checkbox"/>	2010 Team	<input type="text" value="Cannone"/>
<input type="checkbox"/>	Boat number	<input type="text" value="45"/>
<input type="checkbox"/>	Races	<input type="text" value="27"/>
<input type="checkbox"/>	Championships	<input type="text" value="0"/>
<input checked="" type="checkbox"/>	Wins	<input type="text" value="Rn[1,3]"/>
<input checked="" type="checkbox"/>	Podiums	<input type="text" value="1"/>
<input type="checkbox"/>	Fastest laps	<input type="text" value="22"/>
<input type="checkbox"/>	First race	<input type="text" value="2003 Jesolo Grand Prix"/>
<input type="checkbox"/>	First win	<input type="text" value="2004 Palermo Grand Prix"/>
<input type="checkbox"/>	Last win	<input type="text" value="2009 Como Grand Prix"/>
<input type="checkbox"/>	Last season	<input type="text" value="2010"/>
<input type="checkbox"/>	Last position	<input type="text" value="2"/>























Infobox: Persondata

result	
Max. results	<input type="text" value="9950"/>
Similarity class	<input type="text" value="http://dbpedia.org/ontology/FormulaOneRacer"/>
Filter by a Wikipedia category	<input type="text" value="Choose a category"/>
Order By	<input type="text" value="Podiums"/>

more exotic query
 Italian F1 drivers with
 1 to 3 victories,
 ordered by podiums

Advanced research

Something found! Your results (11):

<input checked="" type="checkbox"/>	Name	DBpedia page	Wikipedia page	Podiums
<input checked="" type="checkbox"/>	Ludovico Scarfiotti			1
<input checked="" type="checkbox"/>	Gianni Morbidelli			1
<input checked="" type="checkbox"/>	Giancarlo Baghetti			1
<input checked="" type="checkbox"/>	Vittorio Brambilla			1
<input checked="" type="checkbox"/>	Piero Taruffi			5
<input checked="" type="checkbox"/>	Luigi Fagioli			6
<input checked="" type="checkbox"/>	Luigi Musso			7
<input checked="" type="checkbox"/>	Lorenzo Bandini			8
<input checked="" type="checkbox"/>	Alessandro Nannini			9
<input checked="" type="checkbox"/>	Elio de Angelis			9
<input checked="" type="checkbox"/>	Giancarlo Fisichella			19

Problems are non only ours...

- Same problems affect DBPedia, and hence LOD...
- Some effort could be done to mitigate them
 - e.g., recognize unusable properties

Spacetime: a Two Dimensions Search and Visualisation Engine Based on Linked Data

Fabio Valsecchi and **Marco Ronchetti**
DISI, Università degli Studi di Trento
Povo di Trento, Italy

Our proposal: Spacetime

- WHAT? Set of DBPedia entities having spatial and temporal data

(Organisation, Person, Event, Place, Species and Work)

- WHERE? Attributes having geocoordinates
- WHEN? Attributes having data type *xsd:date*.

Formulating queries

The screenshot displays the Spacetime web application interface, which is used for formulating queries based on spatial and temporal data. The interface is divided into three main sections for query formulation, with a world map visible on the right side.

1 Select a category:

- ☒ Populated place
- ☐ Administrative region
- ☐ Country
- ☐ Island
- ☐ Settlement
- ☐ Protected area
- ☐ Sport facility

2 Where:

filter:

- ☐ country
- ☐ district
- ☐ region
- ☐ department
- ☐ state
- ☐ neighboring municipality
- ☐ part
- ☐ arrondissement

3 When: from to

filter:

- ☐ population as of
- ☐ founding date
- ☐ dissolution date
- ☐ day
- ☐ birth date

Options:

