

Semantic Web

Report #1

Introduction to the Semantic Web

Report #2

XML

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1 Extracting RDF metadata

Number	Subject	Predicate	Object
1	http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://xmlns.com/foaf/0.1/Image
2	http://www.w3.org/RDF/Validator/run/1336426511365#p1	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://jibbering.com/vocabs/image/#Rectangle
3	http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg	http://jibbering.com/vocabs/image/#hasPart	http://www.w3.org/RDF/Validator/run/1336426511365#p1
4	http://www.w3.org/RDF/Validator/run/1336426511365#p1	http://jibbering.com/vocabs/image/#points	"47,29 143,96"
5	http://www.w3.org/RDF/Validator/run/1336426511365#p1	http://purl.org/dc/elements/1.1/title	"glowa"
6	http://www.w3.org/RDF/Validator/run/1336426511365#p1	http://purl.org/dc/elements/1.1/description	"glowa kaczki nr 1"
7	http://www.w3.org/RDF/Validator/run/1336426511365#p1	http://jibbering.com/vocabs/image/#depicts	genid:A15964
8	genid:A15964	http://purl.org/dc/elements/1.1/description	"gumowa glowa gumowej kaczki 1"
9	http://www.w3.org/RDF/Validator/run/1336426511365#p2	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://jibbering.com/vocabs/image/#Rectangle
10	http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg	http://jibbering.com/vocabs/image/#hasPart	http://www.w3.org/RDF/Validator/run/1336426511365#p2
11	http://www.w3.org/RDF/Validator/run/1336426511365#p2	http://jibbering.com/vocabs/image/#points	"141,6 214,62"
12	http://www.w3.org/RDF/Validator/run/1336426511365#p2	http://purl.org/dc/elements/1.1/title	"glowa 2"
13	http://www.w3.org/RDF/Validator/run/1336426511365#p2	http://purl.org/dc/elements/1.1/description	"glowa kaczki nr 2"
14	http://www.w3.org/RDF/Validator/run/1336426511365#p2	http://jibbering.com/vocabs/image/#depicts	genid:A15965
15	genid:A15965	http://purl.org/dc/elements/1.1/description	"gumowa glowa gumowej kaczki 2 siedzacej z tyłu"

16	http://www.w3.org/RDF/Validator/run/1336426511365#p3	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://jibbering.com/vocabs/image/#Rectangle
17	http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg	http://jibbering.com/vocabs/image/#hasPart	http://www.w3.org/RDF/Validator/run/1336426511365#p3
18	http://www.w3.org/RDF/Validator/run/1336426511365#p3	http://jibbering.com/vocabs/image/#points	"154,71 254,143"
19	http://www.w3.org/RDF/Validator/run/1336426511365#p3	http://purl.org/dc/elements/1.1/title	"glowa 3"
20	http://www.w3.org/RDF/Validator/run/1336426511365#p3	http://purl.org/dc/elements/1.1/description	"glowa kaczki nr 3"
21	http://www.w3.org/RDF/Validator/run/1336426511365#p3	http://jibbering.com/vocabs/image/#depicts	genid:A15966
22	genid:A15966	http://purl.org/dc/elements/1.1/description	"gumowa glowa gumowej kaczki 3 siedzacej z przodu"
23	http://www.w3.org/RDF/Validator/run/1336426511365#p4	http://www.w3.org/1999/02/22-rdf-syntax-ns#type	http://jibbering.com/vocabs/image/#Rectangle
24	http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg	http://jibbering.com/vocabs/image/#hasPart	http://www.w3.org/RDF/Validator/run/1336426511365#p4
25	http://www.w3.org/RDF/Validator/run/1336426511365#p4	http://jibbering.com/vocabs/image/#points	"21,7 288,219"
26	http://www.w3.org/RDF/Validator/run/1336426511365#p4	http://purl.org/dc/elements/1.1/title	"trzy kaczki"
27	http://www.w3.org/RDF/Validator/run/1336426511365#p4	http://purl.org/dc/elements/1.1/description	"trzy gumowe kaczki"
28	http://www.w3.org/RDF/Validator/run/1336426511365#p4	http://jibbering.com/vocabs/image/#depicts	genid:A15967
29	genid:A15967	http://purl.org/dc/elements/1.1/description	"gumowe kaczki z pomaranczowymi dziobami"

