

Are you afraid of **Semantic** Web?

Dr. Sabin-Corneliu Buraga

Faculty of Computer Science

“A.I.Cuza” University of Iași, România

<http://www.infoiasi.ro/~busaco/>



Attention, please... a first question for you:

What is **Semantic** Web?

Any opinions?



Some (possible) answers

Semantic Web is...

- A vision of Sir **Tim Berners-Lee** (the creator of World Wide Web)
- A transition from “classical” Web to a more structured and flexible one
- A way of describing data, in terms of metadata (data about data) and explain certain relations between resources



They could told you that...

...**Semantic Web** is:

- Just hype – YABW (Yet Another Buzz Word)
- Nothing but the Web 2.0 in disguise
- About “strange” and complex formalisms (e.g., description logic)
- A field of study for “mad” scientists and their flying ideas
- Not applicable in practice (e.g., not interesting for industry)



Wrong!



The truth

Semantic Web is already among us!

Semantic Web is a misnomer – in fact,

Data Web is a more suitable term

- From “opaque” documents to machine understandable data (resources + links between them)
- A plenty of tools, applications, services, expertise available



Ingredients

RDF (Resource Description Framework)

- Defining & describing data and relations among data
- Suitable to attach metadata to certain resources
- Data modeling must make the implicit explicit:
 - “PHP is a programming language.”
 - “pOWL is an application written in PHP.”
 - “PHP is easy than C++.”

Some people can understand these assertions.
How about the machines?



Ingredients

RDF (Resource Description Framework)

- A triple {subject, property, object} model
 - hasWebsite ("#php", "http://www.php.net/")
 - isA ("#php", "#language")
 - isWrittenIn ("http://powl.sf.net/", "#php")
- It's all about triples of URIs (Uniform Resource Identifiers)
- Many syntactic representations, including XML (Extensible Markup Language)



Ingredients

RDF (Resource Description Framework)

```
<rdf:RDF>
```

```
<rdf:Description rdf:about="http://powl.sf.net/">
```

```
<s:Title>PHP-based ontological Web platform.</s:Title>
```

```
<s:Version s:major="1" s:minor="0" />
```

```
</rdf:Description>
```

```
</rdf:RDF>
```

Our defined metadata vocabulary



Ingredients

OWL (Web Ontology Language)

- Structuring and characterizing resources/relations
(e.g., “PHP” is an instance of “Language” class)
- Defining logical relationships among resources and the relationships (1-to-1, 1-to-many,...)
- Based on RDF
- Used to denote taxonomies, thesauri, ontologies



Other ingredients

Metadata vocabularies

- **DCMI (Dublin Core Metadata Initiative)**
- **FOAF (Friend Of A Friend)**
- **DOAP (Description Of A Project)**
- **SIOC (Semantically-Interlinked Online Communities)**

- ...and many others



Other ingredients

```
<foaf:Person rdf:ID="lucian">
  <foaf:name>Lucian Savluc</foaf:name>
</foaf:Person>
<foaf:Person rdf:ID="sabin">
  <foaf:name>Sabin Buraga</foaf:name>
  <foaf:homepage rdf:resource="http://www.infoiasi.ro/~busaco" />
  <foaf:knows rdf:ID="#lucian" />
</foaf:Person>
<foaf:Image rdf:about="http://eliberatica.ro/2007/photos/part.jpg">
  <dc:title>eLiberatica participants</dc:title>
  <foaf:depicts rdf:resource="#lucian" />
  <foaf:depicts rdf:resource="#sabin" />
</foaf:Image>
```



Other ingredients

Web syndication via RSS/Atom

- Metadata about blog entries, wiki changes,...
- Syndication as Web service

Query via SPARQL

```
SELECT ?name ?url
WHERE {
  ?person foaf:name ?name.
  OPTIONAL{ ?person foaf:homepage ?url. }
}
ORDER BY DESC (?name)
```



Other ingredients

Microformats

- Embedding semantic constructs into XHTML documents
- Using XHTML markups and CSS classes
- Representative: hCard, hCalendar, hReview, hResume, geo, rel-tag,...
- Useful for semantic tagging (folksonomies)
- Suitable to create mash-ups, too

More: RDFa, XHTML 2.0, ontologies for Web services, RIF (Rules Interchange Format) etc.



