Are you afraid of Semantic Web?

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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

Tools

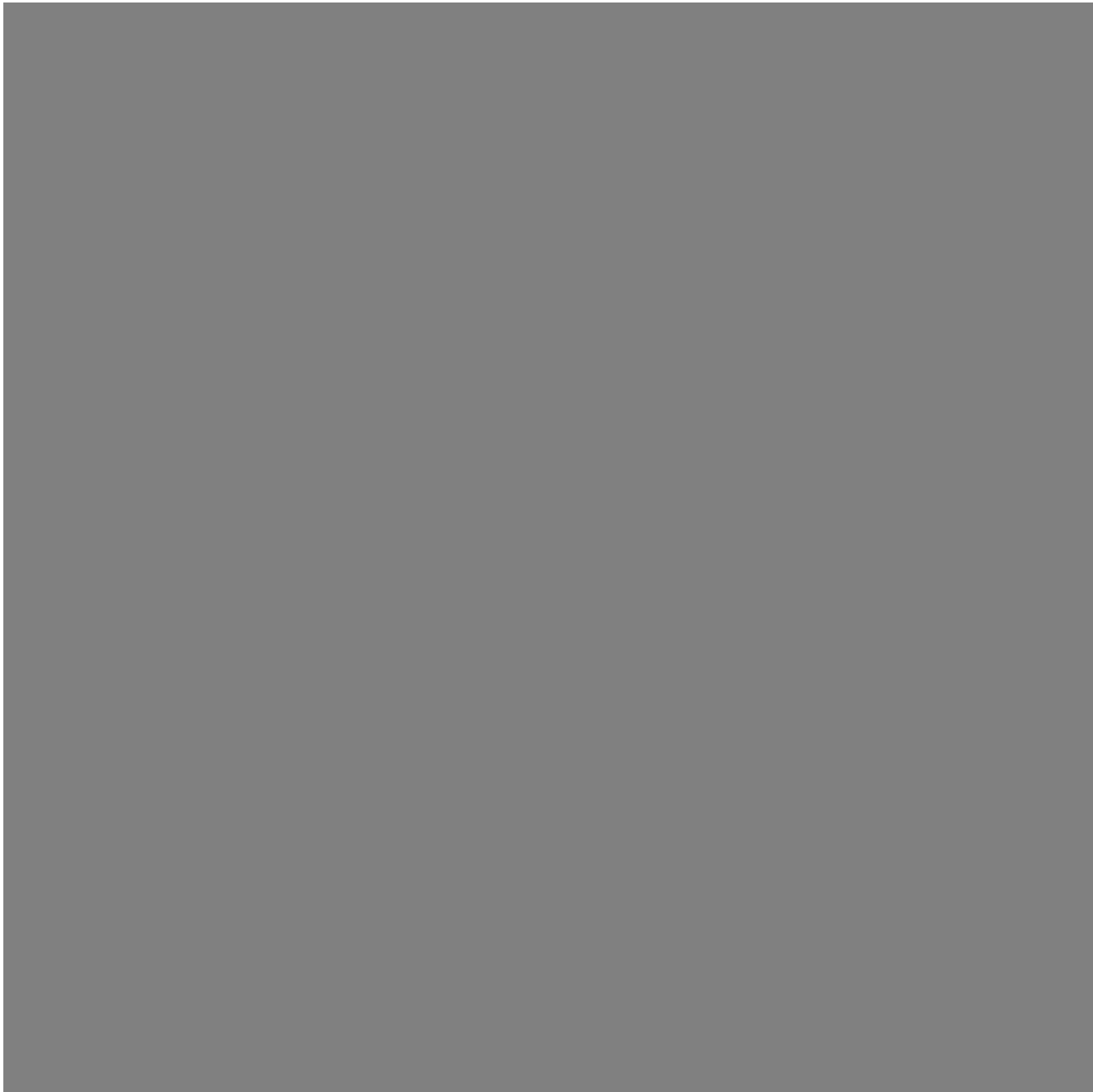
- Firefox extensions for retrieving metadata: PiggyBank, Operator, Semantic Radar, Tails
- Editors: Protégé, SWOOP, vi
- Semantic platforms: Jena, KAON, pOWL, Redland
- Semantic wikis: IkeWiki, Semantic MediaWiki, XWiki
- Search for ontologies: Swoogle

