

Government Linked Data: A Tipping Point for the Semantic Web

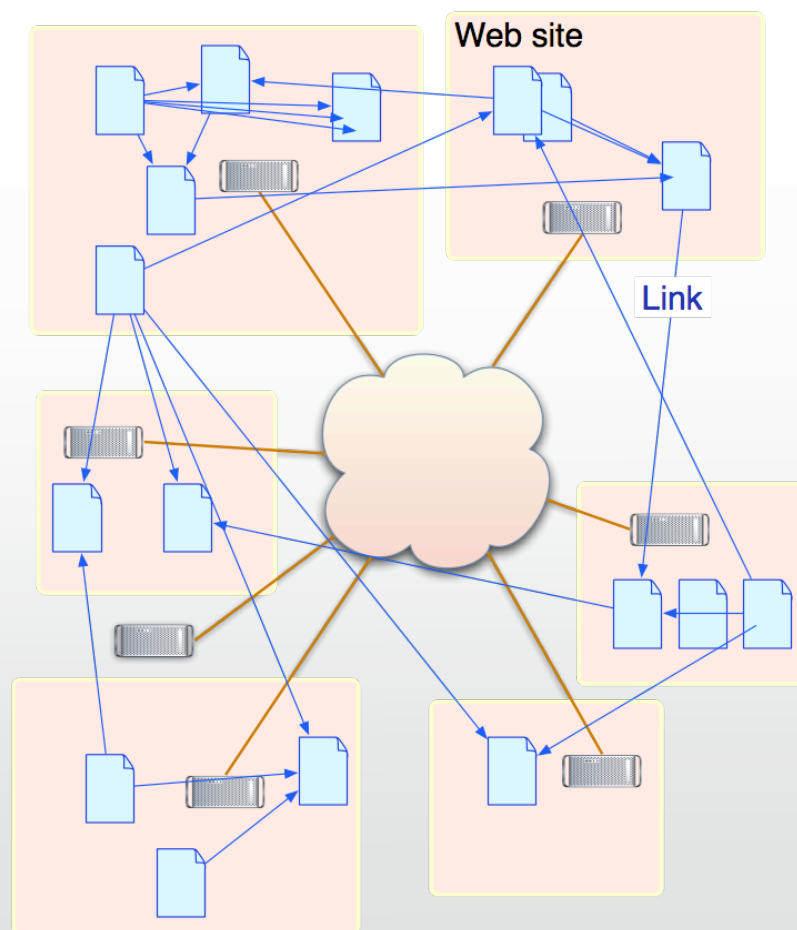
Professor Nigel Shadbolt FREng
UK Government Information Advisor

ASWC 2009, Shanghai 8 December 2009

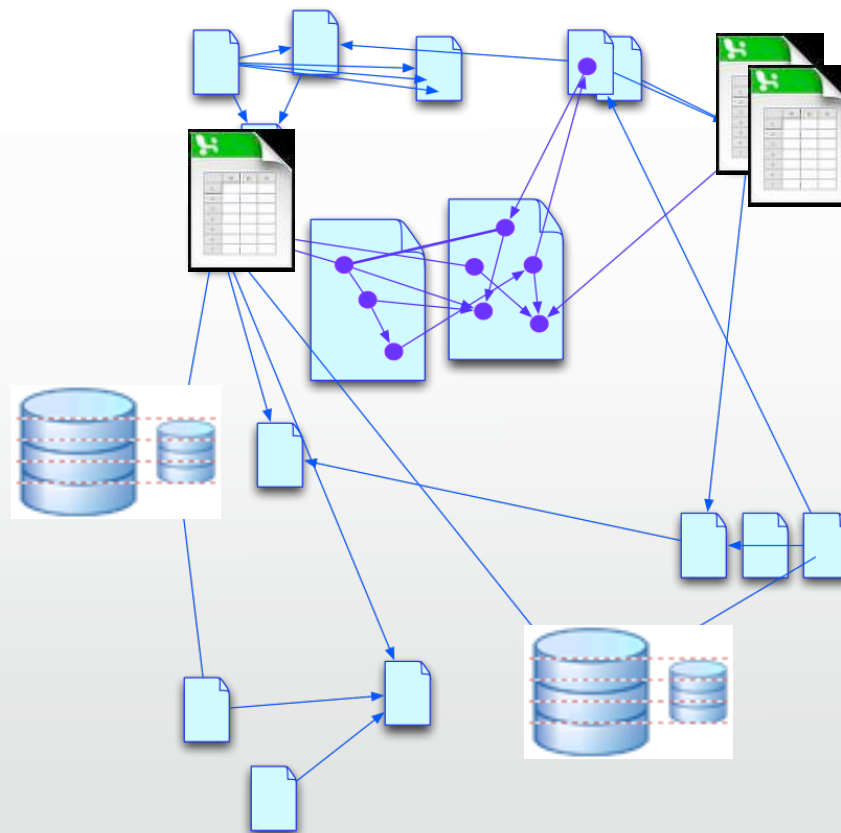
Structure

- Review the principles of Linked Data
- The growing Web of Linked Open Data
- Describe the UK Making Public Data Public Project
- Lessons Learnt
- Implications and opportunities

From a Web of documents...



To a Web of data...



Technical Principles

The four micro principles of the Semantic Web

1. All entities of interest, such as information resources, real-world objects, and vocabulary terms should be identified by URI references.
2. URI references should be dereferenceable, meaning that an application can look up a URI over the HTTP protocol and retrieve RDF data about the identified resource.
3. Data should be provided using the RDF/XML syntax
4. Data should be interlinked with other data.

The Semantic Web Revisited

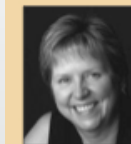
Nigel Shadbolt and Wendy Hall, *University of Southampton*
Tim Berners-Lee, *Massachusetts Institute of Technology*



Nigel Shadbolt is a professor of artificial intelligence in the School of Electronics and Computer Science at Southampton University. Contact him at nrs@ecs.soton.ac.uk.



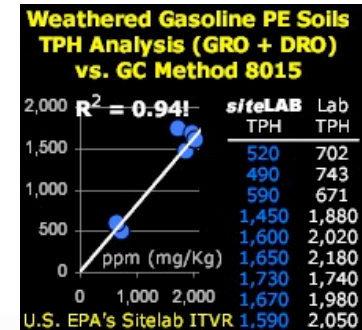
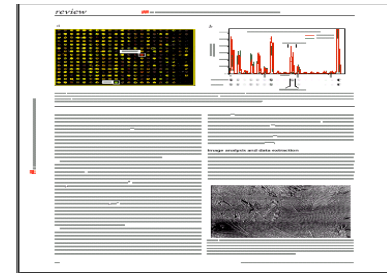
Tim Berners-Lee is the director of the World Wide Web Consortium, a senior researcher at the Massachusetts Institute of Technology's Computer Science and Artificial Intelligence Laboratory, and a professor of computer science in the Department of Electronics and Computer Science at Southampton University. Contact him at timbl@w3.org.



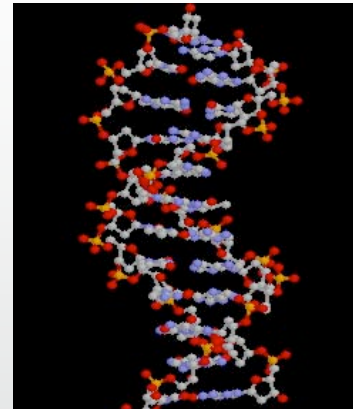
Wendy Hall is a professor of computer science in the School of Electronics and Computer Science at Southampton University. Contact her at wh@ecs.soton.ac.uk.

Can mark up and link any resource...

- Publications...
- Multimedia...
- Databases...
- Scientific structures...
- Workflow...
- People...



Web data set (XHTML)



Principle 1: URIs

- Uniform Resource identifier
- A Web based identifier
- You can dereference them – get something back
- Information about objects, relations, properties and values

<http://id.ecs.soton.ac.uk/person/2686>

<http://rdf.ecs.soton.ac.uk/person/2686>

<http://rdf.ecs.soton.ac.uk/project/464>

<http://rdf.ecs.soton.ac.uk/publication/11065>

<http://education.data.gov.uk/doc/school/120805>

<http://southampton.rkbexplorer.com/id/person-02686>

http://dbpedia.org/resource/Nigel_Shadbolt

Principle 2: Dereferencable

- Uniform Resource identifier
- A Web based identifier
- You can dereference them – get something back
- Information about objects, relations, properties and values

▼ Southampton ECS People: Professor Nigel R Shadbolt		
Southampton ECS People: Professor Nigel R Shadbolt	Description	This rdf document contains information about a person Southampton.
Nigel Shadbolt	Source	http://www.ecs.soton.ac.uk/people/nrs
	Title	Southampton ECS People: Professor Nigel R Shadbo
	Date Created	2009-11-26T10:53:20Z
	type	Ontology
	label	Southampton ECS People: Professor Nigel R Shadbo
	Appellation	Professor
	Family Name	Shadbolt
	Full Name	Professor Nigel R Shadbolt
	Given Name	Nigel R
	Role	http://id.ecs.soton.ac.uk/role/2686
	member Of	http://id.ecs.soton.ac.uk/project/221 http://id.ecs.soton.ac.uk/project/293 http://id.ecs.soton.ac.uk/project/312 http://id.ecs.soton.ac.uk/project/353 http://id.ecs.soton.ac.uk/project/361 http://id.ecs.soton.ac.uk/project/395 http://id.ecs.soton.ac.uk/project/443 http://id.ecs.soton.ac.uk/project/44 http://id.ecs.soton.ac.uk/project/45 http://id.ecs.soton.ac.uk/project/463 http://id.ecs.soton.ac.uk/project/464 http://id.ecs.soton.ac.uk/project/465 http://id.ecs.soton.ac.uk/project/466 http://id.ecs.soton.ac.uk/project/467 http://id.ecs.soton.ac.uk/project/508 http://id.ecs.soton.ac.uk/project/623 http://id.ecs.soton.ac.uk/project/629 http://id.ecs.soton.ac.uk/project/630
	type	Person
	family name	Shadbolt
	givenname	Nigel R
	homepage	http://users.ecs.soton.ac.uk/nrs/
	img	http://www.ecs.soton.ac.uk/image.php?id=person_268 http://www.ecs.soton.ac.uk/image.php?id=person_268&checksum=6c2158b33a0c10e328ec62f9ed1cc73
	mbox	mailto:nrs@ecs.soton.ac.uk
	name	Professor Nigel R Shadbolt

Principle 3: RDF back

- Uniform Resource identifier
- A Web based identifier
- You can dereference them – get something back
- Information about objects, relations, properties and values

▼ Southampton ECS Projects: MIMEX: Multivariant Information Management and Exploitation

Southampton ECS Projects: MIMEX: Multivariant Information Management and Exploitation	Description	This rdf document contains information about e University of Southampton.
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label		Southampton ECS Projects: MIMEX: Multivari
http://id.ecs.soton.ac.uk/project/443	associated With	http://id.ecs.soton.ac.uk/UoS
	Name	General Dynamics
	type	Organization
	Name	University of Card
	type	Organization
	Name	Ministry of Defenc
	type	Organization
	associated With Unit	http://id.ecs.soton.ac.uk/UoS/ECS
Name		MIMEX: Multivariant Information Management
Theme		http://id.ecs.soton.ac.uk/theme/106
		http://id.ecs.soton.ac.uk/theme/127
		http://id.ecs.soton.ac.uk/theme/130
		http://id.ecs.soton.ac.uk/theme/38
		http://id.ecs.soton.ac.uk/theme/66
		https://www.edefence.org/mimex
Web Page		http://id.ecs.soton.ac.uk/group/iam
run By Group		
begins		in Calendar Clock
		day
		hour
		minute
		month
		year
		type
		in Calendar Clock Data Type
		2006-07-03T00:00:00Z
		type
		Instant
	ends	in Calendar Clock
		day
		hour
		minute
		month
		year
		type
		in Calendar Clock Data Type
		2009-03-31T00:00:00Z
		type
		Instant

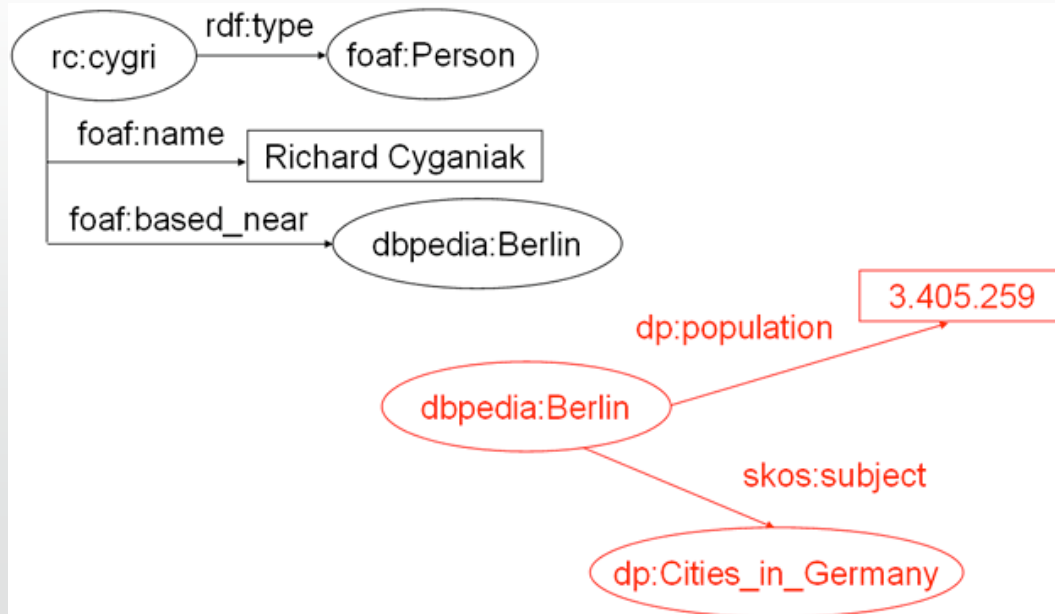
Essential RDF

- Statements about resources in the form of subject-predicate-object
- A knowledge representation language for the Web
- Represents information as sets of triples
- Every element of a triple can be a URI or literal
- Sets of RDF triples can be represented as graphs

