Open Data in Practice

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The Open Data Institute

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Introductions

Your name

What is your favourite example/use of open data?

What do you want to do differently after the course?

Course aim

Build a solid foundation and experience in publishing, consuming and building a business in Open Data

Schedule

Day 1: Practical publication

Day 2: Business, the law and open data

Day 3: Enriching and visualising data

Today

The characteristics of open data

Open data discovery patterns

Open data publication

Quick big data break

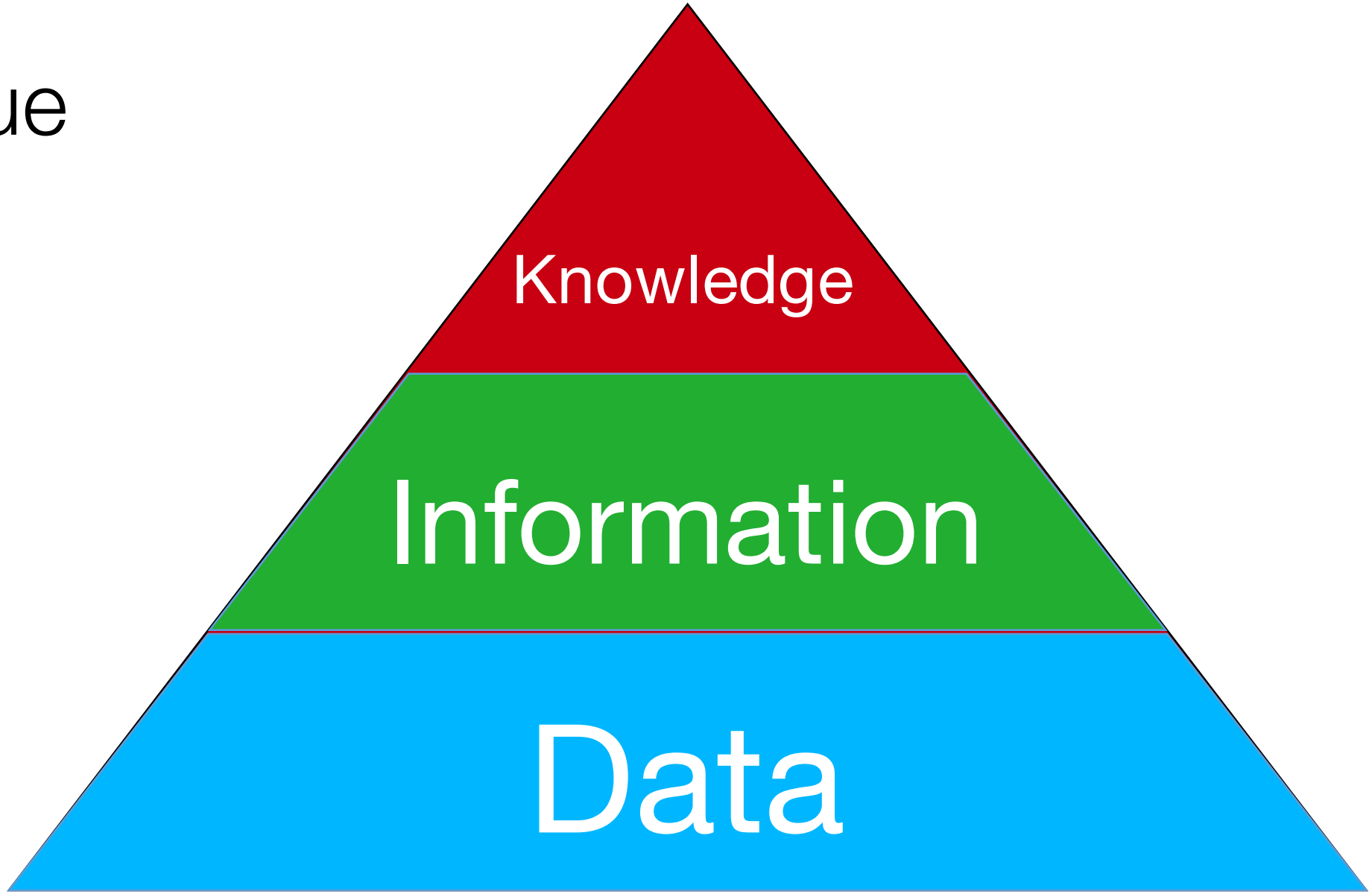
Practical publication hands-on

Recap session

Exercise

What is Data?

Value



Exercise

What is Open Data?

Option A

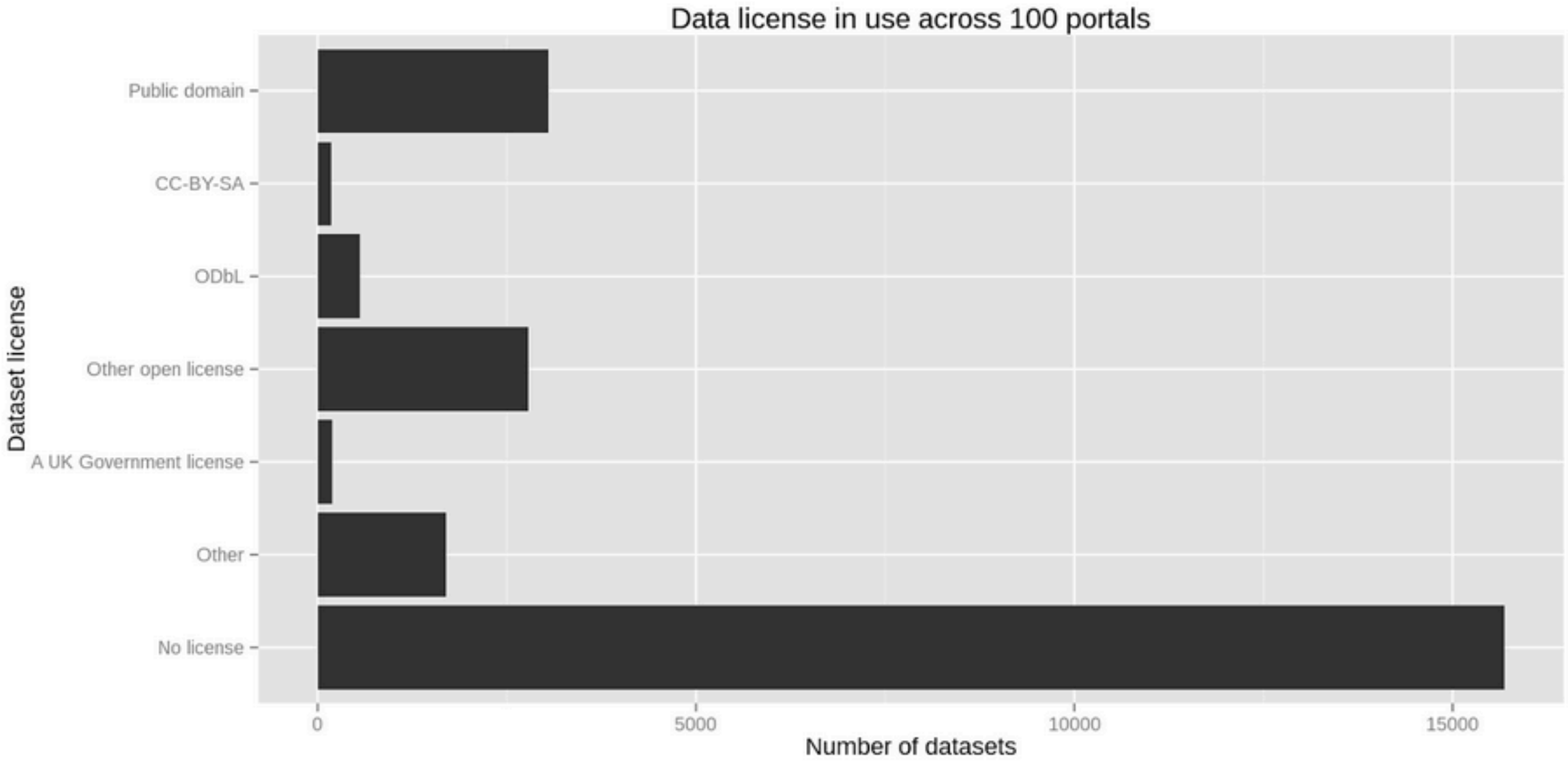
Open data is data that is made **available** by **organisations**, **businesses** and **individuals** for **anyone** to **access**, **use** and **share**.

- Open Data Institute

Introduced November 2014

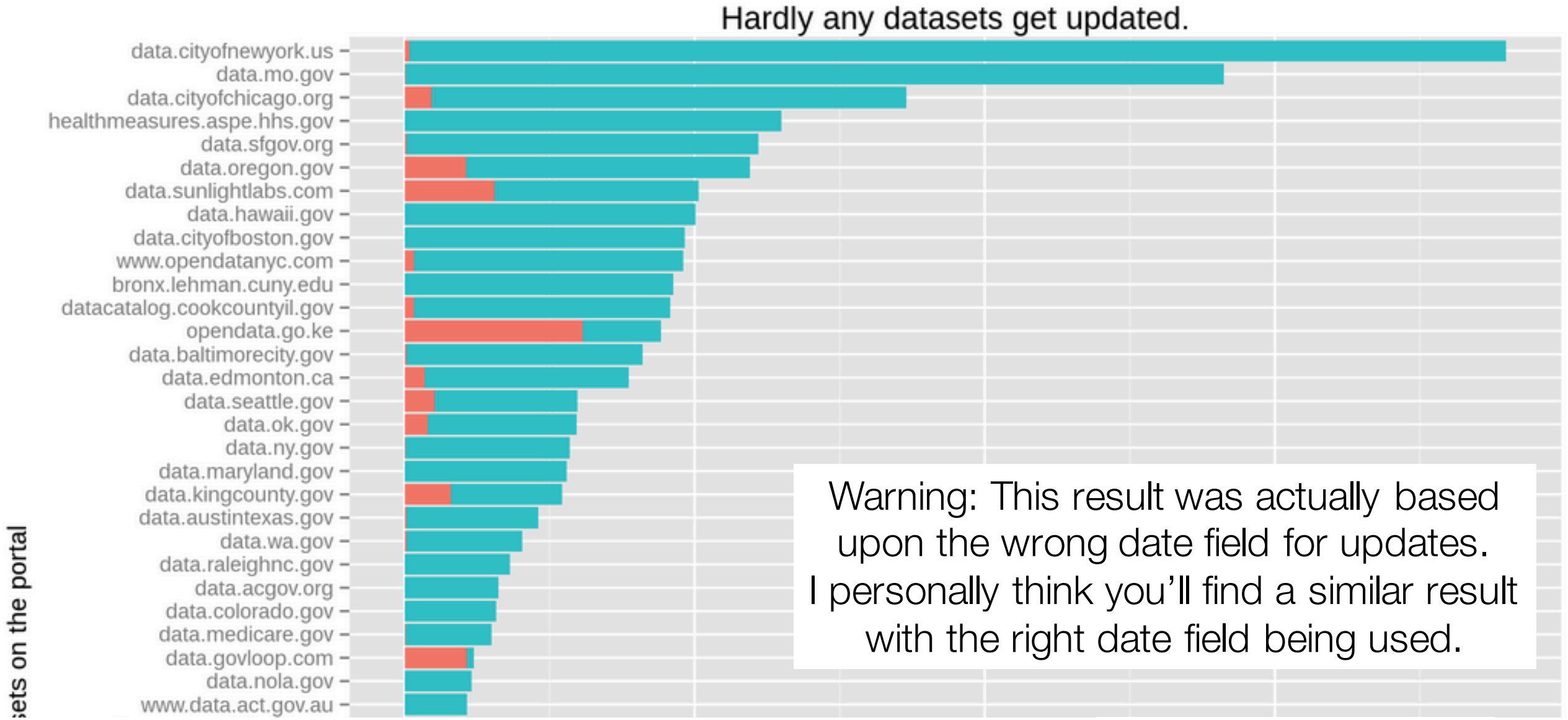
	Open Definition *Open Knowledge Foundation*	**OMB Memo, 2013** *The White House Sylvia Burwell et al.*	**Data.Gov.UK** *Antonio Acuña*	**"DBpedia: A Nucleus for a Web of Open Data"** *Sören Auer et al.*	**Open Data Institute (ODI)** *Open Data Institute*	**LinkedGov** *LinkedGov*	**McKinsey** *James Manyika et al.*	**Open Data Now** *Joel Gurin*	**Open Data Barometer** *Tim Davies*	**The World Bank** *The World Bank*
Free	✓	✓		✓	✓		✓			
Negligible Cost							✓			
Publicly Available	✓	✓			✓		✓	✓		
Re-usable	✓		✓		✓					✓
Can be Redistributed	✓			✓						✓
Non-exclusive (No Restrictions from copyright, patents, etc.)	✓			✓	✓				✓	✓
Structured for Usability		✓	✓				✓		✓	✓
Requires "Open" License			✓		✓	✓			✓	✓
Non Personally Identifiable						✓				
Produced during business operation						✓				
Belongs to the Taxpayer (when not in violation of laws/privacy)						✓				
Accessible in Bulk									✓	

Open data is hardly ever appropriately licensed.



