Semantic Web Engineering

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http://seal.ifi.uzh.ch/semweb

Fr. 10:15-11:45, Room 2.A.10

University of Zurich
Department of Informatics

s.e.a.l.
software evolution & architecture lab

Organization

- Lecture every Friday 10:15 – 11:45
- First lecture: Overview Semantic Web
- Seminar style:
  - Weekly exercise of reading task
  - Questions to answer until next lecture
  - Discussion of answers in next lecture
- Participation in discussion basis for grading
- Final grade before Christmas

Topic of the Lecture

- What is the Semantic Web?
- W3C recommendations RDF, RDFS, OWL
- Ontology Engineering
- Storing and retrieving of semantic data
- Semantic Web in practice
- Semantic Web technologies beside the Web

Introduction

Overview of the Semantic Web

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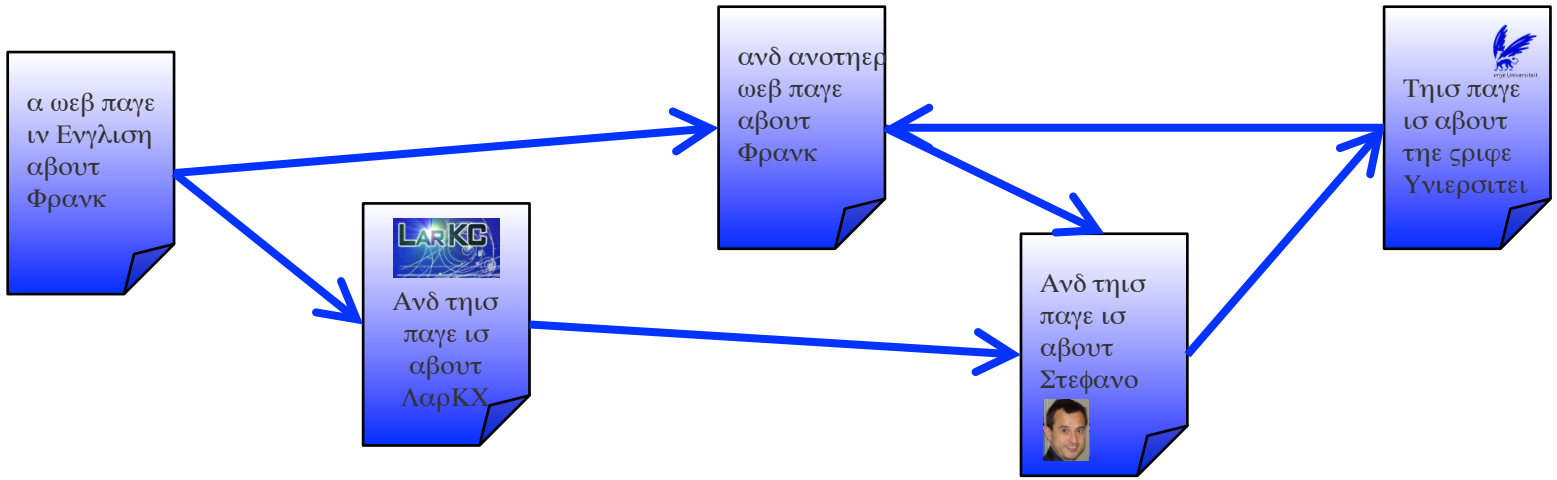
The Current Web of Text and Pictures



linked web-pages,
written by people,
written for people,
used only by people...