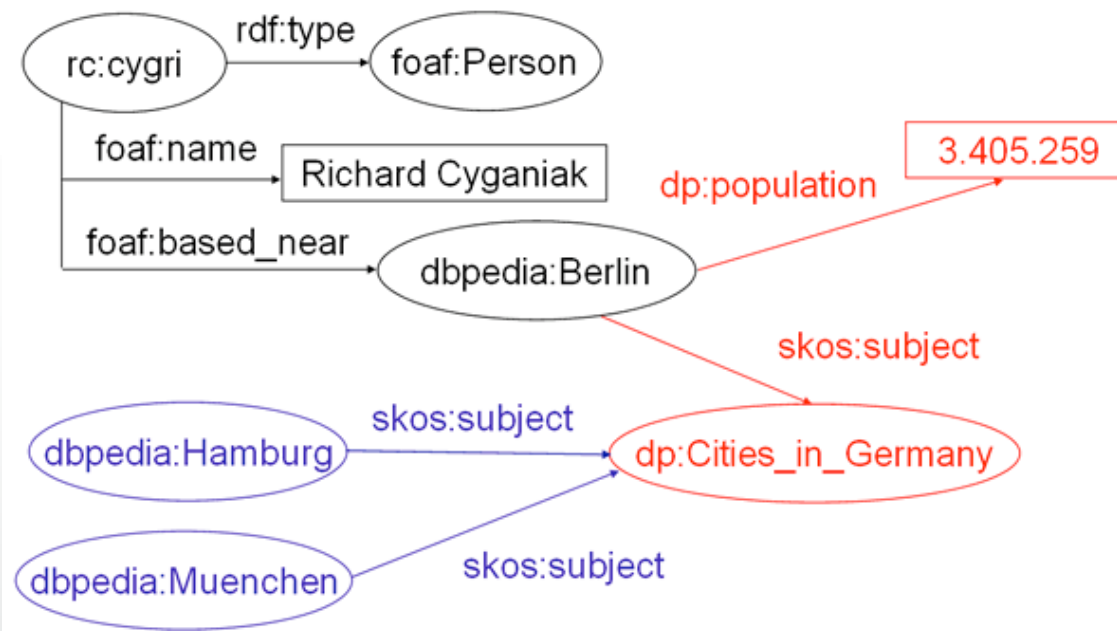
rc:cygri	rdf:type	foaf:Person.
rc:cygri	foaf:name	"Richard Cyganiak" .
rc:cygri	foaf:based_near	dbpedia:Berlin .
dbpedia:Berlin	dp:population	"3,405,259"
dpedia:Berlin	skos:subject	dp:Cities_in_Germany.

Essential RDF

- Statements about resources in the form of subject-predicate-object
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Principle 4: Link data



Chris Bizer et al

Principle 4: Link data

<http://rdf.ecs.soton.ac.uk/person/2686>

<http://southampton.rkbexplorer.com/id/person-02686>

http://dbpedia.org/resource/Nigel_Shadbolt

The screenshot displays three instances of the SIG.MA Semantic Information Mashup interface. Each instance shows a profile page for a person, with a list of sources on the right. The leftmost instance is for 'Nigel R Shadbolt' and shows a detailed profile with personal information and a list of 20 sources. The middle instance is for 'Nigel Shadbolt' and shows a list of 8 sources. The rightmost instance is for 'Nigel Shadbolt' and shows a list of 15 sources. Each instance includes a search bar, navigation links, and a list of sources with their titles, counts, and dates.

SIG.MA SEMANTIC INFORMATION MASHUP

Help About Forum

http://southampton.rkbexplorer.com/id/perso Add More Info Start New Options Use it Order

N R Shadbolt

given name: Nigel R [1]

N [1]

N R [1]

Nigel [1]

family name: Shadbolt [1]

is creator of: AKT Selected Papers 2004 [2]

INSTRUCTA-Phase II [3]

Techniques of Temporal Representation [4]

Research & Development in Expert Systems VI [5,6]

Expert Systems - A Natural History [5]

Report of the 8th Workshop of the Planning Special Interest Group [7]

Processing Reference [8]

Expert Systems in the Financial Industries [9]

Intelligent Interfaces [10]

Preliminary Report of the Workshop on Teaching AI in Departments of Psychology [11]

A Framework for Research in Cognitive Science [12]

Living Documents [13]

Tempus Fugit I: Representing Time and Change [14]

Hypermedia for knowledge engineering [15]

Human Sciences Technology Audit [16]

Final Report of the 9th Workshop of The UK Planning Special Interest Group [17]

Knowledge Technologies [18]

Education and Human-Computer Interaction [19]

Knowledge Technologies and the Semantic Web [20] show 282 more values +

appellation: http://www.aktors.org/ontology/portal#Prof [1]

Sources (20) Approved (0) Rejected (0)

- 1 Nigel R Shadbolt 316 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/person-02686
- 2 AKT Selected Papers 2004 4 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-12485
- 3 INSTRUCTA-Phase II 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2408
- 4 Techniques of Temporal R... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2409
- 5 Expert Systems - A Natur... 5 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2374
- 6 Research and Development... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2272
- 7 Report of the 8th Worksh... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2388
- 8 Processing Reference 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2314
- 9 Expert Systems in the FI... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2401
- 10 Intelligent Interfaces 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2402
- 11 Preliminary Report of th... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2403
- 12 A Framework for Research... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2405
- 13 Living Documents 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2407
- 14 Tempus Fugit I: Represen... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-2410
- 15 Hypermedia for knowledge... 3 facts | 2009-09-17
http://southampton.rkbexplorer.com/id/eprints-4177

< 1 2 > reject all approve all
http://example.loc/document.rdf add source url

ANTIC INFORMATICA HUP

Help About Forum

resource/Nigel_Shadbolt Add More Info Start New Options Use it Order

resource/Nigel_Shadbolt [1]

http://dbpedia.org/resource/Nigel_Shadbolt [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20]

Semantic Web [8,16]

Nigel Shadbolt [1]

Nigel Shadbolt [14,15,17,18,19,20]

Semantic Web [8]

Academics of the University of Southampton [1,7]

British computer scientists [1,13]

Living people [1]

People from London [1]

Fellows of the Royal Academy of Engineering [1,10]

Fellows of the British Computer Society [1,9]

English computer scientists [1,6]

Person [8,16]

Show your web data in Sigma, learn how
Get this sigma embedded, in rdf or in json format.

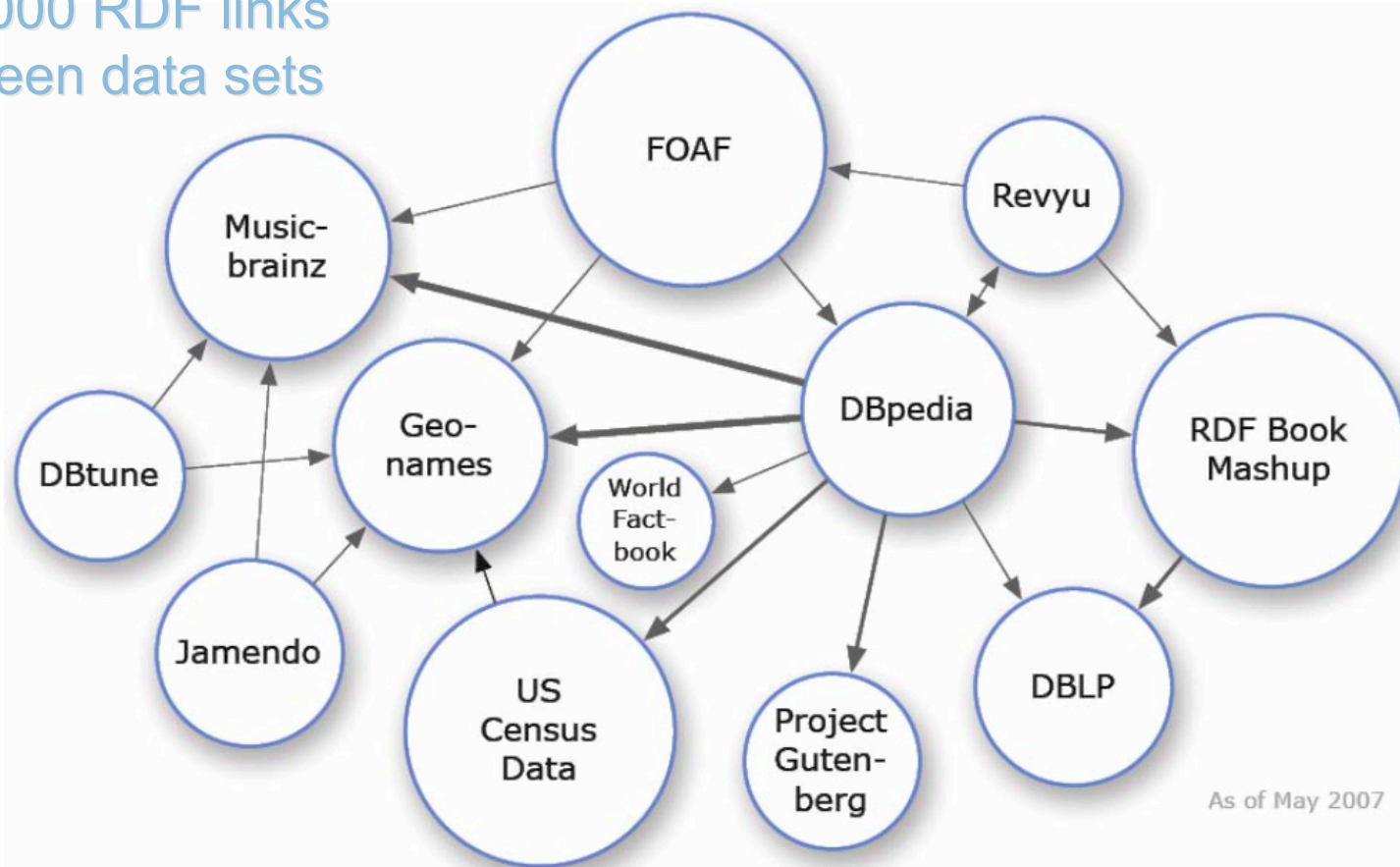
Sources (20) Approved (0) Rejected (0)

- 1 Nigel Shadbolt 10 facts | 2009-09-20
http://dbpedia.org/resource/Nigel_Shadbolt
- 2 Untitled document 1 facts | 2009-08-25
http://dbpedia.org/resource/Professor_Nigel_Shadbolt...
- 3 Untitled document 1 facts | 2009-08-24
http://dbpedia.org/resource/Web_Science_Research_In...
- 4 Untitled document 1 facts | 2009-08-27
http://dbpedia.org/resource/Daniel_Weltzner
- 5 Untitled document 1 facts | 2009-08-27
http://dbpedia.org/resource/Web_Science
- 6 English computer scienti... 2 facts | 2009-09-22
http://dbpedia.org/resource/Category:English_comput...
- 7 Academics of the Univers... 2 facts | 2009-09-19
http://dbpedia.org/resource/Category:Academics_of_t...
- 8 Semantic Web 8 facts | 2009-11-11
http://dbpedia.org/resource/Semantic_Web
- 9 Fellows of the British C... 2 facts | 2009-09-19
http://dbpedia.org/resource/Fellows_of_the...
- 10 Fellows of the Royal Aca... 2 facts | 2009-09-19
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- 11 Untitled document 1 facts | 2009-09-23
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- 12 Untitled document 1 facts | 2009-08-25
http://dbpedia.org/resource/Nottingham_University
- 13 British computer scienti... 2 facts | 2009-09-19
http://dbpedia.org/resource/Category:British_comput...
- 14 Wendy Hall | Faviki... 2 facts | 2009-09-06
http://www.faviki.com/tag/Wendy_Hall
- 15 Nigel Shadbolt | Faviki... 2 facts | 2009-09-07
http://www.faviki.com/tag/Nigel_Shadbolt

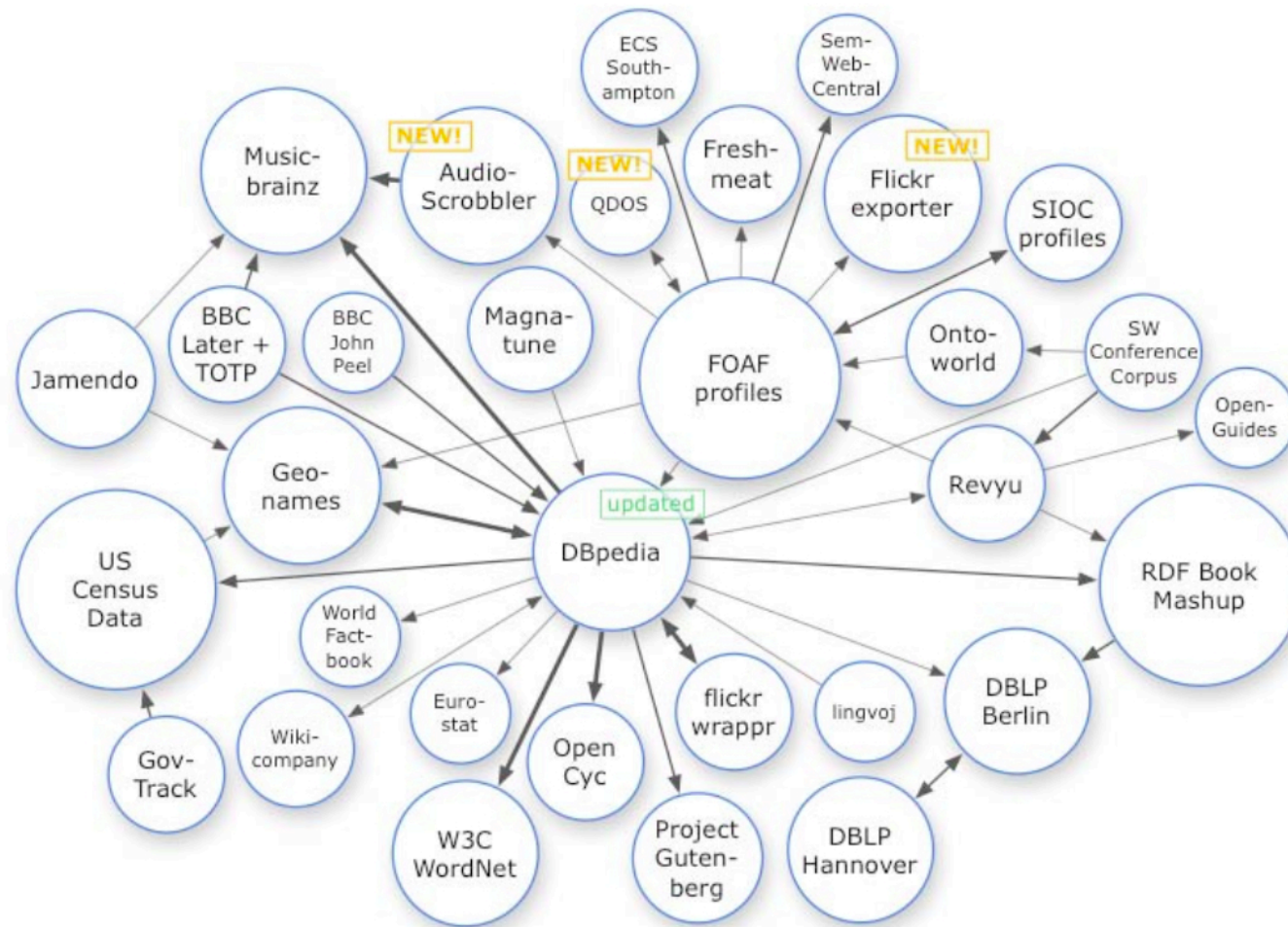
< 1 2 > reject all approve all
http://example.loc/document.rdf add source url

