

SEMAINE 07 : vers plus d'intégration de données

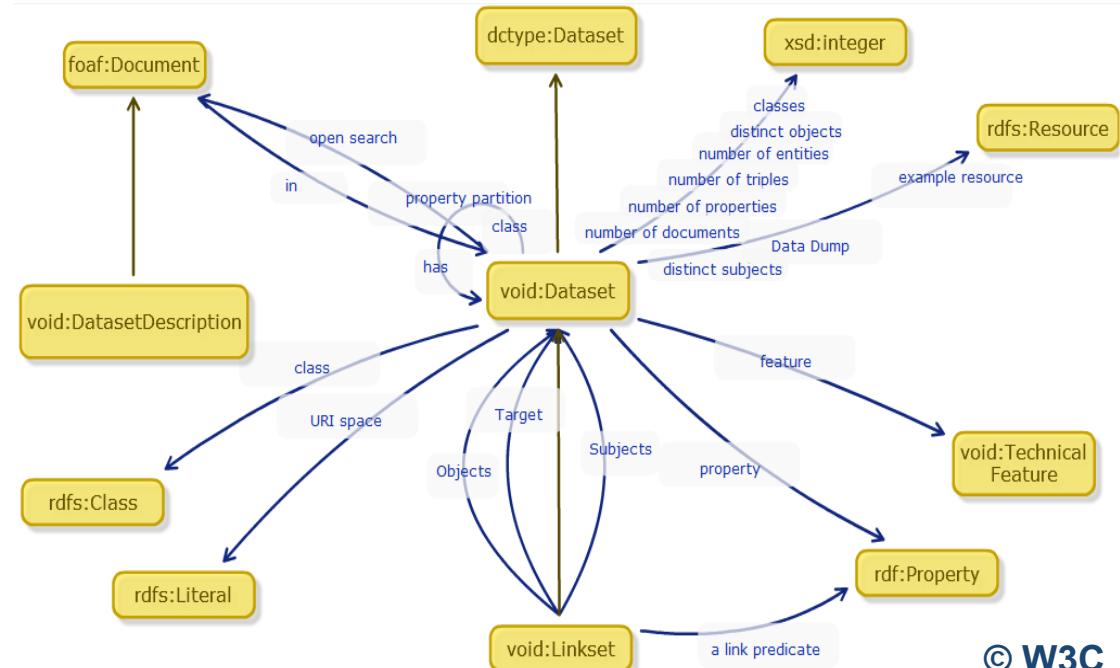
1. VoID pour les bases RDF
2. DCAT pour les jeux de données
3. PROVenance et traçabilité
4. RDF dans les pages HTML
5. Liens avec les bases de données

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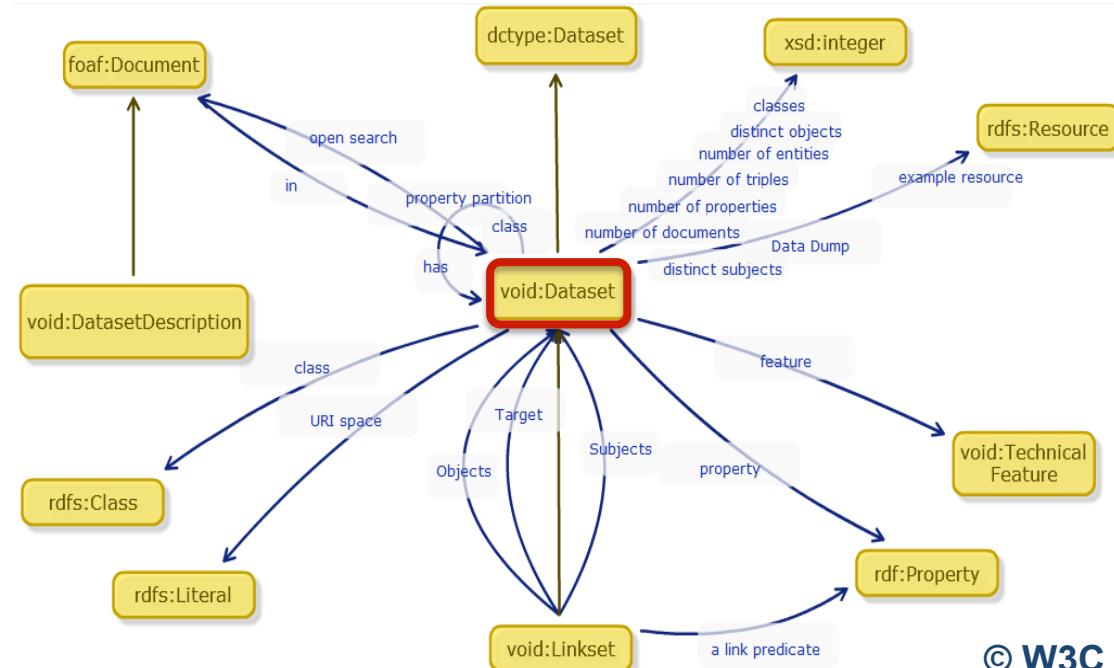
VoID (Vocabulary of Interlinked Datasets)

schéma pour annoter des jeux de données publiées et liées en RDF



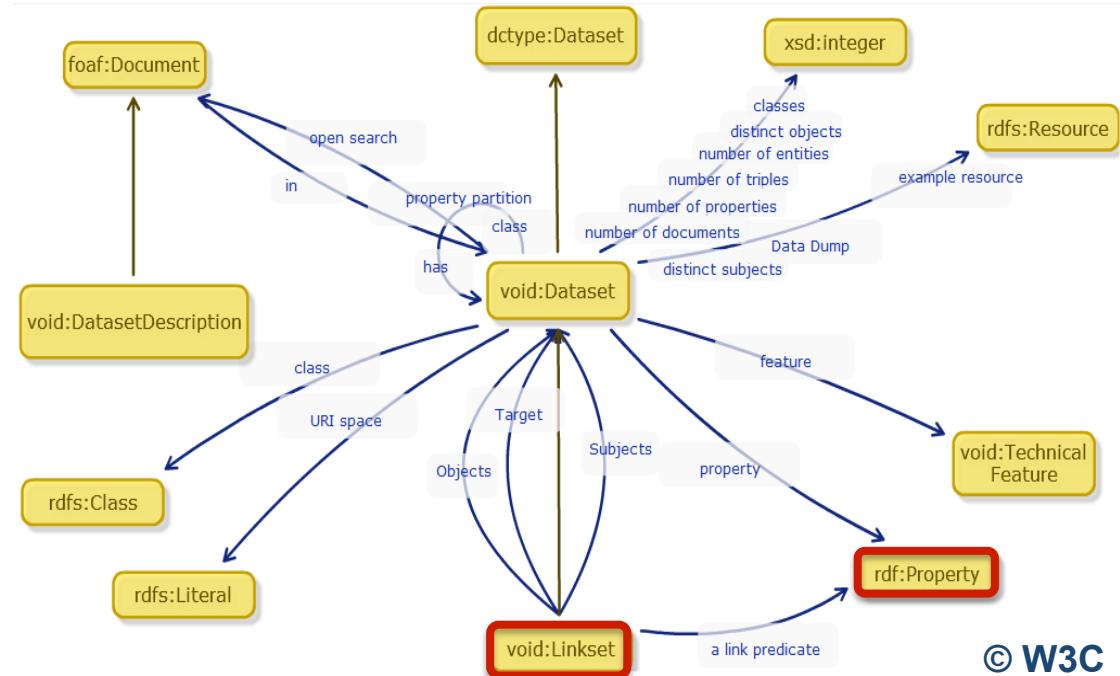
VoID (Vocabulary of Interlinked Datasets)

schéma pour annoter des jeux de données publiées et liées en RDF



VoID (Vocabulary of Interlinked Datasets)

schéma pour annoter des jeux de données publiées et liées en RDF



jeu de données et jeux de liens

déclarer un jeu de données
:DBpedia a void:Dataset .

déclarer un jeu de liens
:DBpedia_Geonames a void:Linkset .

ex. description du dataset DBpedia

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. DBpedia est un dataset

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString=> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. DBpedia a un point d'accès SPARQL

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString=> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. DBpedia est disponible en *RDF/XML*

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. DBpedia a des sous ensembles

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. DBpedia a un accès par mots-clefs

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
dcterms:title "DBPedia";  
dcterms:description "RDF data extracted from Wikipedia";  
dcterms:publisher :DBpedia_community;  
dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. combiner avec d'autres vocabulaires

```
:DBpedia a void:Dataset;  
void:sparqlEndpoint <http://dbpedia.org/sparql>;  
void:feature :RDFXML ;  
void:subset :DBpedia2Geonames ;  
void:uriLookupEndpoint <http://lookup.dbpedia.org/api/search.asmx/KeywordSearch?QueryString=> ;  
dcterms:modified "2008-11-17"^^xsd:date;  
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dcterms:license <http://creativecommons.org/licenses/by-sa/3.0/>;  
dcterms:source <http://dbpedia.org/resource/Wikipedia>.
```

ex. Geonames dataset

```
:Geonames a void:Dataset;  
void:sparqlEndpoint <http://geosparql.appspot.com/query>;  
void:triples "107983838"^^xsd:integer ;  
dcterms:subject <http://dbpedia.org/resource/Location> .
```

ex. Geonames dataset

```
:Geonames a void:Dataset;  
void:sparqlEndpoint <http://geosparql.appspot.com/query>;  
void:triples "107983838"^^xsd:integer ;  
dcterms:subject <http://dbpedia.org/resource/Location> .
```

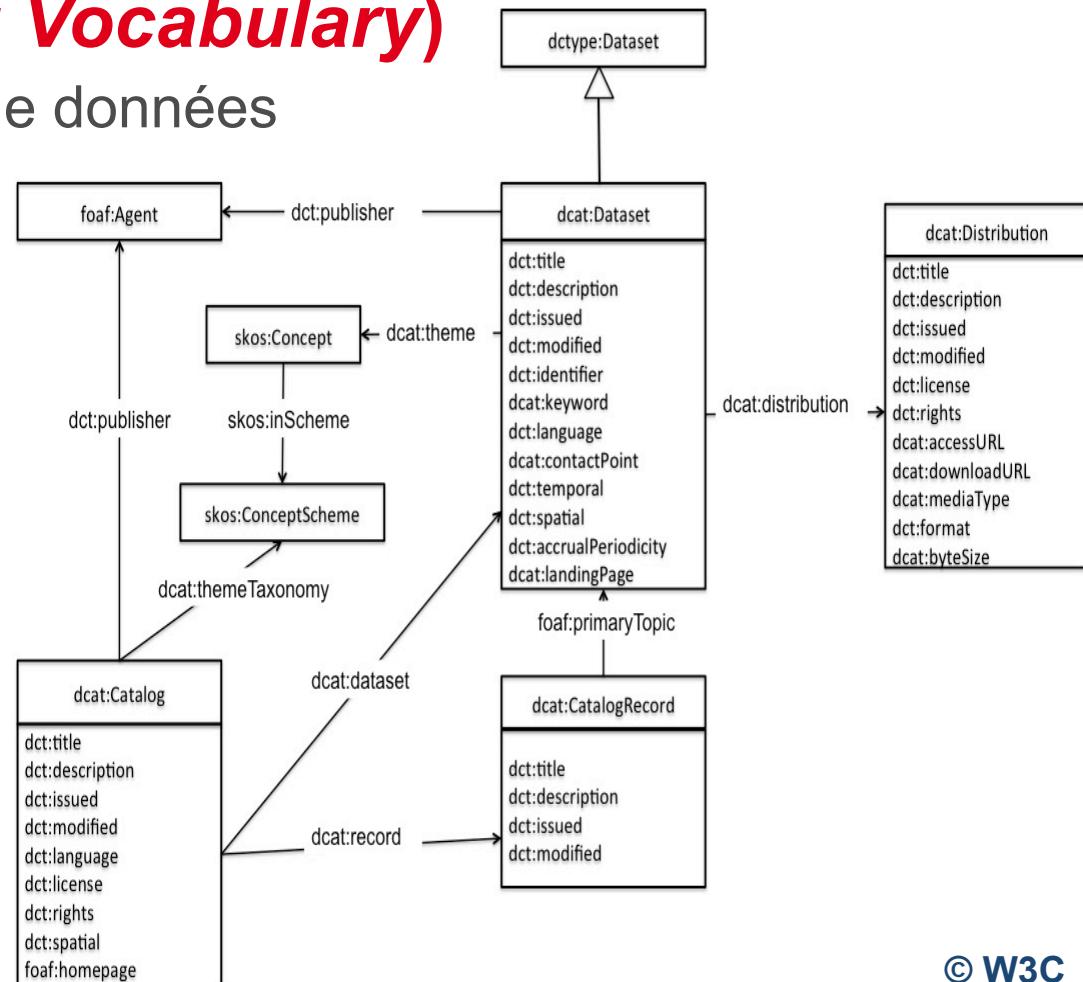
```
:DBpedia2Geonames a void:Linkset ;  
void:linkPredicate owl:sameAs ;  
void:target :DBpedia ;  
void:target :Geonames .
```