Source: Thomas Levine

Source: Thomas Levine

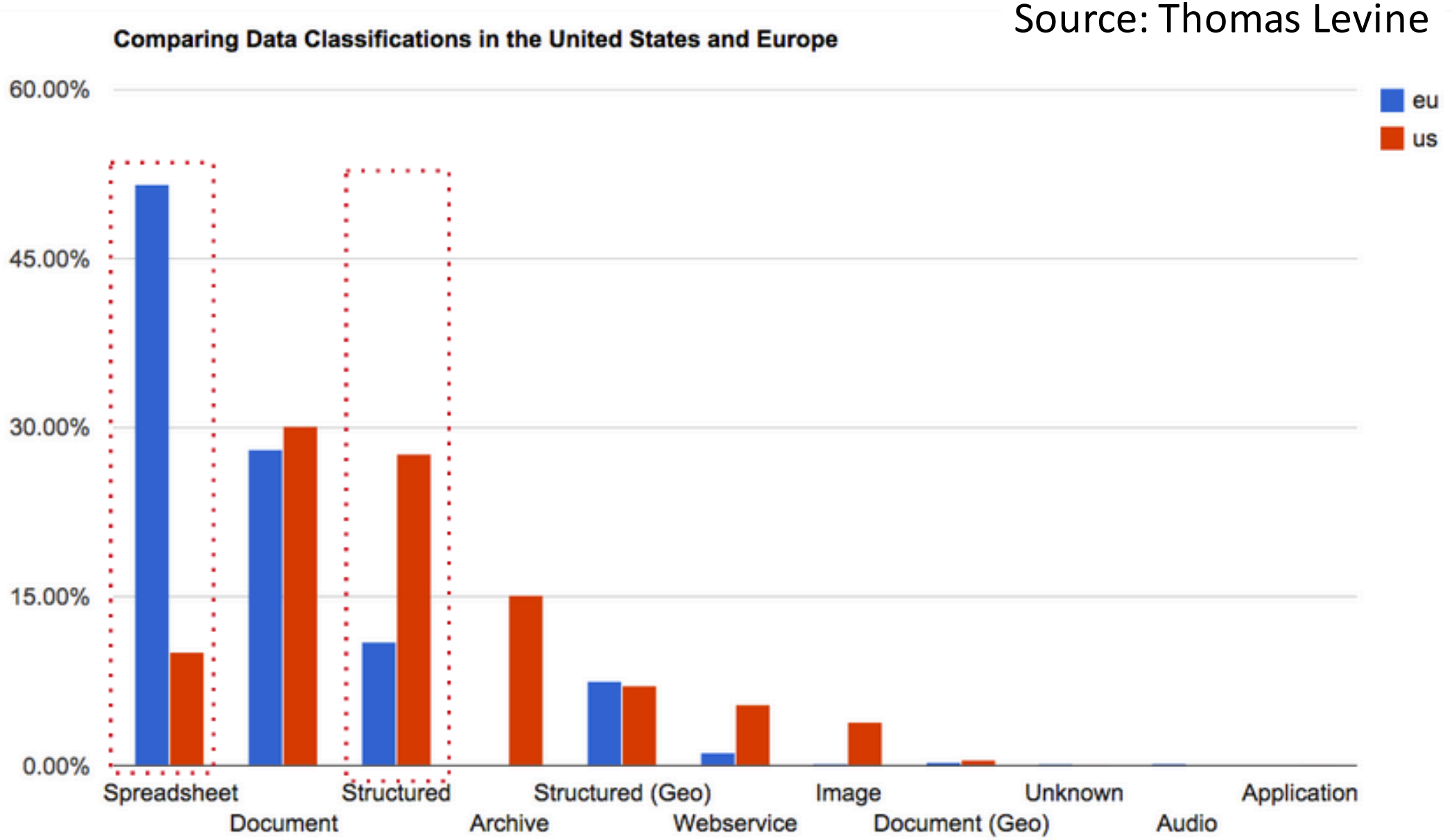


Warning: This result was actually based upon the wrong date field for updates. I personally think you'll find a similar result with the right date field being used.

Source: Thomas Levine

Open data is rarely structured.

Source: Thomas Levine



Publication phases

Phase 1: Get the data online, in some form. This will help with the trust and transparency and community building.

Phase 2: Increase the usability of the data by potentially publishing differently and keeping it up to date.

Today's mission

To move to phase 2 of publishing open data and solve some of the phase 1 problems

Guidelines

5 - S t a r s

5-Stars

http://5stardata.info/

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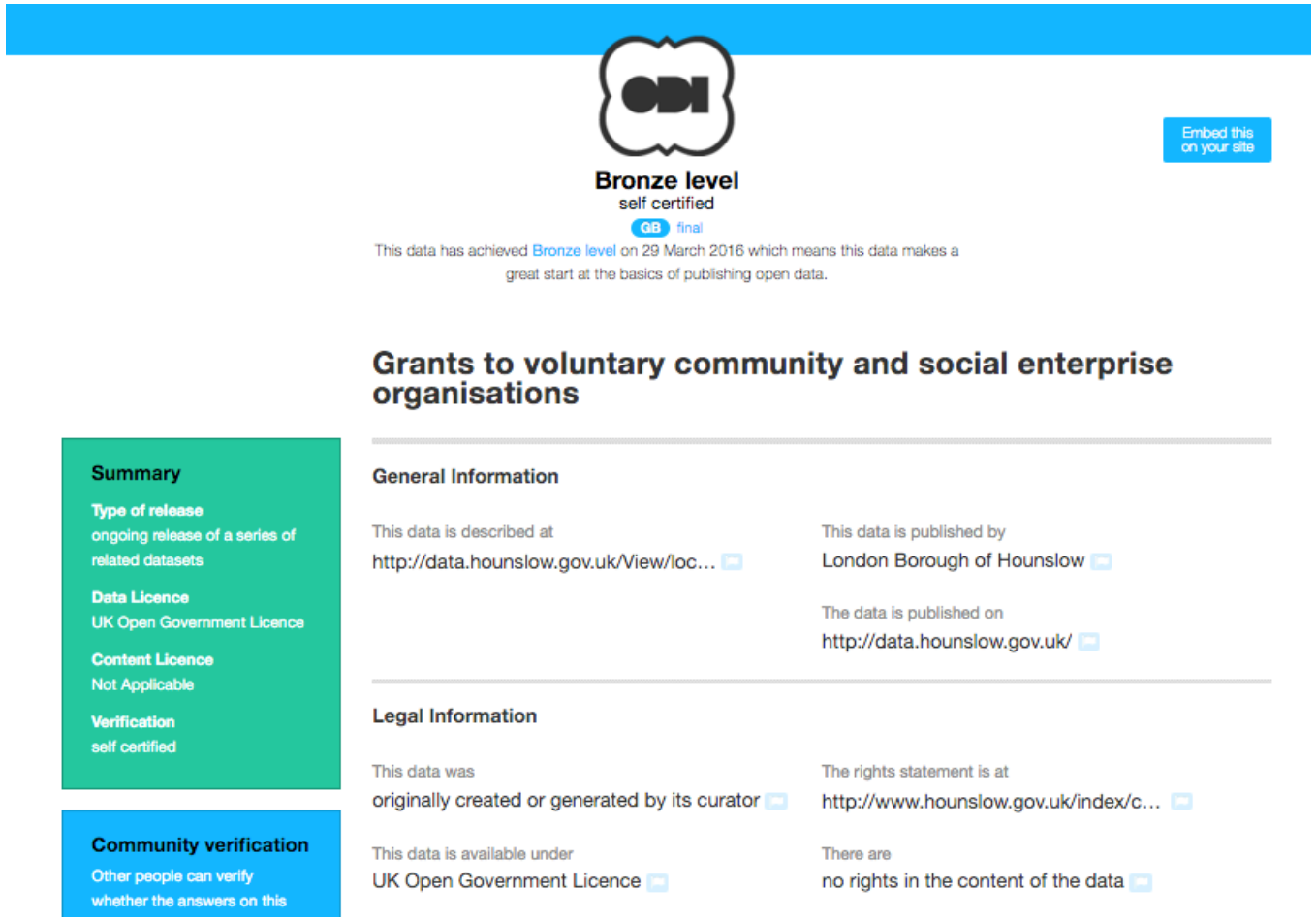
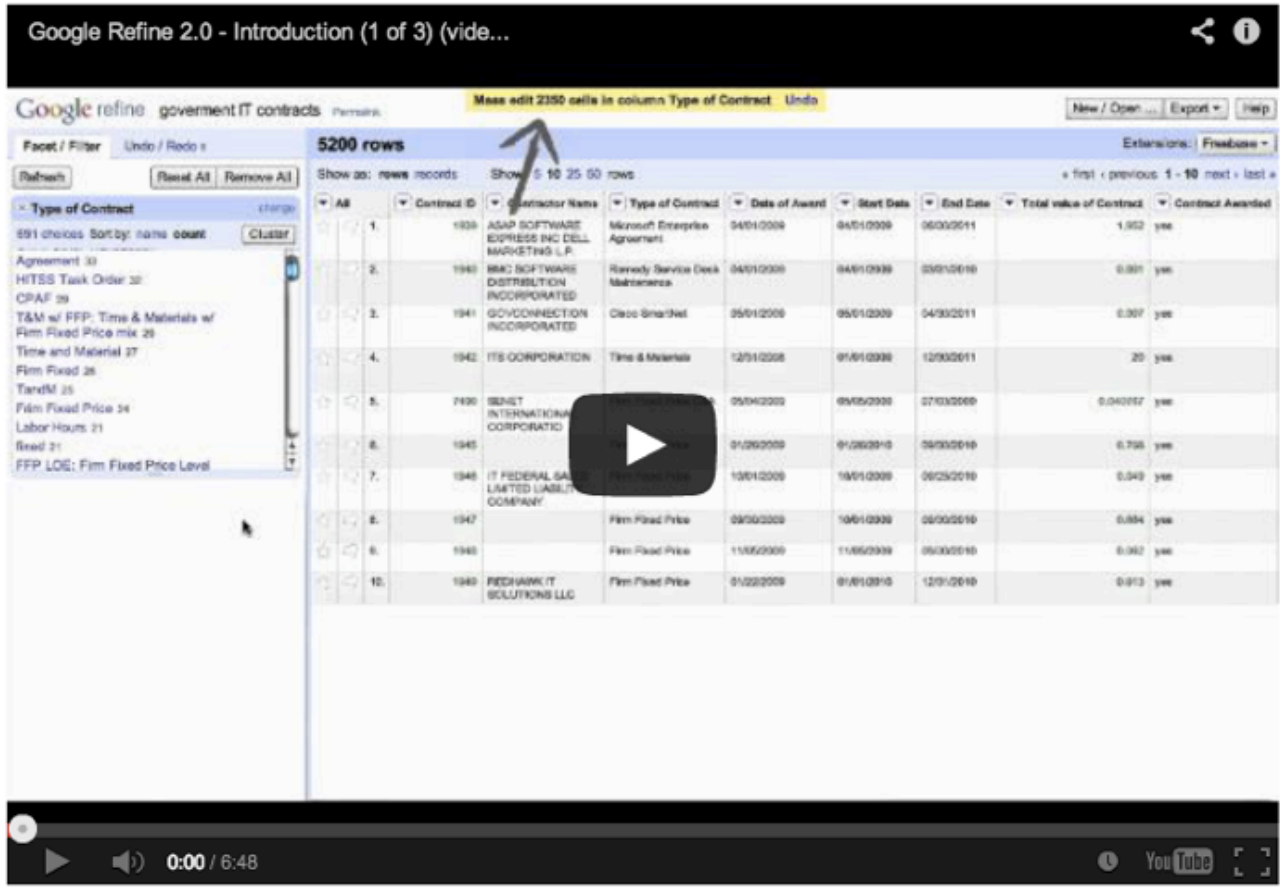
Open Data Certificate