Linked Data on the Web: May 2007

500 Million RDF Triples
120,000 RDF links
between data sets



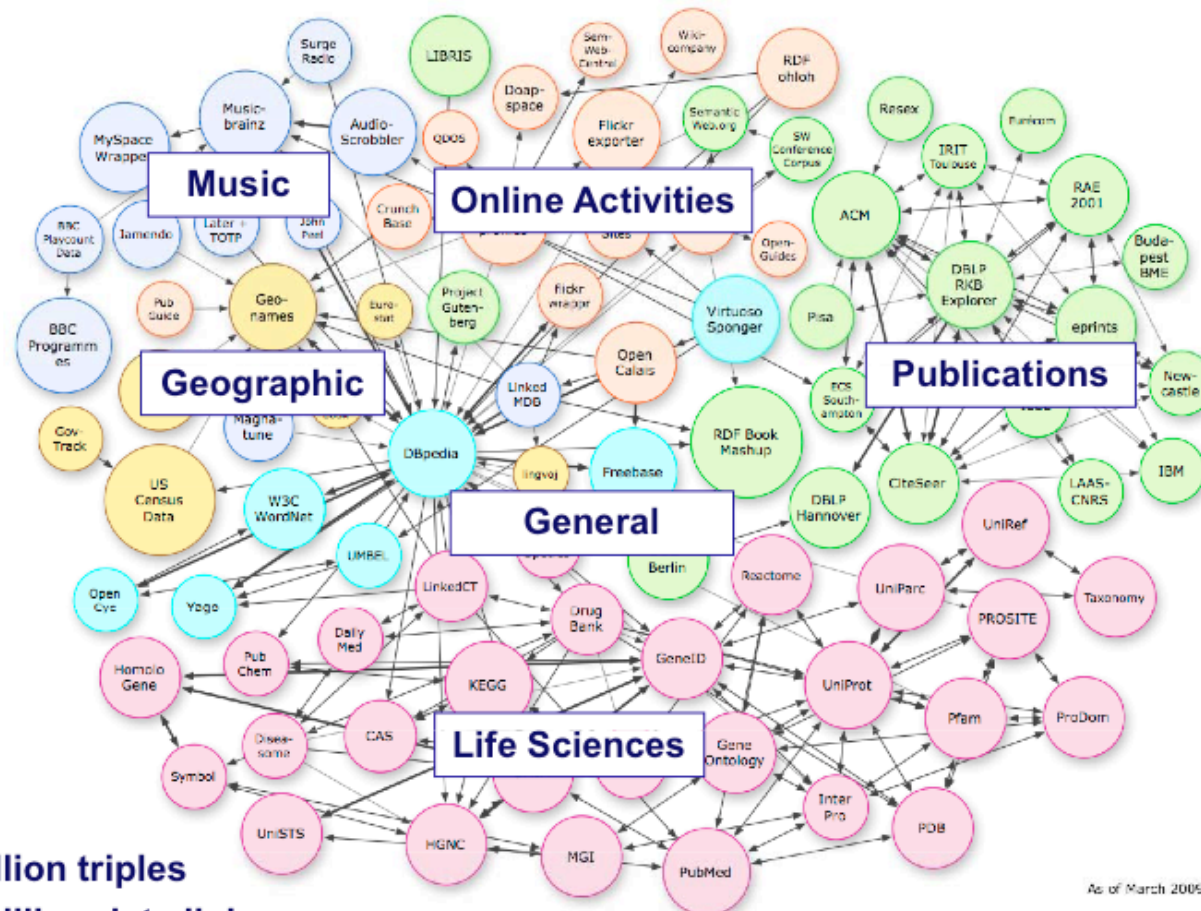
Linked Data on the Web: February 2008



Richard Cyganiak

Linked Data on the Web: March 2009

LOD Datasets on the Web: March 2009



SPARQL

- A data access language for RDF triples on the Web
- Queries across diverse data sources, whether the data is stored natively as RDF or viewed as RDF via middleware
- SPARQL contains capabilities for querying required and optional graph patterns along with their conjunctions and disjunctions

The screenshot shows the SPARQL Explorer interface for dbpedia.org. The query is a SELECT statement that filters for persons born before 1800-01-01 and located in London. The results are displayed in a table with columns for name, birth, death, and person.