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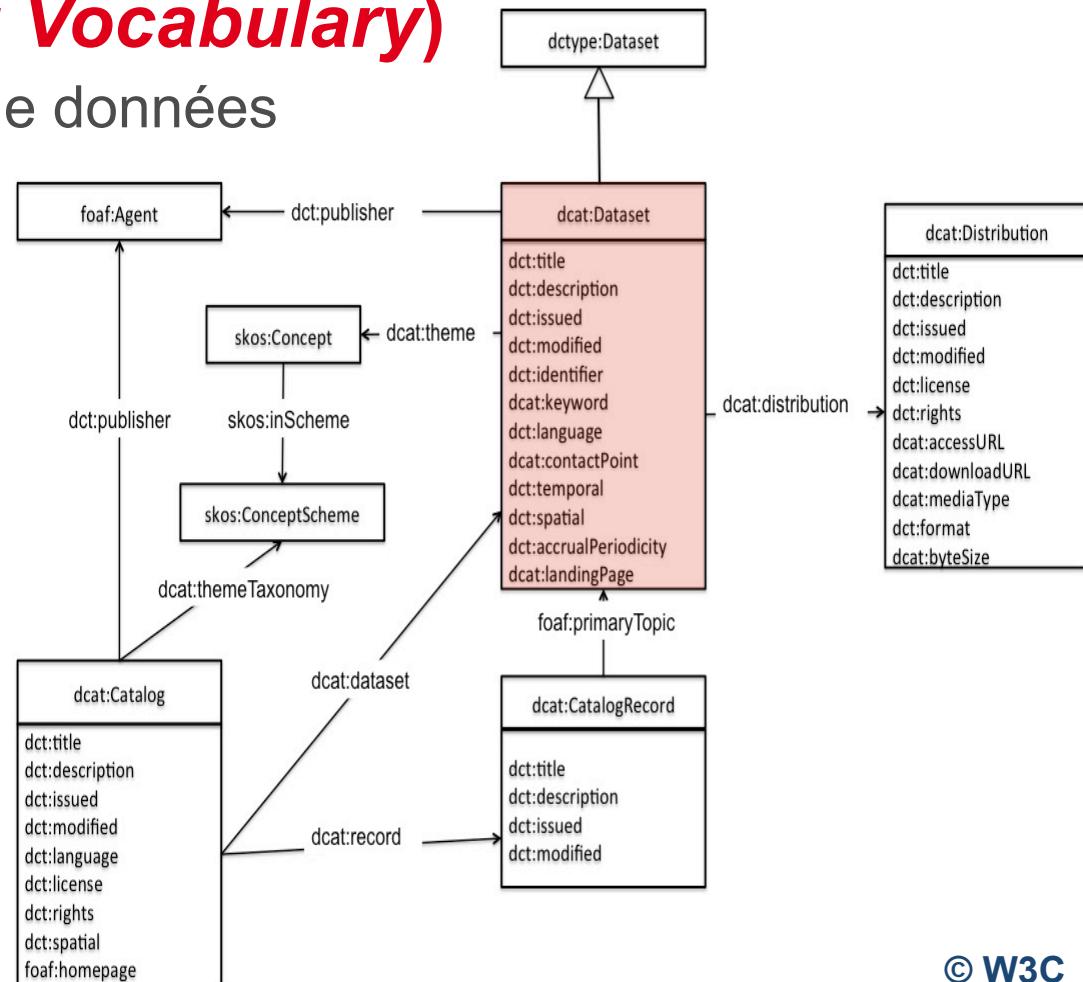
DCAT (*Data Catalog Vocabulary*)

décrire n'importe quel jeu de données



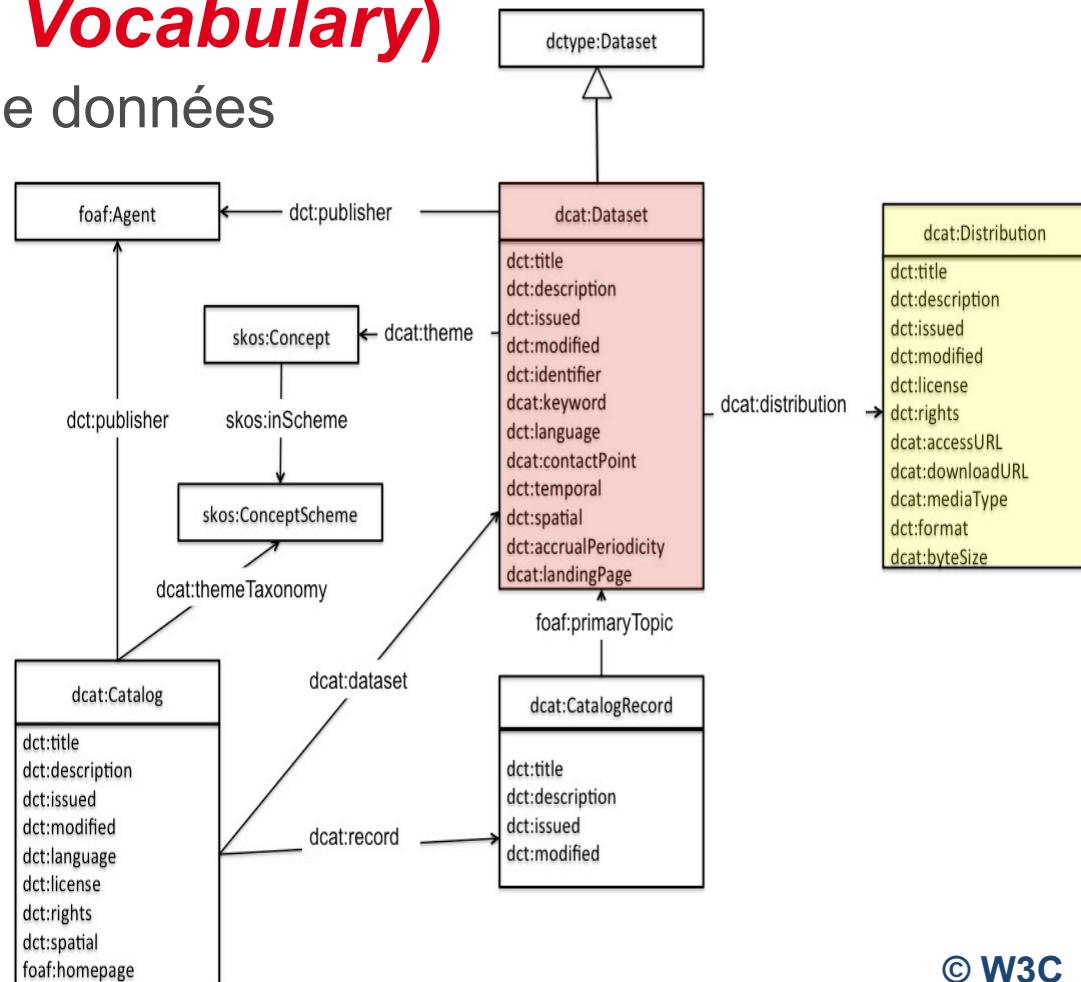
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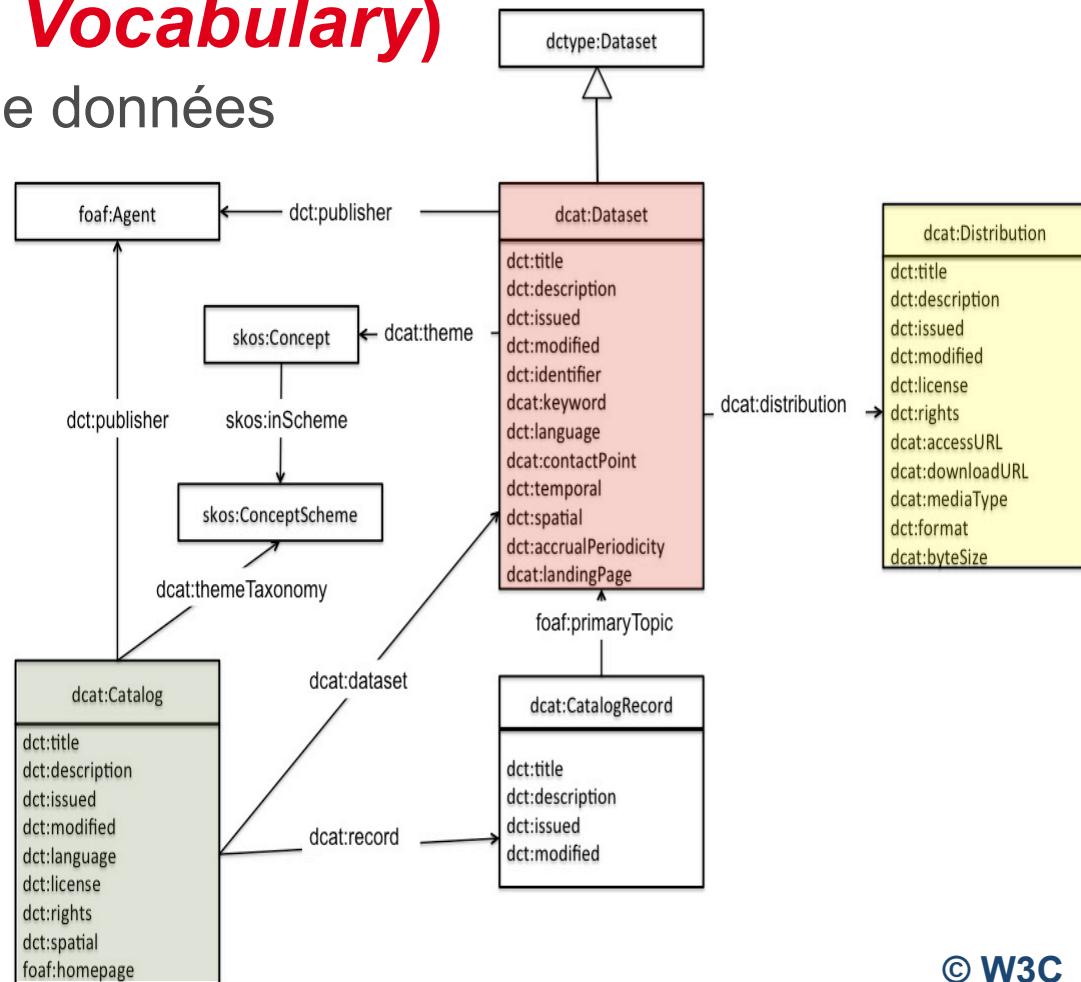
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décrire n'importe quel jeu de données



exemple de DCAT

un feuille de tableur mise en ligne (ex. un fichier Excel au format CSV)

```
<census> a dcat:Dataset ;
    dcat:distribution <census-spreadsheet> .

<census-spreadsheet> a dcat:Distribution ;
    dcat:downloadURL <http://example.org/dist1.csv> ;
    dcat:format [ rdfs:label "CSV" ] ;
    dcat:mediaType "text/csv" .
```

exemple de DCAT

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<census> a dcat:Dataset ;
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```

