

RDFa

attributs XHTML pour supporter RDF

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exemple tiré du
RDFa 1.1 Primer - Second Edition

Buts

- expression de données structurées dans un langage de balisage
- rendre le texte et les liens HTML accessibles aux machines
- ne pas répéter de contenu
- éviter d'avoir à distribuer séparément le contenu lisible par la machine
- règles de traitement pour produire des triplets RDF à partir du XHTML+RDFa

Historique

- semblable à la notion de *microformat* qui intègre de la sémantique au XHTML
 - coordonnées géographiques
 - événements de calendrier
 - informations de contact
- proposé par Mark Birbeck en 2004
- recommandation W3C (2e ed) en août 2013

Browsers vs Humans



A browser window mockup with a header bar containing three small squares and a long rectangle. The main content area features a large bold **Headline**, a **Subheadline**, and a line of *Italics*. Below this is a block of ten lines of placeholder text, each starting with 'Text'. At the bottom, there are four blue underlined links: [Link1](#), [Link2](#), [Link3](#), and [Link4](#).



A browser window mockup with a header bar containing three small squares and a long rectangle. The main content area features a large bold **Title**, followed by **Author** and *Publication Date*. Below this is a block of ten lines of placeholder text, each starting with 'Article Content'. At the bottom, there are three blue underlined tags: [Tag1](#), [Tag2](#), and [Tag3](#), followed by a blue underlined [Copyright License](#).

Pourquoi ajouter de la sémantique à ses pages web ?

Création de rich snippets

The image shows three examples of rich snippets:

- Little Water Cantina - Eastlake - Seattle, WA**
www.yelp.com › Restaurants › Mexican
★★★★☆ 60 reviews - Price range: \$\$
60 Reviews of Little Water Cantina. "Three things are on my list when I eat out: great food, atmosphere, and
- Vegetarian Vegan Pizza No Cheese Recipe - Food.com - 248865**
www.food.com/recipe/vegetarian-vegan-pizza-no-c...
★★★★★ 2 reviews - 1 hr 32 mins - 2429 cal
Aug 26, 2007 - This is from my dad, who developed some **vegan recipes** that don't have any cheese, and you
- Leonard Cohen - Free listening, videos, concerts, stats, & pictures at...**
www.last.fm/music/Leonard+Cohen
Watch videos & listen to Leonard Cohen: Suzanne, Hallelujah & more, plus 132 pictures. Leonard Cohen, (born September 21, 1934 in Montreal, Quebec, ...)

Track	Duration
Suzanne	3:48
The Darkness	4:29
Going Home	3:51
Hallelujah	6:12

Utilisation du vocabulaire schema.org

- Creative works: CreativeWork, Book, Movie, MusicRecording, Recipe, TVSeries ...
- Embedded non-text objects: AudioObject, ImageObject, VideoObject
- Event
- Health and medical types: notes on the health and medical types under MedicalEntity.
- Organization
- Person
- Place, LocalBusiness, Restaurant ...
- Product, Offer, AggregateOffer
- Review, AggregateRating

Comment fournir de la sémantique au browser - I

- Réutilisation de balises existantes
 - `@rel` : relation entre deux ressources
 - `@rev` : relation inverse entre deux ressources
 - `@content` : littéral RDF
 - `@href` : URI exprimant la ressource de `rel/rev`
 - `@src` : URI exprimant la ressource de `rel/rev` quand elle est *embedded*

Comment fournir de la sémantique au browser - 2

- Nouveaux attributs spécifiques
 - `@about` : sujet RDF
 - `@property` : relation entre un sujet et des littéraux
 - `@resource` : objet d'une relation (non-cliquable...)
 - `@datatype` : type d'un littéral
 - `@typeof` : type d'un sujet

Comment fournir de la sémantique au browser - 3

- Utilise les `id` des éléments pour y référer
- `curie` : compact URI

```
<div xmlns:db="http://dbpedia.org/">  
  <div about="[db:resource/Albert_Einstein]">  
    ...  
  </div>  
</div>
```

- semblables à l'utilisation des préfixes de namespaces
- peut couper URI n'importe où
- préfixe `_` pour les noeuds blancs
- notion de *safe curie* pour différencier des URI
- on peut mettre plusieurs `curie` séparés par des blancs

RDFa en RDF

- sujet : @about
- prédicat : @property, @rel, @rev
- objet : @href, @resource, @src
- littéral : @content
- type de donnée : @datatype

The trouble with Bob

Date: 10th of September, 2011

Alice

The trouble with Bob is that he takes much better photos than I do:



Beautiful Sunset by Bob.