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 dbpedia: <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 dbpedia:birthPlace <http://dbpedia.org/resource/London> .
  ?person dbo:birthDate ?birth .
  ?person foaf:name ?name .
  ?person dbo:deathDate ?death
  FILTER (?birth < "1800-01-01"^^xsd:date) .
}
ORDER BY ?name
```

SPARQL results:

name	birth	death	person
"<small>Countess of Chatham"	"1720-11-08"^^xsd:date	"1803-04-09"^^xsd:date	:Hester_Pitt%2C_Countess_of_Chatham
"Aaron Hart"	"1724-08-16"^^xsd:date	"1800-12-28"^^xsd:date	:Aaron_Hart_%28businessman%29
"Alexander Pope"	"1688-05-21"^^xsd:date	"1744-05-30"^^xsd:date	:Alexander_Pope
"Alexander Schomberg"	"1720-01-01T00:00:00-05:00"^^xsd:gYear	"1804-01-01T00:00:00-05:00"^^xsd:gYear	:Alexander_Schomberg
"Anne Killigrew"	"1660-01-01T00:00:00-05:00"^^xsd:gYear	"1685-06-16"^^xsd:date	:Anne_Killigrew
"Aubrey George Spencer"	"1795-02-12"^^xsd:date	"1872-02-24"^^xsd:date	:Aubrey_George_Spencer
"Ben Jonson"	"1572-06-11"^^xsd:date	"1637-08-06"^^xsd:date	:Ben_Jonson
"Benjamin Aislable"	"1774-01-01T00:00:00-05:00"^^xsd:gYear	"2"	:Benjamin_Aislable
"Benjamin Aislable"	"1774-01-01T00:00:00-05:00"^^xsd:gYear	"6"	:Benjamin_Aislable
"Benjamin Aislable"	"1774-01-01T00:00:00-05:00"^^xsd:gYear	"1842-01-01T00:00:00-05:00"^^xsd:gYear	:Benjamin_Aislable
"Benjamin"	"1784-03-18"^^xsd:date	"1809-01-01T00:00:00-05:00"^^xsd:gYear	:Benjamin_Bathurst_%28diplomat%29

AKT_{ive} PSI



Office of
PUBLIC SECTOR INFORMATION



Lewisham

Land Registry
Cymraeg



Camden



Department
of Health

national STATISTICS

LONDON

CabinetOffice



The London Gazette

defra

Department for Environment
Food and Rural Affairs



The proof of concept

Unlocking the Potential of Public Sector Information with Semantic Web Technology

Harith Alani¹, David Dupplaw¹, John Sheridan², Kieron O'Hara¹, John Darlington¹,
Nigel Shadbolt¹, and Carol Tullo²

¹ Intelligence, Agents, Multimedia
School of Electronics and Computer Science
University of Southampton, Southampton, UK
`{h.alani, dpd, jd, kmo, nrs}@ecs.soton.ac.uk`

² Office Of Public Sector Information
Admiralty Arch, The Mall
London, UK
`{john.sheridan, carol.tullo}@opsi.x.gsi.gov.uk`

The proof of concept

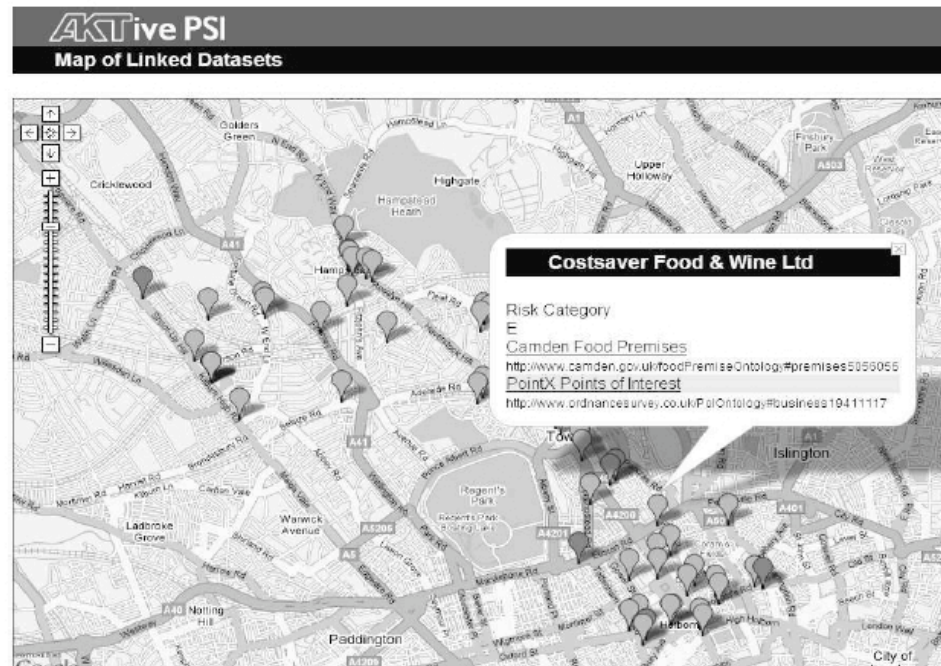


Fig.2. Google Maps mashup of the Camden Food Premises dataset made possible by mapping the data to the OS Address Layer II and PointX dataset

The approach became embedded



Office of
PUBLIC SECTOR INFORMATION



The United Kingdom Implementation of the European Directive on the Re-use of Public Sector Information

- the first two years

A Report by the Office of Public Sector Information

July 2007

AKTive PSI: Leading by Example

- 4.20 The UK public sector is a source of rich, high quality and sought after data. While much of this information is published and available for re-use by others, it is often trapped by poor data structures, locked up in legacy data formats or in fragmented databases.
- 4.21 To explore the issues more fully, in 2005-6, OPSI worked with Advanced Knowledge Technologies (AKT),³⁶ an inter-disciplinary research project led by the University of Southampton. OPSI's work with AKT, in a research project called AKTive PSI, had two aims:
- to raise awareness about and disseminate the capabilities of semantic web technologies amongst government departments, agencies and local authorities;
 - to show what is possible using this technology.
- 4.22 OPSI brought together a diverse collection of public sector information assets to experiment with. A number of public sector organisations were involved in the project, including Ordnance Survey, the Met Office, the Department for Communities and Local Government, the Office for National Statistics, the Department for Environment, Food and Rural Affairs, the Environment Agency and the London Boroughs of Camden and Lewisham. The project underlined the potential for the use of semantic web technology in large scale integration of public sector information and the benefits such aggregation would bring. Semantic Web technology provides the best model for a range of interoperability issues. If widely adopted it would do much to harness the re-use of public sector information.
- 4.23 AKTive PSI has spawned further work in government using Semantic Web technology³⁷. OPSI is using this technology in the following ways:

And then the unanticipated Information Advisors to HMG

UNIVERSITY OF
Southampton
School of Electronics
and Computer Science



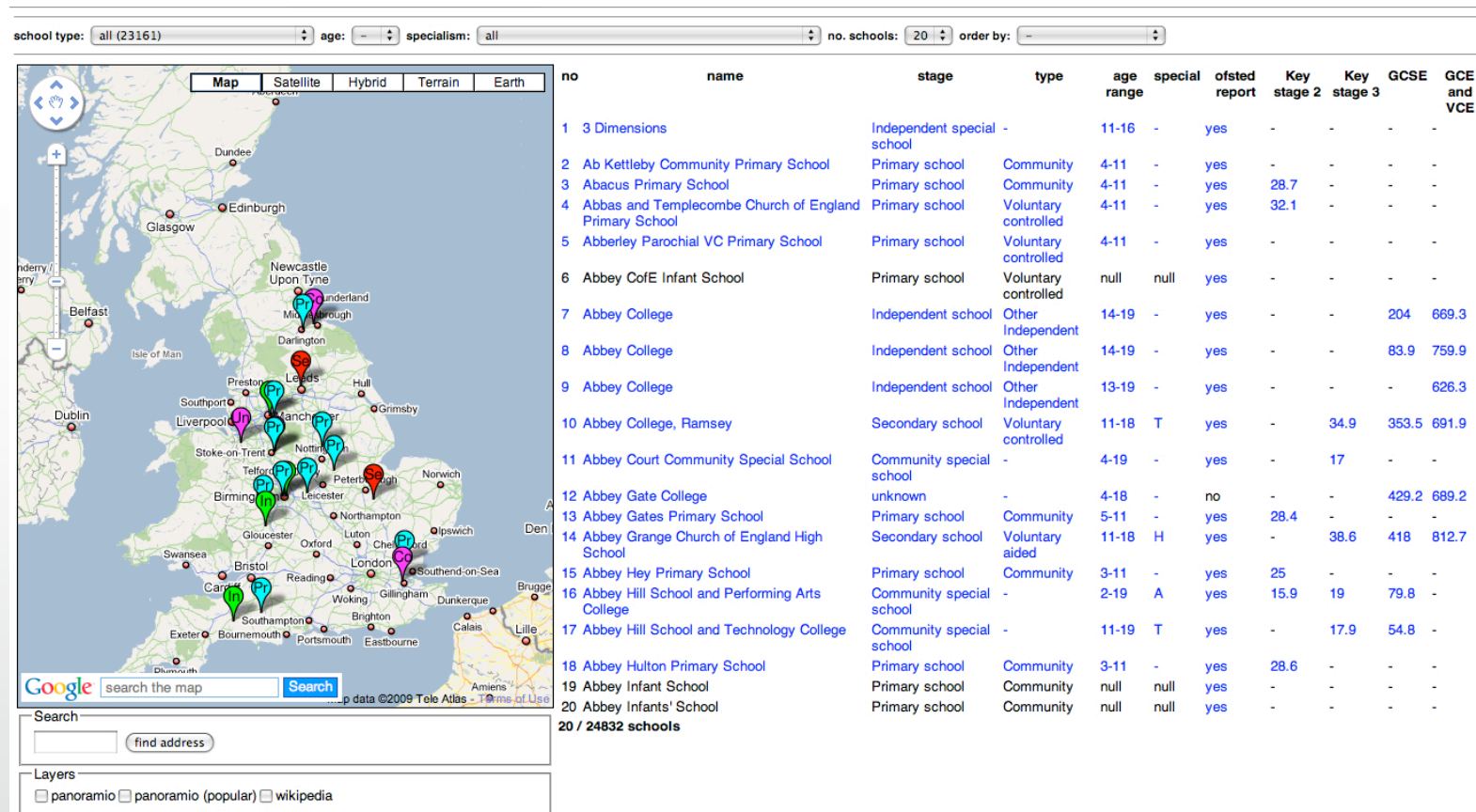
The Context

- Berners-Lee and Shadbolt - Information Advisors
- Context - PoI Taskforce
- Previous work with OPSI
- Why do this?
 - Transparency and accountability
 - Economic and Social Value
 - Public Service Improvement
 - New Industries New Jobs

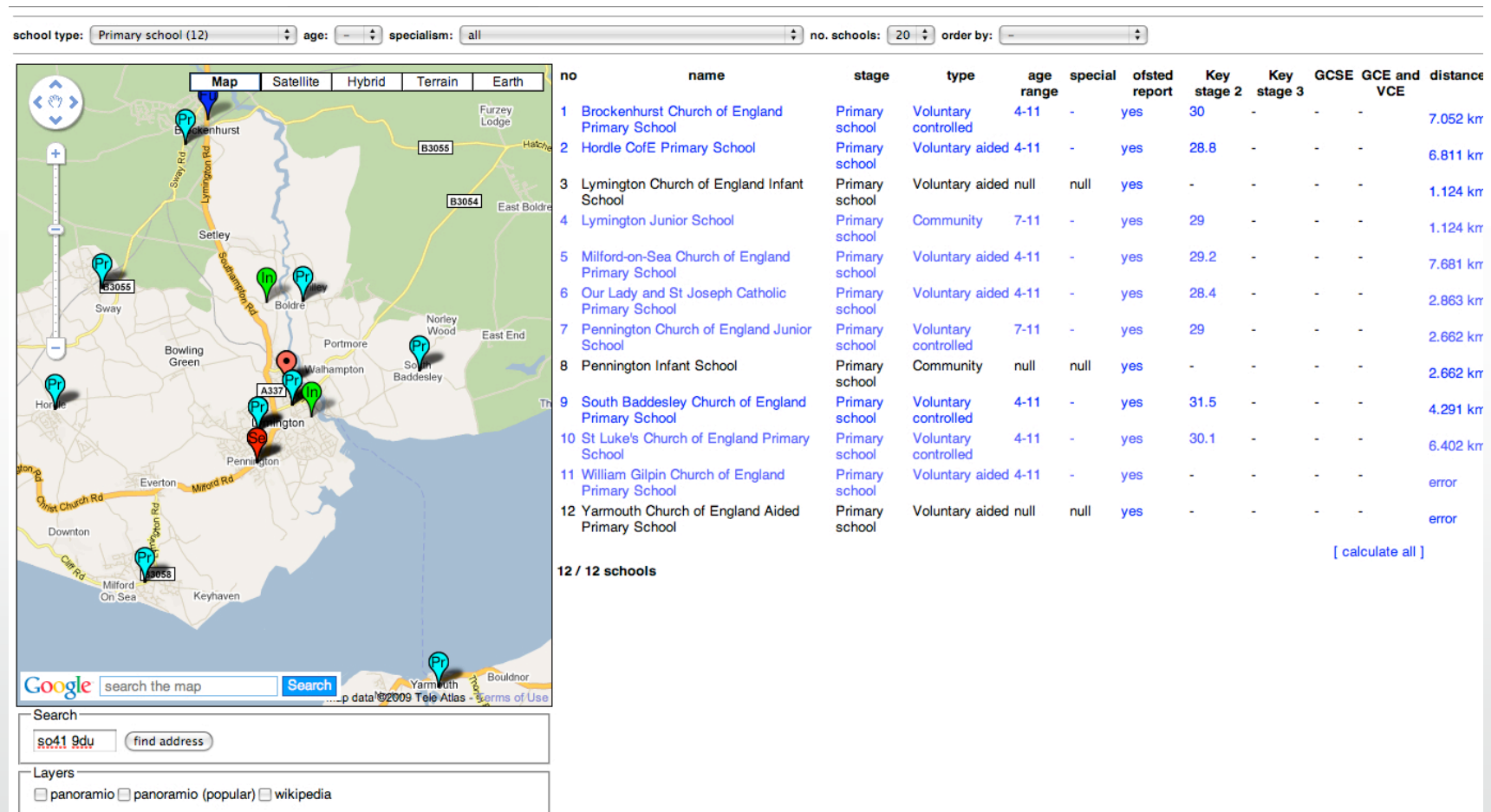
Transparency and Accountability



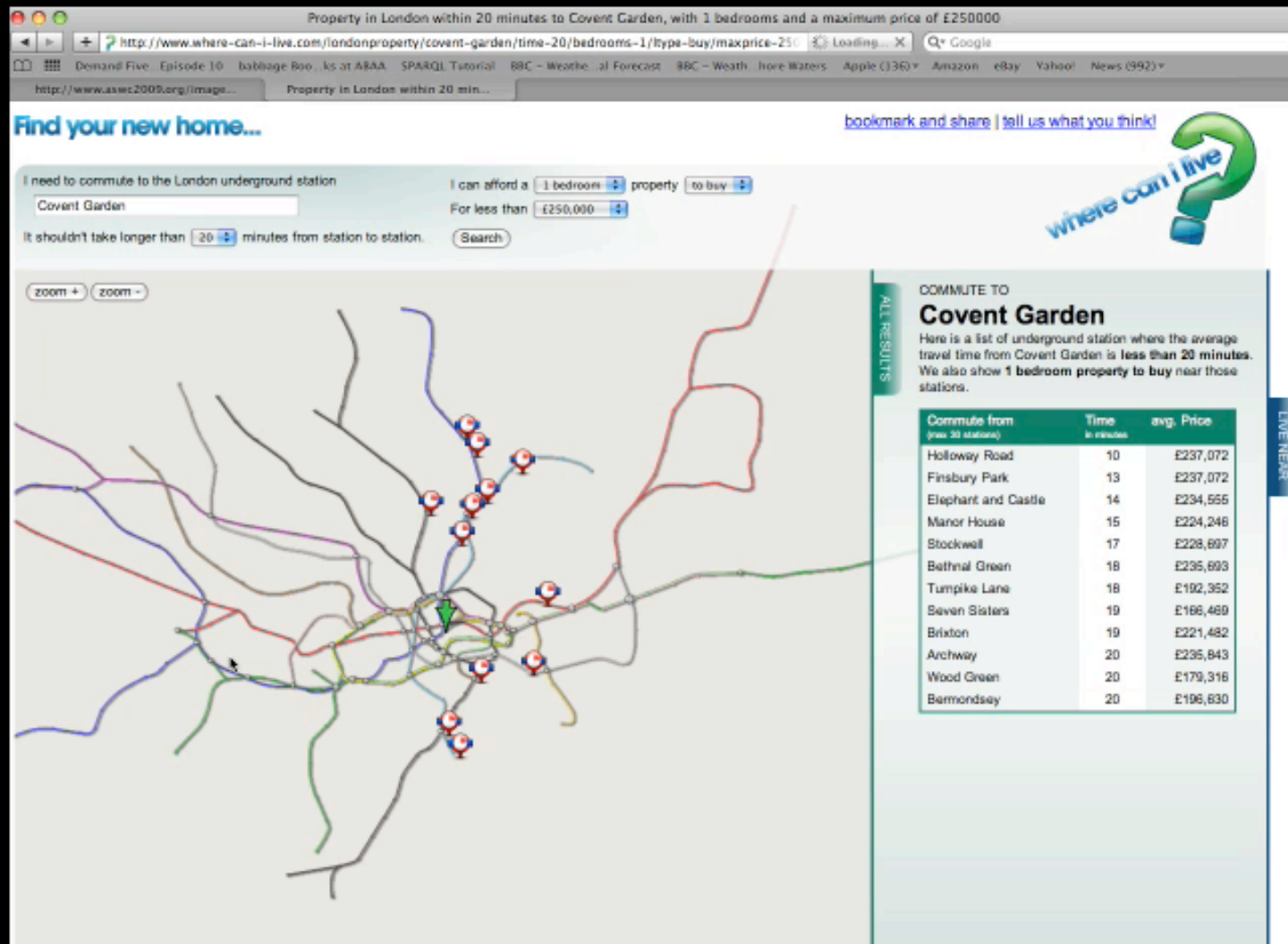
Social and Economic Value



Social and Economic Value



Social and Economic Value



Improving Public Services



working for cycling

FillThatHole
.ORG.UK



Contents

- ▼ Hazards
 - Report a hazard
 - Map
 - List
 - Monthly Totals
- ▼ Authorities
 - List
 - League Table
- Information
 - Pothole News
 - Search
 - Help
 - Contact

User login

Username:

Password:

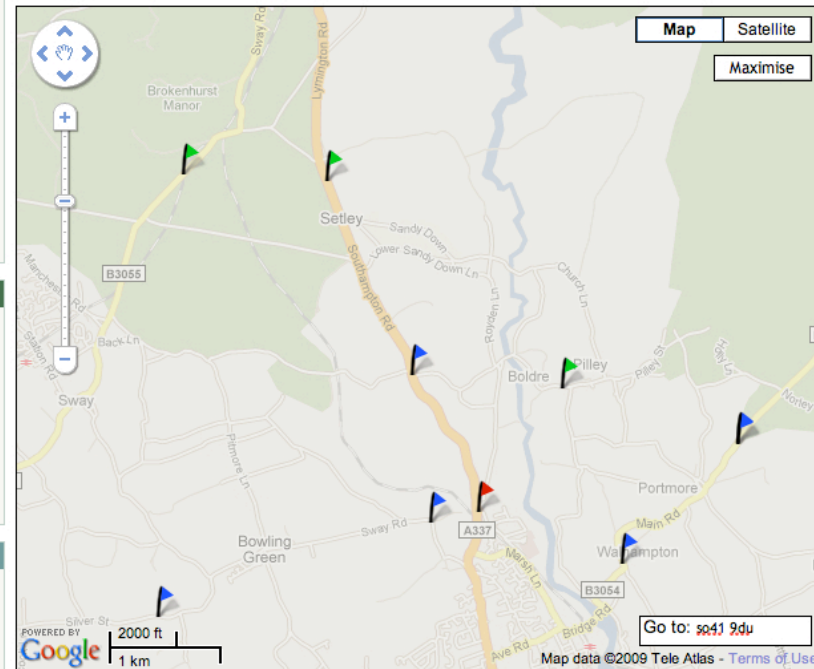
- [Create new account](#)
- [Request new password](#)

CTC Websites

- [Main CTC Site](#)
- [Accident Line](#)
- [Cycle insurance](#)
- [Forum](#)
- [Holidays](#)
- [Maps](#)
- [Shop](#)
- [Travel Insurance](#)

Map

Click on the map to zoom in, click a hazard marker flag for more information.



[Link to this view](#)

[Google Earth KML](#)

Go To Hazard

#

Site Statistics

Total reports: 23,657
Fixed reports: 8,627
Percent fixed: 36%
Reports per day: 22.1



Improving Public Services



FillThatHole
.ORG.UK



- Contents**
- ▼ Hazards
 - Report a hazard
 - Map
 - List
 - Monthly Totals
 - ▼ Authorities
 - List
 - League Table
 - Information
 - Pothole News
 - Search
 - Help
 - Contact

User login

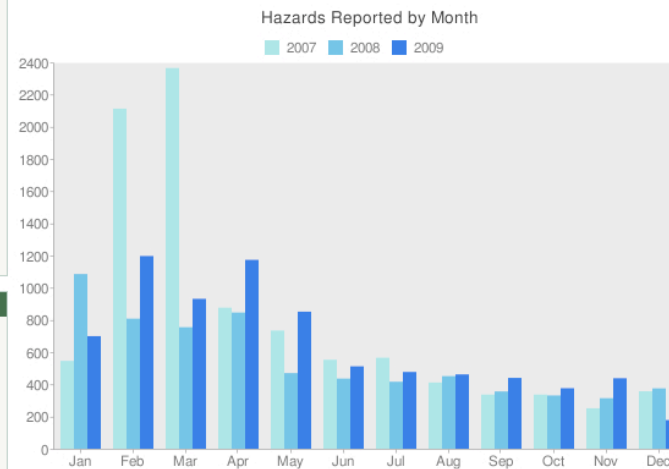
Username:

Password:

- [Create new account](#)
- [Request new password](#)

- CTC Websites**
- [Main CTC Site](#)
 - [Accident Line](#)
 - [Cycle insurance](#)
 - [Forum](#)
 - [Holidays](#)
 - [Maps](#)
 - [Shop](#)
 - [Travel Insurance](#)

Monthly Totals



Hazards Reported by Month

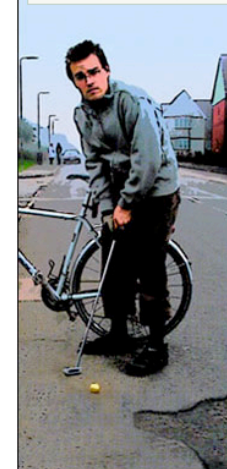
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	546	2112	2364	876	734	553	565	411	336	336	251	357
2008	1085	808	755	846	470	436	416	451	356	331	314	375
2009	699	1197	931	1173	851	512	477	462	440	376	438	178

Go To Hazard

#

Site Statistics

Total reports: 23,657
Fixed reports: 8,627
Percent fixed: 36%
Reports per day: 22.1



Improving Public Services



FillThatHole
.ORG.UK



Contents	
▼ Hazards	
◦ Report a hazard	
◦ Map	
◦ List	
◦ Monthly Totals	
▼ Authorities	
◦ List	
◦ League Table	
► Information	
► Pothole News	
◦ Search	
◦ Help	
◦ Contact	

User login	
Username:	<input type="text"/>
Password:	<input type="password"/>
	<input type="button" value="Log in"/>
<ul style="list-style-type: none"> • Create new account • Request new password 	

CTC Websites	
◦	Main CTC Site
◦	Accident Line
◦	Cycle insurance
◦	Forum
◦	Holidays
◦	Maps
◦	Shop
◦	Travel Insurance

League Table

Rank (Fixed %)	Authority	Total Reports	Open Reports	Fixed Reports	Fixed %
1	Torfaen	3	0	3	100%
2	Cumbria	225	32	188	85%
3	East Ayrshire	11	2	9	82%
4	Gateshead	17	3	13	81%
5	Clackmannanshire	16	3	13	81%
6	Newcastle	75	14	59	81%
7	Northumberland	202	39	140	78%
8	Durham	54	12	41	77%
9	Sefton	16	4	12	75%
10	Bolton	59	12	33	73%
11	Bracknell Forest	18	5	12	71%
12	North Tyneside	86	23	49	68%
13	Luton	8	3	5	63%
14	Kirklees	108	42	63	60%
15	Scottish Borders	21	8	12	60%
16	Rutland	6	2	3	60%
17	Aberdeenshire	32	13	19	59%
18	Waltham Forest	36	15	21	58%
19	Slough	14	5	7	58%
20	Hounslow	325	129	173	57%
21	Blackpool	8	3	4	57%
22	Halton	7	3	4	57%
23	Blackburn	38	16	21	57%
24	Suffolk	254	106	139	57%
25	Northern Ireland Roads Service	64	27	35	56%
26	Sunderland	19	7	9	56%
27	Powys	20	8	10	56%
28	Plymouth	60	26	31	54%

Go To Hazard	
#	<input type="text"/>
	<input type="button" value="Go"/>

Site Statistics	
Total reports:	23,657
Fixed reports:	8,627
Percent fixed:	36%
Reports per day:	22.1



Improving Public Services

(Fixed %)		Reports	Reports	Reports	▼
177	Wakefield	23	17	5	23%
178	Isle of Anglesey	9	7	2	22%
179	Pembrokeshire	9	7	2	22%
180	Neath Port Talbot	23	18	5	22%
181	Leeds	501	395	106	21%
182	Central Bedfordshire	19	15	4	21%
183	Rotherham	48	38	10	21%
184	Glasgow	493	384	101	21%
185	Bromley	144	110	28	20%
186	Islington	258	204	51	20%
187	Bridgend	20	16	4	20%
188	Carmarthenshire	5	4	1	20%
189	Highways Agency	38	29	7	19%
190	Havering	33	27	6	18%
191	Stockton-on-Tees	23	18	4	18%
192	Inverclyde	22	18	4	18%
193	Croydon	423	346	76	18%
194	Coventry	219	180	38	17%
195	Isle of Wight	23	19	4	17%
196	Transport for London	189	155	30	16%
197	Argyll and Bute	19	16	3	16%
198	Monmouthshire	13	11	2	15%