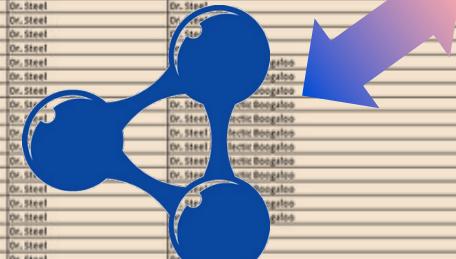
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CSV sur le Web, CSV-LD, Linked CSV

contextes pour interpréter et générer du CSV

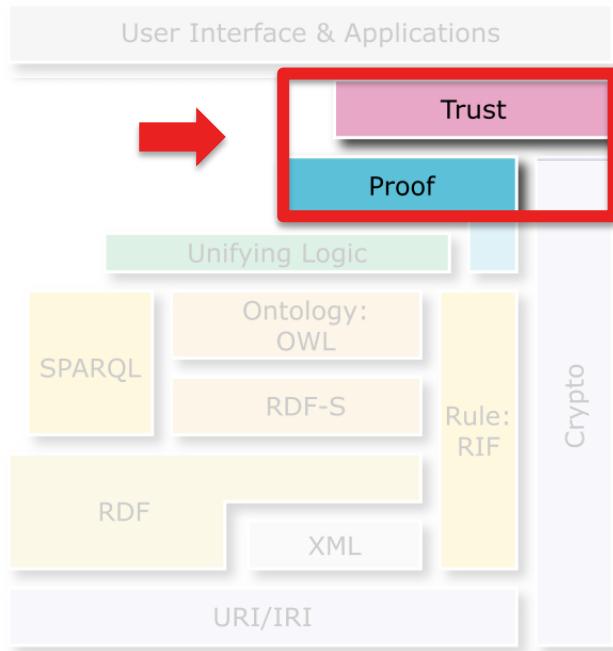
conventions pour lier et publier des fichiers CSV



A	B	C	D	E	F	G	H	I
1 Name	Artist	Album	Genre	Year	Disc Count	Track Number	File	Alt Path
2 If I Could Change Your Mind	The Alan Parsons Project	Eve	Rock	1979			d AAC audio file	192
3 Barbra Gurl (Radio)	Aqua	Aquarium	Pop	1997			d AAC audio file	256
4 Bumble Bee	Bambee	On Ice	Pop	2001			d AAC audio file	256
5 Move Away	Boy George And Culture Club	At Worst... The Best of Boy George and Culture Club	Pop				d AAC audio file	256
6 Love Is Love	Boy George And Culture Club	At Worst... The Best of Boy George and Culture Club	Pop				d AAC audio file	256
7 The Crying Game	Boy George And Culture Club	At Worst... The Best of Boy George and Culture Club	Pop				d AAC audio file	256
8 Zombie	The Cranberries	No Need to Argue	Pop				d AAC audio file	160
9 Love Song	The Cure	Countdown 1989	Pop				d AAC audio file	192
10 The Hanging Garden	The Cure	Popnography	Pop				d AAC audio file	256
11 Dr. Steel	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
12 Spaceboy	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
13 Marionette	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
14 Are We Having Fun Yet?	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
15 Conspiracy	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
16 Curse of the Crystal Skull	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
17 Donkey Town	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
18 Getting Directions / Thudd	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
19 On the Run	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
20 Bokigrum from satan	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
21 Smiley's Theme	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
22 Raja	Dr. Steel	Dr. Steel	Dr. Steel				d AAC audio file	256
23 Prelude to Domination	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	1	Purchased AAC audio file	256
24 Deep Da Bomb	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	2	Purchased AAC audio file	256
25 Build the Robots	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	3	Purchased AAC audio file	256
26 Lament for a Toy Factory	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	4	Purchased AAC audio file	256
27 Greedy	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	5	Purchased AAC audio file	256
28 The Dr. Steel Show	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	6	Purchased AAC audio file	256
29 Bohemian Groove	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	7	Purchased AAC audio file	256
30 Stopped By Moe	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	8	Purchased AAC audio file	256
31 Schizophrenic	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	9	Purchased AAC audio file	256
32 Lullaby Bye	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	10	Purchased AAC audio file	256
33 Totally Minded	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	11	Purchased AAC audio file	256
34 Childhood (Don't) Go-Go	Dr. Steel	Dr. Steel	Dr. Steel	2007	3	12	Purchased AAC audio file	256
35 Imagination	Dr. Steel	Dr. Steel	Dr. Steel	2008	3	13	Purchased AAC audio file	256
36 Fibonacci Sequence	Dr. Steel	Dr. Steel	Dr. Steel	2008	3	14	Purchased AAC audio file	256
37 Planet X Marks the Spot	Dr. Steel	Dr. Steel	Dr. Steel	2008	3	15	Purchased AAC audio file	256
38 Back and Forth	Dr. Steel	People & Earth	Alternative	2008	3	16	Purchased AAC audio file	256
39 Doggyman Boogie	Dr. Steel	People & Earth	Alternative	2008	3	17	Purchased AAC audio file	256