Alice Birpenswick,
Email: alice@example.com,
Phone: +1 617.555.7332.

My buddies:

- [Bob](#)
- [Eve](#)
- [Manu](#)

Jo's Barbecue

Date: 14th of September, 2011

Eve

...

I will post my photos nevertheless...

Date: 15th of September, 2011

Alice

...

The trouble with Bob

Date: 10th of September, 2011

Alice

The trouble with Bob is that he takes much better photos than I do



Beautiful Sunset by Bob.

Jo's Barbecue

Date: 14th of September, 2011

Eve

...

I will post my photos nevertheless...

Date: 15th of September, 2011

Alice

...

```
<div class="blog-content">
  <div class="blog-post" resource="/alice/posts/trouble_with_bob"
    typeof="schema:BlogPosting">
    <h2 property="title">The trouble with Bob</h2>
    <p>Date: <span property="created" content="2011-09-10">10th of September,
      2011</span></p>
    <h3 property="creator schema:creator" resource="#me">Alice</h3>
    <div property="schema:articleBody">
      <p>The trouble with Bob is that he takes much better photos than I do:</p>
    </div>
    <div class="imgbox"
      resource="http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg">
      
      <p><span property="title">Beautiful Sunset</span> by <span
        property="creator">Bob</span>.</p>
    </div>
  </div>

  <div class="blog-post" resource="/alice/posts/jos_barbecue"
    typeof="schema:BlogPosting">
    <h2 property="title">Jo's Barbecue</h2>
    <p>Date: <span property="created" content="2011-09-14">14th of September,
      2011</span></p>
    <h3 property="creator schema:creator">Eve</h3>
    <div property="schema:articleBody">
      <p>...</p>
    </div>
  </div>

  <div class="blog-post" resource="/alice/posts/my_photos" typeof="schema:BlogPosting">
    <h2 property="title">I will post my photos nevertheless...</h2>
    <p>Date: <span property="created" content="2011-09-15">15th of September,
      2011</span></p>
    <h3 property="creator schema:creator" resource="#me">Alice</h3>
    <div property="schema:articleBody">
      <p>...</p>
    </div>
  </div>
</div>
```

The trouble with Bob

Date: 10th of September, 2011

Alice

The trouble with Bob is that he takes much better photos than I do:



Beautiful Sunset by Bob.

Alice Birpenswick,
Email: alice@example.com,
Phone: +1 617.555.7332.

My buddies:

- [Bob](#)
- [Eve](#)
- [Manu](#)

Jo's Barbecue

Date: 14th of September, 2011

Eve

...

I will post my photos nevertheless...

Date: 15th of September, 2011

Alice

...

The trouble with Bob

Date: 10th of September, 2011

Alice

The trouble with Bob is that he takes much better photos than I do:



Beautiful Sunset by Hob.

Jo's Barbecue

Date: 14th of September, 2011

Eve

...

I will post my photos nevertheless

Date: 15th of September, 2011

Alice

...

Alice Birpemsrick,
Email: alice@example.com,
Phone: +1 617.555.7332.