Other ingredients

Microformats

hCard Creator

hCard-o-matic

name

company

street

city **state** **zip**

phone

url

photo url


code

```

<div class="vcard">
  
  <a class="url fn" href="http://www.infoiasi.ro/~busaco/">Sabin
  Buraga</a>
  <div class="org">UAIC</div>
  <div class="adr">
    <div class="street-address">Berthelot, 16</div>
    <span class="locality">Iasi</span>,
    <span class="region">IS</span>
    <span class="postal-code">400475</span>
  </div>

```

preview



[Sabin Buraga](#)
 UAIC
 Berthelot, 16
 Iasi, IS 400475
 +40232201090

Tools

- Firefox extensions for retrieving metadata: PiggyBank, Operator, Semantic Radar, Tails
- Editors: Protégé, SWOOP, vi
- Semantic platforms: Jena, KAON, pOWL, Redland
- Semantic wikis: IkeWiki, Semantic MediaWiki, XWiki
- Search for ontologies: Swoogle



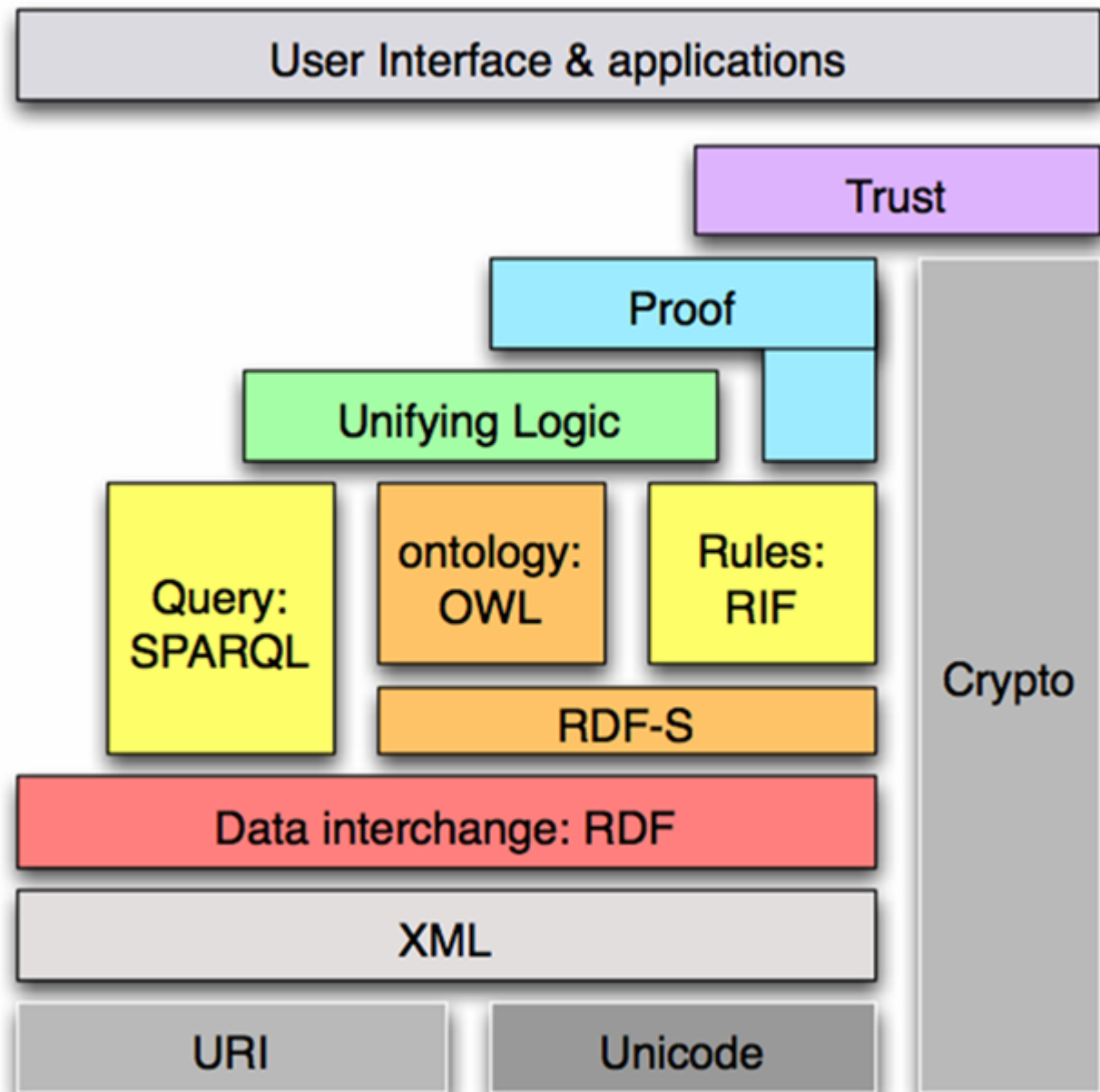
Applications

- Portals: Harper's Online magazine, Sun's SwordFish, Vodafone's Live Mobile Portal
- Agent systems: ADF, Zeus
- Web services: WSMX
- Biology: BioPAX, Haystack, Gene Ontology