The original RDF/XML document

```
1: <rdf:RDF
2:   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
3:   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
4:   xmlns:dc="http://purl.org/dc/elements/1.1/"
5:   xmlns:foaf="http://xmlns.com/foaf/0.1/"
6:   xmlns:image="http://jibbering.com/vocabs/image/#"
7:   xmlns:an="http://www.w3.org/2000/10/annotation-ns#"
8: >
9:   <foaf:Image rdf:about="http://www.kanzaki.com/works/2004/imgdsc/miniduck_by_ccc.jpg">
10:     <image:hasPart>
11:       <image:Rectangle rdf:ID="p1">
12:         <image:points>47,29 143,96</image:points>
13:         <dc:title>glowa</dc:title>
14:         <dc:description>glowa kaczkki nr 1</
dc:description>
15:         <image:depicts rdf:parseType="Resource">
16:           <dc:description>gumowa glowa gumowej kaczkki
1</dc:description>
17:         </image:depicts>
18:       </image:Rectangle>
19:     </image:hasPart>
20:     <image:hasPart>
21:       <image:Rectangle rdf:ID="p2">
22:         <image:points>141,6 214,62</image:points>
23:         <dc:title>glowa 2</dc:title>
24:         <dc:description>glowa kaczkki nr 2</
dc:description>
25:         <image:depicts rdf:parseType="Resource">
26:           <dc:description>gumowa glowa gumowej kaczkki
2 siedzacej z tyłu</dc:description>
27:         </image:depicts>
28:       </image:Rectangle>
29:     </image:hasPart>
30:     <image:hasPart>
31:       <image:Rectangle rdf:ID="p3">
32:         <image:points>154,71 254,143</image:points>
```

```
33:     <dc:title>glowa 3</dc:title>
34:     <dc:description>glowa kaczkki nr 3</
dc:description>
35:     <image:depicts rdf:parseType="Resource">
36:         <dc:description>gumowa glowa gumowej kaczkki
3 siedzacej z przodu</dc:description>
37:     </image:depicts>
38: </image:Rectangle>
39: </image:hasPart>
40: <image:hasPart>
41:     <image:Rectangle rdf:ID="p4">
42:         <image:points>21,7 288,219</image:points>
43:         <dc:title>trzy kaczkki</dc:title>
44:         <dc:description>trzy gumowe kaczkki</
dc:description>
45:         <image:depicts rdf:parseType="Resource">
46:             <dc:description>gumowe kaczkki z pomaranc-
zowymi dziobami</dc:description>
47:         </image:depicts>
48:     </image:Rectangle>
49: </image:hasPart>
50: </foaf:Image>
51: </rdf:RDF>
```


2 Common Vocabularies

Vocabulary	What for?	Which application use it?
SKOS	to express the basic structure and content of concept schemes such as thesauri, classification schemes, subject heading lists, taxonomies, folksonomies, and other types of controlled vocabulary	Library of Congress Subject Headings
Dublin Core	to describe resources for the purposes of discovery. The terms can be used to describe a full range of web resources: video, images, web pages etc. and physical resources such as books and objects like artworks	Open Source Metadata Framework, PBCore, Zope CMF's, ERP5, SimpleDL, FedoraCommons
FOAF	to describe persons, their activities and their relations to other people and objects	Semantic Web Applications , Wordpress, Yandex, My Opera
DOAP	to describe software projects, and in particular open-source	Apache Software Foundation, Python Package Index, Dolibarr ERP/CRM

3 FOAF

Dominika:

```
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:admin="http://webns.net/mvcb/">
<foaf:PersonalProfileDocument rdf:about="">
  <foaf:maker rdf:resource="#me"/>
  <foaf:primaryTopic rdf:resource="#me"/>
  <admin:generatorAgent rdf:resource="http://www.ldodds.com/foaf/foaf-a-matic"/>
  <admin:errorReportsTo rdf:resource="mailto:leigh@ldodds.com"/>
</foaf:PersonalProfileDocument>
<foaf:Person rdf:ID="me">
<foaf:name>Dominika Kamola</foaf:name>
<foaf:title>Mrs</foaf:title>
<foaf:givenname>Dominika</foaf:givenname>
<foaf:family_name>Kamola</foaf:family_name>
<foaf:nick>Dośka</foaf:nick>
<foaf:mbox_sha1sum>3d723781cbbdd9cece8989789a424687402cc56e</foaf:mbox_sha1sum>
<foaf:schoolHomepage rdf:resource="www.agh.edu.pl"/></foaf:Person>
</rdf:RDF>
```