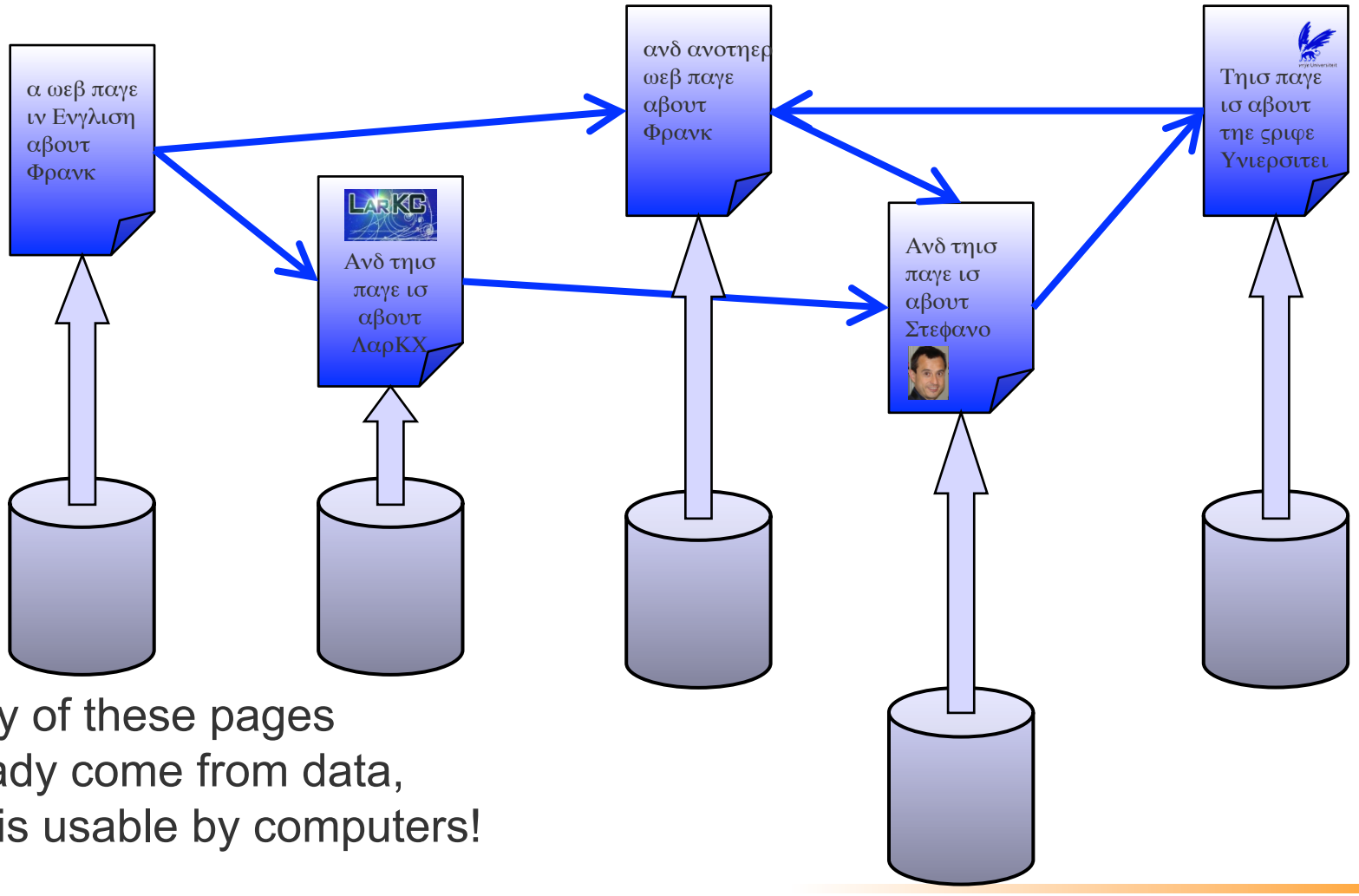
Problem with current Web Pages

- Mark-up consists of:
  - rendering information (e.g., font size and color)
  - Hyper-links to related content
- Semantics of the content is accessible to humans but not (easily) to computers…
  - Requires (at least) NL understanding