199	Thurrock	7	6	1	14%
200	Darlington	22	19	3	14%
201	Barnsley	37	32	5	14%
202	South Ayrshire	8	7	1	13%
203	Conwy	40	36	4	10%
204	Dumfries and Galloway	91	74	8	10%
205	West Lothian	12	11	1	8%
206	West Dunbartonshire	9	8	0	0%
207	Bedford	7	7	0	0%
208	Ceredigion	4	4	0	0%
209	Merthyr Tydfil	3	3	0	0%
210	Shetland	2	2	0	0%
211	South Tyneside	1	1	0	0%

Our ToR

1. Establish single point of access for all public UK datasets - data.gov.uk
2. Specific proposals to implement and extend to wider public sector PSI principle
 - Select and implement common standards for release of public data
 - Select, develop and implement common terms for data where necessary
 - Develop licenses - CC variants
 - Support exploitation and publication of distributed and decentralised information assets
 - Potential for reform of info regulatory framework
3. Drive use of internet to improve Gov consultation process
4. Engage with International dimension
5. Drive culture change in Whitehall - total publication of non-personal data using open standards

Progress to date

- Top down
 - Ministerial
 - CIO/CTOs
 - Engaged key data holders
- Middle Out
 - Civil Servants
 - Inventory of Information Assets
- Bottom up
 - Engaging with developer community
 - Cross Gov URI workshops
 - data.gov.uk
- Dissemination

The screenshot shows the Number10.gov.uk website. The header includes the site name and navigation links: Home, News, Communicate, Meet the PM, History and Tour, and Number 10 TV. A search bar is also present. The main content area features a news article titled "Ordnance Survey to open up data - PM" dated Tuesday 17 November 2009. The article text states that the Prime Minister has announced that the public will have more access to Ordnance Survey maps from next year, as part of a government drive to open up data to improve transparency. It lists two bullet points: "Communities and Local Government website" and "Read more about the Make Public Data Public project". A quote from Mr. Brown is included: "I think we're on the verge of a revolution that can transform public services and the public sector. I'm speaking very specifically about how government can change to meet the needs of the times. I think we are determined to be the first government in the world to open up public information in a way that is far more accessible to the general public." The article also mentions that the government will help secure necessary efficiencies while building on public services already available. On the right side, there are sections for "Newsletter", "Around the Web" (with a Flickr link), "Latest Photos", and "Latest Videos". A calendar for November 2009 is visible on the left side of the article.

Number10.gov.uk
The official site of the Prime Minister's Office

Home News Communicate Meet the PM History and Tour Number 10 TV

Home > Ordnance Survey to open up data - PM

News

Latest News
Speeches and Transcripts
Statements and Articles
Prime Minister's Questions
Press Briefings
Press Notices
Webchats

November 2009

M	T	W	T	F	S	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

« Oct

Tuesday 17 November 2009

Ordnance Survey to open up data - PM

The Prime Minister has announced that the public will have more access to Ordnance Survey maps from next year, as part of a government drive to open up data to improve transparency.

- Communities and Local Government website
- Read more about the Make Public Data Public project

Gordon Brown said the government and Ordnance Survey, Great Britain's national mapping agency, will open up the data relating to electoral and local authority boundaries, postcode areas and mapping information.

Mr Brown made the announcement at a Smarter Government seminar at Downing Street this afternoon.

He said:

"I think we're on the verge of a revolution that can transform public services and the public sector. I'm speaking very specifically about how government can change to meet the needs of the times. I think we are determined to be the first government in the world to open up public information in a way that is far more accessible to the general public."

Gordon Brown said Smarter Government will help secure necessary efficiencies while building on the public services already available.

During the Smarter Government seminar, Sir Tim Berners-Lee and Professor Nigel Shadbolt spoke about the work they have been doing on the 'Make Public Data Public' project. As part of the project, the Government has already released 1,100 datasets to the public.

Newsletter

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Around the Web

[flickr](#)

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YouTube

Latest Videos

The Cabinet in the East Midlands
Thu Nov 26 2009

Progress to date


- Top down
 - Ministerial
 - CIO/CTOs
 - Engaged key data holders
- Middle Out
 - Civil Servants
 - Inventory of Information Assets
- Bottom up
 - Engaging with developer community
 - Cross Gov URI workshops
 - data.gov.uk
- Dissemination



data.gov.uk

- Currently under development scrutiny and extension
 - Over 1100 datasets
 - Over 1000 registered developers
 - The beginning of linked data
- Beta service to be released January 2010
- Access to OS from April 2010
- Clear schedule of release thereafter

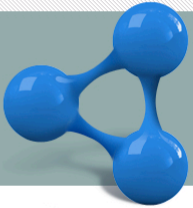
data.gov.uk

 HM Government hmg.gov.uk/data

[Home](#) [Data](#) [Blog](#) [Apps](#) [Ideas](#) [Resources](#) [About](#)

Unlocking innovation

Working with UK Public Sector information and data



Advised by Sir Tim Berners-Lee and Professor Nigel Shadbolt and others, we are opening up government data for reuse. This is a preview of what a public site could look like. We want to work with you to make it better.

We're very aware that there are more people like you outside of government who have the skills and abilities to make wonderful things out of public data. These are our first steps in building a collaborative relationship with you.

Search Data

To list all datasets, search without any keywords.

Enter keyword(s) [Search](#)

e.g. nhs, traffic, local authority, uk, XML

Powered by: [CKAN](#)


Featured Data


Education and training participation: 16-18 year olds


Continuing participation in education and training by 16 and 17 year olds in each local...

Tags: education training DCSF





Most Recent Apps

 **PlanningAlerts**
PlanningAlerts.com is a

 **FillThatHole**
This site provides a single

 **Where Can I Live?**
An app to tell you where

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What is the Semantic Web?

Combining different data sources has never been easy but the Semantic Web will enable data to be joined easily across boundaries.

[Read more](#)

Digital Engagement Twitter stream



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[Submit your app](#)

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data.gov.uk

 HM Government

hmg.gov.uk/data

Home **Data** Blog Apps Ideas Resources About

Search data.gov.uk

Search Data Feeds

Search Data

To list all datasets, search without any keywords.

Enter keyword(s)

e.g. nhs, traffic, local authority, uk, XML

Powered by: [CKAN](#)

Packages

[alcohol_profile_-_alcohol-attributable_hospital_admission_females_2005](#)

Title: Alcohol Profile: Alcohol-attributable hospital admission, females
Description: Persons admitted to hospital due to alcohol attributable conditions (females), crude rate per 100,000 population
Source: NWPHO from Hospital Episodes S...
Tags: office_for_national_statistics england alcohol hospital

[alcohol_profile_-_alcohol-attributable_hospital_admission_males_2005](#)

Title: Alcohol Profile: Alcohol-attributable hospital admission, males
Description: Persons admitted to hospital due to alcohol attributable conditions (males), crude rate per 100,000 population
Source: NWPHO from Hospital Episodes S...
Tags: office_for_national_statistics england alcohol hospital

[alcohol_profile_-_alcohol_attributable_incapacity_benefit_claimants_2005](#)

Title: Alcohol Profile: Alcohol attributable Incapacity Benefit claimants
Description: The number of claimants of Incapacity Benefit or Severe Disablement Allowance whose main medical reason is alcoholism per 100,000 working age populati...
Tags: department_for_work_and_pensions office_for_national_statistics england benefit alcohol

[alcohol_profile_-_alcohol-attributable_mortality_-_females_2005](#)


Title: Alcohol Profile: Alcohol-attributable mortality - females
Description: Deaths from alcohol-attributable conditions (all ages), directly standardised rate per 100,000 population
Source: NWPHO from Office for National Stat...
Tags: office_for_national_statistics england alcohol mortality

What is the Semantic Web?

Combining different data sources has never been easy but the Semantic Web will enable data to be joined easily across boundaries.

[Read more](#)

Digital Engagement Twitter stream

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Innovate 09 today