My buddies:

- [Bob](#)
- [Eve](#)
- [Manu](#)

```
<div class="sidebar" vocab="http://xmlns.com/foaf/0.1/" resource="#me" typeof="Person">
  <p>
    <span property="name">Alice Birpemsrick</span>,<br /> Email: <a property="mbox"
      href="mailto:alice@example.com">alice@example.com</a>,<br /> Phone: <a
        property="phone" href="tel:+1-617-555-7332">+1 617.555.7332</a>.</p>
  <p>My buddies:</p>
  <ul>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/bob">
        <span property="name">Bob</span>
      </a>
    </li>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/eve">
        <span property="name">Eve</span>
      </a>
    </li>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/manu">
        <span property="name">Manu</span>
      </a>
    </li>
  </ul>
</div>
```

Définitions de prédicats

```
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <title>Page 7</title>
    <meta name="author" content="Mark Birbeck" />
    <link rel="prev" href="page6.html" />
    <link rel="next" href="page8.html" />
  </head>
  <body>...</body>
</html>
```

XHTML

```
<html
  xmlns="http://www.w3.org/1999/xhtml"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
>
  <head>
    <title>My home-page</title>
    <meta property="dc:creator" content="Mark Birbeck" />
    <link rel="foaf:topic" href="http://www.formsPlayer.com/#us" />
  </head>
  <body>...</body>
</html>
```

RDFa

Prédictat sur du texte

This document is licensed under a

```
<a xmlns:cc="http://creativecommons.org/ns#"
  rel="cc:license"
  href="http://creativecommons.org/licenses/by-nc-nd/3.0/">
  Creative Commons License
</a>.
```

XHTML

```
<html
  xmlns="http://www.w3.org/1999/xhtml"
  xmlns:cal="http://www.w3.org/2002/12/cal/ical#"
  >
  <head><title>Jo's Friends and Family Blog</title></head>
  <body>
    <p>
      I'm holding
      <span property="cal:summary">
        one last summer Barbecue
      </span>,
      on September 16th at 4pm.
    </p>
  </body>
</html>
```

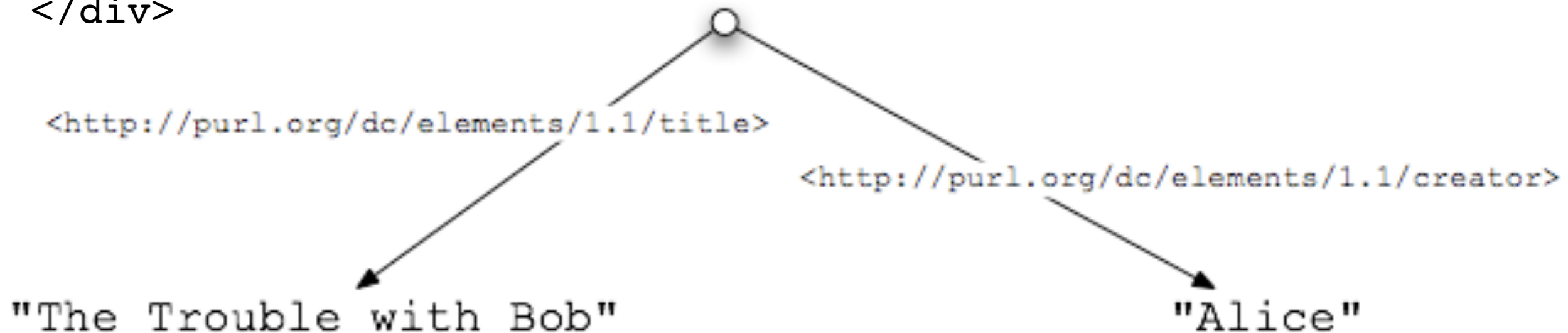
RDFa

Ajout de types et précision

```
<html
  xmlns="http://www.w3.org/1999/xhtml"
  xmlns:cal="http://www.w3.org/2002/12/cal/ical#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
>
<head><title>Jo's Friends and Family Blog</title></head>
<body>
  <p>
    I'm holding
    <span property="cal:summary">
      one last summer Barbecue
    </span>,
    on
    <span property="cal:dtstart"
      content="2007-09-16T16:00:00-05:00"
      datatype="xsd:dateTime">
      September 16th at 4pm
    </span>.
  </p>
</body>
</html>
```


Exemples du RDFa Primer

```
<div xmlns:dc="http://purl.org/dc/elements/1.1/"  
  about= "/alice/posts/trouble_with_bob" >  
  <h2 property="dc:title">The trouble with Bob</h2>  
  <h3 property="dc:creator">Alice</h3>  
  ...  
</div>
```