http://certificates.theodi.org

Content created by
The Open Data Institute

Open Refine



http://openrefine.org

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Session 1

The characteristics of open data

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Outcomes

Identify a number of different characteristics of data

Explain the justifications for publishing different types of data

Evaluate the current open data ecosystem and future opportunities

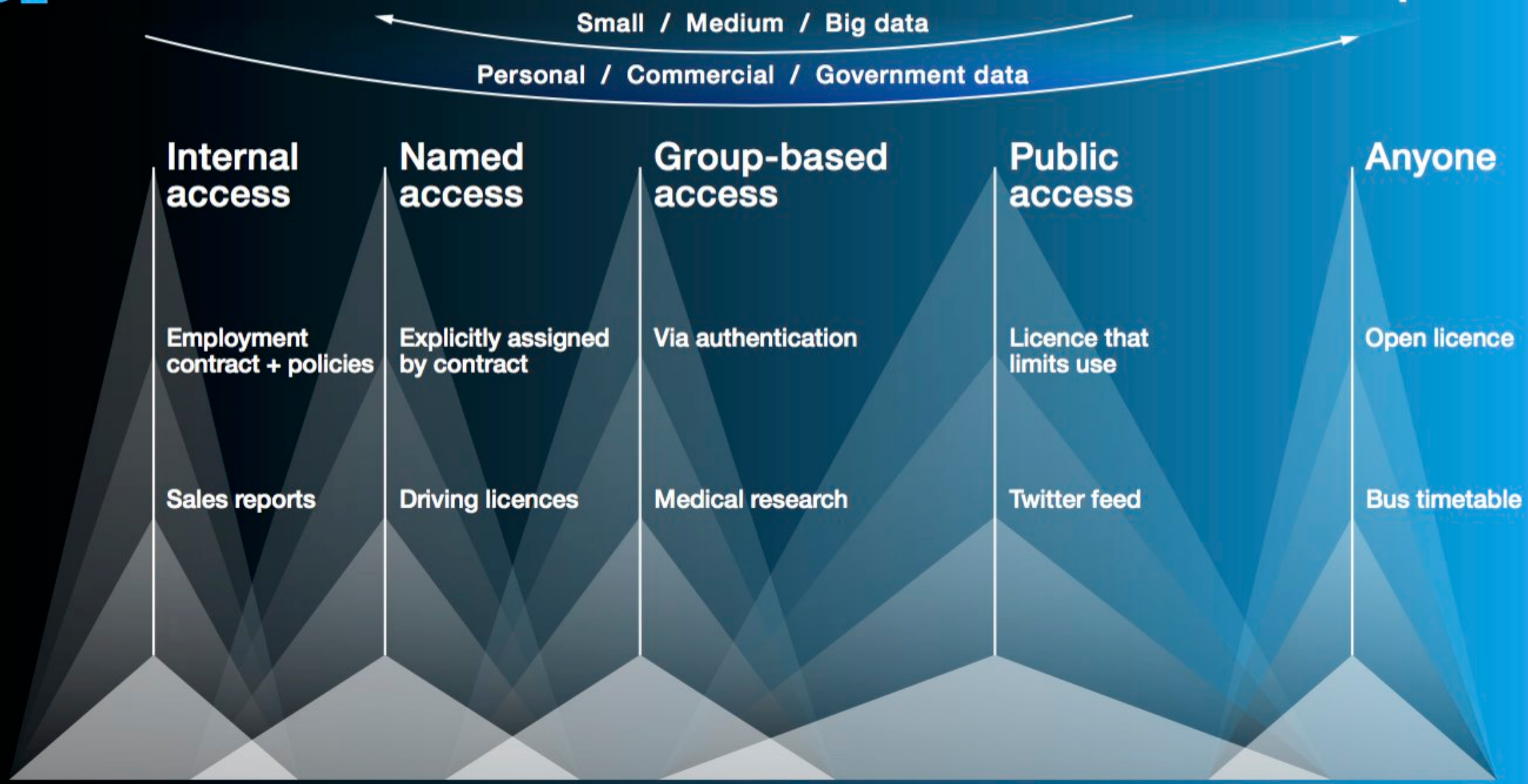
Exercise (part 1)

In your pre-training exercise, you were all asked to identify a dataset.

In your groups briefly discuss each others datasets and write down some key characteristics of each.

Also write the dataset title on a post-it, one per post-it.

The Data Spectrum



theodi.org/data-spectrum

Types of Data

Reference data

“things”

Transaction data

“stats involving things”

Exercise

Categorize your data into reference and transactional data.

If they are all in one category you have 2 minutes to add some new datasets to the empty category.

When done, put a “T” or and “R” on each dataset post-it.

Types of Data

Reference data

“things”

People Facilities Places
Books Buildings

Transaction data

“stats involving things”

Expenditure Weather
Consumption

Observation

Update frequency

Static

In frequent updates

Frequent updates

Live

Exercise

Categorize your data into **frequency of updates**

If they are all in one category you have 2 minutes to add some new datasets to the empty category/ies

Put a number on your post-its representing the frequency of updates.

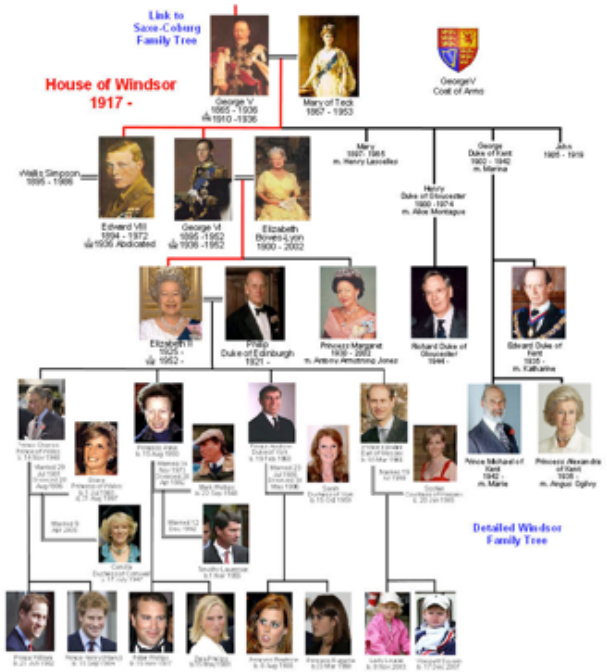
0 = static, 1= In frequent, 2 = Frequent, 3 = Live

Data Representations

Tabular

Region	Production		
Country Level 2	Production (thousand MT)	Change from last year	Change from 5 year average
Brazil	57289	-4.05%	+2.88%
Mato Grosso	18,008	0.90%	6.17%
Parana	9,571	-19.55%	-9.08%
Rio Grande do Sul	7,844	0.88%	9.35%
Goias	6,820	4.23%	5.27%
Mato Grosso do Sul	4,218	-7.69%	-1.97%
Minas Gerais	2,667	5.12%	2.41%
Bahia	2,512	-8.58%	4.84%
Sao Paulo	1,392	-3.77%	-6.81%
Maranhao	1,087	-13.93%	0.58%
Santa Catarina	1,039	9.81%	13.35%
Tocantins	902	-0.90%	7.05%
Piaui	856	4.49%	23.75%
Para	194	-3.13%	1.02%
Distrito Federal	155	1.37%	-1.11%
Roraima	22	-54.10%	-41.70%

Hierarchical



Network/Graph

Exercise

Categorize your data into **tabular, hierarchical (tree) and graph (network)**

If they are all in one category you have 2 minutes to add some new datasets to the empty category.

Add the word “**tab**”, “**tree**” or “**net**” to your post-its to represent the different structures.

Justifications

Trust and Transparency

Enabling the economy

One more

Categorize your data into **transparent** and **enabling**.

Summing up

Do you have any obvious grouping of your datasets?

Is this reflective of the whole open data ecosystem?

Policy paper

G8 Open Data Charter and Technical Annex

Published 18 June 2013

Contents

Exercise

Pick one “group” of datasets that share similar colours and come up with a data publication strategy for getting these datasets online and usable.

What are the publication requirements on the human publisher?

What are the requirements on potential users?

Outcomes

Identify a number of different characteristics of data

Explain the justifications for publishing different types of data

Evaluate the current open data ecosystem and future opportunities

Session 2

Open data discovery patterns

Outcomes

Identify a number of different sources of open data on the web.

Create search patterns that enable easy discovery of new sources of open data.

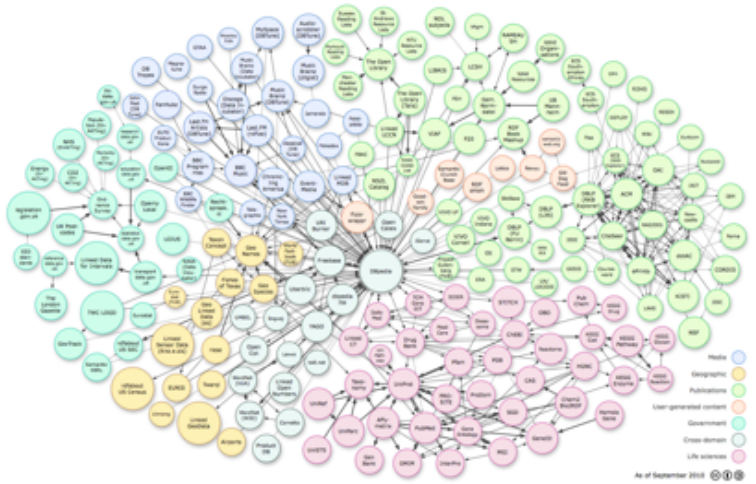
Analyse the usability of available data and formulate plans for usage.

Understand the difference between “data on the web” and the “web of data.