Shortcomings of the Current Web

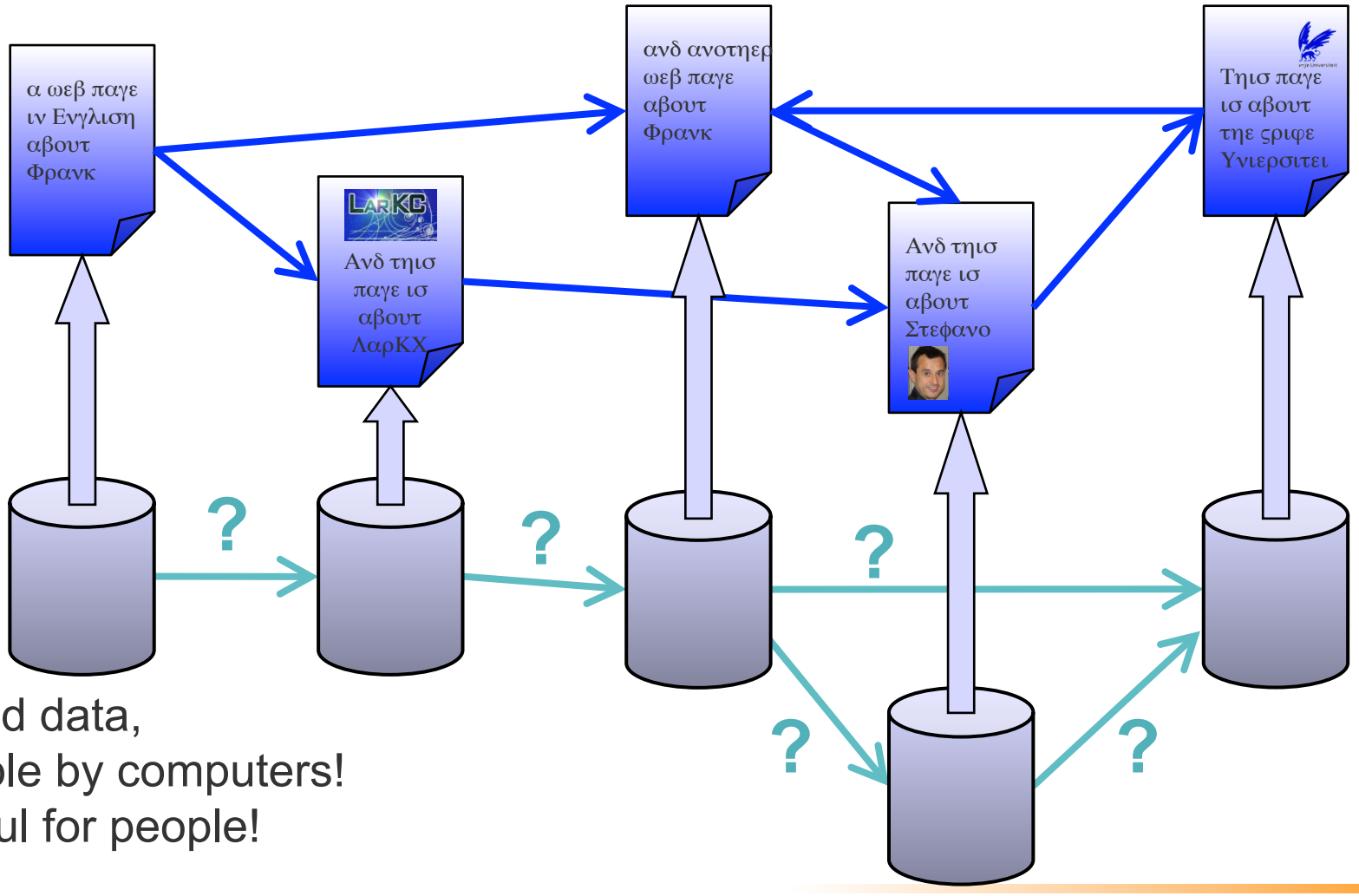
- To navigate through the Web we use:
  - Links that establish connections between Web pages.
  - Search engines support only for keyword search
    - The same word is used for different concepts in the real world:
      - jaguar (animal) ↔ jaguar (car)
    - Problem when formulating complex queries: Find information about “animals that use sonar but are neither bats nor dolphins”, (e.g. barn owl)
    - When formulating the search request the user has to think of words that might appear on Web pages that contain the wanted information.
    - A search results in a set of Web pages that might contain the wanted information, not the information itself.
      - Information retrieval ←→ location finder
    - One gets lost in the vast number of irrelevant search results and may miss relevant material.