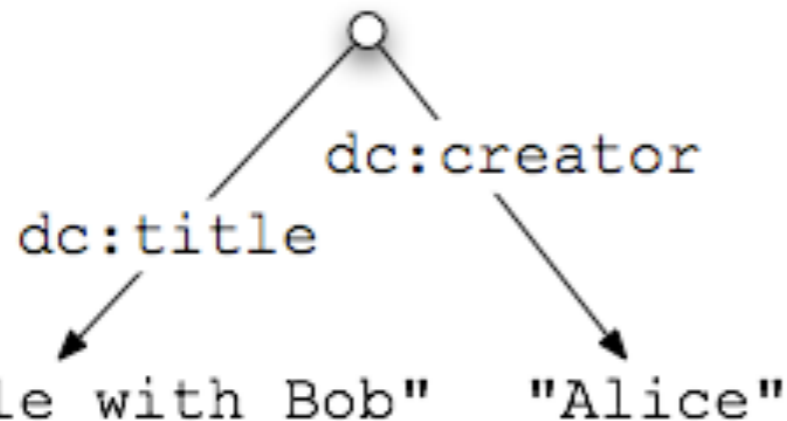


```
<http://www.example.com/alice/posts/trouble_with_bob>  
  <http://purl.org/dc/elements/1.1/title> "The Trouble with Bob";  
  <http://purl.org/dc/elements/1.1/creator> "Alice" .
```

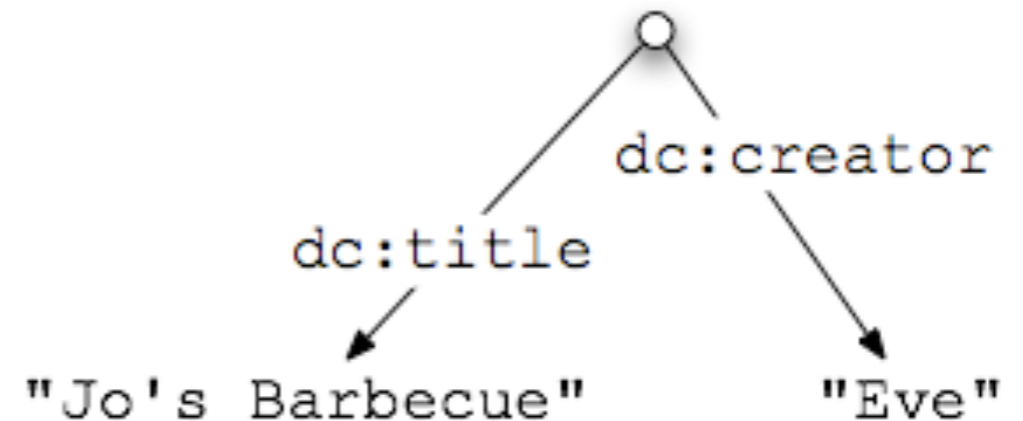
Exemples du RDFa Primer

```
<div xmlns:dc="http://purl.org/dc/elements/1.1/">  
  <div about="/alice/posts/trouble_with_bob">  
    <h2 property="dc:title">The trouble with Bob</h2>  
    <h3 property="dc:creator">Alice</h3>  
    ...  
  </div>  
  <div about="/alice/posts/jos_barbecue">  
    <h2 property="dc:title">Jo's Barbecue</h2>  
    <h3 property="dc:creator">Eve</h3>  
    ...  
  </div>  
  ...  
</div>
```