Approaches to publishing data

ON the web

IN the web



Finding data on the web **(of documents)**

Government data

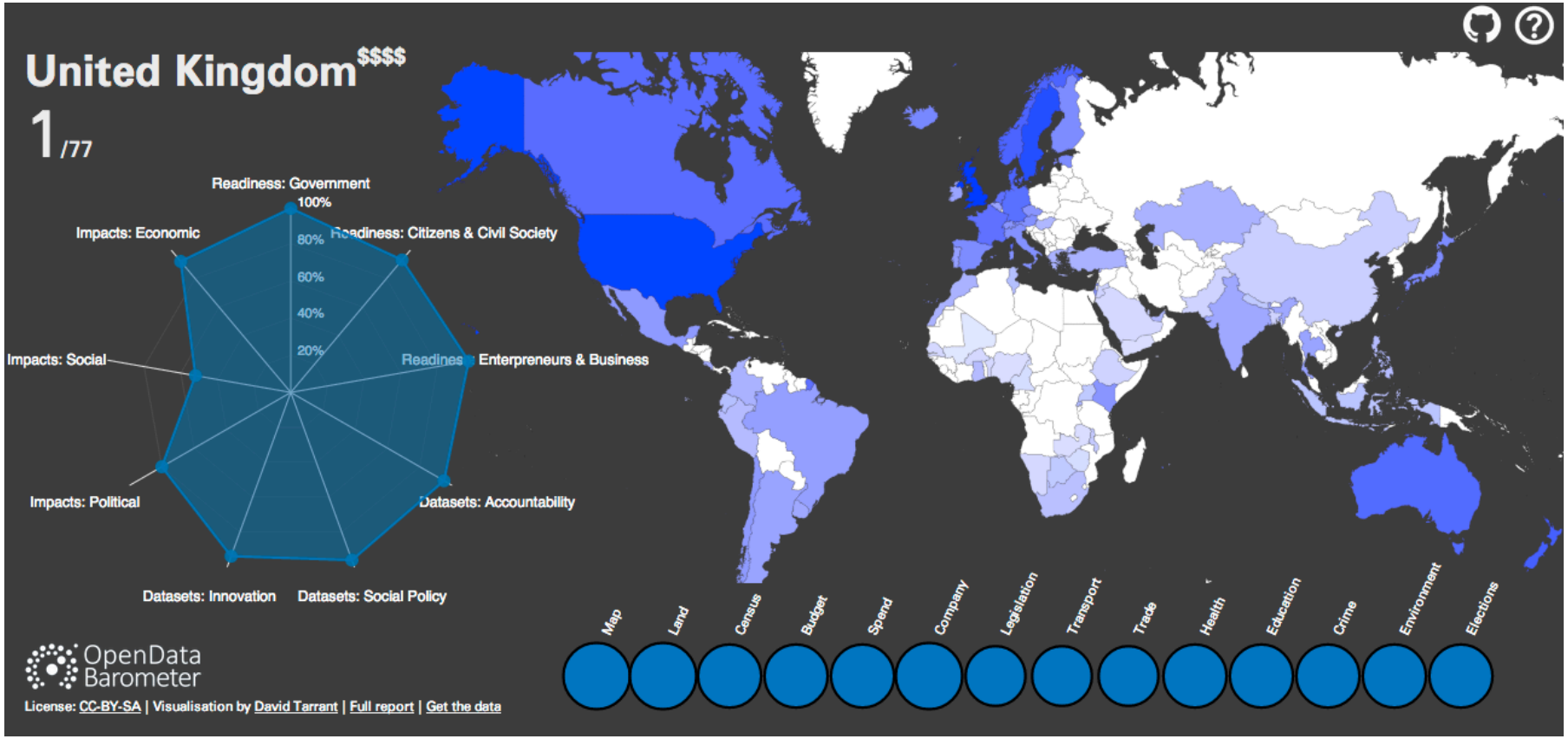
Private sector data

Google advanced

Aggregators and portals

Scraping

Government data



http://www.opendatabarometer.org/

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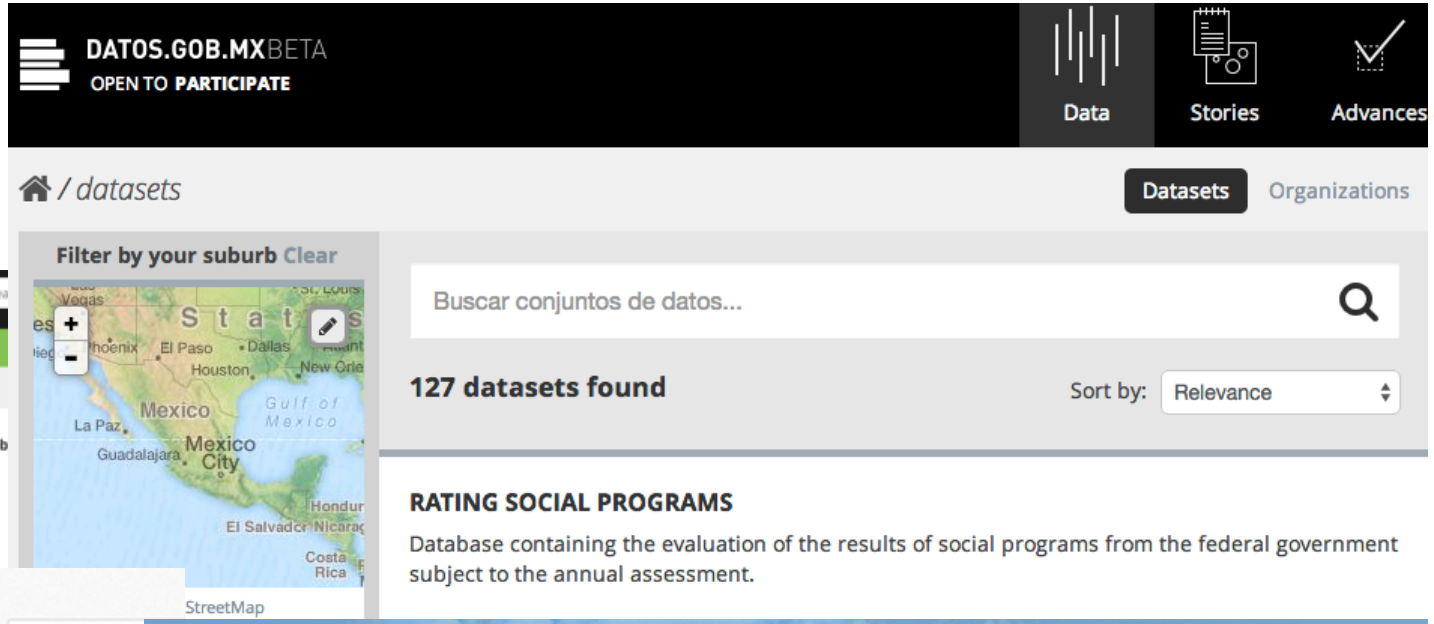
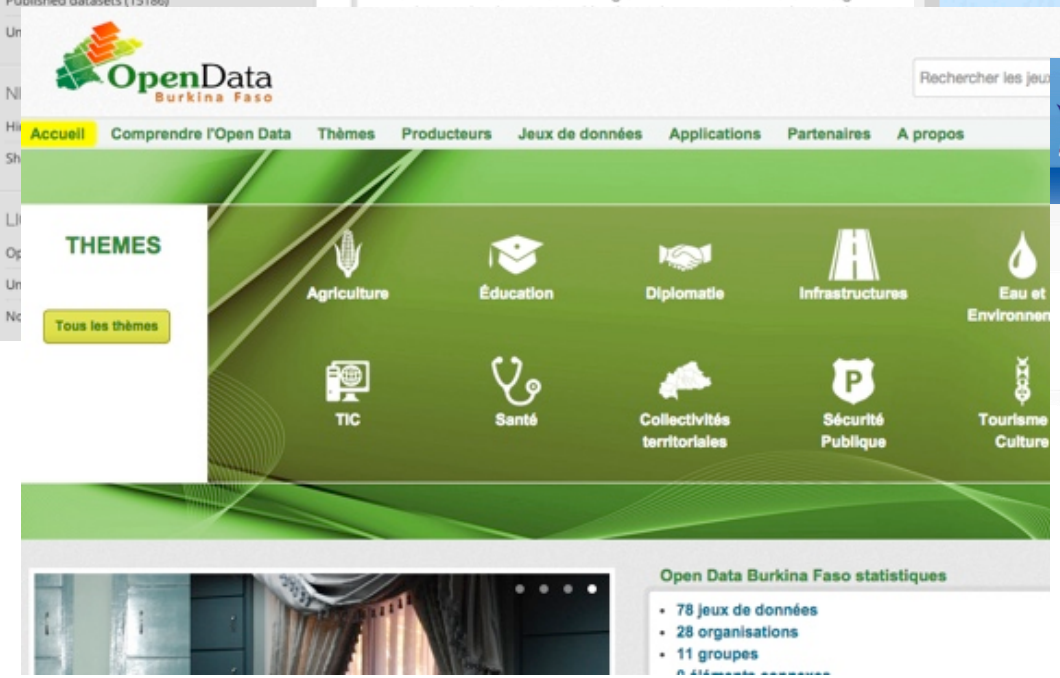
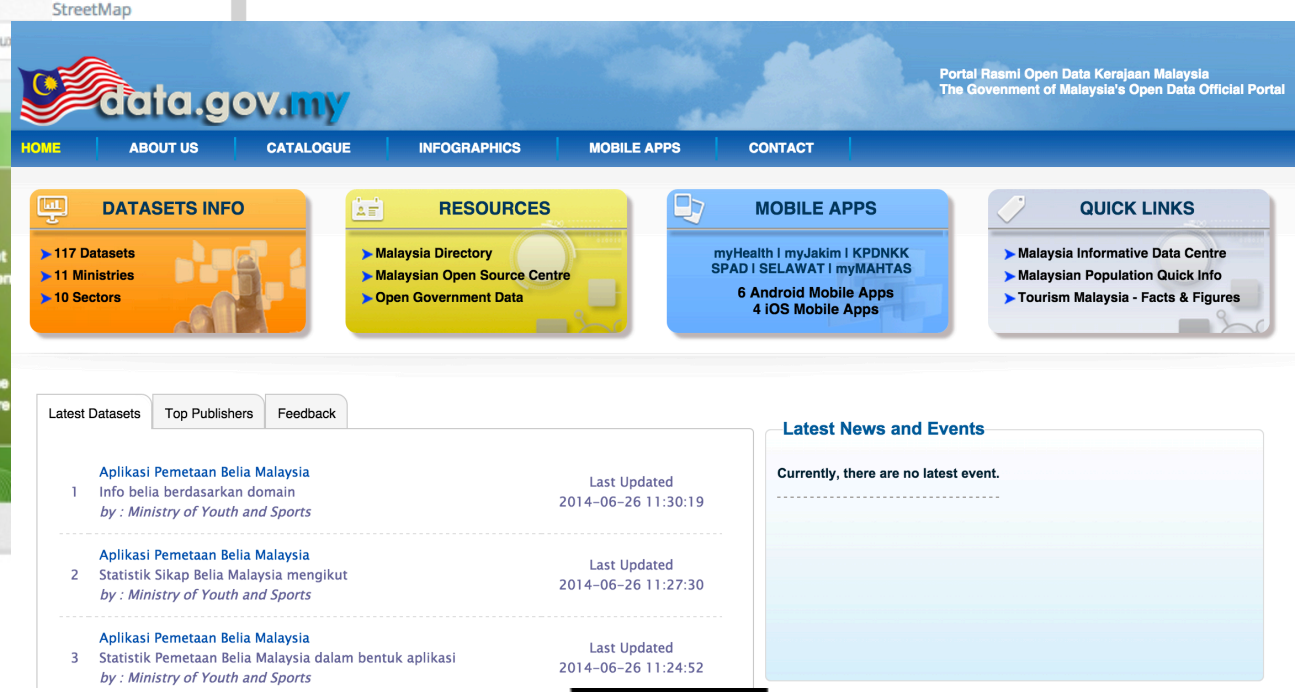
data.gov.XX







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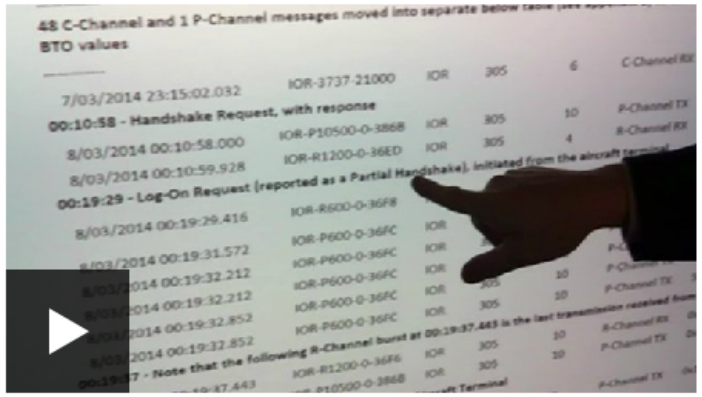
Government / Private

Flight MH370: Malaysia releases raw satellite data



The BBC's Richard Westcott visited Inmarsat's headquarters to find out what the data tells us about MH370's fate

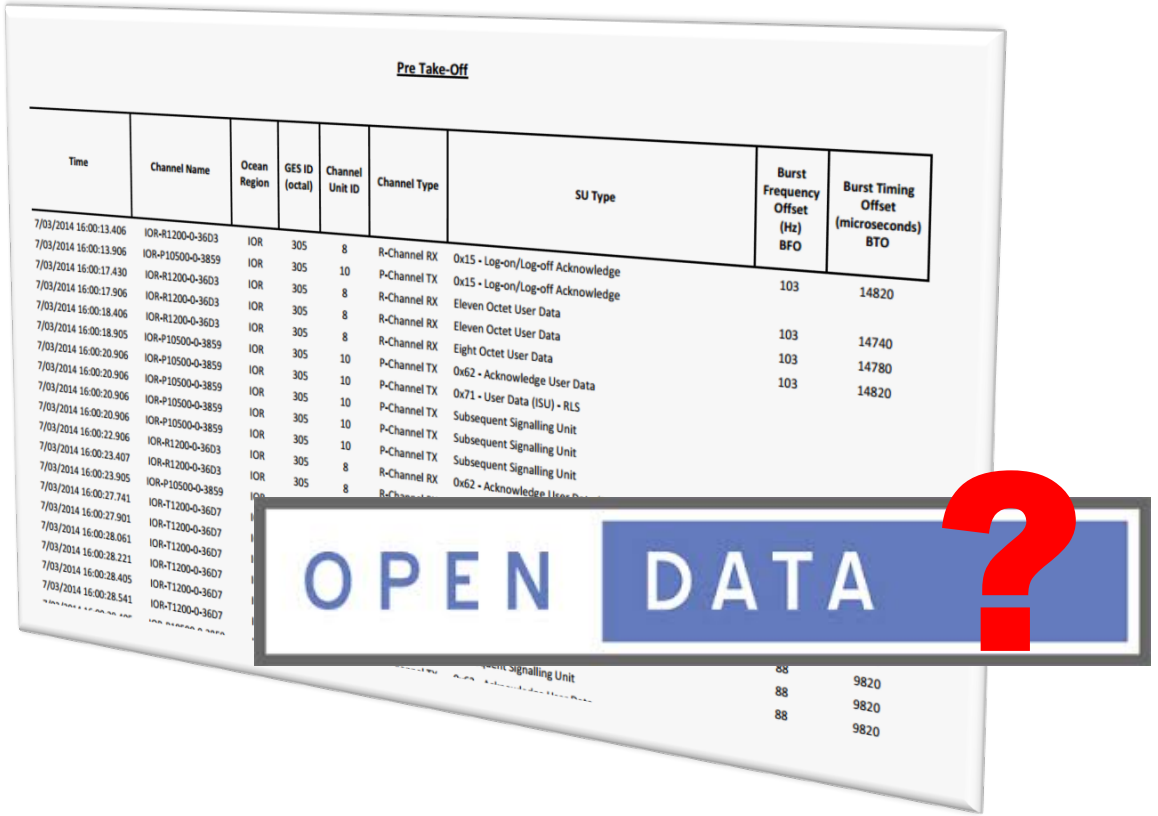
The Malaysian government has released the raw data used to determine that the missing Malaysia Airlines flight MH370 crashed into the southern Indian Ocean.

The data was first released to relatives of passengers, who have been asking for greater transparency, before copies were also provided to media.

The document released on Tuesday comprises 47 pages of data, plus notes, from British firm Inmarsat.