- Register for the live webcast of the event here
<http://bit.ly/I211d> #innovate09

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Developed a great app or visualisation you'd like to share with us?

[Submit your app](#)

Featured blogs



Alastair Dant (left) / David McCandless (right)

£ Massive Outgoings

Cost for average British taxpayer per day

GOVERNMENTS



ESSENTIALS

NHS



£9.05

Schools



£2.56

Defence



£3.99

TRAVEL

Roads



£3.10

LRT



£0.14

BANKING CHARGES

Recapitalisations



£9.23

SECURITY

Police



£0.53

Prisons



£0.19

Afghanistan



£0.32

GOING OUT

Arts



£0.04

Museums



£0.03

HELPING OTHERS

Child support



£1.86

Job Seekers



£0.25

Housing benefit



£1.52

Disability benefit



£1.44

Pensions



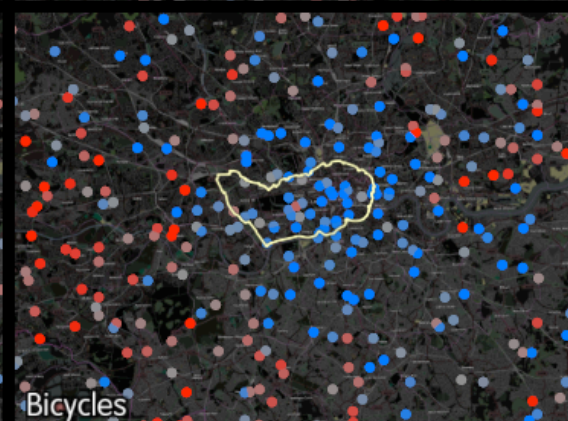
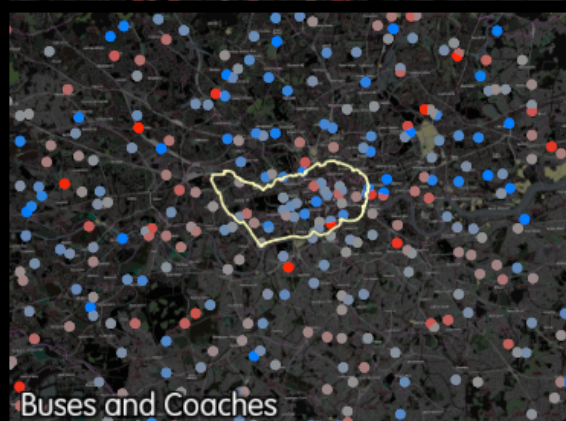
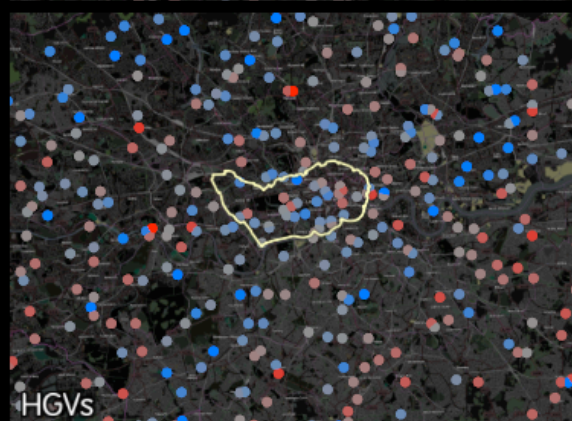
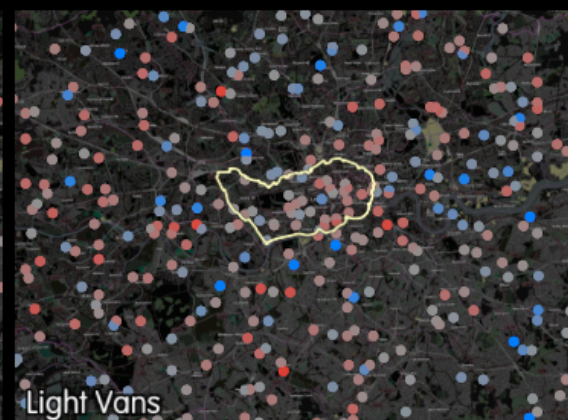
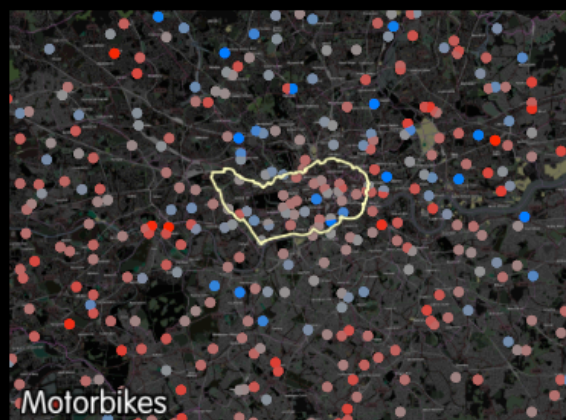
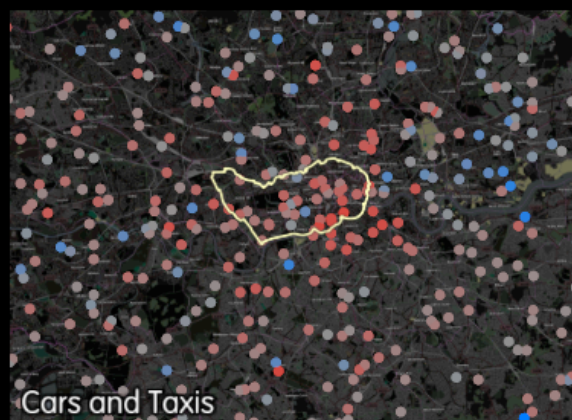
£5.55

Overseas aid



£0.43

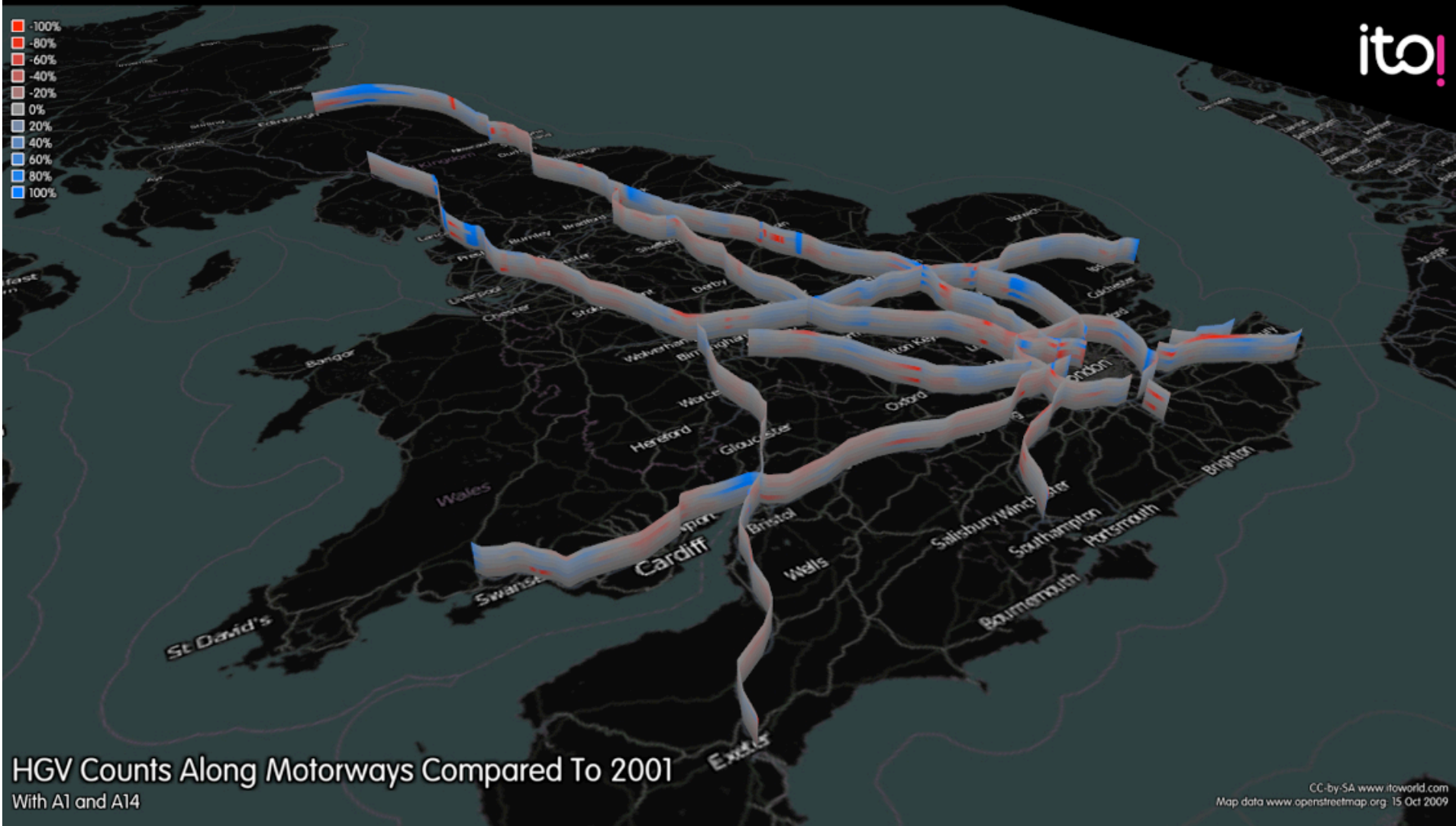
David McCandless



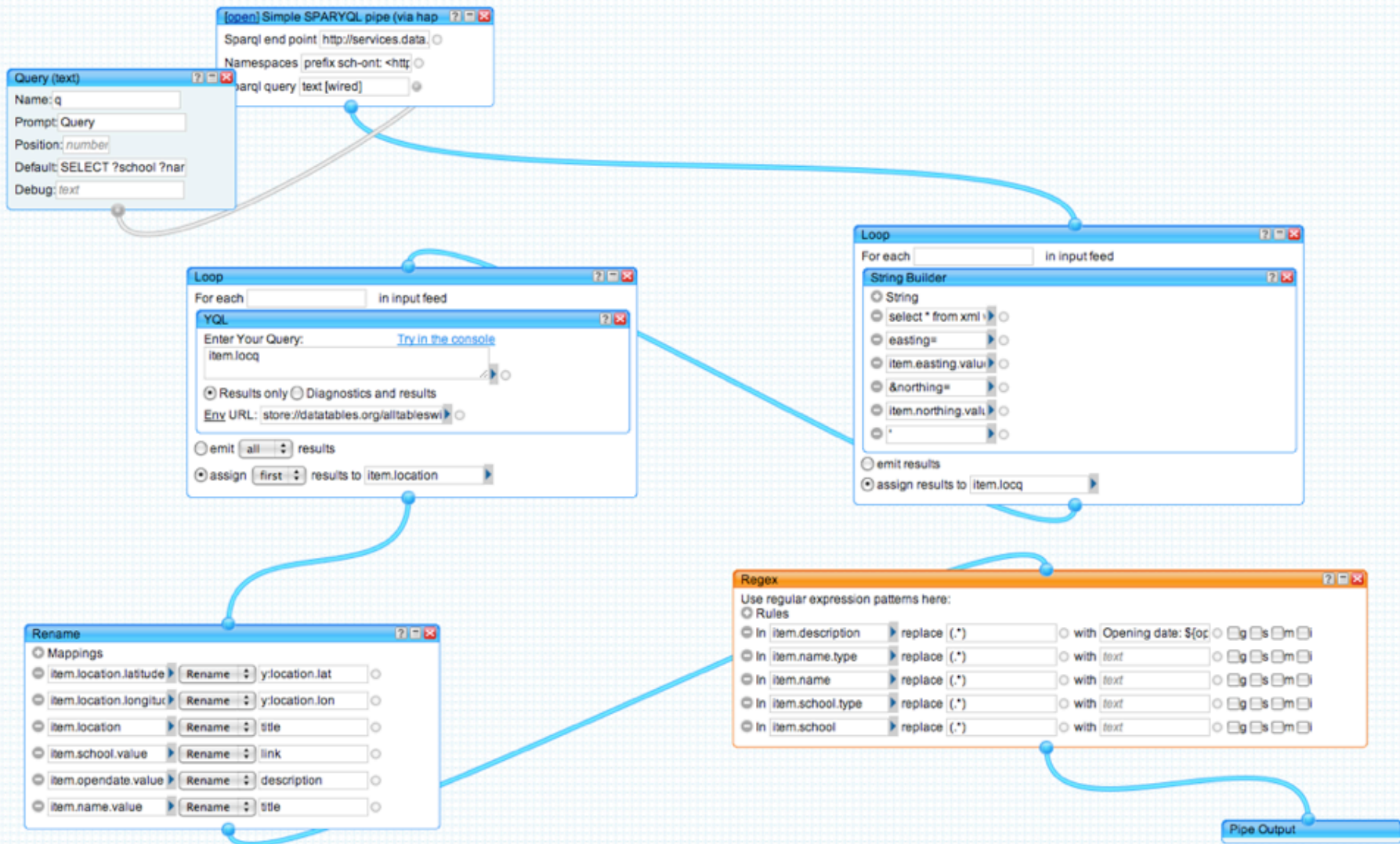
2008 London Counts Compared To 2001

CC-by-SA www.itoworld.com
Map data www.openstreetmap.org: 15 Oct 2009

Chris Osborne



HGV Counts Along Motorways Compared To 2001
With A1 and A14



Time taken: 0.536219s [Refresh](#)

Forge Valley Community School
Rochdale Sixth Form College
New VA RC Pri @ Shernhall Street
New Comm Sec @ Egerton Street
To Be Confirmed
New Comm Pri Sch @ Greenway Avenue
Maycliffe Grange Special School
Delius Special School
More...

Tony Hirst

http://pipes.yahoo.com/pipes/pipe.info?_id=baae2049ef88831992c657d6cf486bec

Debugger: Regex (10 items)



Author:
Tony Hirst

Properties

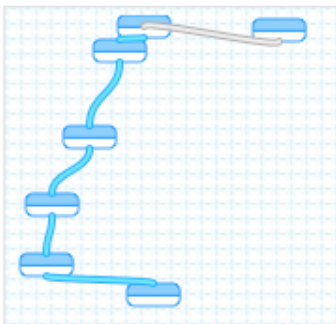
Not published
0 runs
7 clones

Bookmark / Share



Modules (8)

[fetchdata](#)
[regex](#)
[rename](#)
[textinput](#)
[strconcat](#)
[subpipe](#)
[loop](#)
[yql](#)



[View Source](#)

data.gov.uk Education data demo

Pipe Web Address: <http://pipes.yahoo.com/ouseful/baae2049ef88831992c657d6cf486bec>

☆ [View Source](#) [Clone](#)

Query [Run Pipe](#)

[Configure this Pipe](#)

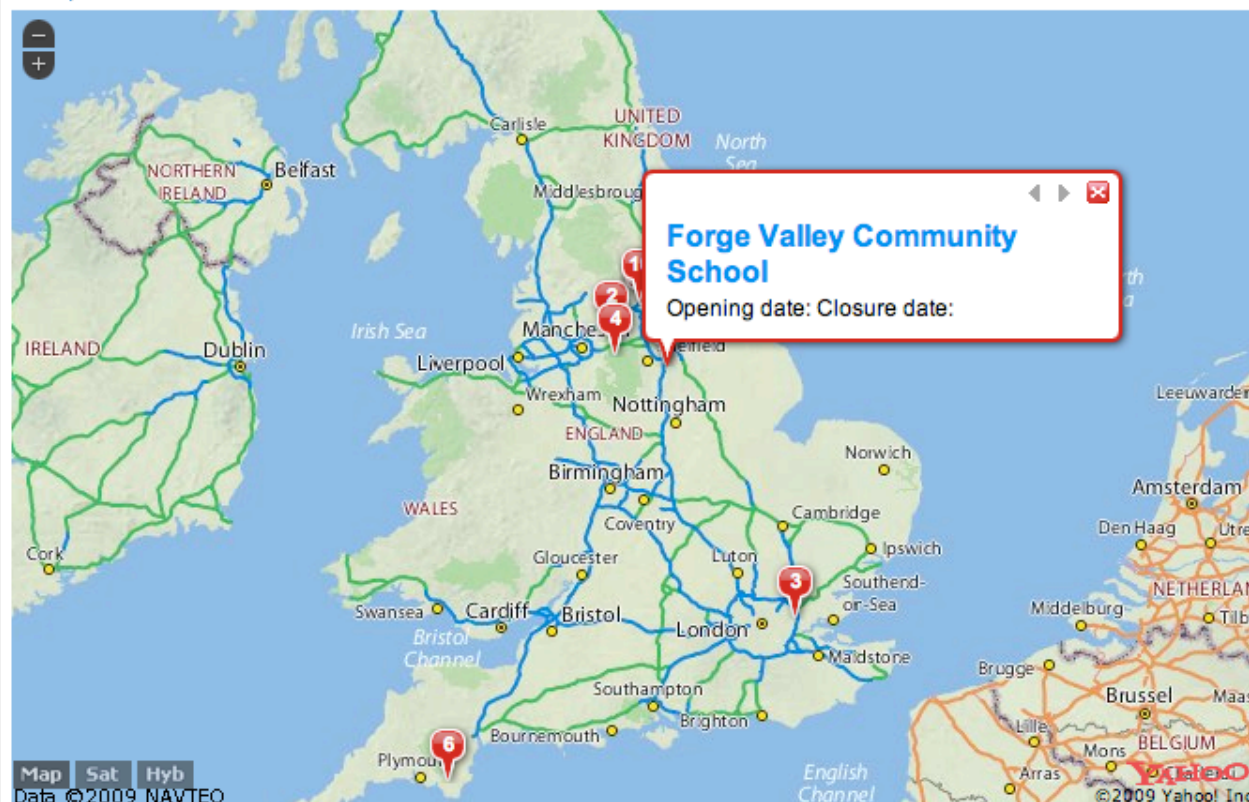
Use this Pipe

[Get as a Badge](#) [MY YAHOO!](#) [Google](#) [Get as RSS](#) [Get as JSON](#) [More options](#)

Map

List

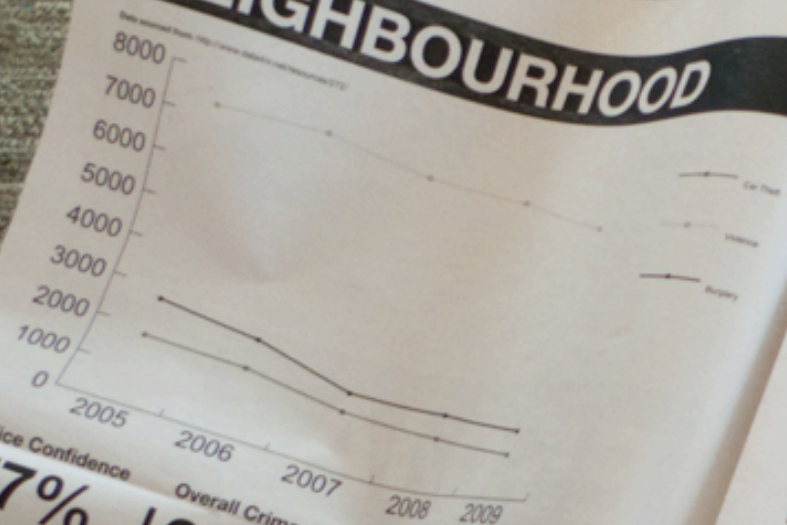
10 items



[Report abusive Pipe](#)



NEIGHBOURHOOD



Police Confidence
77%

Overall Crime
↓39%

Gun Crime
↓37%

Knife Crime
↓17%

Robbery
↓14%

Theft
↓13%

Woundings
↓20%

10000
 fewer crime victims

Summary
 Hackney Police and the Council work very closely to tackle and prevent crime in the borough. Seventy seven per cent of residents now have confidence in Hackney's Police, according to the British Crime Survey, a rise of 55 per cent in less than two years.

The survey also reveals that crime in Hackney has dropped 36.5 per cent over five years, the second largest drop of all London boroughs. Last year, there were ten thousand fewer victims of crime in Hackney than five years ago.

In 2008/09, gun crime was reduced by over 37 per cent and knife crime by 17 per cent. Youth crime also fell by 10 per cent. Satisfaction with the Police and the Fire Brigade are six per cent above the London average.

-- Hackney Council

ALLOTMENTS

- 1 St John's Road
Entrance at rear of 57 St John's Road
- 2 Asher Terrace
Entrance at north end of Clarendon Crescent
- 3 Springdale Road
Entrance between 42 and 44 Springdale Road
- 4 Church Walk
Entrance at south end of Church Walk
- 5 Queensbridge Road
At rear of 228 Queensbridge Road
- 6 Manor Gardens
Western Road
- 7 Oakbury Street
Corner of Oakbury Street and Rushmore Road
- 8 Leaside Road
Entrance at west side of railway bridge over Leaside Road
- 9 Spring Lane
Entrance on Spring Lane at side of River Lee
- 10 Spring Hill
North east corner of sports field



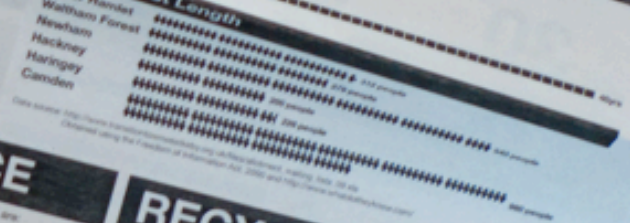
Allotment Plots

Tower Hamlet	282	Waltham Forest	1,382
Newham	415	Hackney	113
Haringey	1,715	Camden	195

Waiting List Time

Tower Hamlet	18 yrs
Waltham Forest	18 yrs
Newham	2 yrs
Hackney	2 yrs
Haringey	2 yrs
Camden	2 yrs

Waiting List Length

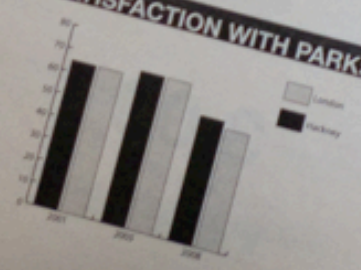


GREEN SPACE

23%
 by land area in Hackney

- Your nearest parks are:
- Hackney Marshes (10 mins east)
 - Victoria Park (15 mins south west)
 - London Fields (20 mins south west)

% SATISFACTION WITH PARKS



RECYCLING

Your nearest Recycling and Reuse Center is on South Access Road, Walthamstow, E17 (via Marshhouse Avenue, near Low Hall Manor Business Centre).

Open every day of the year, except on 25 December, 26 December and 1 January. Open from 8.30am to 5.15pm. South Access Road is for mixed, bulky household waste and trade waste. This site does not accept:

If you intend to use a van to bring your waste please call 020 8509 3664 at least 24 hours prior to visiting the site. Vans are only allowed to the site between 6.30am and 4pm Monday to Saturday.

You can recycle the following items at this site:

- Bicycles
- Car batteries
- Cardboard
- Computers and printers
- Cooking oil
- Electrical items
- Engine oil
- Food/drink cans and foil
- Furniture in good condition
- Garden waste
- Gas bottles
- Glass bottles and jars
- Handicapped
- Household batteries
- Long life light bulbs
- Metal
- Mobile telephones
- Paper
- Plasterboard
- Plastic bottles
- Reusable

TRAVEL TIMES

Times calculated from TfL Journey Planner for a journey arriving at 9:30am

Oxford Circus

41 mins



42 mins

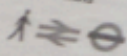


Tottenham Court Road

37 mins



47 mins



King's Cross

30 mins



35 mins



Victoria

51 mins

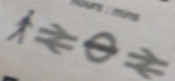


45 mins



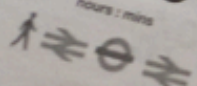
Manchester

2:44 hours : mins



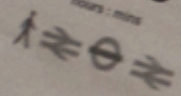
Paris

3:00 hours : mins



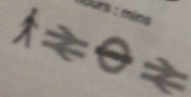
Edinburgh

5:00 hours : mins



Bristol

3:00 hours : mins



LOCAL TRANSPORT



Route finder

Start: Tottenham Court Road

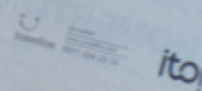
Destination	Route	Time
236	Highway 101	2:44
242	Highway 102	2:44
276	Highway 103	2:44
308	Highway 104	2:44
488	Highway 105	2:44

Destination finder

Destination	Route	Time
A	Highway 101	2:44
B	Highway 102	2:44
C	Highway 103	2:44
D	Highway 104	2:44
E	Highway 105	2:44

Destination	Route	Time
236	Highway 101	2:44
242	Highway 102	2:44
276	Highway 103	2:44
308	Highway 104	2:44
488	Highway 105	2:44

For free cycle training in Hackney, call 020 8356 2897



**David Peterson**

David Peterson has been a web developer since the early years - 1995. He works in the [steamy tropics](#) and is trying to kick start the Semantic Web down under. Not only that, but he is an Advisory Committee representative to the W3C, wow. His wonderful family, making lovely photographs and searching for the perfect espresso keeps him happy.

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[Open Source Image Editors ... for Designers? »](#)

Obama's Groundbreaking use of the Semantic Web

 by [David Peterson](#)

In a revolutionary move, Obama's administration is set to utilise next generation web technologies to bring an unprecedented level of transparency to government. In this case it will shed light on how the roughly US \$800 billion dollar economic stimulus will be spent. The recently launched [recovery.gov](#) website (powered by nothing other than Drupal) brought with it the promise that citizens would be able to view where the money was going and how it was going to be spent.

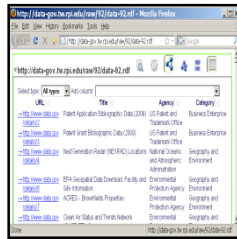
To enable the citizen masher to do their wizardry, the administration will be opening up a veritable candy store of goodies: [Semantic Web](#), [RDF](#), [Linked Data](#), [SPARQL](#), [RDFa](#), [SIOC](#), [ATOM](#), [RESTful](#) APIs, JSON, Widgets, [Wikis](#), XForms, P2P Networks. Wow. They only forgot the lions and tigers and bears oh my... This is an unbelievable stack of technology. I didn't think the government even knew what an RSS feed was :)

Semantic Web Architecture for Government Data

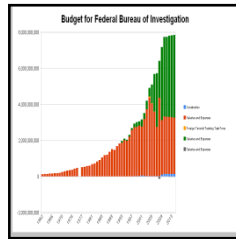
View & Use Data



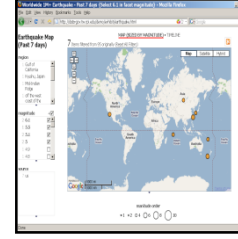
↑ Sem Wiki



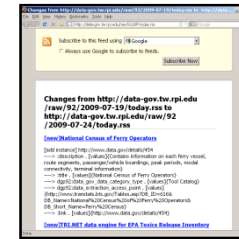
↑ Tabulator



↑ Google Viz



↑ MIT Exhibit



↑ RSS 1.0



↑ tagCloud

Link & Enrich Data

XSLT Service

Diff Service

Link Annotator

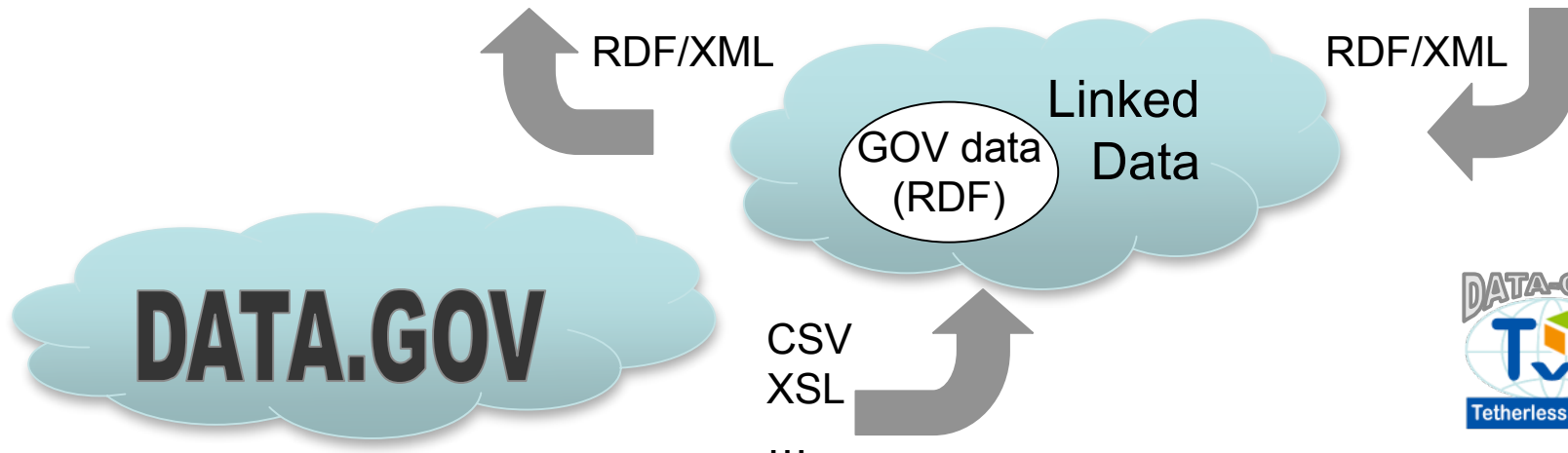
RSS Generator ...

Data Processors
(Web Services & Analyzers)

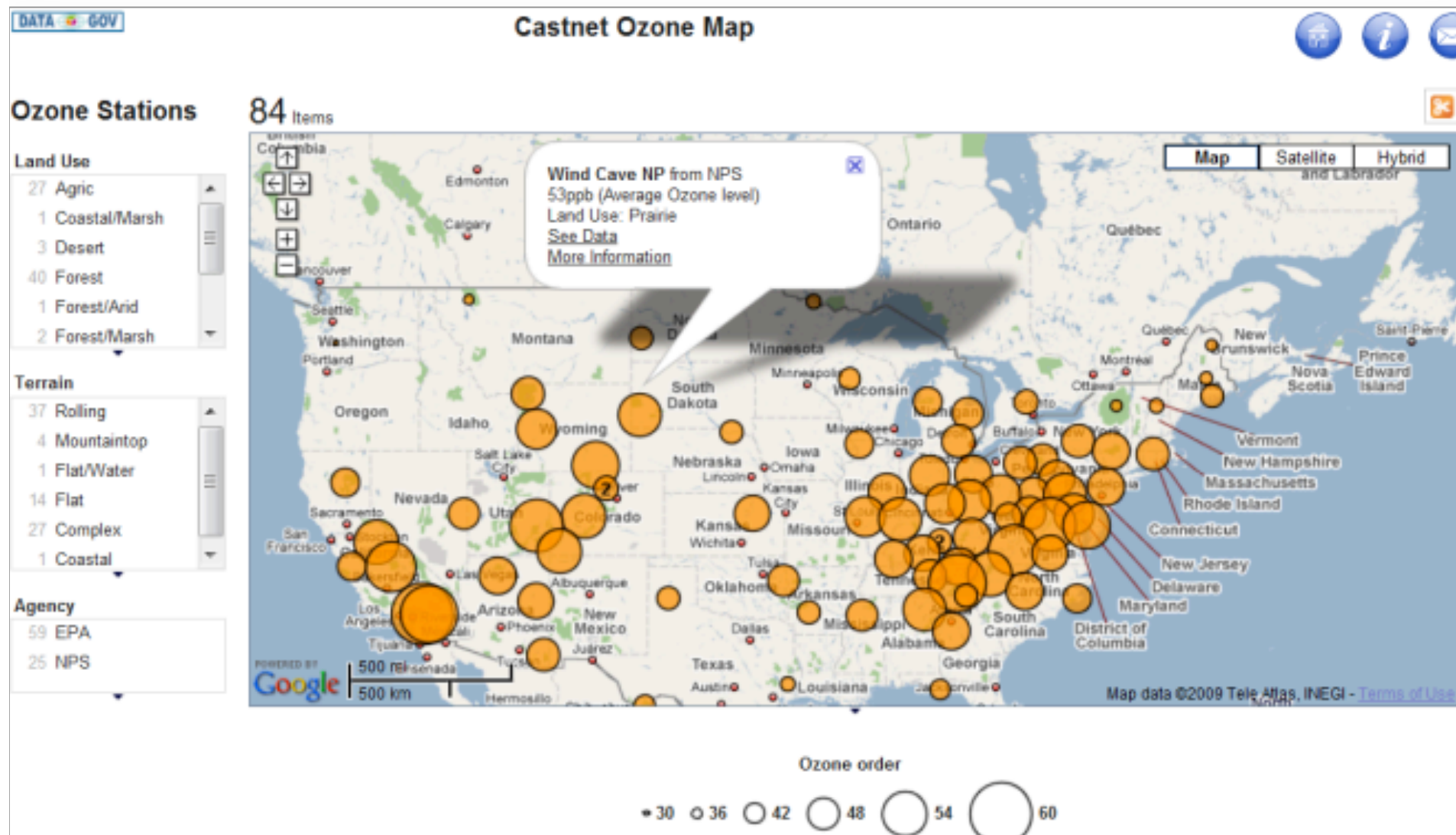
SPARQL End Point

SPARQL Web Service

Convert Data

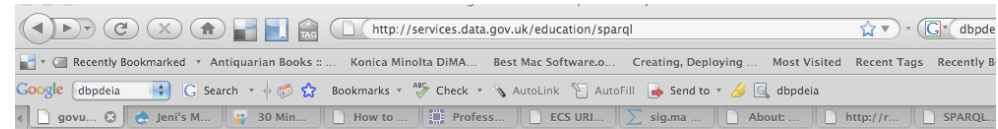


Data.gov + epa.gov



Linking outside data.gov.uk

- Example from one of our education datasets
- A SPARQL query against data.gov.uk
- A transformation into KML
- A representation on Google Maps
- A link to the dbpedia URI for one of our schools
- This is information enrichment



govuk-education

Run SPARQL query against this store

SPARQL query:

```
prefix geo: <http://www.w3.org/2003/01/geo/wgs84_pos#>
prefix sch-ont: <http://education.data.gov.uk/def/school/>
SELECT ?title ?lat ?long WHERE {
  ?school a sch-ont:School;
    sch-ont:establishmentName ?title;
    sch-ont:districtAdministrative
      <http://statistics.data.gov.uk/id/local-authority-district/00AA> ;
    geo:lat ?lat;
    geo:long ?long.
}
ORDER BY ?title
```

Search

Bigfoot/30.1258.56780

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```
</result>
- <result>
  - <binding name="title">
    <literal>St Paul's Cathedral School</literal>
  - <binding name="lat">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">51.51384</literal>
  - <binding name="long">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">-0.09679</literal>
  </binding>
</result>
- <result>
  - <binding name="title">
    <literal>The Charterhouse Square School</literal>
  - <binding name="lat">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">51.52038</literal>
  - <binding name="long">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">-0.09886</literal>
  </binding>
</result>
- <result>
  - <binding name="title">
    <literal>The Charterhouse Square School</literal>
  - <binding name="lat">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">51.52038</literal>
  - <binding name="long">
    <literal datatype="http://www.w3.org/2001/XMLSchema#decimal">-0.09886</literal>
  </binding>
</result>
```