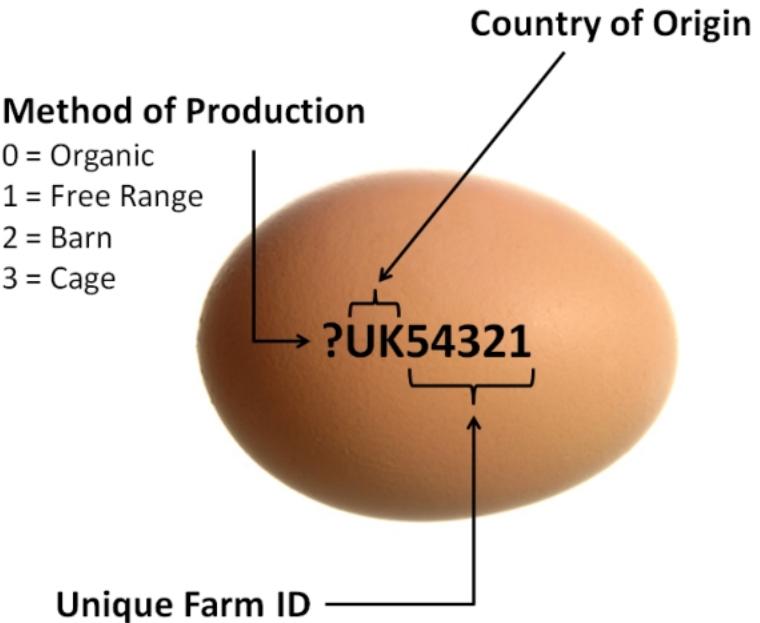
sources, provenance et traçabilité

documenter les flux et transformations des données



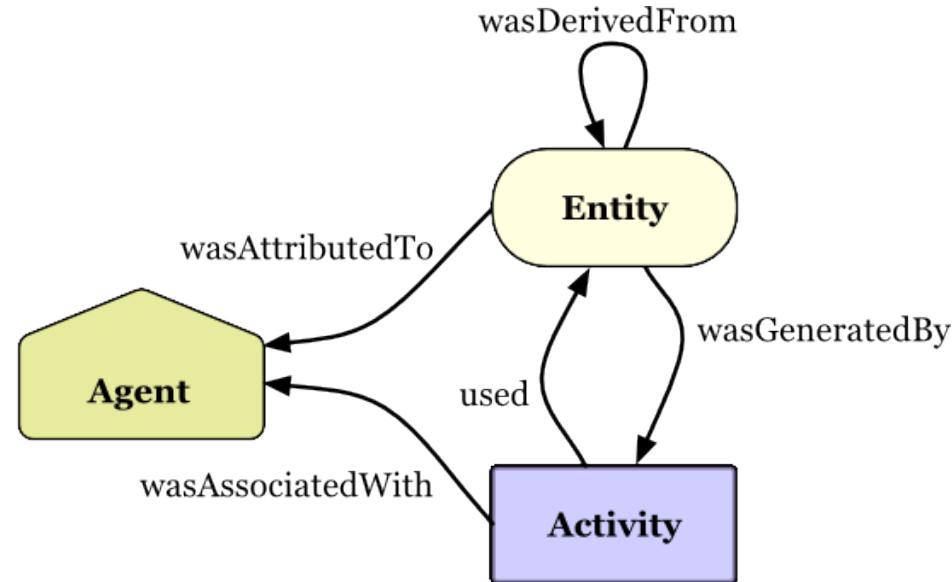
traçabilité des données

origines et transformations subies



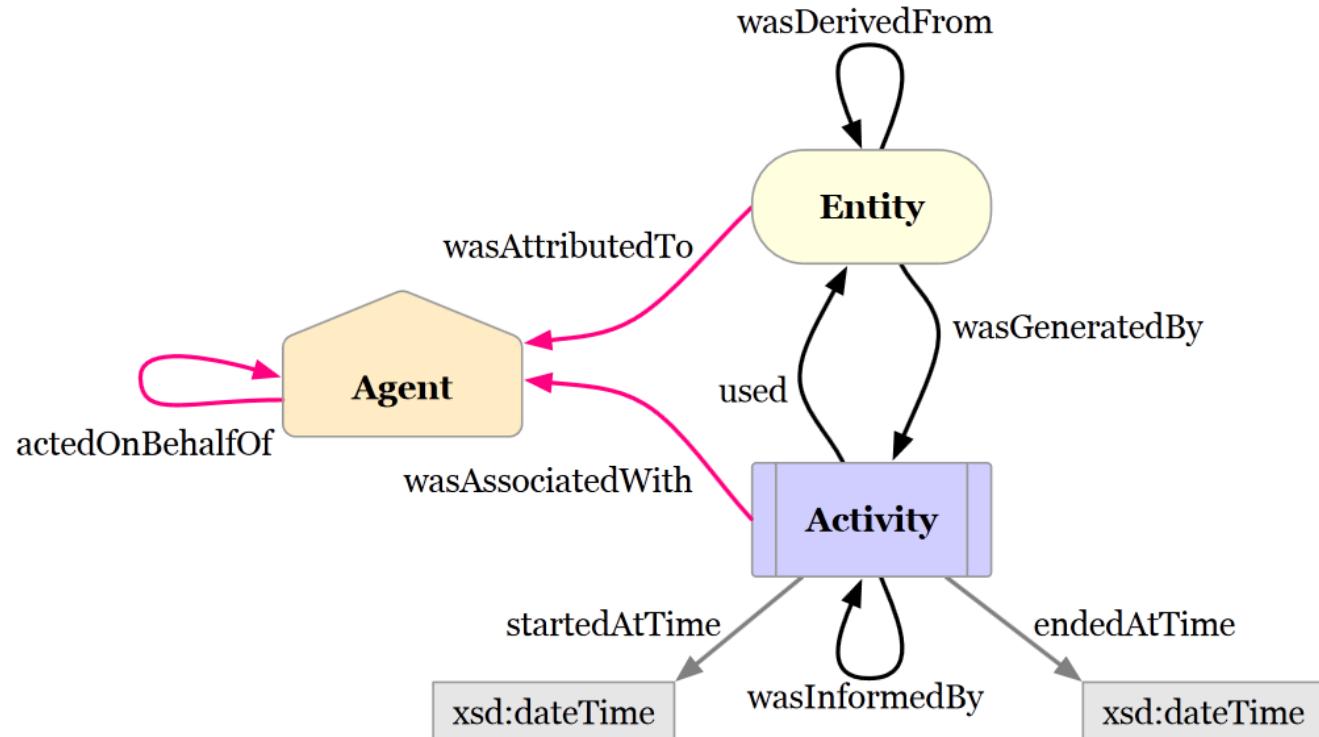
PROV-O: ontologie de provenance

décrire les entités et les activités de la création d'une ressource



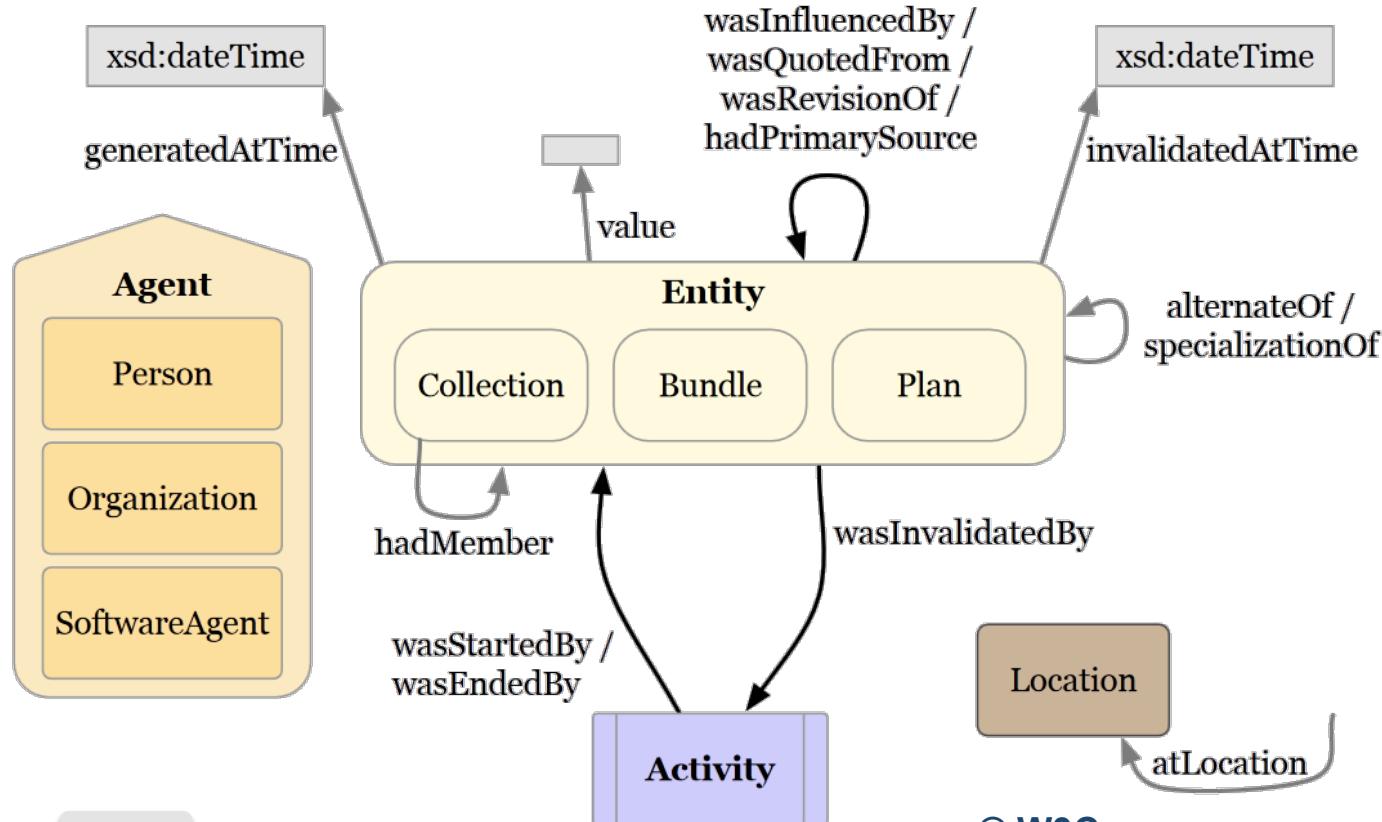
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PROV-O: ontologie de provenance

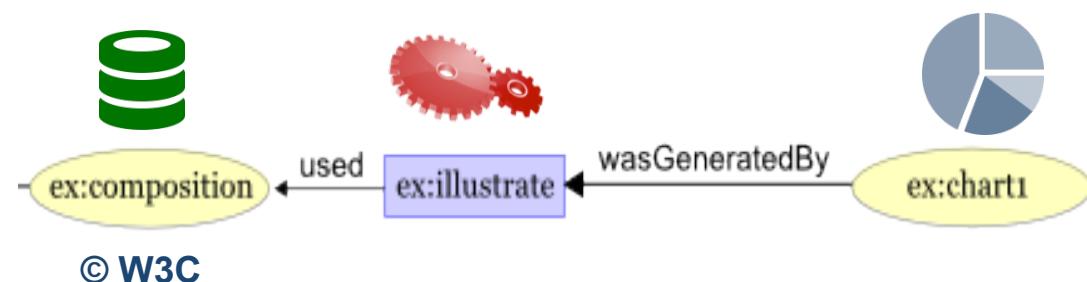
décrire les entités et les activités de la création d'une ressource



ex. un graphique produit à partir de deux sources

`ex:illustrate prov:used ex:composition .`

`ex:chart1 prov:wasGeneratedBy ex:illustrate`



© W3C

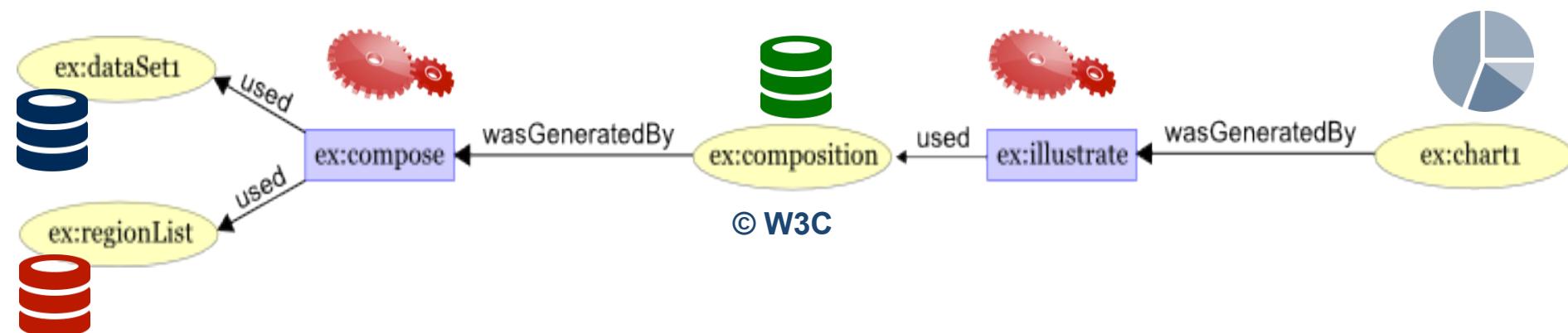
ex. un graphique produit à partir de deux sources

```
ex:compose prov:used ex:dataSet1 ;  
          prov:used ex:regionList .
```

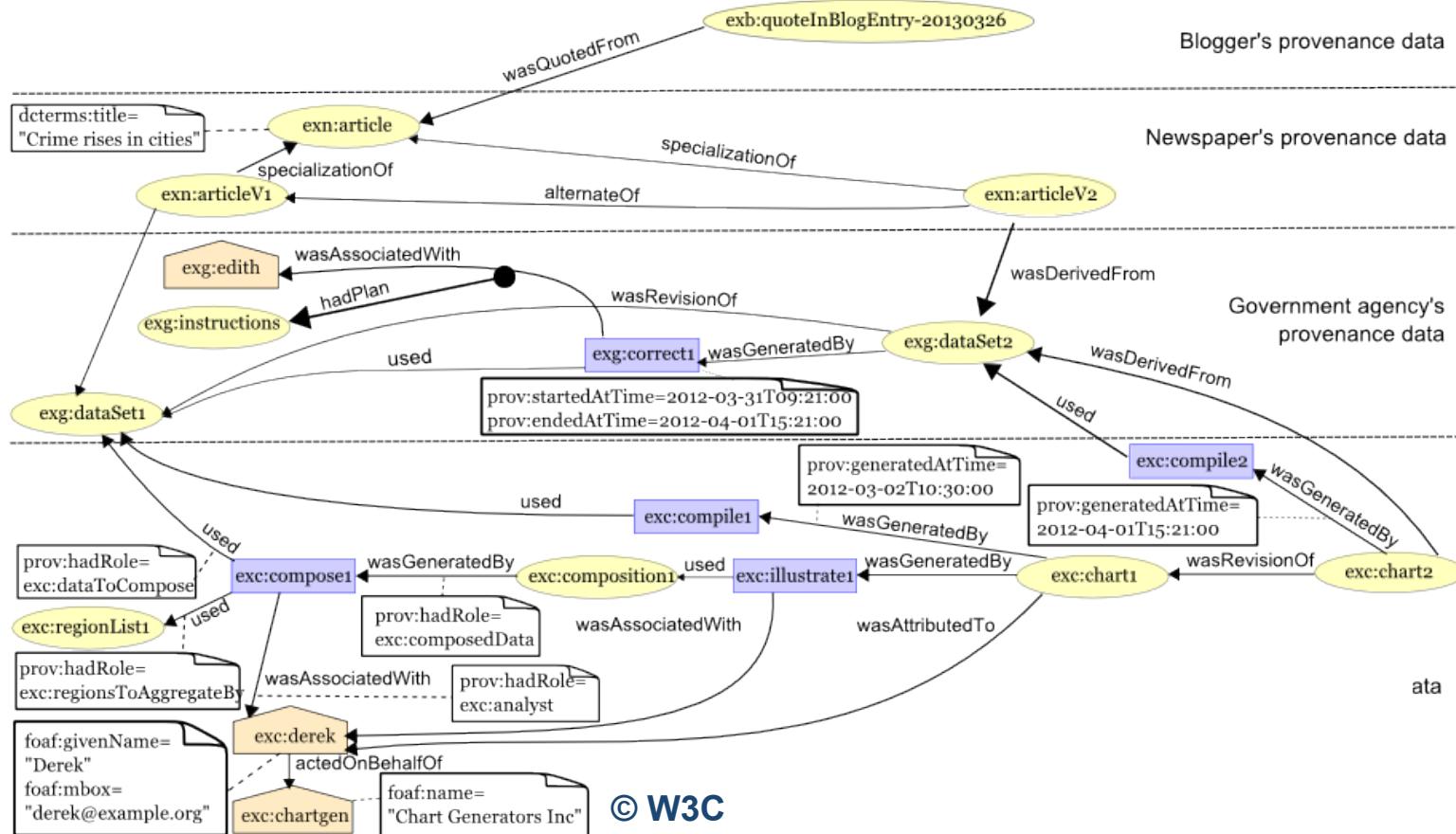
```
ex:composition prov:wasGeneratedBy ex:compose .
```

```
ex:illustrate prov:used ex:composition .
```

```
ex:chart1 prov:wasGeneratedBy ex:illustrate
```



les traces génèrent beaucoup de données



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RDFa: une syntaxe particulière pour RDF



The Man Who Mistook His Wife for a Hat (Picador) (Paperback)

by [Oliver Sacks](#) (Author)

 (19 customer reviews)

RRP: £8.99

Price: £6.99 & eligible for Free UK delivery on orders over £15 with Super Saver Delivery. [See details and conditions](#)

You Save: £2.00 (22%)

Availability: In stock.

Note: this item will be delivered in time for Christmas in the UK. For orders from our third-party sellers, please refer to the seller's page for delivery information. For destinations outside the UK, please see [last-order dates](#). Dispatched from and sold by Amazon.co.uk.