<http://example.com/alice/posts/trouble_with_bob>

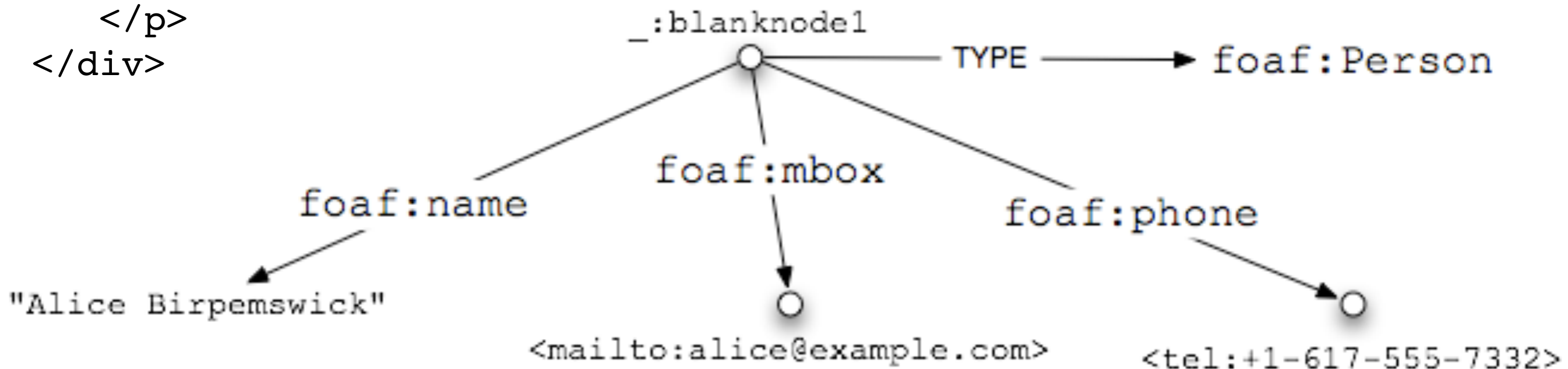


<http://example.com/alice/posts/jos_barbecue>



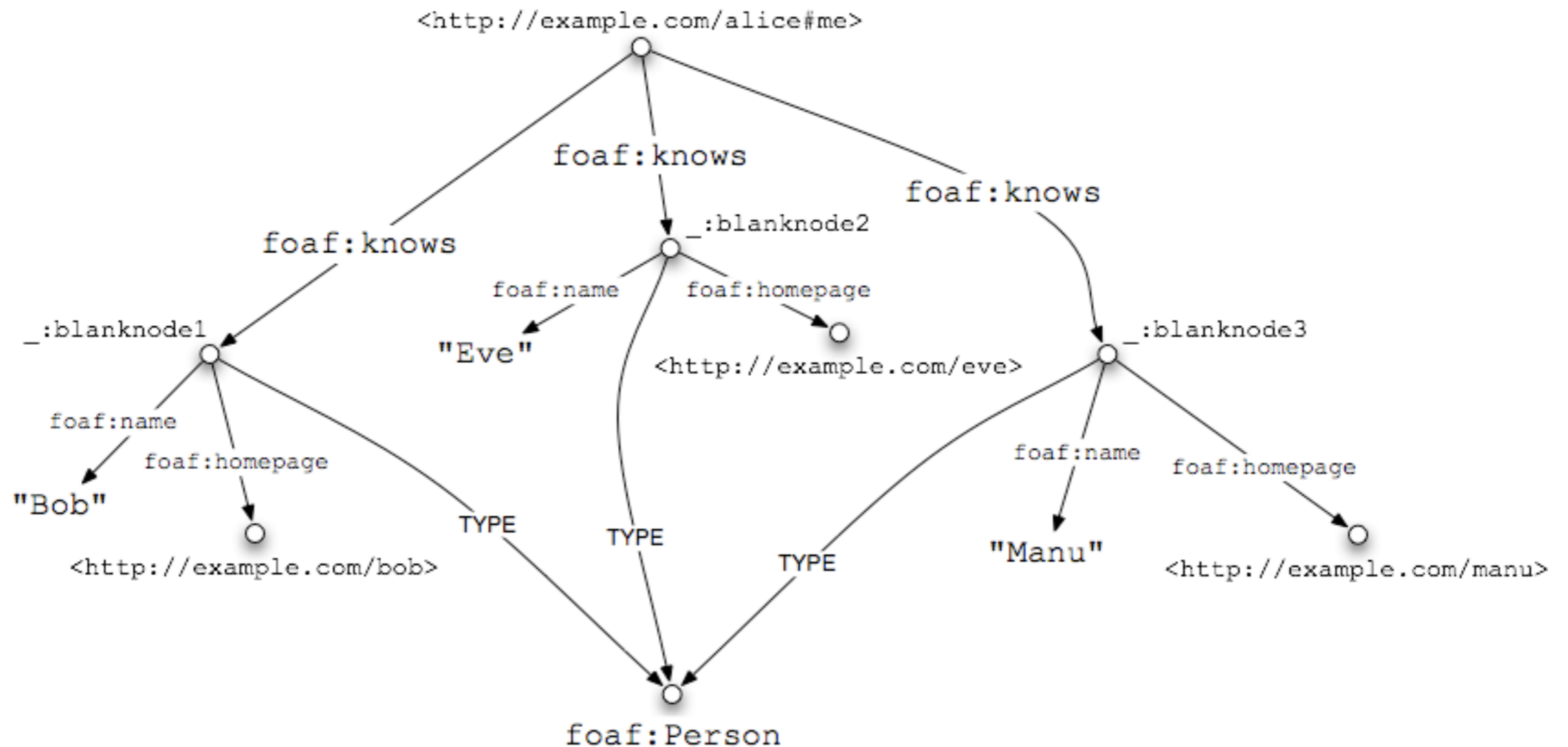
Exemples du RDFa Primer

```
<div typeof="foaf:Person" xmlns:foaf="http://xmlns.com/foaf/0.1/">  
  <p property="foaf:name">  
    Alice Birpemswick  
  </p>  
  <p>Email: <a rel="foaf:mbox"  
    href="mailto:alice@example.com">alice@example.com</a>  
  </p>  
  <p> Phone:  
    <a rel="foaf:phone" href="tel:+1-617-555-7332">  
      +1 617.555.7332  
    </a>  
  </p>  
</div>
```