MH370 mystery

- Deep sea challenge
- Ocean maps problem
- Costs of the search
- What we know



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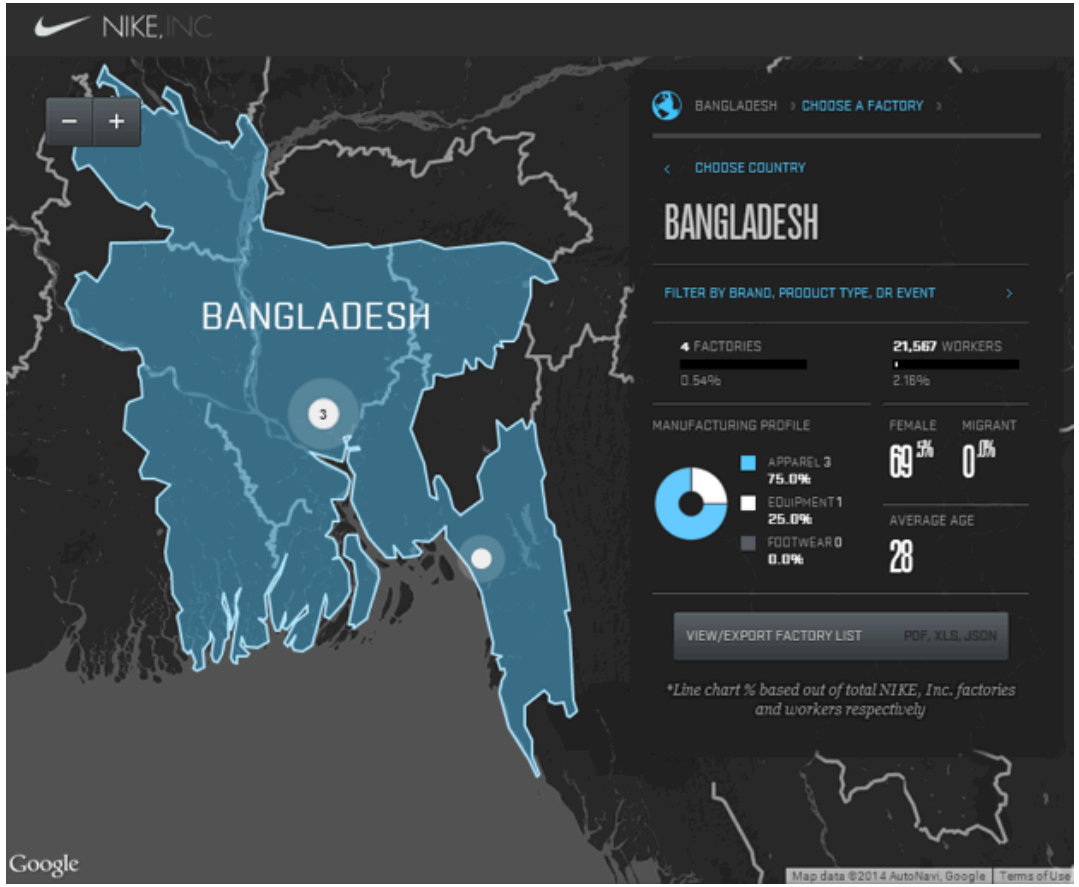
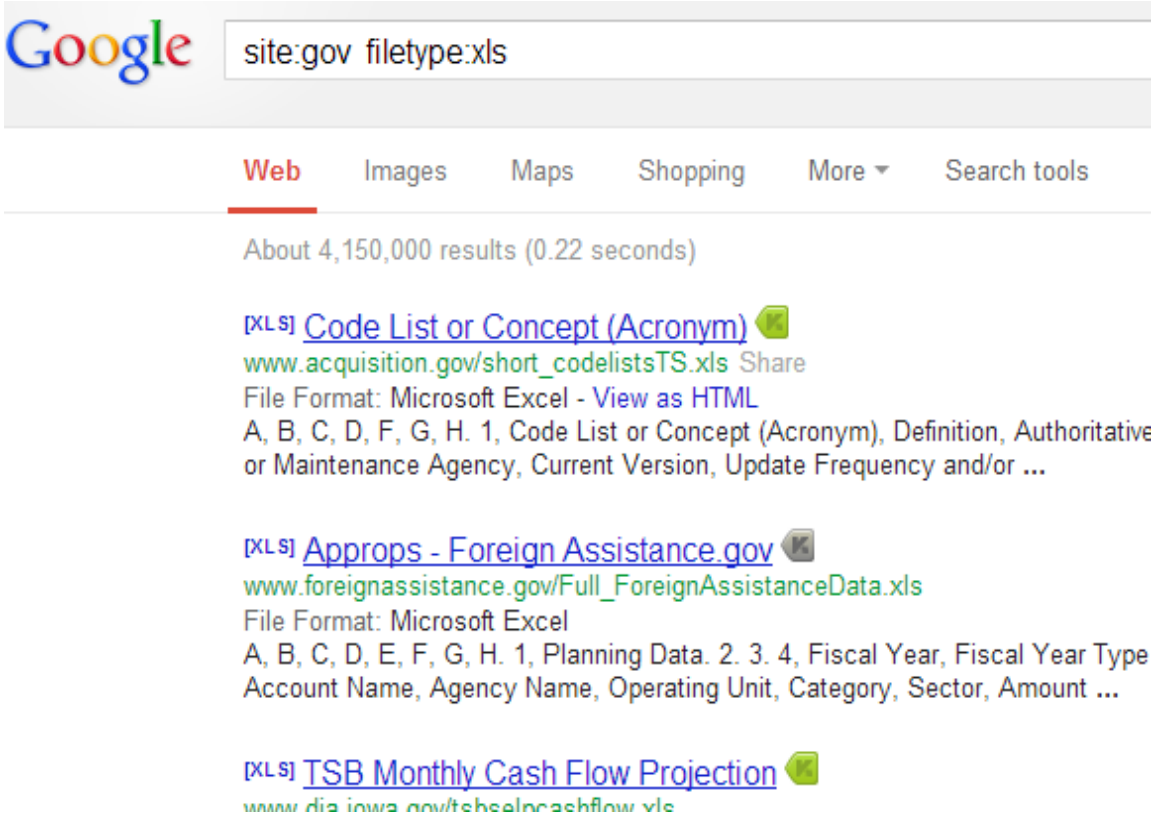
Suppliers



http://manufacturingmap.nikeinc.com/#

Google advanced



site: Get results only from certain sites or domains

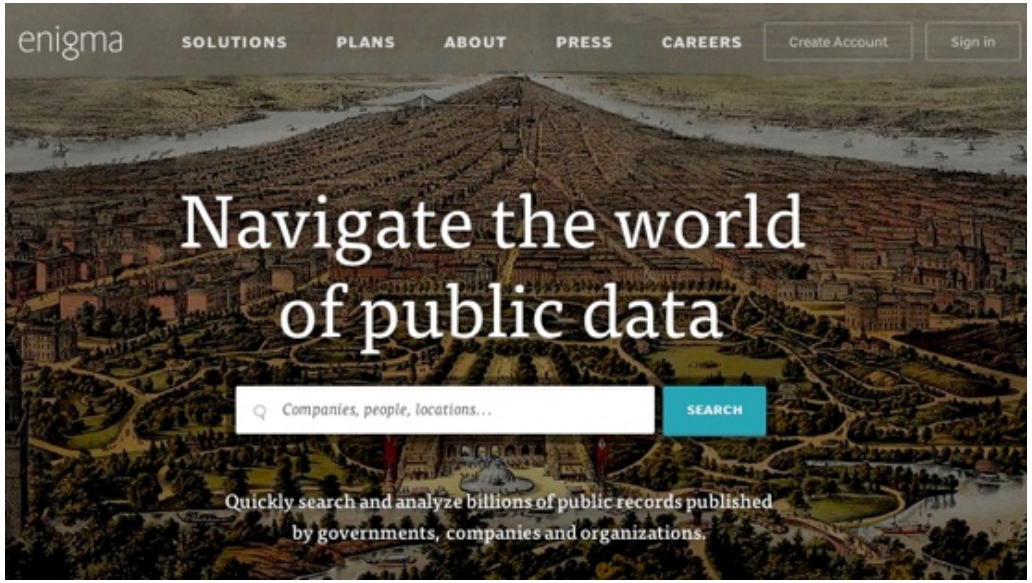
link: Find pages that link to a certain page

related: Find sites similar to one you already know

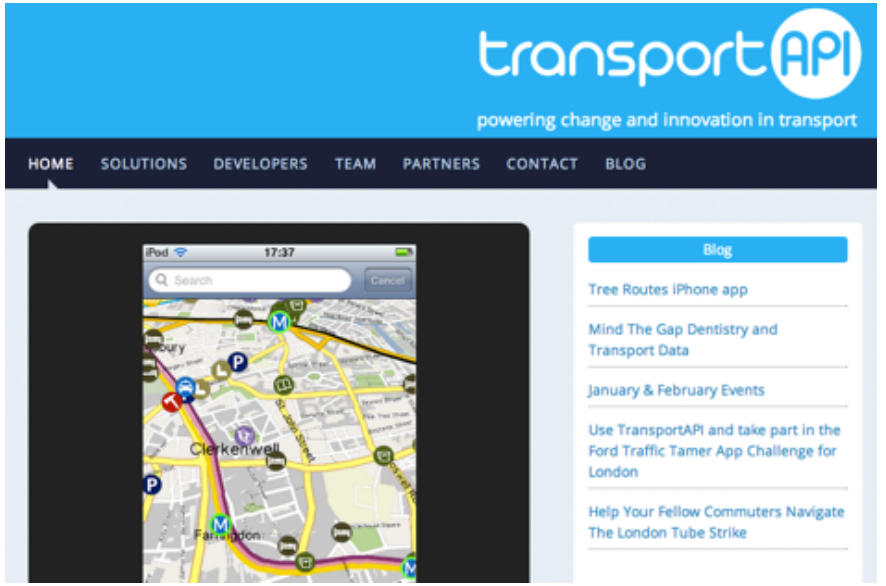
filetype: Find certain file types only

Aggregators and portals

Collect together data from across the web into one place.



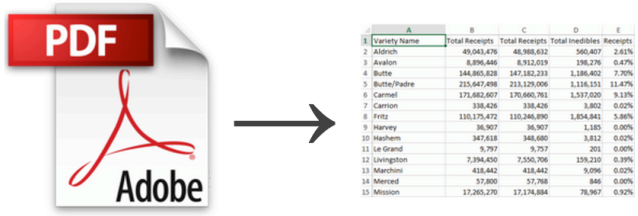
enigma.io



transportAPI

Scraping

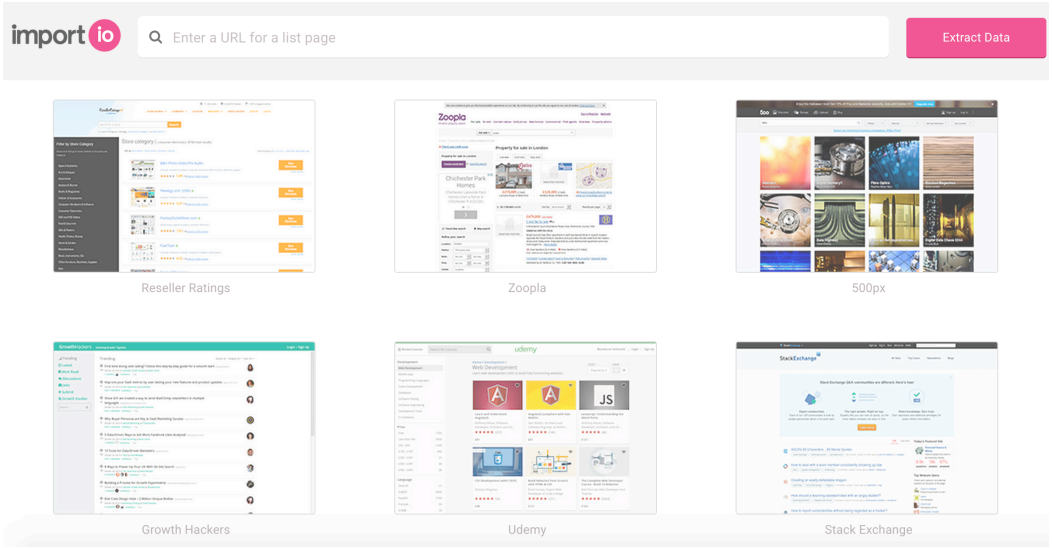
If you can't obtain usable data (csv, xls) then you may have to resort to scraping.



"excellent, so excited beyond description"

George Ofosu, Doctoral Student, UCLA

pdftables.com



magic.import.io

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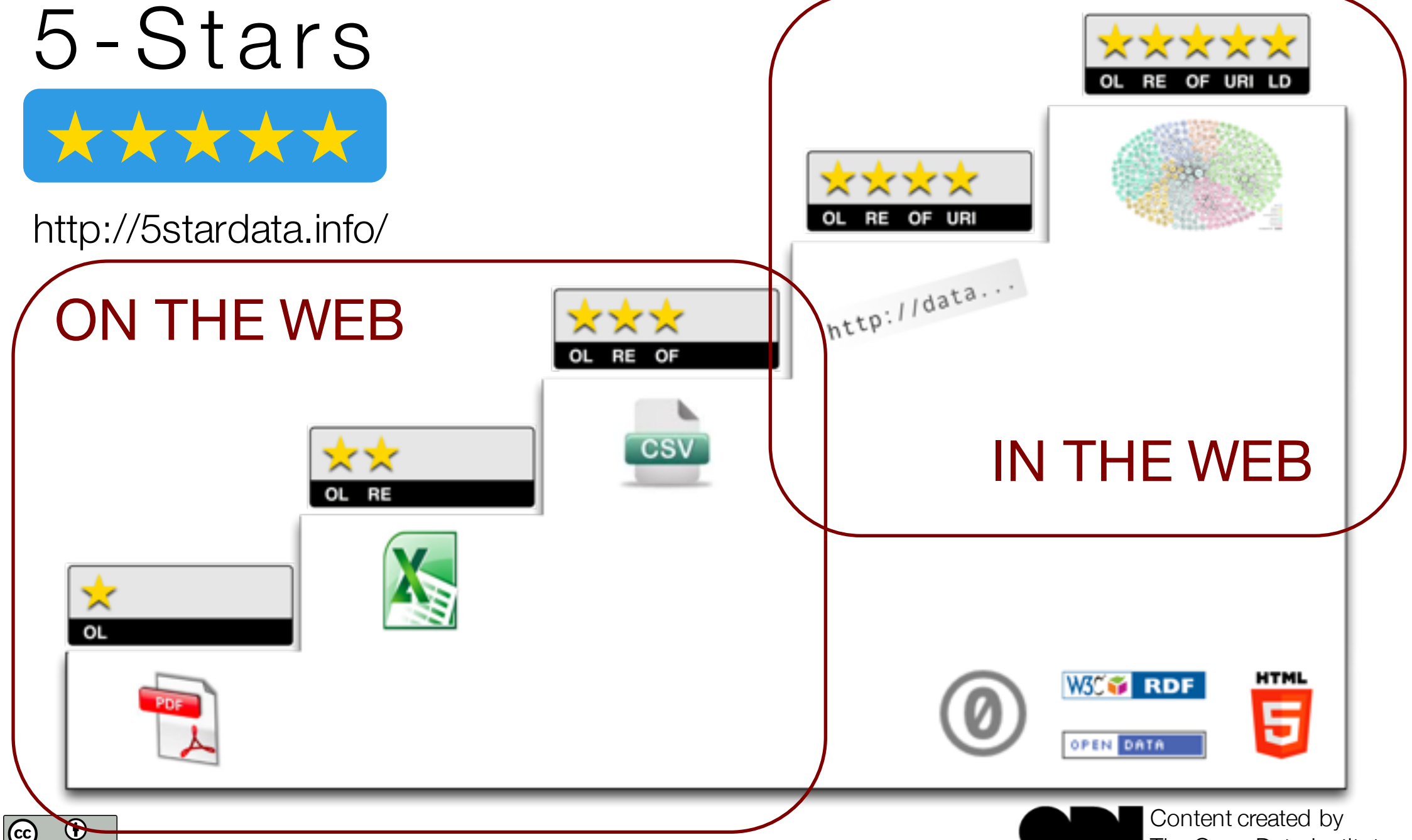
5-Stars