Search

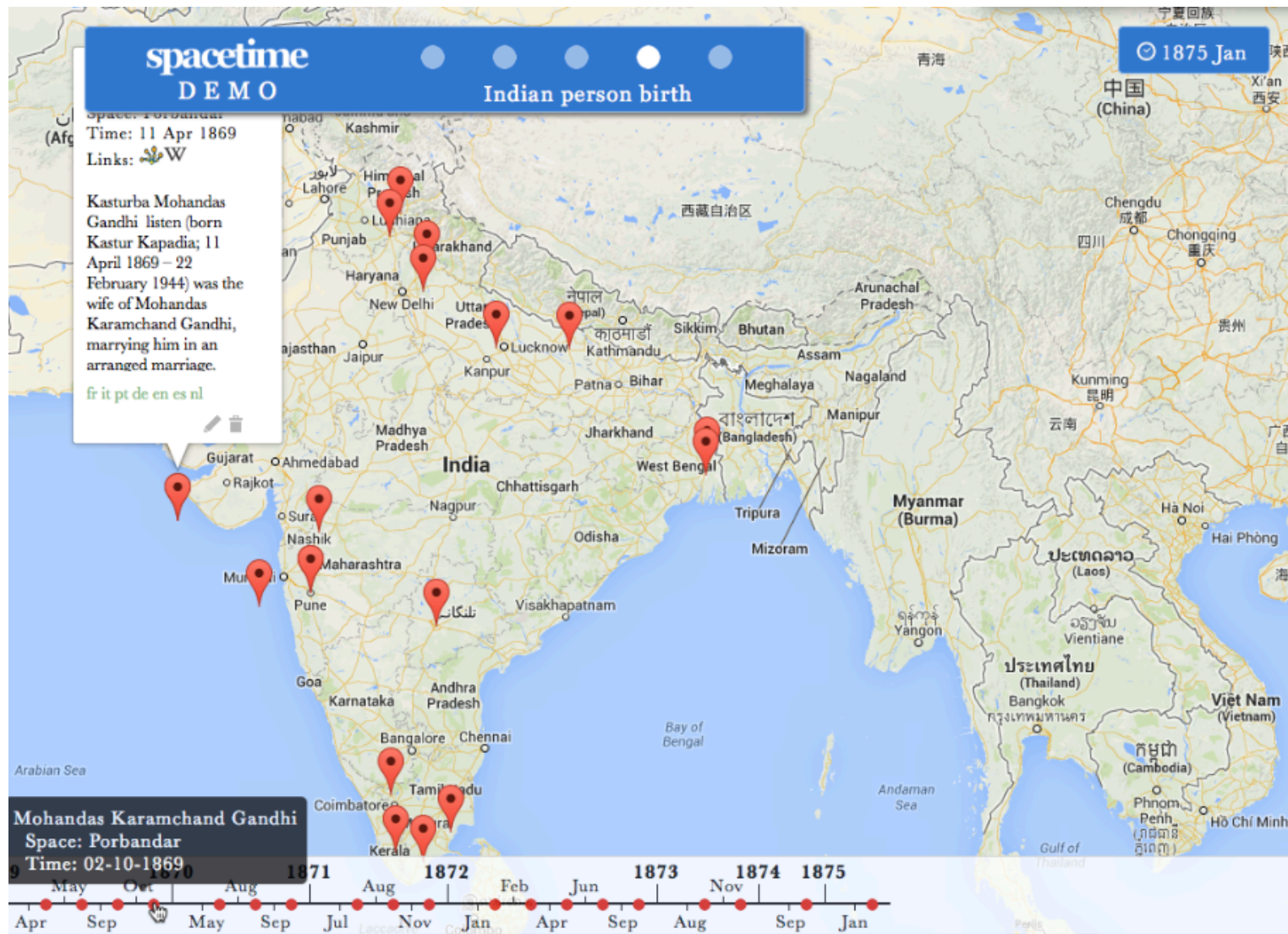
The world map on the right side of the interface shows various countries labeled with their names in English and some in their native languages. The map is centered on the Atlantic Ocean, showing North America, South America, Europe, and Africa.