Exemples du RDFa Primer

```
<div xmlns:foaf="http://xmlns.com/foaf/0.1/" about="#me" rel="foaf:knows">
  <ul>
    <li typeof="foaf:Person">
      <a property="foaf:name" rel="foaf:homepage" href="http://example.com/bob">Bob</a>
    </li>
    <li typeof="foaf:Person">
      <a property="foaf:name" rel="foaf:homepage" href="http://example.com/eve">Eve</a>
    </li>
    <li typeof="foaf:Person">
      <a property="foaf:name" rel="foaf:homepage" href="http://example.com/manu">Manu</a>
    </li>
  </ul>
</div>
```



Exemple plus complet

- XHTML
- RDF (format Turtle)

Parcours du XHTML pour la génération des triplets

- Débute avec la racine du DOM et on parcourt récursivement les enfants
- Règles de génération de triplets
- Règles de changement de contexte
 - sujet / objet parent
 - liste des URI actifs
 - triplets incomplets


```

@prefix cc: <http://creativecommons.org/ns#> .
@prefix dcterms: <http://purl.org/dc/terms/> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix og: <http://ogp.me/ns#> .
@prefix schema: <http://schema.org/> .
@prefix xsd: <http://www.w3.org/2001/XMLSchema#> .

<http://example.com/> cc:license <http://creativecommons.org/licenses/by/3.0/>;
  og:image "http://example.com/alice/bob-ugly.jpg";
  og:title "Alice's Blog";
  og:type "text";
  dcterms:date "2011"^^xsd:gYear.

<http://example.com/alice/posts/jos_barbecue> a schema:BlogPosting;
  dcterms:created "2011-09-14";
  dcterms:creator "Eve";
  dcterms:title "Jo's Barbecue";
  schema:articleBody "...";
  schema:creator "Eve" .

<http://example.com/alice/posts/ny_photos> a schema:BlogPosting;
  dcterms:created "2011-09-15";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "I will post my photos nevertheless.";
  schema:articleBody "...";
  schema:creator <http://example.com/#me> .

<http://example.com/alice/posts/trouble_with_bob> a schema:BlogPosting;
  dcterms:created "2011-09-10";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "The trouble with Bob";
  schema:articleBody "The trouble with Bob is that he takes much better photos than I do.";
  schema:creator <http://example.com/#me> .

<http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg> dcterms:creator "Bob";
  dcterms:title "Beautiful Sunset" .

<http://example.com/#me> a foaf:Person;
  foaf:knows
    [ a foaf:Person;
      foaf:homepage <http://example.com/bob>;
      foaf:name "Bob" ],
    [ a foaf:Person;
      foaf:homepage <http://example.com/eve>;
      foaf:name "Eve" ],
    [ a foaf:Person;
      foaf:homepage <http://example.com/manu>;
      foaf:name "Manu" ];
  foaf:mbox <mailto:alice@example.com>;
  foaf:name "Alice Birpenswick";
  foaf:phone <tel:+1-617-555-7332> .