http://5stardata.info/



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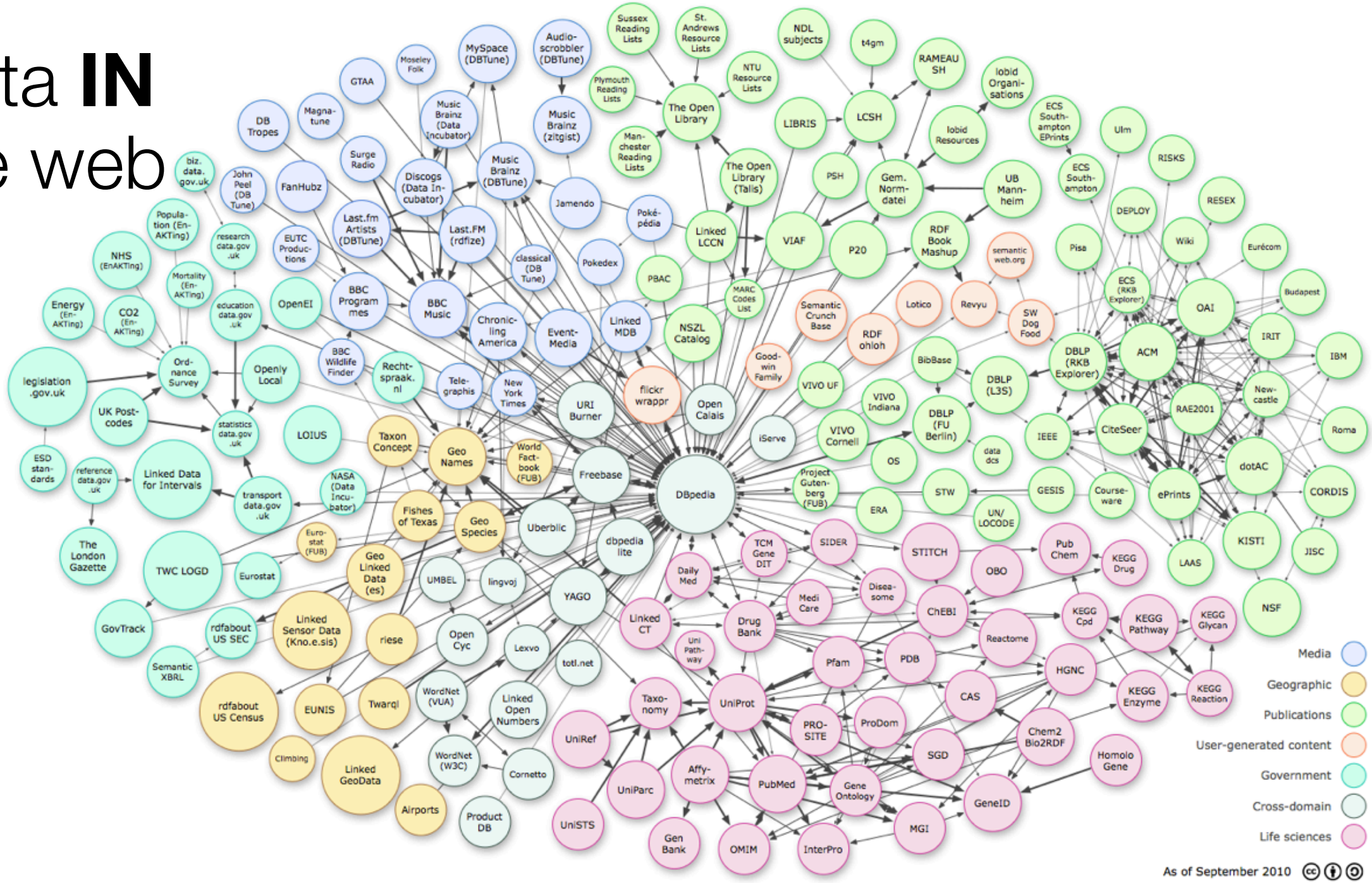
Data **IN** the web



Linked data

Amazing but challenging to publish and use

EEE Building

http://id.southampton.ac.uk/building/32 ← This is the URI

Detail | Facilities | Services | Energy

Site: Highfield Campus
Construction: 2006
Architect: John McAslan & Partners
Features: Building 32 is non-residential

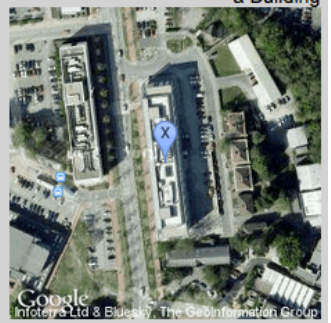
View Disability Report for this Building

©2010 Francois-Xavier Beckers (CC-BY)

Occupants

Electronics & Computer Science
Southampton Education School
Agents, Interactions & Complexity
Web & Internet Science
Leadership School Improve &Effectiveness
Lifelong & Work-Related Learning
Mathematics & Science Education
Social Justice & Inclusive Education
Teaching Only Staff
Deanery

a Building



ton.ac.uk/building/32
→ rooms:Building, http://id.southampton.ac.uk/ns/UoSBuilding
⟶ "EEE Building"
cupant ⟶ Electronics & Computer Science, Southampton Education School, Agents, Interactions
plexity, Web & Internet Science, ...show 8 more...
tion ⟶ "32"^^http://id.southampton.ac.uk/ns/building-code-scheme
ations:within ⟶ Highfield Campus
⟶ http://www.soton.ac.uk/estates/ourestate/buildings/highfield/32.html
"50.9364157"^^xsd:float
⟶ "-1.395905"^^xsd:float
outhampton.ac.uk/ns/disabledGoPage ⟶ http://www.disabledgo.com/en/access-guide/building-
ations:easting ⟶ "442544"^^xsd:integer
ations:northing ⟶ "115392"^^xsd:integer
Organization ⟶ University of Southampton
outhampton.ac.uk/ns/ombielName ⟶ "Bldg 32 (EEE)"
eature ⟶ Building 32 is non-residential
outhampton.ac.uk/ns/buildingDate ⟶ "2006"
outhampton.ac.uk/ns/buildingArchitect ⟶ John McAslan & Partners
patial ⟶ "POLYGON((-1.3961073411331264 50.93683868764933,-1.3958347895092957 50.9368567227702,-1.3956958407975968
606065737417,-1.3959558923017397 50.93603859197583,-1.3961073411331264 50.93683868764933))"
outhampton.ac.uk/ns/electricityTimeSeries ⟶ "elec/b32/ekw"
← is spatialrelations:within of ← 32 / 3077, 32 / 1015, Physical and Applied Science Faculty Deanery, Social and Human Sciences Faculty Deanery, ...show 54 more...
← is foaf:depicts of ← http://data.southampton.ac.uk/image-archive/buildings/raw/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/1000/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/800/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/600/32.jpg, ...show 5 more...
← is event:place of ← RAeS Solent Branch Christmas Special Lecture - The Red Arrows

Finding data on the web **(of data)**

1. Add random extensions (.xml, .json, .csv etc)
2. Look for alternative links (rss feeds etc)
3. Look for embedded data
4. Do some content negotiation
5. Spot the API
6. Scrape (or search google again)

IN THE WEB

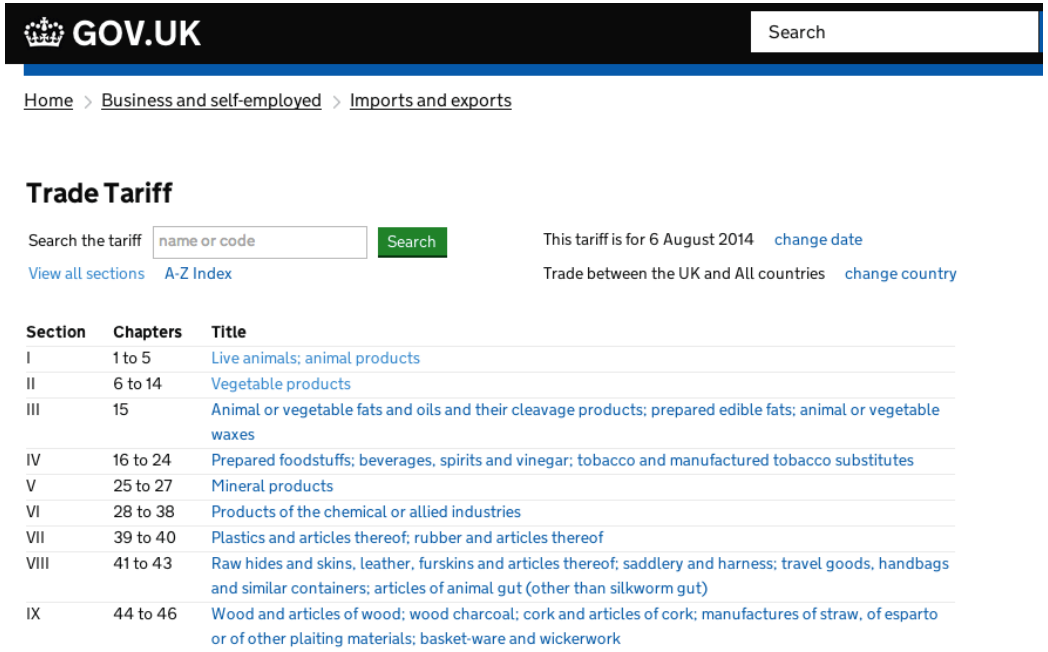
How the web should work, but people forgot that Tim put this in when he invented it!

Duck typed data

If it looks like a duck
and quacks like a duck,
then it's probably a duck.

Basically, keep an eye out for tables,
lists and other stuff that looks like data.

1. Adding random extensions



UK Trade Tariff

BBC Music and Programmes

Try using the following: .csv .json .xml .rss .rdf

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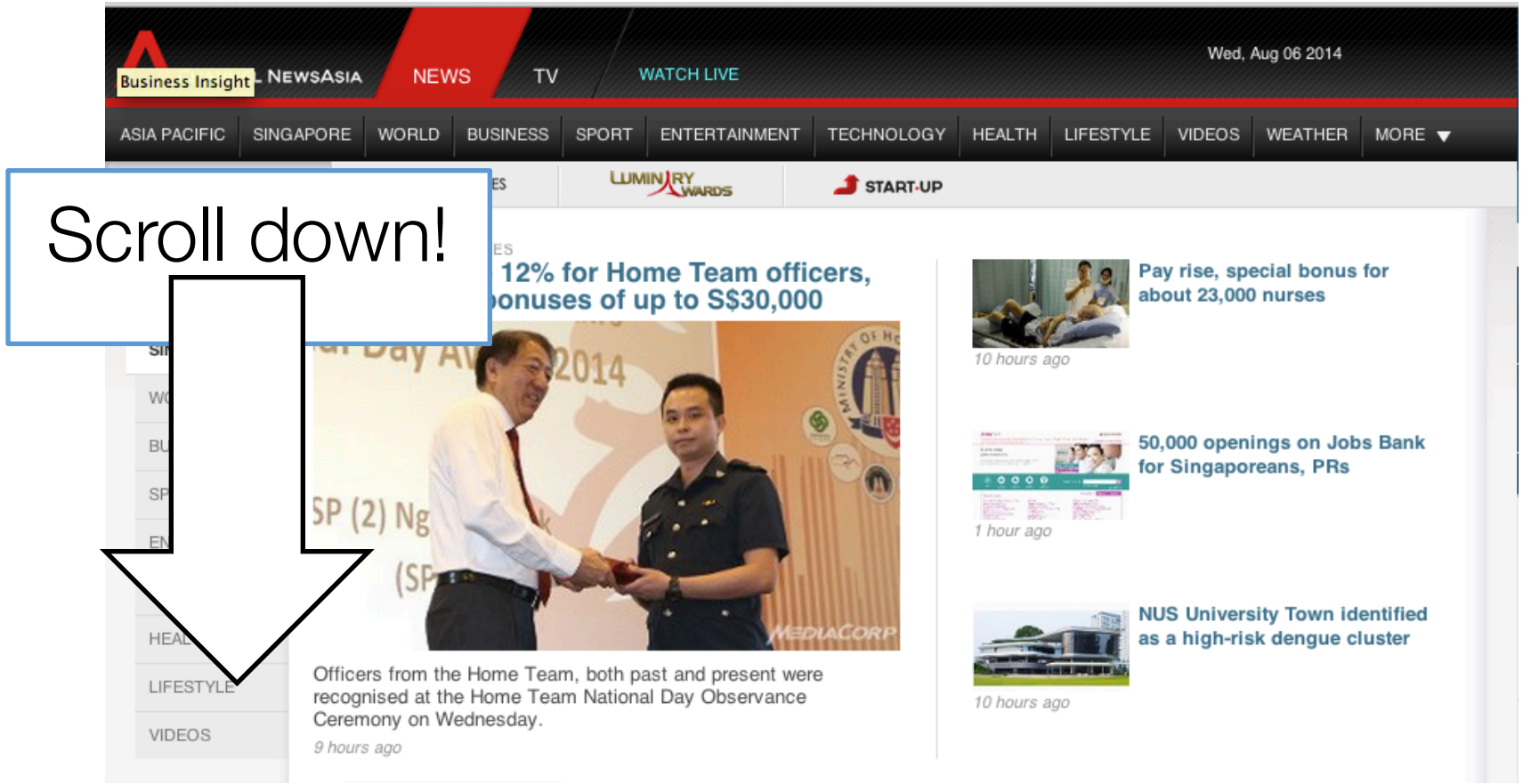
2. Look for alternative links