Applications

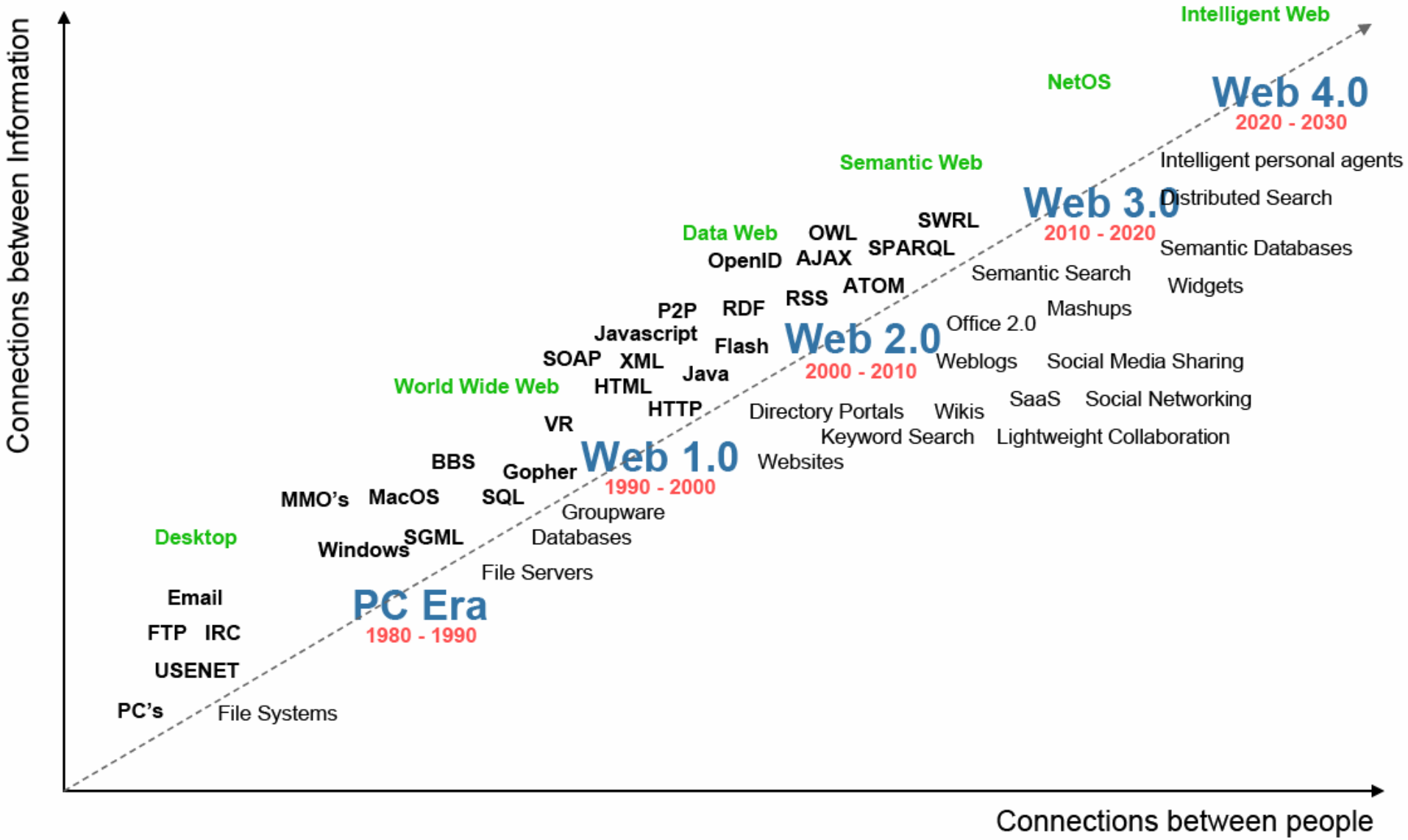
- Portals: Harper's Online magazine, Sun's SwordFish, Vodafone's Live Mobile Portal
- Agent systems: ADF, Zeus
- Web services: WSMX
- Biology: BioPAX, Haystack, Gene Ontology

- 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/bblfish/
- 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!

Acknowledgment

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