```

```
<http://example.com/alice/posts/trouble with bob> a schema:BlogPosting;
  dcterms:created "2011-09-10";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "The trouble with Bob";
  schema:articleBody "The trouble with Bob is that he takes much b
  schema:creator <http://example.com/#me> .
```

```
<http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg> dcterms:creato
  dcterms:title "Beautiful Sunset" .
```

```
<http://example.com/alice/posts/jos_barbecue> a schema:BlogPosting;
  dcterms:created "2011-09-14";
  dcterms:creator "Eve";
  dcterms:title "Jo's Barbecue";
  schema:articleBody "...";
  schema:creator "Eve" .
```

```
<http://example.com/alice/posts/my_photos> a schema:BlogPosting;
  dcterms:created "2011-09-15";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "I will post my photos nevertheless...";
  schema:articleBody "...";
  schema:creator <http://example.com/#me> .
```



```

<div class="blog-content">
  <div class="blog-post" resource="/alice/posts/trouble with bob"
    typeof="schema:BlogPosting">
    <h2 property="title">The trouble with Bob</h2>
    <p>Date: <span property="created" content="2011-09-10">
      2011</span></p>
    <h3 property="creator schema:creator" resource="#me">
      Alice</h3>
    <div property="schema:articleBody">
      <p>The trouble with Bob is that he takes much more
        time to get things done than I do.</p>
    </div>
    <div class="imgbox"
      resource="http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg"
      
      <p><span property="title">Beautiful Sunset</span>
        <span property="creator">Bob</span>.</p>
    </div>
  </div>
  <div class="blog-post" resource="/alice/posts/jos_barbecue"
    typeof="schema:BlogPosting">
    <h2 property="title">Jo's Barbecue</h2>
    <p>Date: <span property="created" content="2011-09-14">
      2011</span></p>
    <h3 property="creator schema:creator" resource="#me">
      Alice</h3>
    <div property="schema:articleBody">
      <p>...</p>
    </div>
  </div>
  <div class="blog-post" resource="/alice/posts/my_photos"
    typeof="schema:BlogPosting">
    <h2 property="title">I will post my photos nevertheless...</h2>
    <p>Date: <span property="created" content="2011-09-15">
      2011</span></p>
    <h3 property="creator schema:creator" resource="#me">
      Alice</h3>
    <div property="schema:articleBody">
      <p>...</p>
    </div>
  </div>
</div>

```

```

<http://example.com/alice/posts/trouble with bob> a schema:BlogPosting;
  dcterms:created "2011-09-10";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "The trouble with Bob";
  schema:articleBody "The trouble with Bob is that he takes much more
    time to get things done than I do.";
  schema:creator <http://example.com/#me> .

<http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg> dcterms:creator
  dcterms:title "Beautiful Sunset" .

<http://example.com/alice/posts/jos_barbecue> a schema:BlogPosting;
  dcterms:created "2011-09-14";
  dcterms:creator "Eve";
  dcterms:title "Jo's Barbecue";
  schema:articleBody "...";
  schema:creator "Eve" .

<http://example.com/alice/posts/my_photos> a schema:BlogPosting;
  dcterms:created "2011-09-15";
  dcterms:creator <http://example.com/#me>;
  dcterms:title "I will post my photos nevertheless...";
  schema:articleBody "...";
  schema:creator <http://example.com/#me> .