The Current Web of Text and Pictures



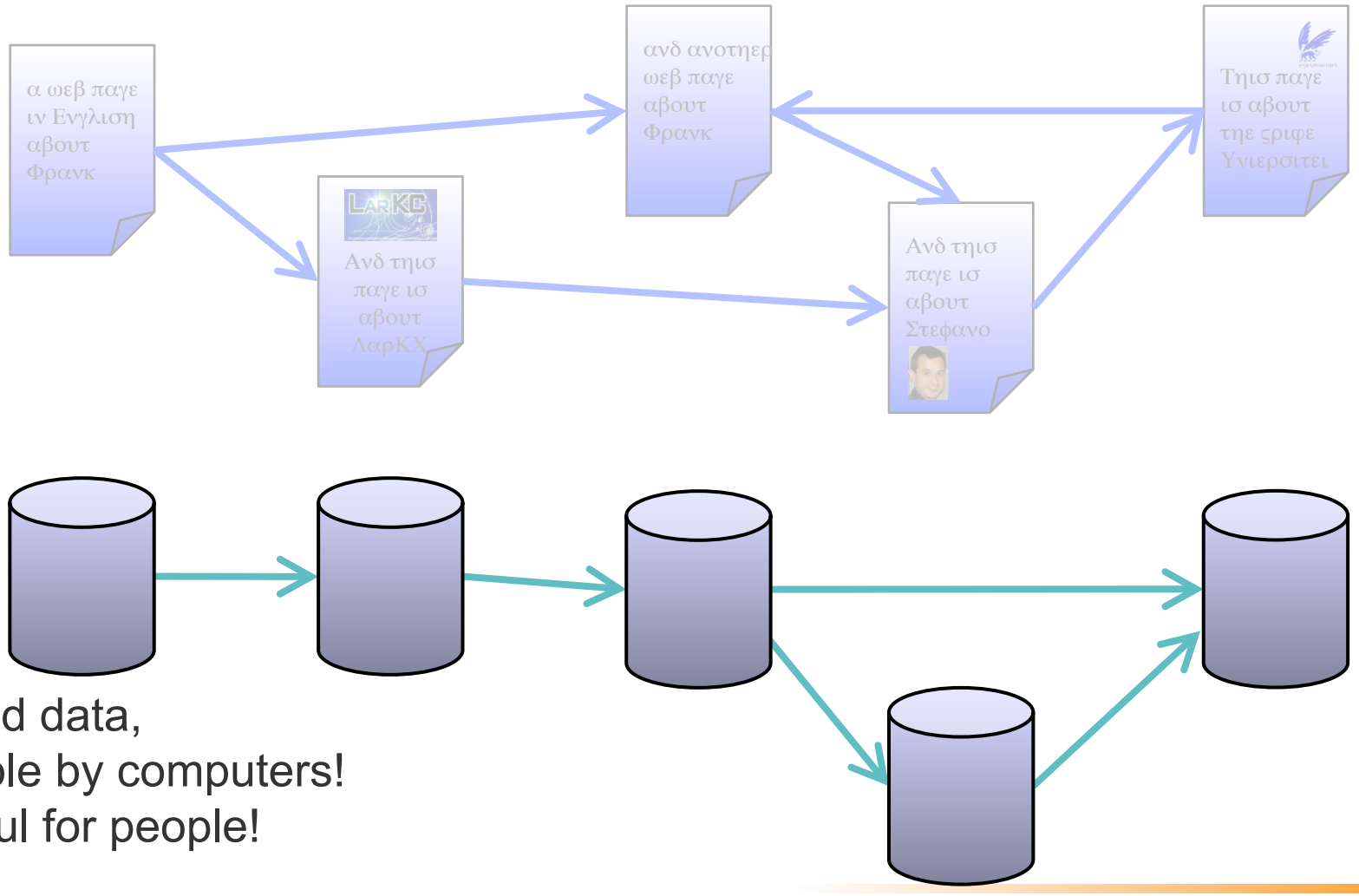
Many of these pages already come from data, that is usable by computers!