Product details

Paperback: 256 pages

Publisher: Picador; New Ed edition (7 Nov 1986)

Language: English

ISBN-10: 0330294911

ISBN-13: 978-0330294911

Product Dimensions: 19.7 x 13.1 x 1.9 cm

Average Customer Review:  (19 customer reviews)

Amazon.co.uk Sales Rank: 1,107 in Books (See [Bestsellers in Books](#))

Popular in these categories:

- #1 in [Books](#) > [Health, Family & Lifestyle](#) > [Psychology & Psychiatry](#) > [Psychiatry](#)
- #1 in [Books](#) > [Science & Nature](#) > [Medicine](#) > [Medical Sciences A-Z](#) > [Psychiatry](#)
- #1 in [Books](#) > [Health, Family & Lifestyle](#) > [Psychology & Psychiatry](#) > [Neuropsychology](#)

(Publishers and authors: [Improve Your Sales](#))

Other Editions: [Hardcover](#) | [Paperback \(Large Print e.\)](#) | [All Editions](#)

RDFa signifie RDF dans des attributs de HTML



```
<body vocab="http://purl.org/dc/terms/>
```



```
<div resource="http://lib.com/books/0684853949">
```



```
<h2 property="title">The Man Who Mistook His  
Wife For a Hat</h2>
```



```
<h3 property="creator">Oliver Sacks</h3>
```

...



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#1 in [Books](#) > [Science & Nature](#) > [Medicine](#) > [Medical Sciences A-Z](#) > [Psychiatry](#)

#1 in [Books](#) > [Health, Family & Lifestyle](#) > [Psychology & Psychiatry](#) > [Neuropsychology](#)

(Publishers and authors: [Improve Your Sales!](#))

Other Editions: [Hardcover](#) | [Paperback](#) (Large Print e.) | [All Editions](#)

contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:
    <span property="created">2012-05-01</span></p>
    <h3 property="creator" resource="#fg">Fabien</h3>
</div>
<div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
  <p> <span property="name">Fabien Gandon</span>,
    phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
    mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
</div>
```

...

contenu HTML+RDFa (rendu navigateur)

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:<br/>
    <span property="created">2012-05-01</span></p>
  <h3 property="author">Fabien Gandon</h3>
</div>
<div vocab="http://purl.org/dc/terms/">
  <p>  <span property="phone"><a href="tel:+33492965170">+33492965170</a></span>
    <span property="mail"><a href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></span></p>
</div>
...
  
```



Le Web Sémantique

Date: 2012-05-01

Fabien

Fabien Gandon, phone: [+33492965170](tel:+33492965170) mail: fgandon@inria.fr

contenu HTML+RDFa (lu par un parseur RDFa)

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:<br/>
    <span property="created">2012-05-01</span></p>
  <h3 property="creator" resource="#fg">Fabien</h3>
</div>
<div vocab="http://purl.org/dc/terms/" prefix="ns1: <http://purl.org/dc/terms/>" prefix="foaf: <http://xmlns.com/foaf/0.1/>" .>
  <p> <span property="phone">+33492965170</span></p>
  <span property="mail"> <a href="mailto:fgandon@inria.fr">fgandon@inria.fr</a>
    </span> <span property="title">Le Web Sémantique</span>
  </p>
</div>
...
<#fg> a ns2:Person;
  ns2:mbox <mailto:fgandon@inria.fr>;
  ns2:name "Fabien Gandon" ;
  ns2:phone <tel:+33492965170> .
```



anatomie d'un contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:
    <span property="created">2012-05-01</span></p>
    <h3 property="creator" resource="#fg">Fabien</h3>
  </div>
  <div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
    <p> <span property="name">Fabien Gandon</span>,
      phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
      mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
  </div>
```

...

schémas utilisés

anatomie d'un contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:
    <span property="created">2012-05-01</span></p>
    <h3 property="creator" resource="#fg">Fabien</h3>
  </div>
<div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
  <p> <span property="name">Fabien Gandon</span>,
    phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
    mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
</div>
```

...

sujets de triplets

anatomie d'un contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:
    <span property="created">2012-05-01</span></p>
    <h3 property="creator" resource="#fg">Fabien</h3>
</div>
<div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
  <p> <span property="name">Fabien Gandon</span>,
    phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
    mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
</div>
```

...

typage

anatomie d'un contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:<br/>
    <span property="created">2012-05-01</span></p>
  <h3 property="creator" resource="#fg">Fabien</h3>
</div>
<div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
  <p> <span property="name">Fabien Gandon</span>,
    phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
    mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
</div>
```

propriétés
& valeurs

anatomie d'un contenu HTML+RDFa

(...)

```
<body vocab="http://purl.org/dc/terms/">
<div resource="/books/web_semantique">
  <h2 property="title">Le Web Sémantique</h2>
  <p>Date:
    <span property="created">2012-05-01</span></p>
    <h3 property="creator" resource="#fg">Fabien</h3>
</div>
<div vocab="http://xmlns.com/foaf/0.1/" resource="#fg" typeof="Person">
  <p> <span property="name">Fabien Gandon</span>,
    phone: <a property="phone" href="tel:+33492965170">+33492965170</a>
    mail: <a property="mbox" href="mailto:fgandon@inria.fr">fgandon@inria.fr</a></p>
</div>
```

...

propriétés
& objets

Screencast site

Listes des classes

exemple de RDFa utilisant schema.org

```
<div vocab="http://schema.org/" typeof="Product">
  
  <span property="name">Dell UltraSharp 30" LCD Monitor</span>

  <div rel="hasAggregateRating" >
    <div typeof="http://schema.org/AggregateRating">
      <span property="ratingValue">87</span>
      out of <span property="bestRating">100</span>
      based on <span property="ratingCount">24</span> user ratings
    </div>
  </div>

  <div rel="offers" >
    <div typeof="http://schema.org/AggregateOffer">
      <span property="lowPrice">$1250</span>
      to <span property="highPrice">$1495</span>
      from <span property="offerCount">8</span> sellers
    </div>
  </div>
```

exemple de RDFa utilisant schema.org

```
<div vocab="http://schema.org/" typeof="Product">
  
  <span property="name">Dell UltraSharp 30" LCD Monitor</span>

  <div rel="hasAggregateRating" >
    <div typeof="http://schema.org/AggregateRating">
      <span property="ratingValue">87</span>
      out of <span property="bestRating">100</span>
      based on <span property="ratingCount">24</span> user ratings
    </div>
  </div>

  <div rel="offers" >
    <div typeof="http://schema.org/AggregateOffer">
      <span property="lowPrice">$1250</span>
      to <span property="highPrice">$1495</span>
      from <span property="offerCount">8</span> sellers
    </div>
  </div>
```

principe similaire dans OGP: le bouton « I like »

Screencast site Imdb avec bouton

Listes des classes

code OGP

```
<html xmlns="http://www.w3.org/1999/xhtml" dir="ltr" lang="en-US"
      xmlns:fb="https://www.facebook.com/2008/fbml">
<head prefix="og: http://ogp.me/ns# fb: http://ogp.me/ns# YOUR_NAMESPACE:
              http://ogp.me/ns/apps/YOUR_NAMESPACE#">
<meta property="fb:app_id" content="YOUR_APP_ID" />
<meta property="og:type" content="YOUR_NAMESPACE:recipe" />
<meta property="og:title" content="Stuffed Cookies" />
<meta property="og:image" content="http://example.com/cookie.jpg" />
<meta property="og:description" content="The Turducken of Cookies" />
<meta property="og:url" content="http://example.com/cookie.html">
<script type="text/javascript">
    function postCook()
    {
        FB.api('/me/YOUR_NAMESPACE:cook' + '?recipe=http://example.com/cookie.html','post',
        (...));
    }
</script>
</head>
<body>
(...)
<form>
    <input type="button" value="Cook" onclick="postCook()" />
</form>
</body>
</html>
```



code OGP

```
<html xmlns="http://www.w3.org/1999/xhtml" dir="ltr" lang="en-US"
      xmlns:fb="https://www.facebook.com/2008/fbml">
<head prefix="og: http://ogp.me/ns# fb: http://ogp.me/ns# YOUR_NAMESPACE:
              http://ogp.me/ns/apps/YOUR_NAMESPACE#">
    <meta property="fb:app_id" content="YOUR_APP_ID" />
    <meta property="og:type" content="YOUR_NAMESPACE:recipe" />
    <meta property="og:title" content="Stuffed Cookies" />
    <meta property="og:image" content="http://example.com/cookie.jpg" />
    <meta property="og:description" content="The Turducken of Cookies" />
    <meta property="og:url" content="http://example.com/cookie.html">
    <script type="text/javascript">
        function postCook()
        {
            FB.api('/me/YOUR_NAMESPACE:cook' + '?recipe=http://example.com/cookie.html','post',
(...))});}
    </script>
</head>
<body>
(...)
<form>
    <input type="button" value="Cook" onclick="postCook()" />
</form>
</body>
</html>
```



les données de ces pages sont accessibles à tous

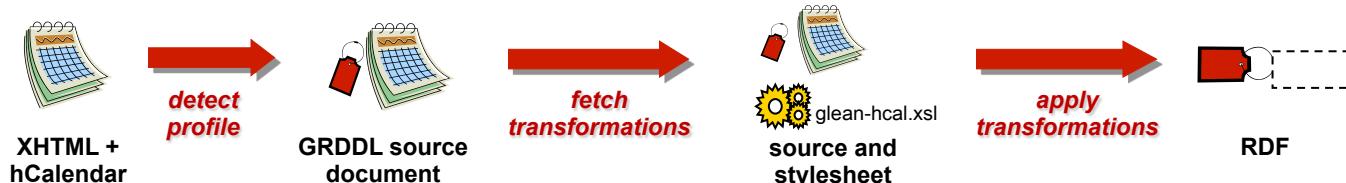
si vous appliquez un parseur à ces pages, vous récupérez vous aussi leurs données...

alternative algorithmique: transformations GRDDL

- prononcé “GRIDEUL”
- signifie “Gleaning Resource Descriptions from Dialects of Languages”
- au lieu de baliser les données on fournit un mécanisme d'extraction.
- fonctionne pour HTML et XML

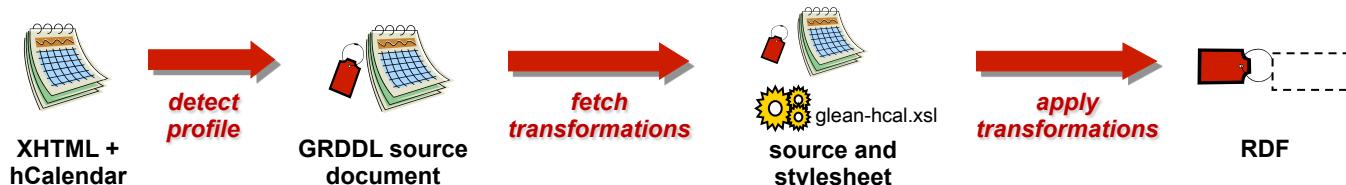
GRDDL : associer une transformation à une source

Transformation associée directement à la source:

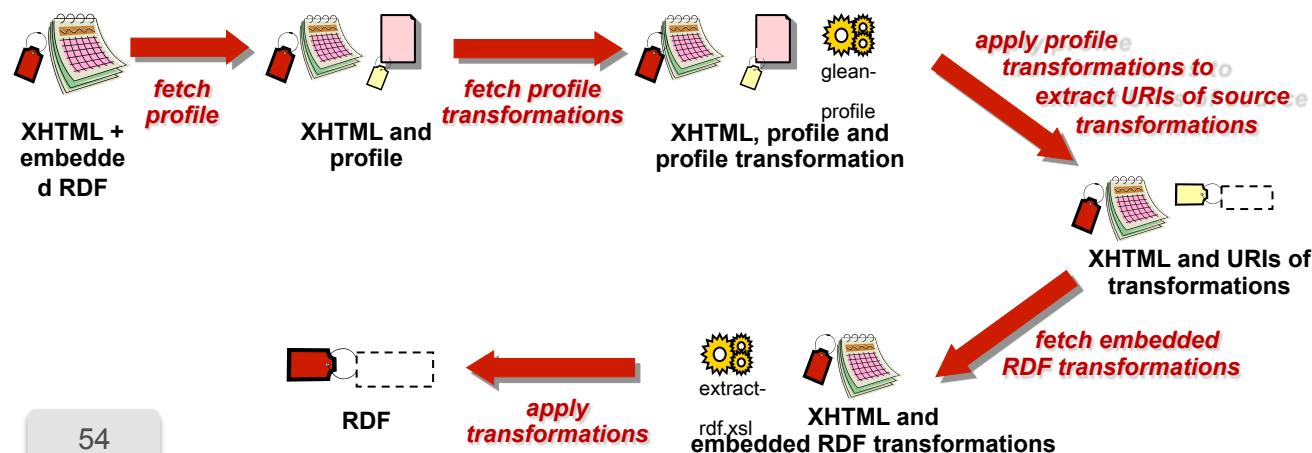


GRDDL : associer une transformation à une source

Transformation associée directement à la source:



Transformation indirectement associée par un profil attaché à la source:



GRDDL en HTML



« je contiens des données »