Content created by
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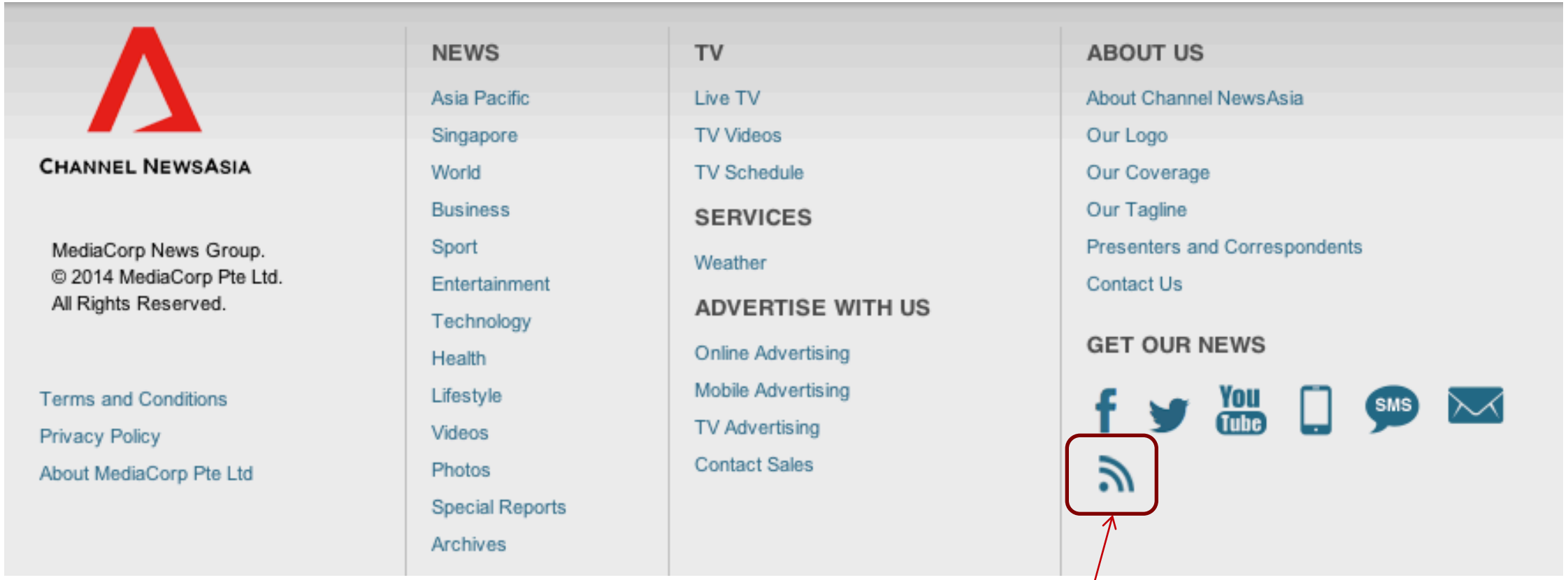
2. Look for alternative links



RSS

Content created by
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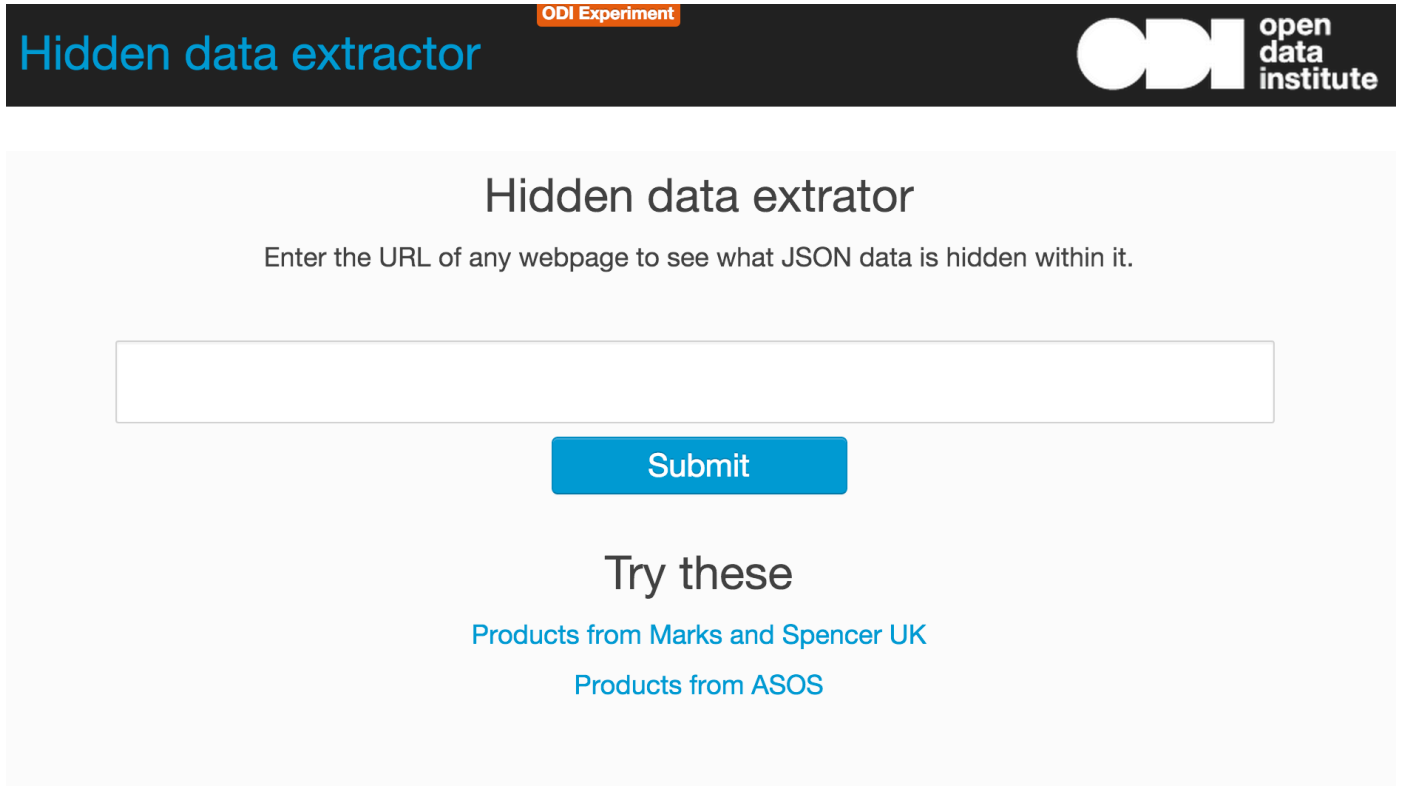
3. Look for embedded data



http://odinprac.theodi.org/hidden-data-extractor/

Finding data on the web **(of data)**

1. Add random extensions (.xml, .json, .csv etc)
2. Look for alternative links (rss feeds etc)
3. Look for embedded data
4. Do some content negotiation
5. Spot the API
6. Scrape (or search google again)

IN THE WEB

How the web should work, but people forgot that Tim put this in when he invented it!

Exercise

Find a data set using one of the routes we've just looked at.....

Ask yourself – (and discuss in groups)

Is it usable?

What makes it usable?

What more do you need to know?

Outcomes

Identify a number of different sources of open data on the web.

Create search patterns that enable easy discovery of new sources of open data.

Analyse the usability of available data and formulate plans for usage.

Understand the difference between “data on the web” and the “web of data.

Session 3

Open data publication platforms

Outcomes

Understand the difference between “data on the web” and the “web of data”

Evaluate a number of different approaches for publishing open data.

Publish a dataset on one of the many available platforms.

Types

Specialist Solution	Integrated Solution
+ Easy to get setup and maintain. + Open Data focused + Clear workflows for publishing open data + Visualisation tools + Data mashing tools + Best for transactional data	+ No new platform to learn + Data is provided in parallel to web pages + No separation from authoritative data + Easy discovery of data + Best for reference data + Best for Linked Open Data

Key characteristics of specialist solution

Separate from your main org website

Designed to publish open data, not to fulfill other org goals

Examples: data.gov.uk | data.cityofchicago.org | data.sncf.com

Key characteristics of integrated solution

It is your main website

Publishes data alongside everything else that the organisation does

Examples: bbc.co.uk/programmes | southampton.ac.uk | gov.uk

Merging specialist and integrated

Method 1: *Build the functionality of your current website into a new open data platform.*

Example: West Sussex Country Council

Method 2: *Hide the specialist solution behind your main website and use it as a loosely coupled CMS.*

Example: southampton.ac.uk

The sliding scale of specialist solutions

1. Catalogue: Point to data (leave it at source)
2. Re-present: Provide data services (leave it at source)
3. Host the data: Be the source
4. Control the data: Be the authority
5. Be the hub: Host the data and processor

Specialist Solutions

comprehensive knowledge archive network

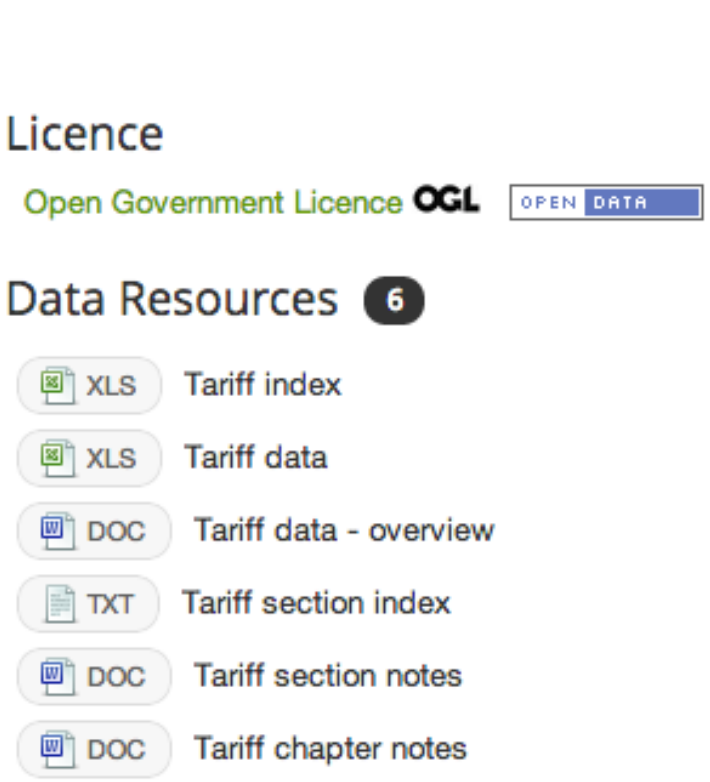
http://www.flickr.com/photos/okfn

OpenDataSoft

Socrata

Content created by
The Open Data Institute

Overview



http://demo.ckan.org/

Open Knowledge Foundation Supported

Data Catalogue

Open Source

Feels like a record manager

Simple API and search

Lots of community tools

Evolution of CKAN (v1.4)