URL to the *.rdf file: http://kamola.best.krakow.pl/Dominika_foaf.rdf

Olga:

```

<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:admin="http://webns.net/mvcb/">
<foaf:PersonalProfileDocument rdf:about="">
  <foaf:maker rdf:resource="#me"/>
  <foaf:primaryTopic rdf:resource="#me"/>
  <admin:generatorAgent rdf:resource="http://www.ldodds.com/foaf/foaf-a-matic"/>
  <admin:errorReportsTo rdf:resource="mailto:leigh@ldodds.com"/>
</foaf:PersonalProfileDocument>
<foaf:Person rdf:ID="me">
<foaf:name>Olga Zachariasz</foaf:name>
<foaf:title>Mrs</foaf:title>
<foaf:givenname>Olga</foaf:givenname>
<foaf:family_name>Zachariasz</foaf:family_name>
<foaf:mbox_sha1sum>c7cf1f7b7080279e1a68f1d1bf58593a34b168d7</foaf:mbox_sha1sum>
<foaf:schoolHomepage rdf:resource="www.agh.edu.pl"/></foaf:Person>
</rdf:RDF>

```

URL to the *.rdf file: http://kamola.best.krakow.pl/Olga_foaf.rdf

4 Schemas

All of the ontologies' creation dates are between **2000-2003**. Their size is different, starting with really small simple 1 or 2-element ontologies, ending on huge, complex ontologies, which consist of few thousands elements.

5/6 Ontology visualisation/reasoning

The application is not working.

7 Linked Open Data

- **Flickr wrappr** – it holds the information about the pictures posted on Flickr - DBpedia with RDF links to photos posted on flickr. The wrappr generates a collection of flickr photos that depict the concept.
- **IEEE** – contains data from IEEE papers,
- **Medi Care** - drug list data,
- **Last.FM (rdfize)** – the data of music events attended by user, event by event ID, Artist by Artist Name, Events by Venue ID, it generates RDF, XML or Turtle file,
- **Telegraphis** - it keeps data such as capitals, continents, countries, currencies + void descriptions of these data sets.

8 Semantic Web tools

- **RDFizers: which in your opinion are the most important?**

What an RDFizer would you add (converting from what format)?

The most important RDFizers are the ones which are used in a day-to-day life, so: JPEG -> RDF, EMail -> RDF, Bibtex -> RDF, Java -> RDF. From my point of view as a photographer-amateur, quite important is also CRW -> RDF (Canon RAW file).

Personally I'd add something what is connected with graphic design files, maybe PSD -> RDF (Photoshop file) or vector files, such as EPS or AI -> RDF.

- **Semantic Web browsers: How many of them are up and running?**

This link took me to the page with a list of 13 semantic web browsers.

Almost all of them are working or can be downloaded and run except: razor-base, iLOD, FenFire, Objectviewer, zLinks + Tabulator works only on Firefox and Camino, which finally gives **8 running browsers**.

- **Semantic Web Search Engines: How easy is it to get started with each of them?**

It's easy to use them. The user has to put the phrase he wants to find into the proper place, then click Search. The engine gives precise results in RDF files.

- **Applications of the Linked Data, including mashups and everyday tools: Which ones do you find useful? What other applications can you think of?**

For me the most useful are the ones where I can find some photos (ODS Gallery), cause I could use them as an inspiration or put them in my 2D graphic works. For those who watch TV, BBC applications seems to be reasonable and useful.

Control questions

- **How one can add semantic annotation to a web page?**

It can be done manually by everyone who knows the syntax of RDF a bit. The risk is that it not everybody can do it properly so it is recommended to use applications which generates RDF.

- **Explain the Semantic Web Stack of technologies.**

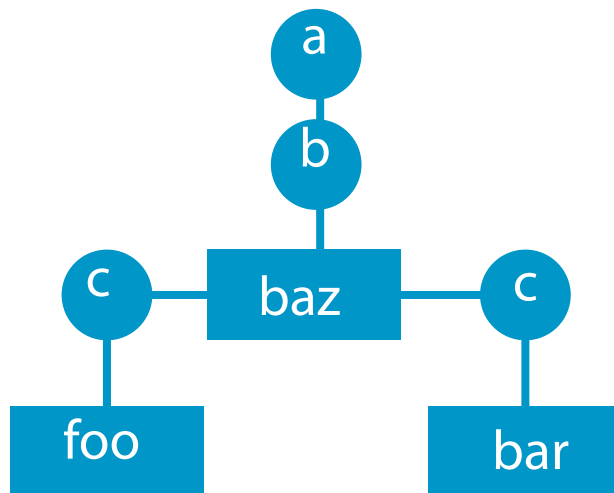
The Semantic Web Stack illustrates the architecture of the Semantic Web. The functions and relationships of the components can be summarized as follows:

- XML provides an elemental syntax for content structure
- XML Schema is a language for providing and restricting the structure and content
- RDF is a simple language for expressing data models
- RDF Schema extends RDF and is a vocabulary for describing properties and classes of RDF-based resources