```


<[http://example.com/alice/posts/trouble with bob](http://example.com/alice/posts/trouble%20with%20bob)> a schema:BlogPosting;-
dcterms:created "2011-09-10";-
dcterms:creator <<http://example.com/#me>>;-
dcterms:title "The trouble with Bob";-
schema:articleBody "The trouble with Bob is that he takes much b";-
schema:creator <<http://example.com/#me>> .-

<<http://www.w3.org/2006/07/SWD/RDFa/primer/sunset.jpg>> dcterms:creato
dcterms:title "Beautiful Sunset" .-

<[http://example.com/alice/posts/jos barbecue](http://example.com/alice/posts/jos%20barbecue)> a schema:BlogPosting;-
dcterms:created "2011-09-14";-
dcterms:creator "Eve";-
dcterms:title "Jo's Barbecue";-
schema:articleBody "...";-
schema:creator "Eve" .-

<[http://example.com/alice/posts/my photos](http://example.com/alice/posts/my%20photos)> a schema:BlogPosting;-
dcterms:created "2011-09-15";-
dcterms:creator <<http://example.com/#me>>;-
dcterms:title "I will post my photos nevertheless...";-
schema:articleBody "...";-
schema:creator <<http://example.com/#me>> .-


```
<div class="sidebar" vocab="http://xmlns.com/foaf/0.1/" resource="#me" typeof="Person">
  <p>
    <span property="name">Alice Birpemswick</span>,<br /> Email: <a property="mbox"
      href="mailto:alice@example.com">alice@example.com</a>,<br /> Phone: <a
        property="phone" href="tel:+1-617-555-7332">+1 617.555.7332</a>.</p>
  <p>My buddies:</p>
  <ul>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/bob">
        <span property="name">Bob</span>
      </a>
    </li>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/eve">
        <span property="name">Eve</span>
      </a>
    </li>
    <li property="knows" typeof="Person">
      <a property="homepage" href="http://example.com/manu">
        <span property="name">Manu</span>
      </a>
    </li>
  </ul>
</div>
```



```
<div class="sidebar" vocab="http://xmlns.com/foaf/0.1/" resource="#me" typeof="Person">
```

```
<p>
```

```
<span property="name">Alice Birpemswick</span>,<br  
href="mailto:alice@example.com">alice@example.  
property="phone" href="tel:+1-617-555-7332">+1
```

```
<p>My buddies:</p>
```

```
<ul>
```

```
<li property="knows" typeof="Person">  
<a property="homepage" href="http://example.co  
<span property="name">Bob</span>  
</a>
```

```
</li>
```

```
<li property="knows" typeof="Person">  
<a property="homepage" href="http://example.co  
<span property="name">Eve</span>  
</a>
```

```
</li>
```

```
<li property="knows" typeof="Person">  
<a property="homepage" href="http://example.co  
<span property="name">Manu</span>  
</a>
```

```
</li>
```

```
</ul>
```

```
</div>
```

```
<http://example.com/#me> a foaf:Person;~
```

```
foaf:knows~
```

```
[ a foaf:Person;~  
foaf:homepage <http://example.com/bob>;~  
foaf:name "Bob" ],~
```

```
[ a foaf:Person;~  
foaf:homepage <http://example.com/eve>;~  
foaf:name "Eve" ],~
```

```
[ a foaf:Person;~  
foaf:homepage <http://example.com/manu>;~  
foaf:name "Manu" ];~
```

```
foaf:mbox <mailto:alice@example.com>;~
```

```
foaf:name "Alice Birpemswick";~
```

```
foaf:phone <tel:+1-617-555-7332> .~
```

Exemple d'utilisation Creative Commons

- Licence en trois formats
 - human readable
 - lawyer readable (sic!)
 - machine readable
- ccREL: Creative Common Rights Expression Language

Conclusion

- **Compromis intéressant entre document**
 - lisible et présentable à un humain
 - traitable automatiquement
- **RDFa Lite 1.1**
 - limité à : @vocab, @typeof, @property, @resource, @prefix
- **Des outils commencent à paraître**
 - Google Structured Data Testing Tool (essai)
 - <http://rdfa.info> (nouvelles)