Geographical approximation

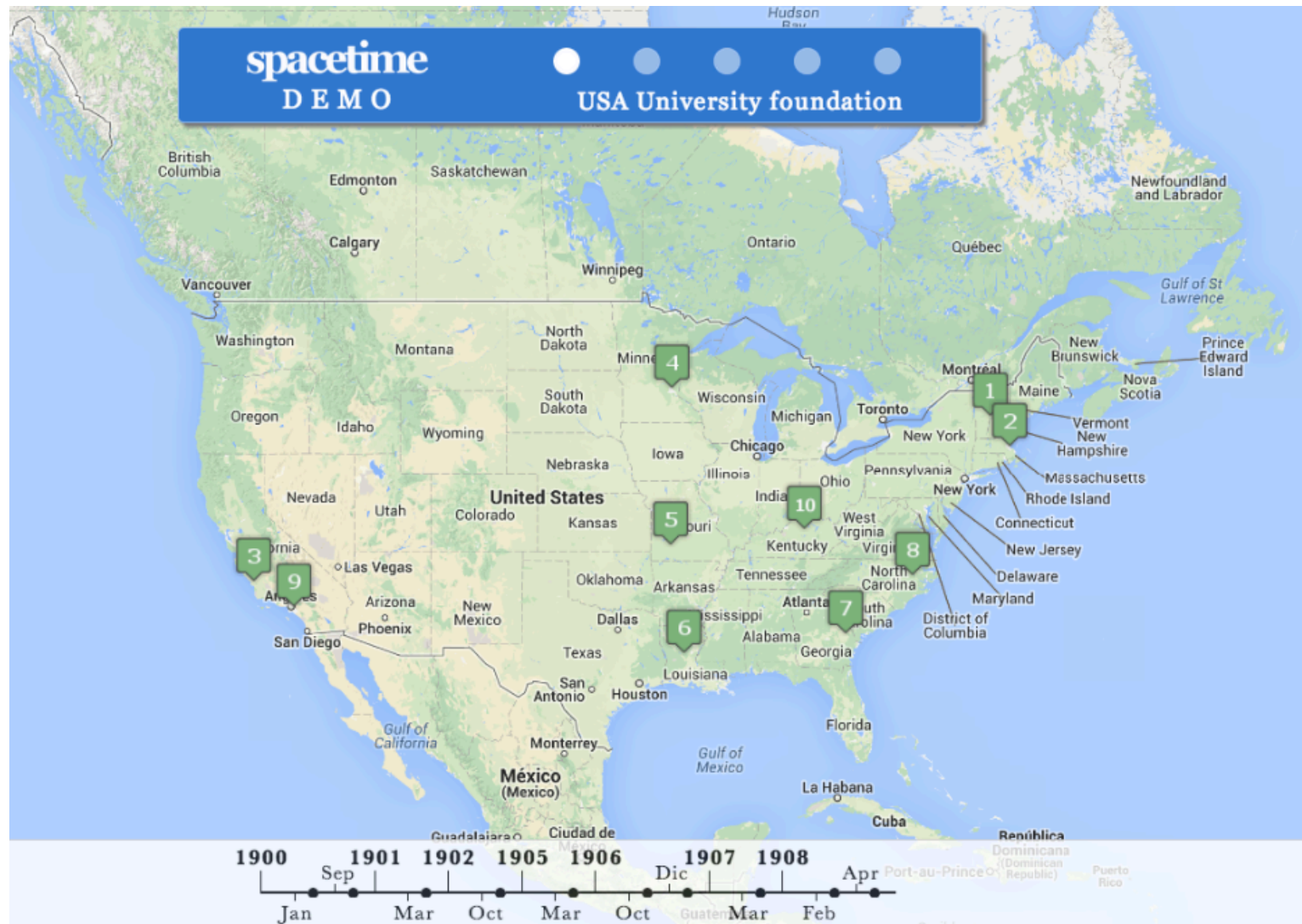
- Bounding box of the geoentity



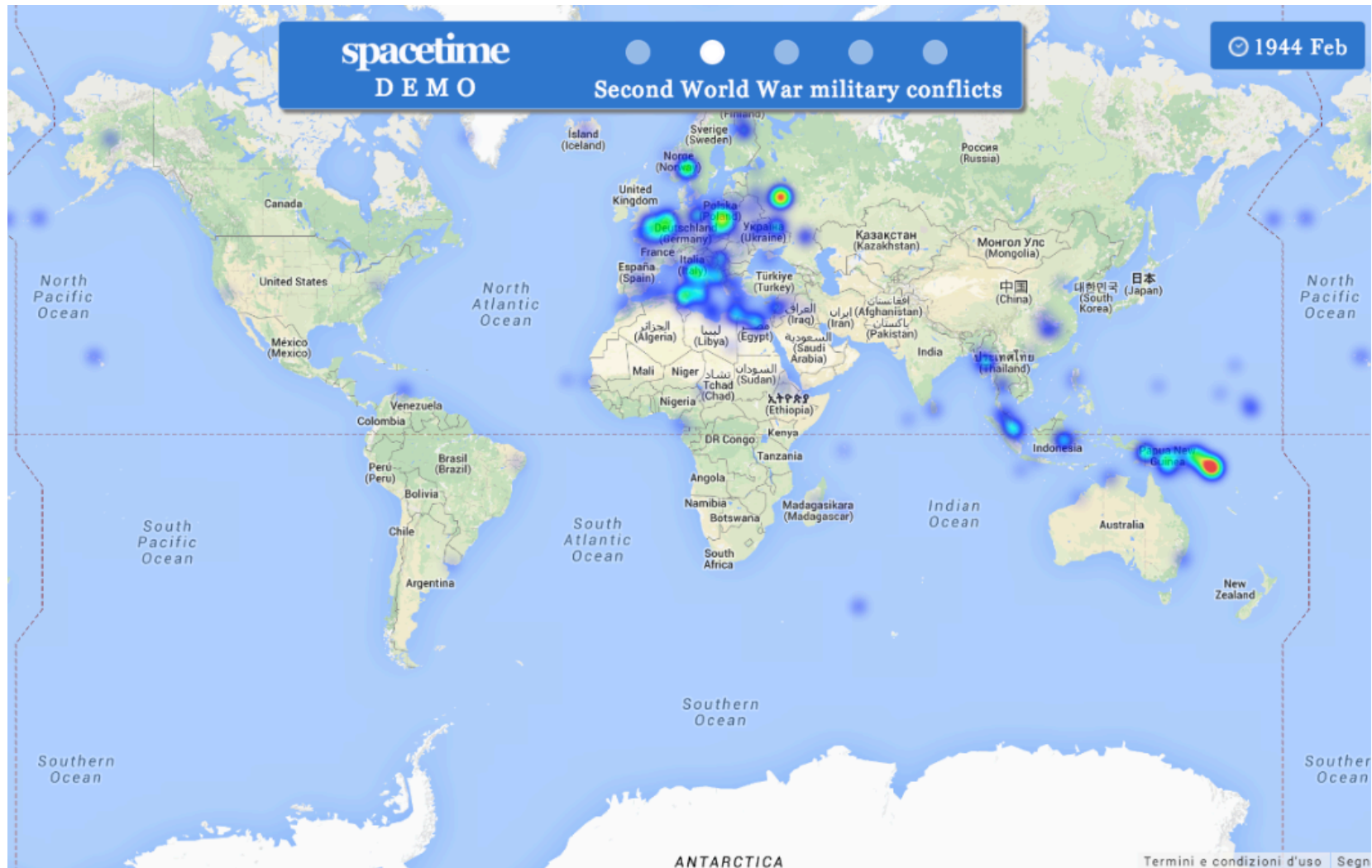
Query results



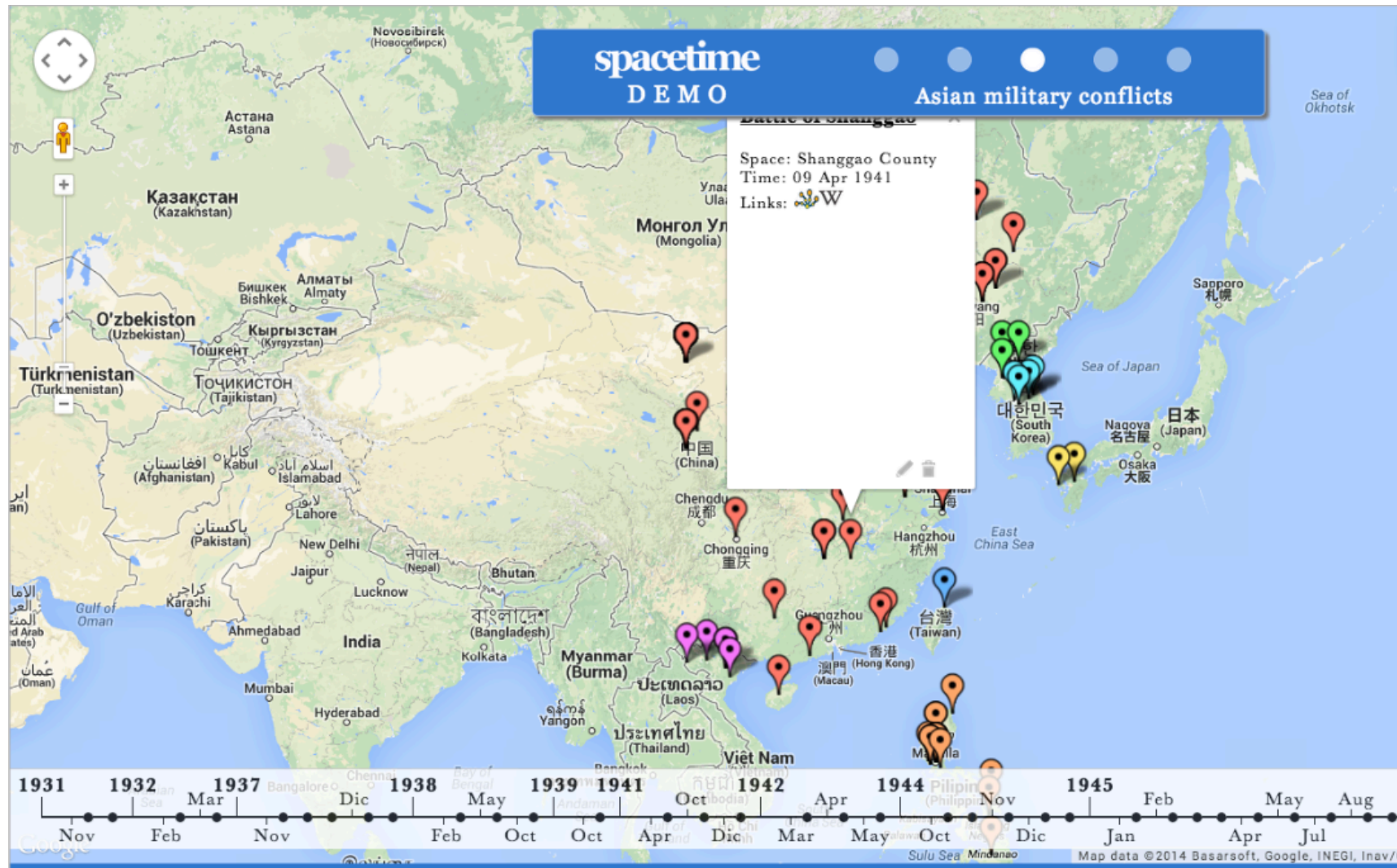
Sequence of results



Density maps



Grouping different queries



Creating a story

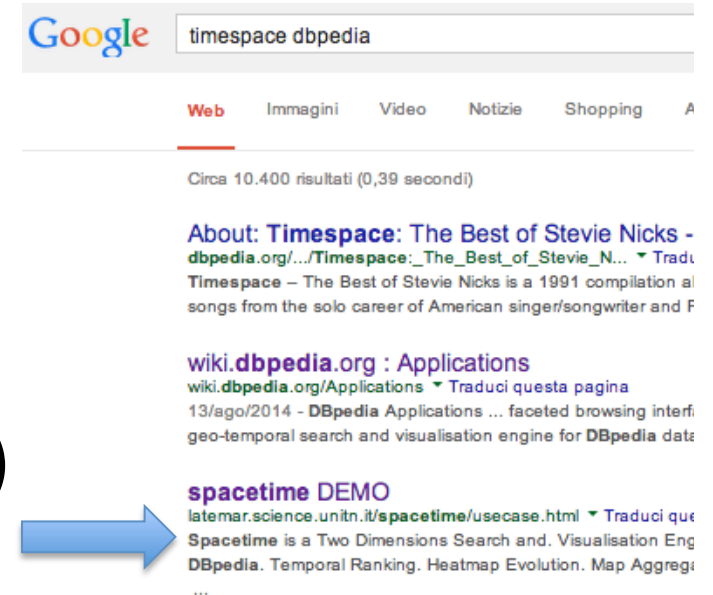


Technologies

- SPARQL: Queries are composed by the Javascript engine, and are executed through the SPARQL endpoint;
- JSON: the results of the SPARQL queries are returned as JSON strings;
- Google Maps JavaScript API v.3: the Google Maps API used for populating a map with the data extracted in the JSON file
- JavaScript and JQuery library: the scripting language and its library define a set of functions that are the core of the application JQuery allows the creation of animations inside Spacetime;
- AJAX: this technology is used to have a responsive user interface compliant with the Rich Internet Application paradigm;
- CSS: for designing the graphical aspect of Spacetime;
- HTML5: used for developing certain parts of the application, such as the map saving operation, and some graphical feature.

Conclusion

- The system is up and running
— (google for Timespace DBPedia)



- Included in the DBPedia front end demos

<http://wiki.dbpedia.org/Applications>

- No user assessment done (yet)