```
<head profile="http://www.w3.org/2003/g/data-view">  
  <title>The man who mistook his wife for a hat</title>  
  
<link rel="transformation"  
      href="http://www.w3.org/2000/06/dc-extract/dc-extract.xsl" />  
  
<meta name="DC.Subject" content="clinical tales" />  
(...)
```

GRDDL en HTML

```
<head profile="http://www.w3.org/2003/g/data-view">  
  <title>The man who mistook his wife for a hat</title>  
    ↗ « voici comment les obtenir »  
  <link rel="transformation"  
        href="http://www.w3.org/2000/06/dc-extract/dc-extract.xsl" />  
  
<meta name="DC.Subject" content="clinical tales" />  
(...)
```

GRDDL en XML: ex. du feuille de calcul Excel

```
<?xml version="1.0"?>

<?mso-application progid="Excel.Sheet"?>

<Workbook xmlns="urn:schemas-microsoft-com:office:spreadsheet"
    xmlns:grddl="http://www.w3.org/2003/g/data-view#"
    grddl:transformation="excel2rdf.xsl">

(...)
```

GRDDL en XML

```
<?xml version="1.0"?>  
<?mso-application progid="Excel.Sheet"?>  
<Workbook xmlns="urn:schemas-microsoft-com:office:spreadsheet"  
    xmlns:grddl="http://www.w3.org/2003/g/data-view#"  
    grddl:transformation="excel2rdf.xsl">  
(...)
```



« je contiens des données »

GRDDL en XML

```
<?xml version="1.0"?>  
  
<?mso-application progid="Excel.Sheet"?>  
  
<Workbook xmlns="urn:schemas-microsoft-com:office:spreadsheet"  
    xmlns:grddl="http://www.w3.org/2003/g/data-view#"  
    grddl:transformation="excel2rdf.xsl">  
  
(...)
```



« voici comment les obtenir »

SEMAINE 07 : vers plus d'intégration de données

- 1. VoID pour les bases RDF**
- 2. DCAT pour les jeux de données**
- 3. PROVenance et traçabilité**
- 4. RDF dans les pages HTML**
- 5. Liens avec les bases de données**

transformation d'une base relationnelle en RDF

- transformation par défaut
[A Direct Mapping of Relational Data to RDF]

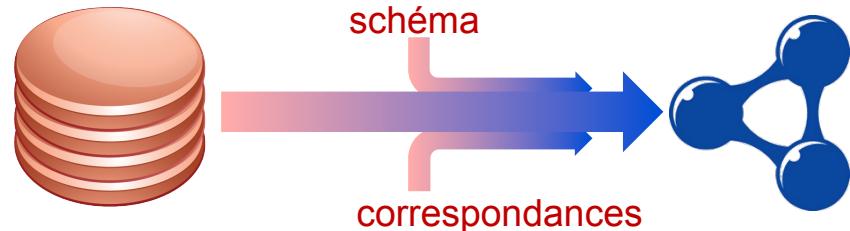


transformation d'une base relationnelle en RDF

- transformation par défaut
[A Direct Mapping of Relational Data to RDF]

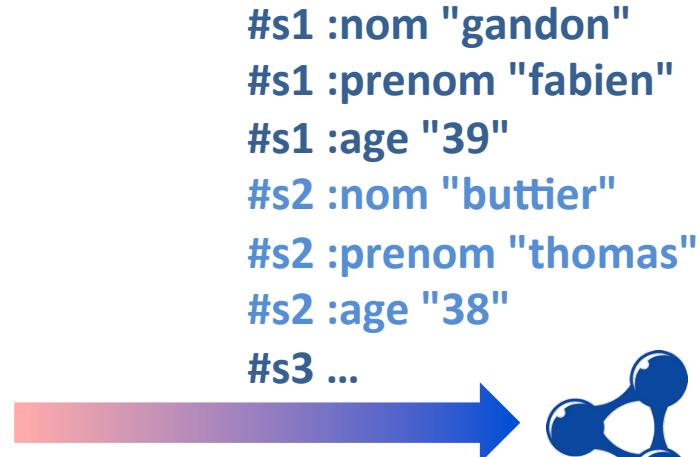
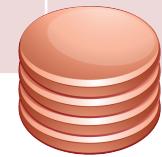


- transformation personnalisée
[R2RML: RDB to RDF Mapping Language]



transformation par défaut / correspondance directe

nom	prenom	age
gandon	fabien	39
buttier	thomas	38

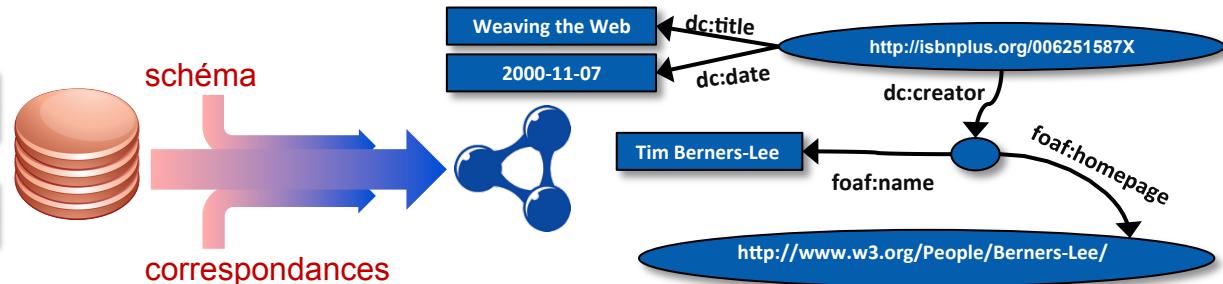


Règles de génération des triplets:

1. les cellules d'une même ligne ont un sujet commun
2. les noms des colonnes donnent les noms des relations
3. la valeur d'une cellule donne la valeur de objet
4. les liens entre tables

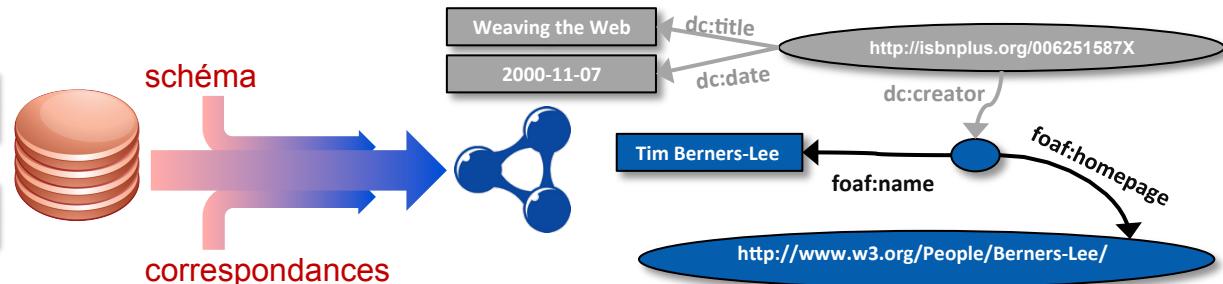
transformation personnalisée d'une BD en RDF

ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



transformation personnalisée d'une BD en RDF

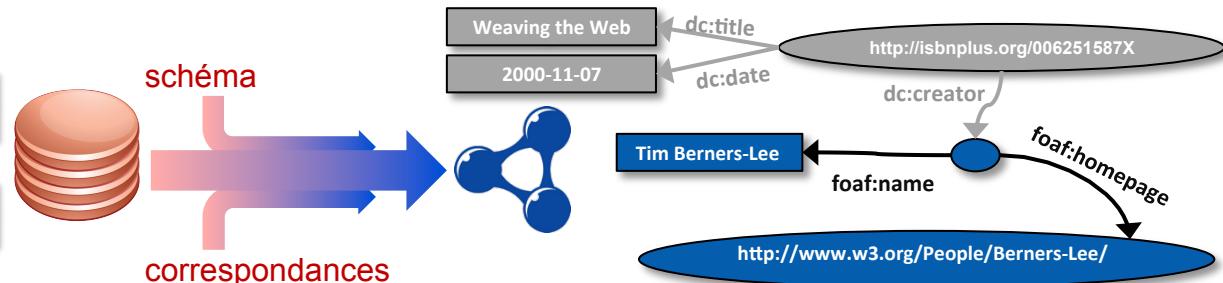
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Author_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [
    rr:termtype "BlankNode" ;
    rr:column "ID" ;
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:name ] ;
    rr:objectMap [ rr:column "FullName" ]
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:homepage ] ;
    rr:objectMap [ rr:column "url" ; rr:termtype "IRI" ]
  ] .
```

transformation personnalisée d'une BD en RDF

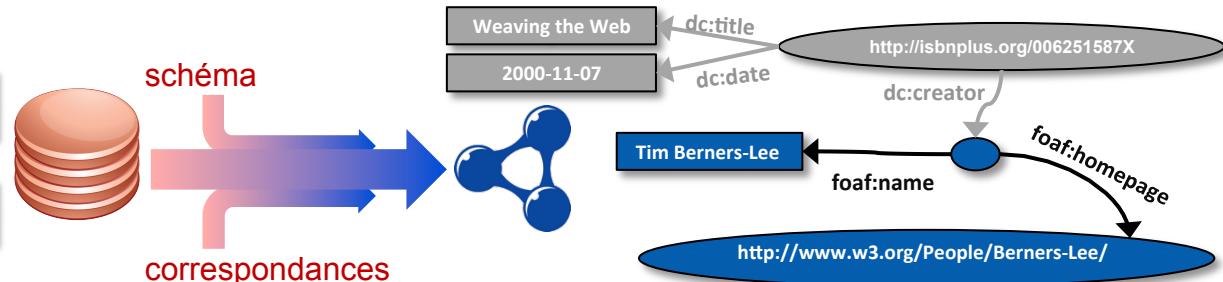
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Author_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [
    rr:termtype "BlankNode" ;
    rr:column "ID" ;
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:name ] ;
    rr:objectMap [ rr:column "FullName" ]
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:homepage ] ;
    rr:objectMap [ rr:column "url" ; rr:termtype "IRI" ]
  ] .
```

transformation personnalisée d'une BD en RDF

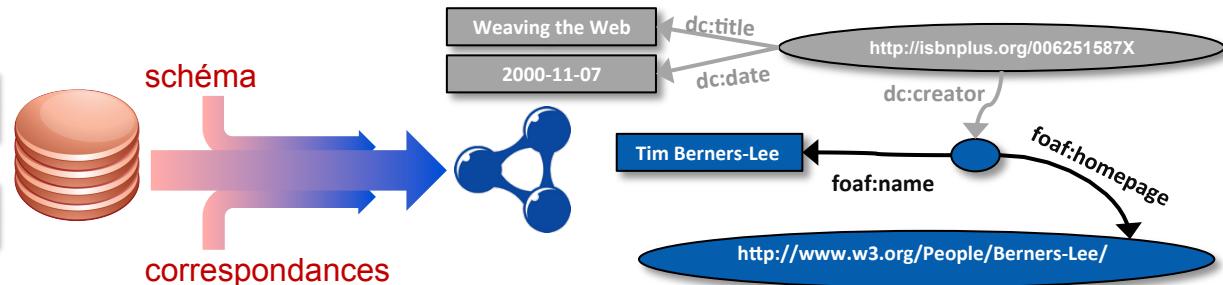
ISBN	Author	Title	Release
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ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Author_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [
    rr:termtype "BlankNode" ;
    rr:column "ID" ;
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:name ] ;
    rr:objectMap [ rr:column "FullName" ]
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:homepage ] ;
    rr:objectMap [ rr:column "url" ; rr:termtype "IRI" ]
  ] .
```