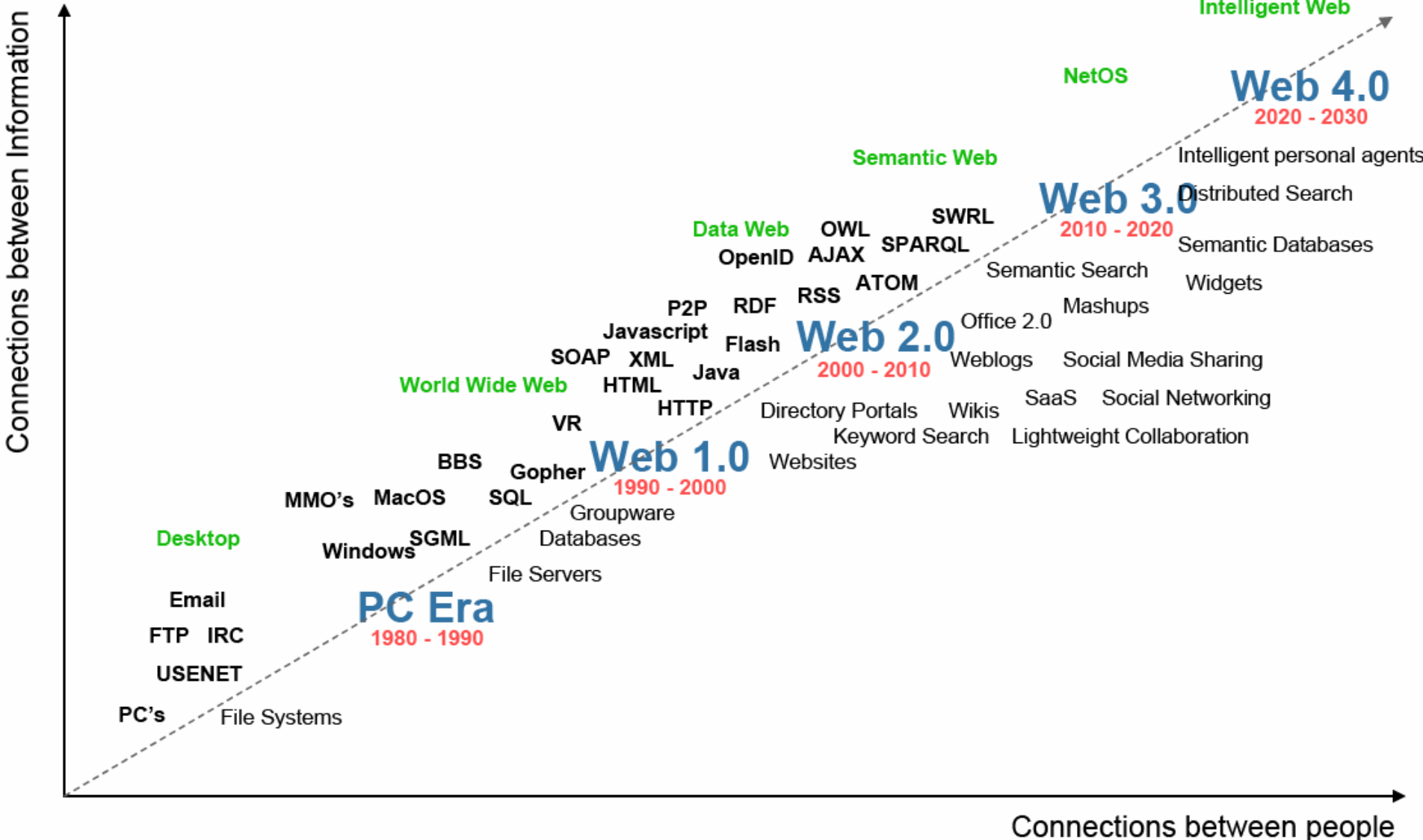
- Current directions: Health Care & Life Sciences, Public Administration, Engineering
- Other initiatives: semantic search, semantic desktop, semantic mash-ups, semantic grid,...
- Semantic anything?!



Layered
architecture
of the
Semantic Web
(Berners-Lee,
2006)



This is just the beginning...



Places to visit...

- Web Consortium: www.w3.org
- PlanetRDF: www.planetrdf.com
- Microformats: www.microformats.org
- BabelFish: <http://blogs.sun.com/bb1fish/>
- List of 250 Semantic Web tools:
www.mkbergman.com/?p=347



Attention, please... a second question for you:

Are you afraid of Semantic Web?

Thank you!



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