The Current Web of Text and Pictures



linked data,
usable by computers!
useful for people!

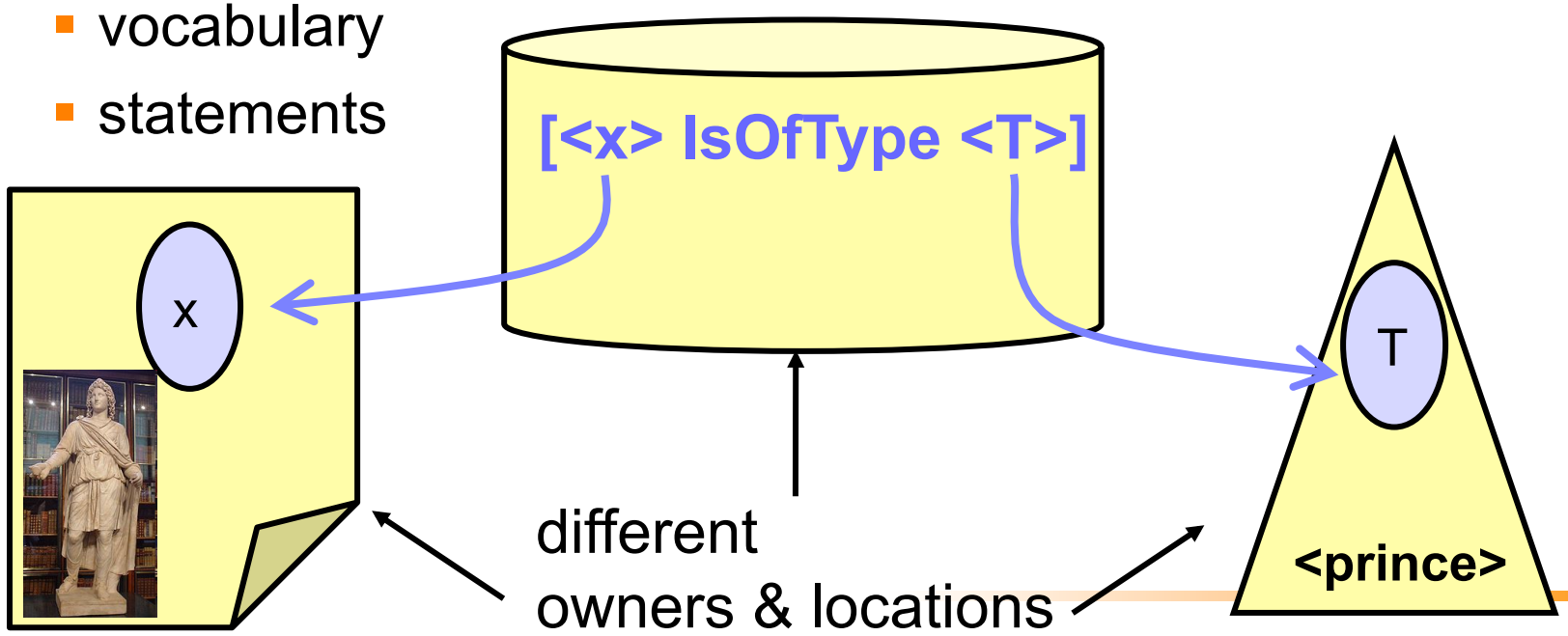