transformation personnalisée d'une BD en RDF

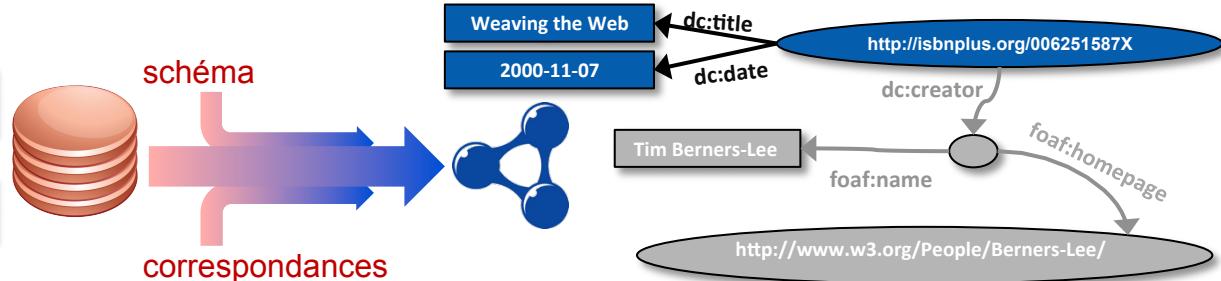
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Author_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [
    rr:termtype "BlankNode" ;
    rr:column "ID" ;
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:name ] ;
    rr:objectMap [ rr:column "FullName" ]
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate foaf:homepage ] ;
    rr:objectMap [ rr:column "url" ; rr:termtype "IRI" ]
  ] .
```

transformation personnalisée d'une BD en RDF

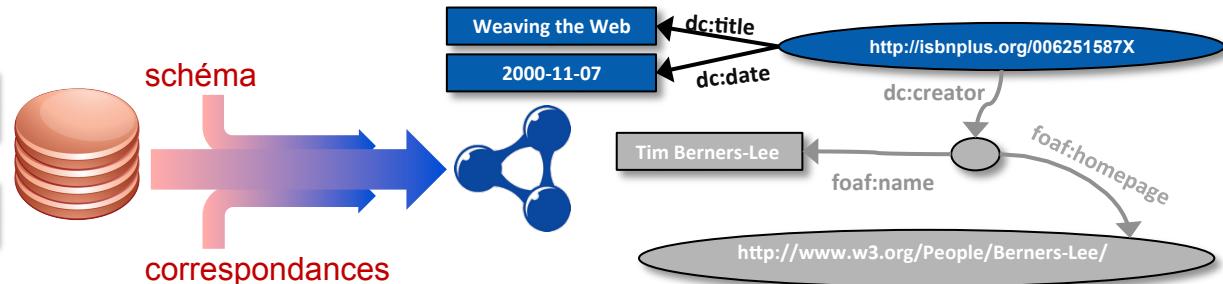
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Book_Table rdf:type rr:TriplesMap ;  
  rr:subjectMap [ rr:template "http://isbnplus.org/{ISBN}" ; ] ;  
  rr:predicateObjectMap [  
    rr:predicateMap [ rr:predicate dc:title ] ;  
    rr:objectMap [ rr:column "Title" ]  
  ] ;  
  rr:predicateObjectMap [  
    rr:predicateMap [ rr:predicate dc:date ] ;  
    rr:objectMap [ rr:column "Release" ]  
  ] ;  
...
```

transformation personnalisée d'une BD en RDF

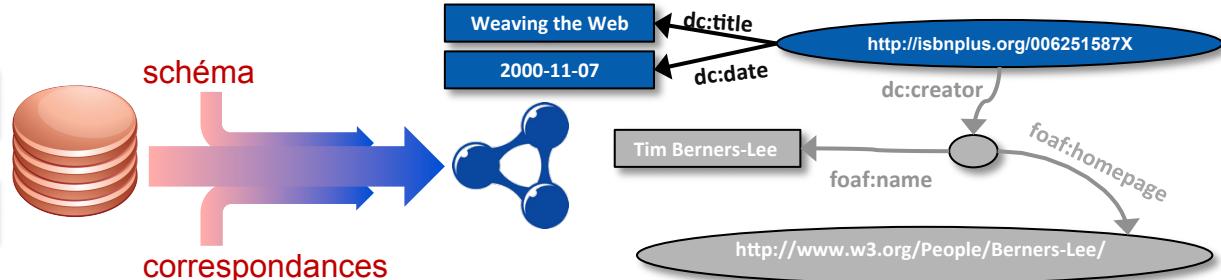
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Book_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [ rr:template "http://isbnplus.org/{ISBN}" ; ];
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:title ] ;
    rr:objectMap [ rr:column "Title" ]
  ] ;
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:date ] ;
    rr:objectMap [ rr:column "Release" ]
  ] ;
...
```

transformation personnalisée d'une BD en RDF

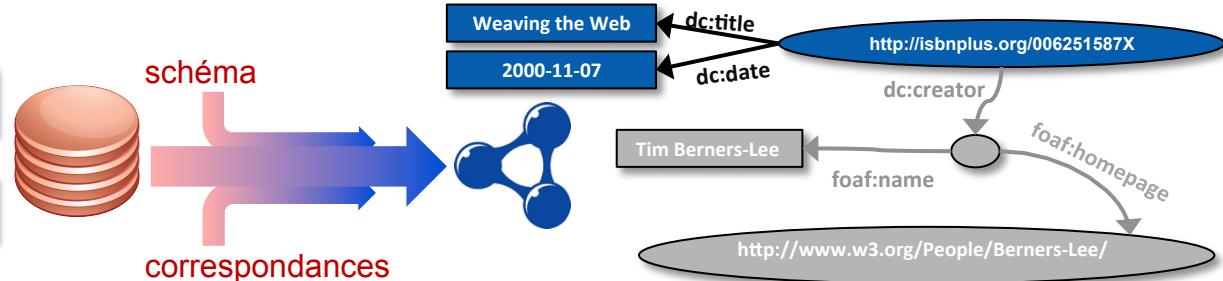
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Book_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [ rr:template "http://isbnplus.org/{ISBN}" ; ];
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:title ];
    rr:objectMap [ rr:column "Title" ]
  ];
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:date ];
    rr:objectMap [ rr:column "Release" ];
  ];
...
```

transformation personnalisée d'une BD en RDF

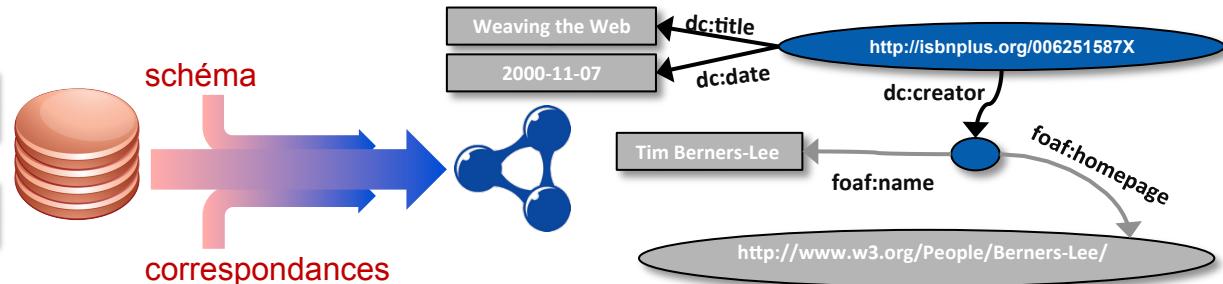
ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



```
:Book_Table rdf:type rr:TriplesMap ;
  rr:subjectMap [ rr:template "http://isbnplus.org/{ISBN}" ; ];
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:title ];
    rr:objectMap [ rr:column "Title" ]
  ];
  rr:predicateObjectMap [
    rr:predicateMap [ rr:predicate dc:date ];
    rr:objectMap [ rr:column "Release" ; ]
  ];
...
```

transformation personnalisée d'une BD en RDF

ISBN	Author	Title	Release
006251587X	auth45	Weaving the Web	2000-11-07
ID	FullName	url	
auth45	Tim Berners-Lee	http://www.w3.org/People/Berners-Lee/	



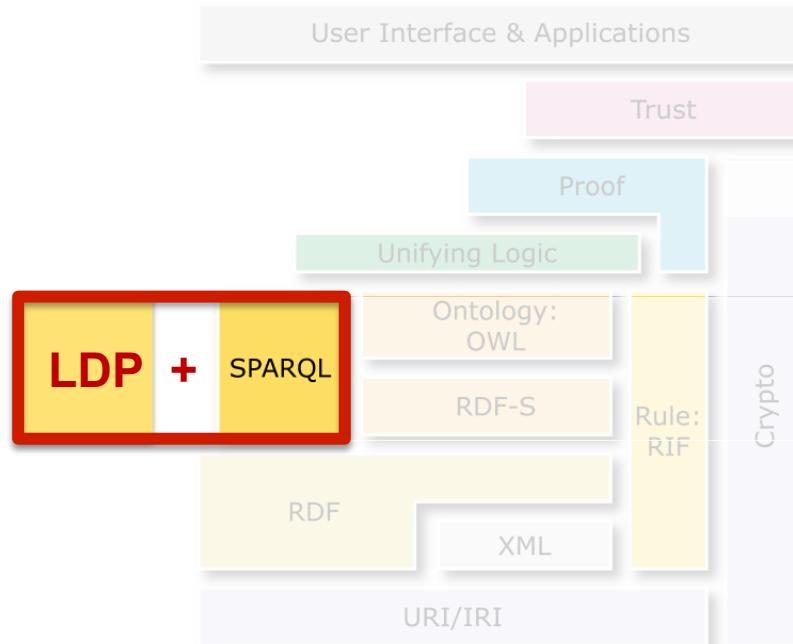
```
:Book_Table rdf:type rr:TriplesMap ;  
...  
rr:refPredicateObjectMap [  
  rr:refPredicateMap [ rr:predicate dc:creator ];  
  rr:refObjectMap  
    [ rr:parentTriplesMap :Author_Table ;  
      rr:joinCondition "{child}.Author= {parent}.ID"  
    ]  
].
```

SEMAINE 07 : vers plus d'intégration de données

1. VoID pour les bases RDF
2. DCAT pour les jeux de données
3. PROVenance et traçabilité
4. RDF dans les pages HTML
5. Liens avec les bases de données
6. LDP, RIF, etc.

d'autres moyens d'accès

SPARQL, HTTP,... Linked Data Platform (LDP), ...

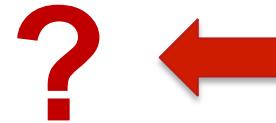


Plateforme des données liées (accès RESTful)

accès HTTP complet aux données: consulter, ajouter, modifier, effacer.

GET /people/fab HTTP/1.1

Host: data.inria.fr



Plateforme des données liées (accès RESTful)

accès HTTP complet aux données: consulter, ajouter, modifier, effacer.

PUT http://data.inria.fr/people/fab HTTP/1.1

Host: data.inria.fr

Content-Type: text/turtle

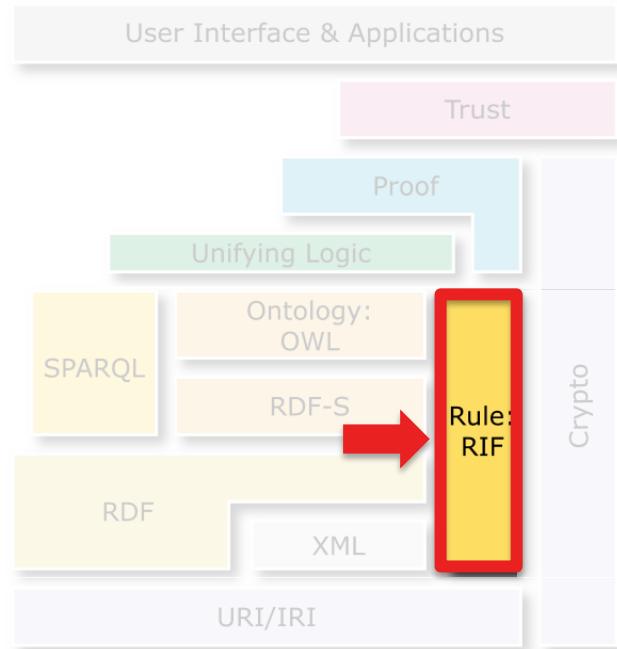
!