Early) Dataset catalogue (data.gov.uk)

no data hosted or searched

Mid) Data and dataset catalogue

no data hosted but it is searchable

Now) Integrated data driven web site

data platform is integrated with data, search and content

Features

Publish, Store and Manage Data and Metadata

Visual and Geospatial

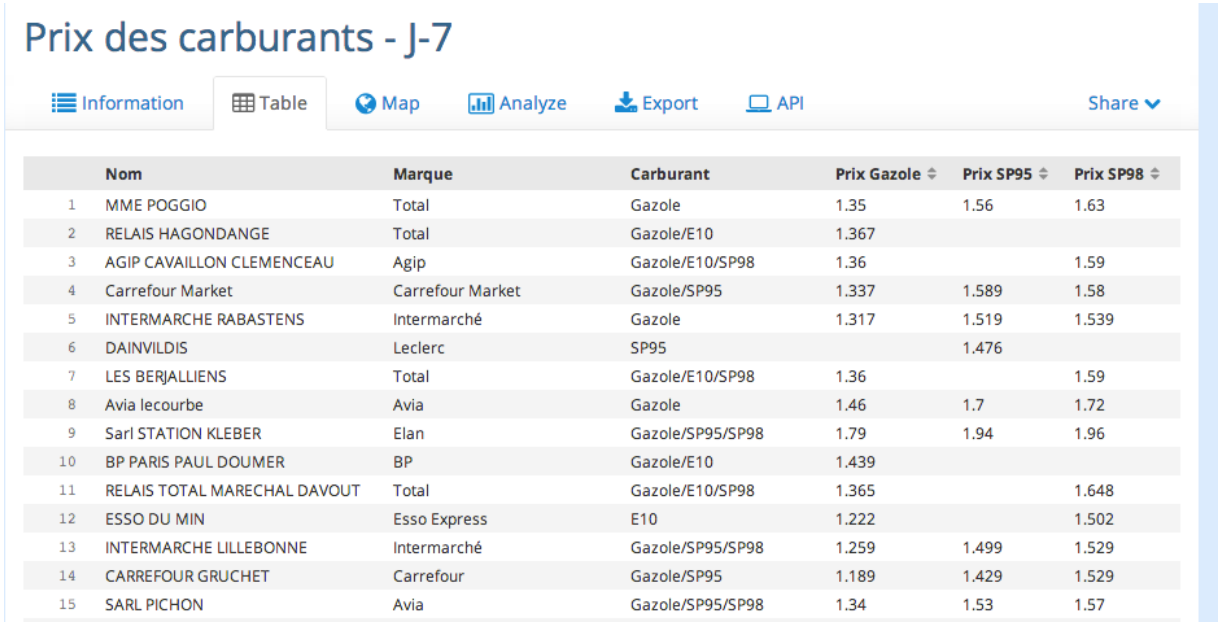
Social

Full Stored History

Federate Your Data With Other Organizations

Rich RESTful JSON API for Developers

Overview



Prix des carburants - J-7

Information | Table | Map | Analyze | Export | API | Share

	Nom	Marque	Carburant	Prix Gazole	Prix SP95	Prix SP98
1	MME POGGIO	Total	Gazole	1.35	1.56	1.63
2	RELAIS HAGONDANGE	Total	Gazole/E10	1.367		
3	AGIP CAVAILLON CLEMENCEAU	Agip	Gazole/E10/SP98	1.36		1.59
4	Carrefour Market	Carrefour Market	Gazole/SP95	1.337	1.589	1.58
5	INTERMARCHE RABASTENS	Intermarché	Gazole	1.317	1.519	1.539
6	DAINVILDIS	Leclerc	SP95		1.476	
7	LES BERJALLIENS	Total	Gazole/E10/SP98	1.36		1.59
8	Avia lecourbe	Avia	Gazole	1.46	1.7	1.72
9	Sarl STATION KLEBER	Elan	Gazole/SP95/SP98	1.79	1.94	1.96
10	BP PARIS PAUL DOUMER	BP	Gazole/E10	1.439		
11	RELAIS TOTAL MARECHAL DAVOUT	Total	Gazole/E10/SP98	1.365		1.648
12	ESSO DU MIN	Esso Express	E10	1.222		1.502
13	INTERMARCHE LILLEBONNE	Intermarché	Gazole/SP95/SP98	1.259	1.499	1.529
14	CARREFOUR GRUCHET	Carrefour	Gazole/SP95	1.189	1.429	1.529
15	SARL PICHON	Avia	Gazole/SP95/SP98	1.34	1.53	1.57

Data as a Service (DaaS)

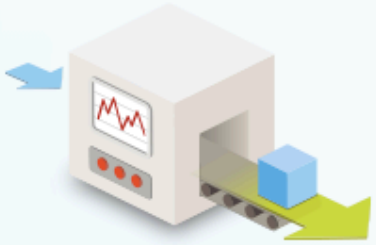
Hosted enterprise solution

Query based API (3-Star)

EU Based

Closed source

Features



Prepare data

- Collect from any source
- Read every kind of formats
- Understand all data types
- Make datasets findable & reusable

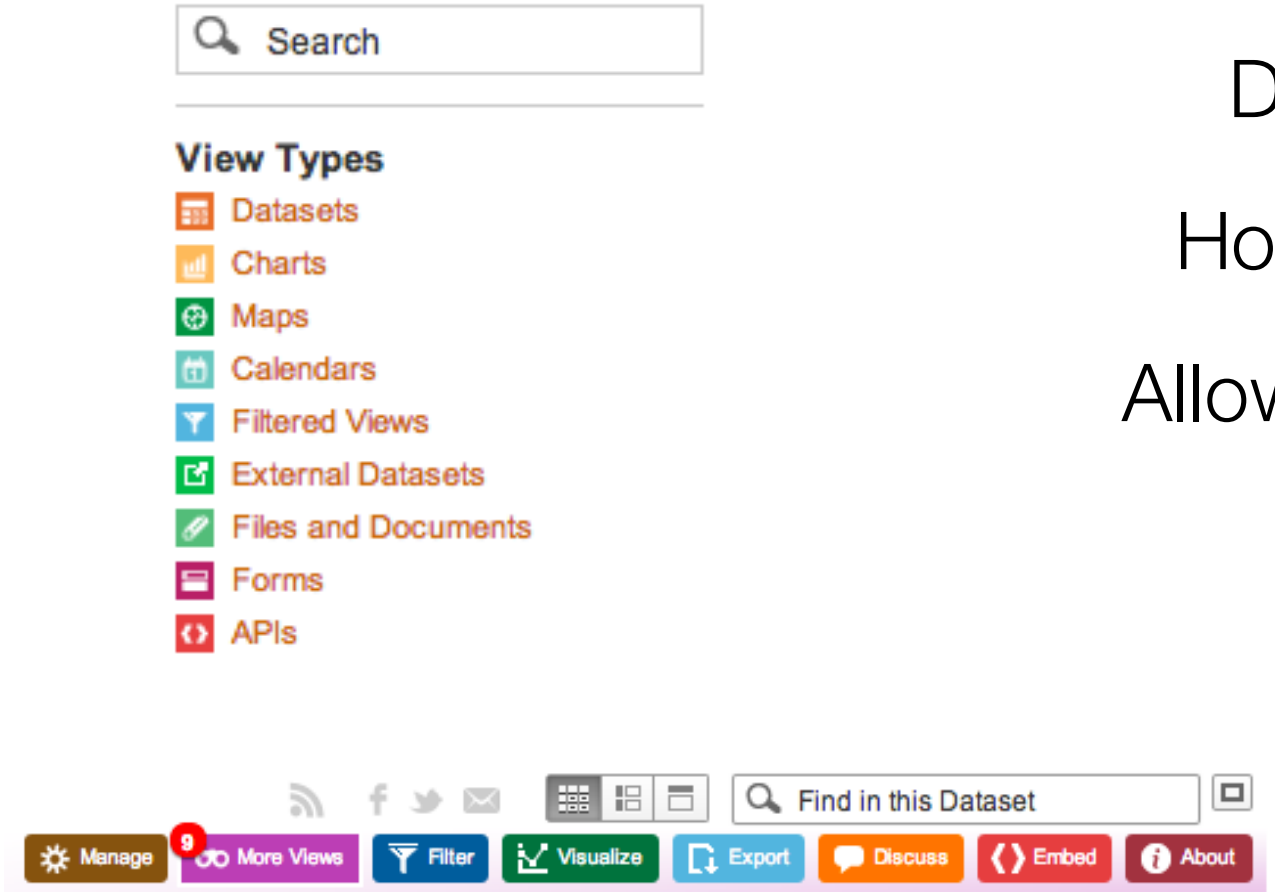
Reuse data

- Full-featured secured API
- Standard access formats
- Interactive & shareable visualization
- Web extensions & open source

Scale services

- Big data technologies
- 100% cloud-based
- API factory
- Monitoring

Overview



Socrata

Data as a Service (DaaS)

Hosted enterprise solution

Allows user created content

Full linked API (5-Star)

US Based

Closed source

Features

Data **Publishing**, Optimized for Business Users

Flexible **Metadata** Management

Federate Your Data With Other Organizations

Metrics of the Success of Your Initiative in Real-time

Anyone Can Create **Maps** and **Charts**

Data Becomes **Social**

Developers Are Supported Every Step of the Way

The sliding scale of specialist solutions

1. Catalogue: Point to data (leave it at source)
2. Re-present: Provide data services (leave it at source)
3. Host the data: Be the source
4. Control the data: Be the authority
5. Be the hub: Host the data and processor

Integrated solutions

Integrated solutions expose data using the current infrastructure (web pages).

Data driven web site

Best for reference and live data

The developers secret

GOV.UK Search

Home > Business and self-employed > Imports and exports

Trade Tariff

Search the tariff name or code Search

View all sections A-Z Index

This tariff is for 6 August 2014 change date

Trade between the UK and All countries change country

Section	Chapters	Title
I	1 to 5	Live animals; animal products
II	6 to 14	Vegetable products
III	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
IV	16 to 24	Prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes
V	25 to 27	Mineral products
VI	28 to 38	Products of the chemical or allied industries
VII	39 to 40	Plastics and articles thereof; rubber and articles thereof
VIII	41 to 43	Raw hides and skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silkworm gut)
IX	44 to 46	Wood and articles of wood; wood charcoal; cork and articles of cork; manufactures of straw, of esparto or of other plaiting materials; basket-ware and wickerwork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Linked data

Amazing but challenging to publish and use

EEE Building

http://id.southampton.ac.uk/building/32 ← This is the URI

Detail | Facilities | Services | Energy

Site: Highfield Campus
Construction: 2006
Architect: John McAslan & Partners
Features: Building 32 is non-residential

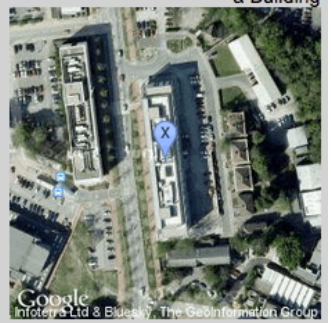
View Disability Report for this Building

©2010 Francois-Xavier Beckers (CC-BY)

Occupants

Electronics & Computer Science
Southampton Education School
Agents, Interactions & Complexity
Web & Internet Science
Leadership School Improve &Effectiveness
Lifelong & Work-Related Learning
Mathematics & Science Education
Social Justice & Inclusive Education
Teaching Only Staff
Deanery

a Building



ton.ac.uk/building/32
→ rooms:Building, http://id.southampton.ac.uk/ns/UoSBuilding
⟶ "EEE Building"
cupant ⟶ Electronics & Computer Science, Southampton Education School, Agents, Interactions
plexity, Web & Internet Science, ...show 8 more...
tion ⟶ "32"^^http://id.southampton.ac.uk/ns/building-code-scheme
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⟶ http://www.soton.ac.uk/estates/ourestate/buildings/highfield/32.html
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outhampton.ac.uk/ns/electricityTimeSeries ⟶ "elec/b32/ekw"
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← is foaf:depicts of ← http://data.southampton.ac.uk/image-archive/buildings/raw/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/1000/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/800/32.jpg, http://data.southampton.ac.uk/image-archive/buildings/600/32.jpg, ...show 5 more...
← is event:place of ← RAeS Solent Branch Christmas Special Lecture - The Red Arrows

Formats, Structures and Files

Data formats are complex and have ~~suffered~~ benefited from years of development in many different domains.

One thing is bringing them all together.

Recap

Specialist Solution	Integrated Solution
+ Easy to get setup and maintain. + Open Data focused + Clear workflows for publishing open data + Visualisation tools + Data mashing tools + Best for transactional data	+ No new platform to learn + Data is provided in parallel to web pages + No separation from authoritative data + Easy discovery of data + Best for reference data + Best for Linked Open Data

Both great for open data

Integrated solutions more suited for building a web of linked data

Exercise

Each table will have one of the publication platforms to explore.

Your task is to publish a prescribed dataset on this platform, with an associated open data certificate.

Outcomes

Understand the difference between “data on the web” and the “web of data”

Evaluate a number of different approaches for publishing open data.

Publish a dataset on one of the many available platforms.

Recap session

Today

The characteristics of open data

Open data discovery patterns

Open data publication

Quick big data break

Practical publication hands-on

The carecteristics of open data

Identify a number of different characteristics of data

Explain the justifications for publishing different types of data

Evaluate the current open data ecosystem and future opportunities

Open data discovery patterns

Identify a number of different sources of open data on the web.

Create search patterns that enable easy discovery of new sources of open data.

Analyse the usability of available data and formulate plans for usage.

Understand the difference between “data on the web” and the “web of data.

Open data publiction

Understand the difference between “data on the web” and the “web of data”

Evaluate a number of different approaches for publishing open data.

Publish a dataset on one of the many available platforms.

Open Data in Practice

Dr David Tarrant

@davetaz

The Open Data Institute

Content created by
The Open Data Institute

Day 1 review:

What are the steps in publishing data as open data?

5-6 steps from nothing to perdection

Step 1

Is open for me?

Do I have personal or sensitive data?

Step 2

Define objective

Why are we doing this? Who are the stakeholders?

Step 3

Define boundaries

What gets published?

What license?

Where are we publishing?

Step 4

Choose methodology

Tools?

Platforms?

Processes?

Step 5

Publish!

Step 6

Showcase / Iterate / Support

See Day 3

Publication phases

Phase 1 (Steps 1-5): Get the data online, in some form. This will help with the trust and transparency and community building.

Phase 2 (Steps 1-5 + 6): Increase the usability of the data by potentially publishing differently and keeping it up to date.