The Future Semantic Web



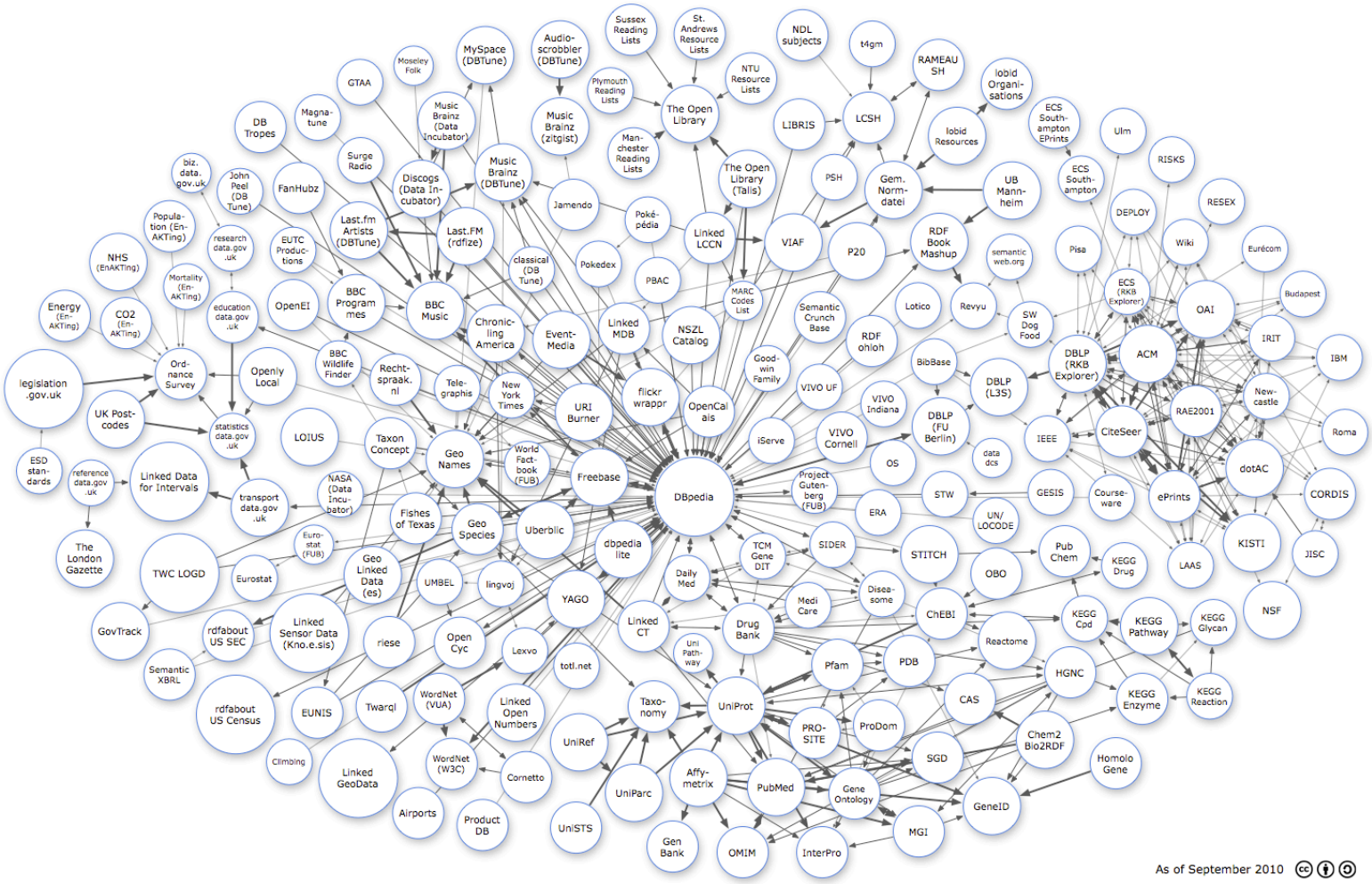
linked data,
usable by computers!
useful for people!