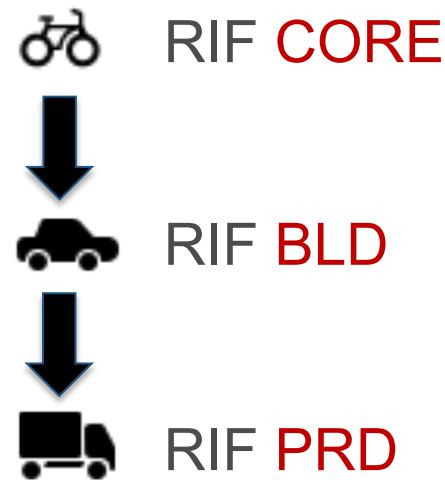
```
<fab> a foaf:Person ;  
    rdfs:label "Fabien" ;  
    foaf:mbox <fabien.gandon@inria.fr> .
```

Rule Interchange Format (RIF)

spécifier et échanger des règles de raisonnement sur le Web



RIF a aussi des fragments / profils



RIF Core: ajout uniquement sous ensemble le plus commun

```
employee1 [function-> "executive"  
          bonus -> 10 ]
```

RIF Core: ajout uniquement

sous ensemble le plus commun

```
employee1 [function-> "executive"  
           bonus -> 10 ]
```



FRAMES RIF

<employee1> :function "executive" ;
:bonus "10" .] TRIPLETS RDF

RIF Core: ajout uniquement

sous ensemble le plus commun

```
employee1 [function-> "executive"  
          bonus -> 10 ]
```

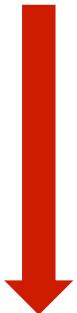


```
ForAll ?emp (?emp [ bonus -> 15 ] :-  
              ?emp [ function -> "executive" ] )
```

RIF Core: ajout uniquement

sous ensemble le plus commun

```
employee1 [function-> "executive"  
          bonus -> 10 ]
```



```
ForAll ?emp (?emp [ bonus -> 15 ] :-  
              ?emp [ function -> "executive" ] )
```

```
employee1 [function -> "executive"  
          bonus -> 10  
          bonus -> 15 ]
```

RIF CORE

clauses de Horn monotones sur des frames

conclusion :- hyp1 and hyp2 and hyp3 ...

1. frames & listes au lieu des triplets
2. IRI pour constantes
3. tester l'existence
4. tester appartenance à une classe
5. tester l'égalité



CORE

RIF BLD (Basic Logic Dialect)

toujours monotone, pas de changements

concl1 & concl2 &... :- hyp1 and hyp2 and hyp3 ...

- 1.conjonction en conclusion
- 2.fonctions, prédictats et arguments nommés
- 3.disjonction en condition (OU / OR)
- 4.égalité en conclusion
- 5.sous-classes



CORE

BLD

RIF PRD (Production Rules Dialect)

règles de production complètes en chaînage avant

Modify(...) :- hyp1 and hyp2 and hyp3 ...

1. ajouter, effacer, modifier, exécuter
2. instancier des frames
3. négation par l'échec

Pas monotone

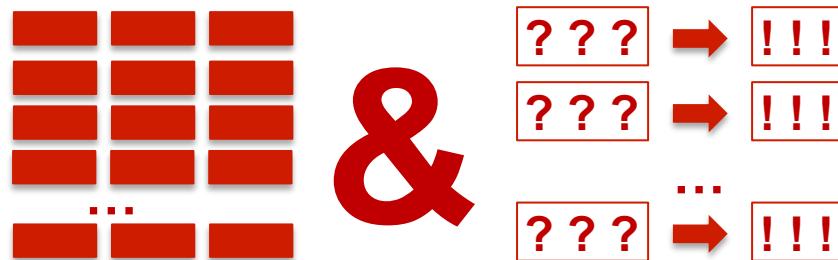


Standards RIF et Standards Web Sémantique

Pour aller plus loin: document RIF SWC,
syntaxe et sémantique pour combiner
RIF + RDF + RDFS + OWL (RL)

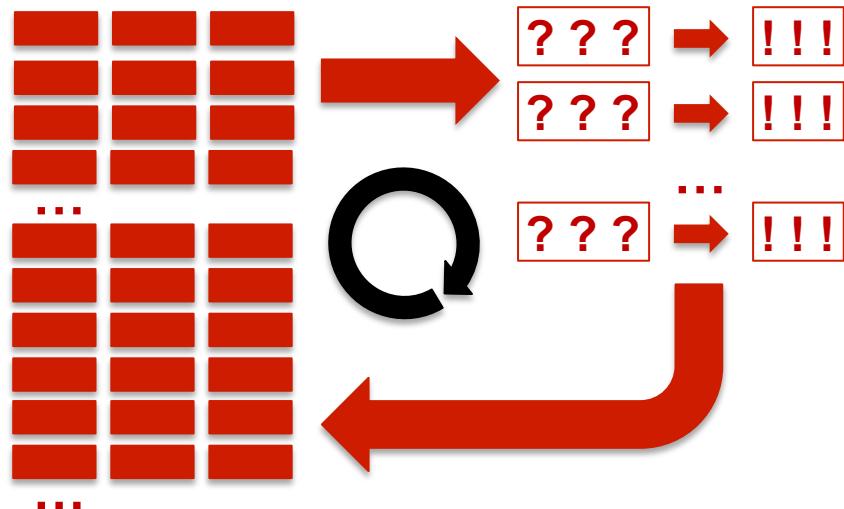
Standards RIF et Standards Web Sémantique

Pour aller plus loin: document RIF SWC,
syntaxe et sémantique pour combiner
RIF + RDF + RDFS + OWL (RL)



ex. chaînage avant

Tirer récursivement toutes les conclusions des faits connus et inférés



exemple de règle

« si un membre d'une équipe est intéressé par un sujet alors l'équipe est aussi intéressée par ce sujet »

```
?person :interestedBy ?topic  
?person :member ?team  
→  
?team :interestedBy ?topic
```

CONCLUSION

nous avons vu :

- les données liées : LD, RDF, SPARQL
- les schémas liés : RDFS, OWL, SKOS, DC, FoaF
- les standards liés

identifier

URL, URI, IRI

décrire et lier

RDF

interroger

HTTP, SPARQL, LDP

raisonner

RDFS & OWL

tracer

PROV-O

LES FINS ET LES MOYENS

identifier

<http://fabien.fr#me>

décrire et lier

#me type man

interroger

select * {?r type ?t}

raisonner

man subClassOf male

tracer

wasAttributedTo #me

LES FINS ET LES MOYENS

vue trois-tiers



RDFa, GRDDL...

vue trois-tiers



RDFa, GRDDL...



LDP, HTTP, JSON-LD...

vue trois-tiers



RDFa, GRDDL...



LDP, HTTP, JSON-LD...



R2RML, SPARQL, RDF...

beaucoup d'outils



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Tools

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Semantic Web Development Tools

Overview

This Wiki contains a collection of tool references that can help in developing Semantic Web applications. These include complete development environments, editors, libraries or modules for various programming languages, specialized browsers, etc. The goal is to list such tools and *not* Semantic Web applications in general (the interested reader may consider looking at the [W3C SW Use Case Collection](#) for those.)

Search for Tools

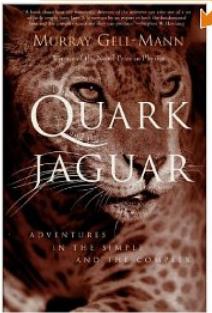
- Facets of tools
 - through [tool categories](#)
 - through [programming languages](#)
 - through [Recommendations and Technologies](#)
- All tools (with possibilities to edit the query)
 - seen as a table ↗
 - seen as a list ↗
- Misc
 - [tool contributors' page](#)

<http://www.w3.org/2001/sw/wiki/Tools>

Web 1.0, 2.0, 3.0...

amazon.com

Click to **LOOK INSIDE!**



The Quark and the Jaguar: Adventures in the Simple and the Complex [Paperback]

Murray Gell-Mann (Author)

★★★★★ (30 customer reviews)

Price: \$13.59

In Stock.

Ships from and sold by **Amazon.com**.

Formats	Amazon Price	New from	Used from
+ Hardcover	--	\$13.67	\$0.55
+ Paperback	\$13.59	\$10.01	\$7.84

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Product Details

Paperback: 392 pages

Publisher: St. Martin's Griffin (September 15, 1995)

Language: English

ISBN-10: 0805072535

ISBN-13: 978-0805072532

Product Dimensions: 9.1 x 6.1 x 1.2 inches

Shipping Weight: 1.2 pounds ([View shipping rates and policies](#))

Web 1.0, 2.0, 3.0...

The screenshot shows an Amazon product page for the book "The Quark and the Jaguar: Adventures in the Simple and the Complex" by Murray Gell-Mann. The page includes the book cover, a 'LOOK INSIDE!' button, author information, customer reviews, price, stock status, formats table, product details, shipping information, average customer review, and a star rating chart.

Product Title: The Quark and the Jaguar: Adventures in the Simple and the Complex [Paperback]

Author: Murray Gell-Mann (Author)

Customer Reviews: ★★★★☆ (30 customer reviews)

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Customer Reviews

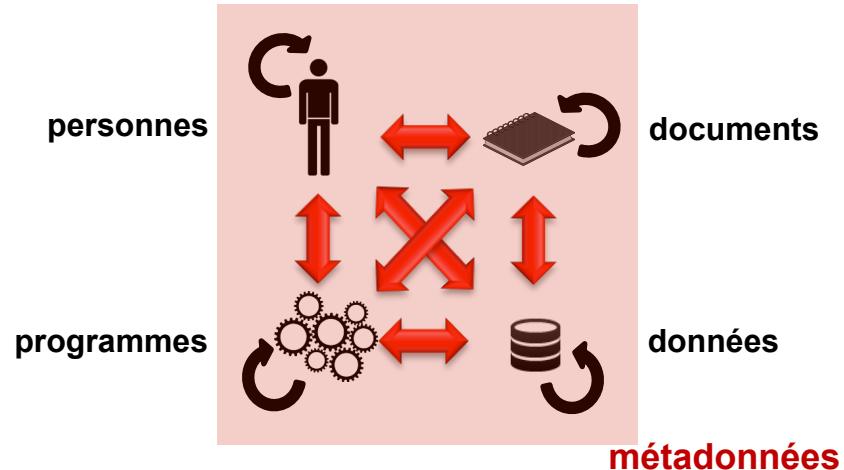
30 Reviews

Star Rating	Count
5 star:	(9)
4 star:	(8)
3 star:	(7)
2 star:	(4)
1 star:	(2)

Average Customer Review: ★★★★☆ (30 customer reviews)

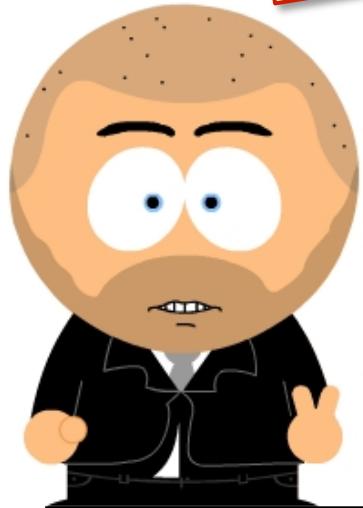
un et un seul web

un espace unique dans tous les sens du terme:



celui qui contrôle les métadonnées contrôle le web

et à travers le *world-wide web* une part grandissante de notre monde



fabien, gandon, @fabien_gandon, <http://fabien.info>