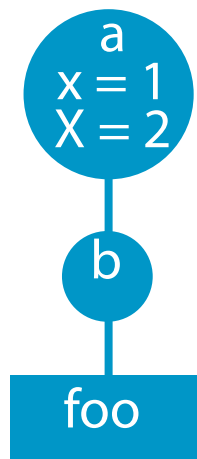
- OWL adds more vocabulary for describing properties and classes: among others, relations between classes.
- SPARQL is a protocol and query language for semantic web data sources.
- **What is the main syntax for RDF? What are its advantages over other syntaxes?**
XML, simplicity in use. It is supported by other programming languages.
- **What is the role of the ontologies in the Semantic Web?**
It is used in information integration, knowledge management and it is supporting information exchange process. Ontologies help both people and machines to communicate precisely to support the exchange of semantics. Ontology language editors help to build semantic Web.
- **What are the 4 principles of Linked Data?**
 - Use URIs to identify things.
 - Use HTTP URIs so that these things can be referred to and looked up ("dereferenced") by people and user agents.
 - Provide useful information about the thing when its URI is dereferenced, using standard formats such as RDF/XML.
 - Include links to other, related URIs in the exposed data to improve discovery of other related information on the Web.

1 Warm-up: Well-formedness of the XML

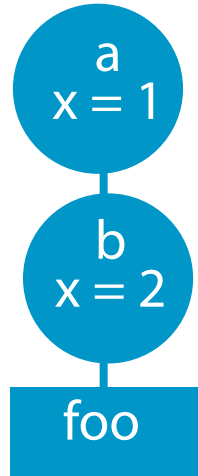
- `<a><a>`
not well-formed. Closing tag of second `<a>` is missing
- `<a>foo<a>bar`
not well-formed. Root element is missing
- `<a>foobar`
not well-formed. Closing tag of `` is missing
- `<a><c>foobar</c>`
not well-formed. Wrong order of closing tags
- `<a/>foobar`
not well-formed. `<a>` element is missing, `` should be with closing tag
- `<a><c>foo</c>baz<c>bar</c>` - well-formed



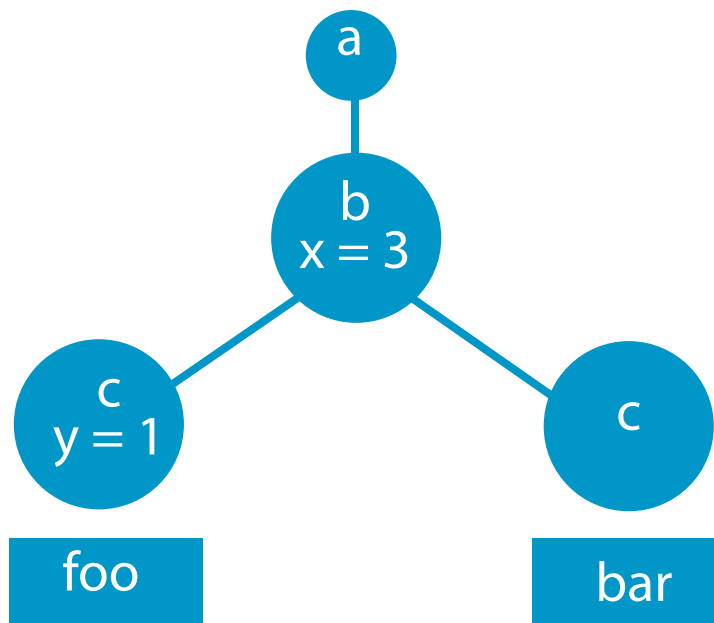
- `foo` - well-formed



- `<b x="2">foo` - well-formed



- `foo`
not well-formed. Parameter x was already defined for <a> element
- `<a><b x="3"><c y="1">foo</c><c>bar</c>` - well-formed



2 Creating XML document

```

<book>
  <author>Jeremy Clarkson</author>
  <title>Świat według Clarksona</title>
  <date>2006</date>
  <publisher>Insignis</publisher>
</book>
  
```

3 DTD

```

<!DOCTYPE book [
<!ELEMENT book (author+, title, date, publisher)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT date (#PCDATA)>
<!ELEMENT publisher (#PCDATA)>
]>

```

4 XSD

```

<?xml version="1.0" encoding="utf-8" ?><xs:schema
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="book">
    <xs:complexType>
<xs:sequence>
  <xs:element name="title" type="xs:string"/>
  <xs:element name="publisher" type="xs:string"/>
  <xs:element name="year" type="xs:positiveInteger"/>
  <xs:element name="authors">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="author"
type="xs:string"
minOccurs="1" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:sequence>
<xs:attribute name="asin" type="xs:string" use="required"/>
  </xs:complexType>
</xs:element>
</xs:schema>

```