Semantic Web – The Web of Data

- All identifiers are URL's (= on the Web)
  - Allows total decoupling of
    - objects
    - vocabulary
    - statements



The Semantic Web is happening!



As of September 2010

Linking Open Data cloud diagram, by Richard Cyganiak and Anja Jentzsch. http://lod-cloud.net/

Semantic Web Definition

"The Semantic Web is an extension of the current Web in which information is given well-defined meaning, better enabling computers and people to work in cooperation."

Tim Berners-Lee, James Hendler, Ora Lassila, *The Semantic Web*, Scientific American, May 2001

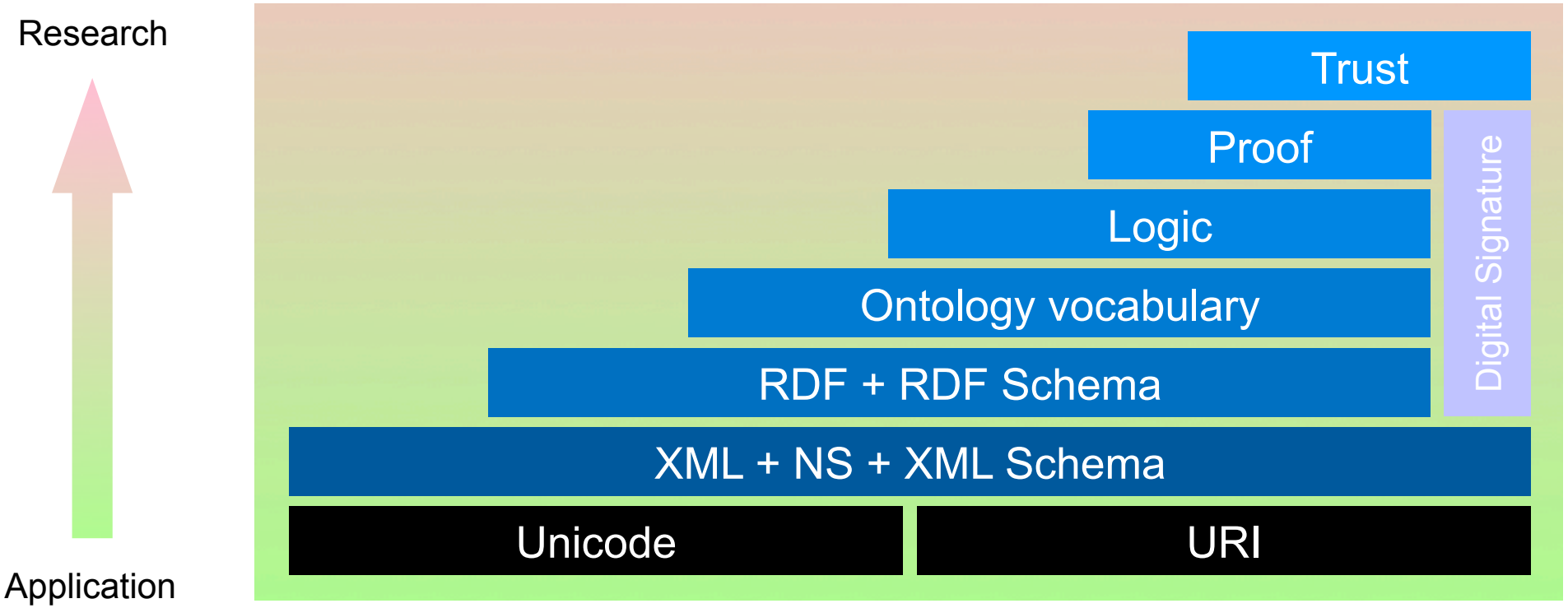
- This definition implies:
  - The Semantic Web is an extension of the current Web.
    Not a new one!
  - Information is given a well-defined meaning (semantic) using meta-data describing the meaning.
  - Tools will then operate on this meta-data.

The Semantic Web Vision

"The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming."

http://www.w3.org/2001/sw/

The Semantic Layered Cake



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