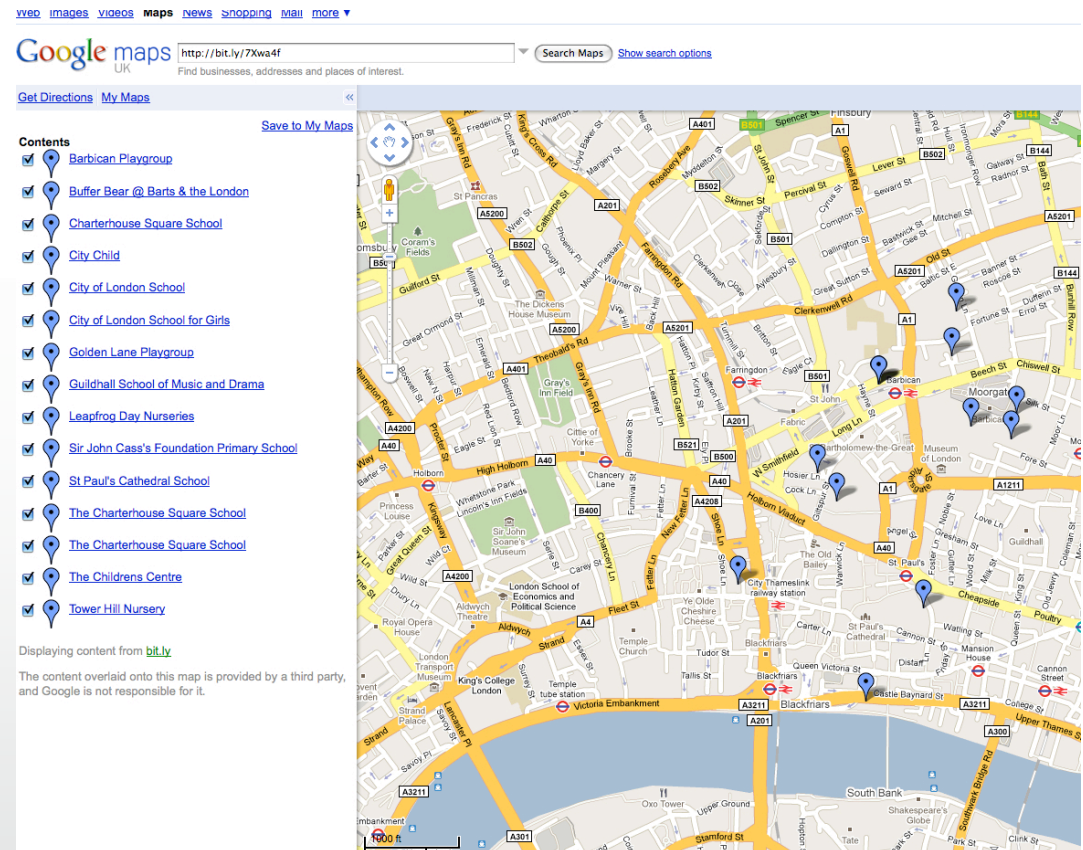
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```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2">
  <Placemark>
    <description/>
    <name>Barbican Playgroup</name>
    <Point>
      <coordinates>-0.09267,51.51879</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <description/>
    <name>Buffer Bear @ Barts & the London</name>
    <Point>
      <coordinates>-0.10086,51.51697</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <description/>
    <name>Charterhouse Square School</name>
    <Point>
      <coordinates>-0.09886,51.52038</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <description/>
    <name>City Child</name>
    <Point>
      <coordinates>-0.09546,51.52122</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <description/>
    <name>City of London School</name>
    <Point>
      <coordinates>-0.09949,51.51112</coordinates>
    </Point>
  </Placemark>
  <Placemark>
    <description/>
    <name>City of London School for Girls</name>
    <Point>
      <coordinates>-0.09454,51.51915</coordinates>
    </Point>
  </Placemark>
</kml>
```

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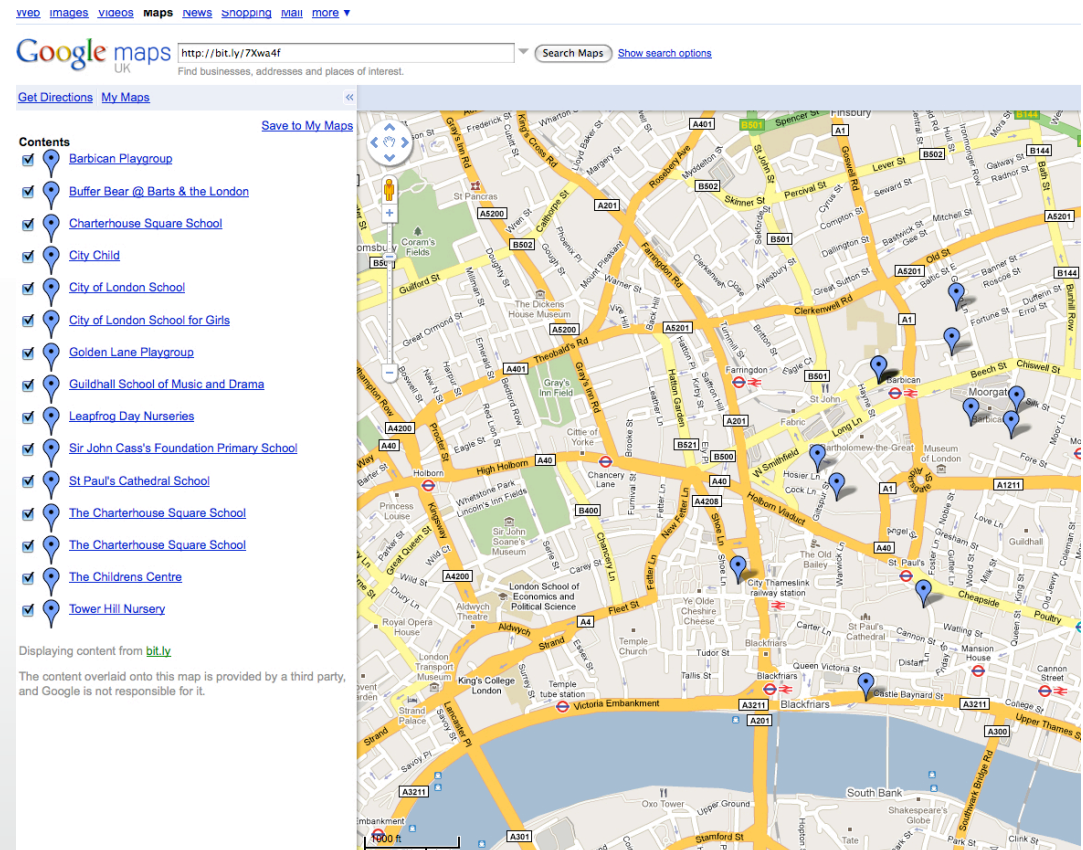
About: [St Paul's Cathedral School](#)
 An Entity in Data Space: dbpedia.org

St. Paul's Cathedral School is a school associated with St Paul's Cathedral in London. Its curriculum focuses on singing and choral music. The school currently enrolls approximately 200 students, and its choristers sing evensong in the Cathedral six times a week. Until 1989, the school had all choristers and all boarders; the school now has day pupils as well as boarders.

Property	Value
dbpedia-owl:EducationalInstitution/city	▪ dbpedia:City_of_London
dbpedia-owl:EducationalInstitution/colours	▪ Burgundy and White ▪ publication =
dbpedia-owl:EducationalInstitution/county	▪ dbpedia:London
dbpedia-owl:EducationalInstitution/established	▪ 1123-01-01 00:00:00 (xsd:date)
dbpedia-owl:EducationalInstitution/staff	▪ 40 (xsd:integer)
dbpedia-owl:EducationalInstitution/students	▪ 240 (xsd:integer)
dbpedia-owl:Organisation/motto	▪ (By Faith and By Learning)
dbpedia-owl:Organisation/postalCode	▪ EC4M 9AD
dbpedia-owl:Organisation/type	▪ dbpedia:Independent_School
dbpedia-owl:School/headLabel	▪ Headmaster
dbpedia-owl:School/lowerAge	▪ 4 (xsd:integer)
dbpedia-owl:School/upperAge	▪ 13 (xsd:integer)
dbpedia-owl:city	▪ dbpedia:City_of_London
dbpedia-owl:colours	▪ Burgundy and White ▪ publication =
dbpedia-owl:county	▪ dbpedia:London
dbpedia-owl:established	▪ 1123-01-01 00:00:00 (xsd:date)
dbpedia-owl:headLabel	▪ Headmaster
dbpedia-owl:lowerAge	▪ 4 (xsd:integer)

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Challenges to free Public Data

- The ubiquity of spreadsheets
 - Large amount of data is in spreadsheets
 - The challenge of implicit and variable semantics in these
- The importance of good URI schemes
- Publish the raw data
 - The perfect is the enemy of the good
 - Don't get into format wars
- Praise the data holders and appreciate their challenges
- The importance of location and time

Challenges to free Public Data

- Cultural & Organisational
 - Data hugging
 - We have released it - sort of...
 - License impediments
- Worries about
 - Confidentiality
 - How it will be Interpreted
 - QoI
 - Lost value
 - Disrupted workflow
 - New IT procurement
- Importance of local authority and other public bodies
- Capability
 - What assets have we got (no duty to hold register of public non-personal datasets)
 - Who can do this work
 - How to share best practice
 - Minting URIs
- Policy
 - Extending the principle to all public sector bodies
 - Consistency in what is published, how it is licensed and its format
 - Range of exceptions do need to be appreciated
 - Confidentiality, accuracy, liability and reputation

Why this matters to us

- More governments, municipalities, cities and media getting machine readable mark up
- The sum is greater than the parts
- Exploitation of
 - open data
 - open standards
- Can apply to data intranets as well as extranets
- Government linked data is showing how heterogeneous information can be shared, linked, mapped and enriched

