



Aalto University  
School of Science  
and Technology

# OOA Architecture

## – Towards a Network of Linked Ontology Repositories

Kim Viljanen, Jouni Tuominen

First.Last@tkk.fi

Semantic Computing Research Group SeCo

Aalto University and University of Helsinki

<http://www.seco.tkk.fi>

November 19, 2010

# Outline of the presentation

- Our background
  - Is there a “one-size fits all” OOR solution?
  - Our suggestion for the OOR architecture
  - What next?
- 
- Please forgive us if some of the issues have been already discussed.

# Our (=SeCo) background

- Semantic Computing Research Group (SeCo), <http://www.seco.tkk.fi/>
- Building a national semantic web infrastructure in Finland (FinnONTO), 2002-
- Running an ontology repository ONKI, 2008- ("production" use)
- Use cases we have been focusing on: annotating, ontology-based information retrieval, ...
- Eero Hyvönen, Kim Viljanen, Jouni Tuominen and Katri Seppälä: [Building a National Semantic Web Ontology and Ontology Service Infrastructure--The FinnONTO Approach](#). *Proceedings of the European Semantic Web Conference ESWC 2008*.
- Kim Viljanen, Jouni Tuominen and Eero Hyvönen: [Ontology Libraries for Production Use: The Finnish Ontology Library Service ONKI](#). *Proceedings of the European Semantic Web Conference ESWC 2009*.
- Kim Viljanen, Jouni Tuominen, Mikko Salonoja and Eero Hyvönen: [Linked Open Ontology Services](#). *Workshop on Ontology Repositories and Editors for the Semantic Web (ORES 2010)*, ESWC 2010.
- For all publications, see: <http://www.seco.tkk.fi/services/onki/>

# What can we bring to the table?

- Ideas and experience
  - Building a national semantic web infrastructure
  - Running an ontology repository, 2008- (“production” use)
  - “LOOS API” – accessing distributed ontology repositories; implementing user-interfaces on top of the LOOS API
  - ONKI Selector widget
  - Implementations for different user-interfaces and ontology servers (generic “ONKI SKOS”, geo ontology server, ...)
  - ...

**ONKI** Ontologies and vocabularies Instructions About Feedback suomi svenska in English

Ontologies and vocabularies

**Finnish Ontology Library Service ONKI**

Please begin by selecting an ontology or a vocabulary for browsing. You can also search from all or specific ontologies and vocabularies by using the search at the right.

**Search information faster**

Yleinen suomi Select your search targets beforehand.  
 allaj  
 Allmän tesauri

Search for concept...  
 Language: en Clear  
 Select ontologies and vocabularies

Search for ontology or vocabulary: 59 hits

**Subject**

- 8 Upper
- 12 Domain
- 5 Business
- 13 Cultural
- 5 Geography
- 10 Health
- 3 Nature
- 3 Public administration

**Structure**

- 30 Class ontology
- 6 Instance ontology
- 18 Advanced vocabulary
- 5 Simple vocabulary

**Publishing status**

- 30 Public ONKI-ontology
- 13 Development
- 5 Own ONKI

- AFO Ontology
- Allmän tesaurus på svenska - Allars
- Coordinate fetching
- Creative Commons Licenses
- DCMI Type Vocabulary
- Disaster ontology
- Erytisyryhmä-ontologia
- Finnish General Upper Ontology - YSO
- Finnish Music Thesaurus - MUSA/CILLA
- Iconclass
- Integrated Public Sector Vocabulary - IPSV
- Julkishallinnon ontologia - JUHO
- Kaunokki Ontology
- Kaunokki Thesaurus

URI: [http://www.yso.fi/onto/sapo/Ahlainen\(1908-1971\)](http://www.yso.fi/onto/sapo/Ahlainen(1908-1971))

Share: [Share](#) | [G+](#) | [Dribbble](#) | [Behance](#) | [Facebook](#) | [Twitter](#)

Map controls: Kartta, Satelliitti, Hybridi

Map labels: Viitameri, Noormarkku, Pori, Ulvila, Viasvedenlahti, Luvia, Nakkila

Map features: Merkarvia, Pomarkku, E8, 8, 23, 11

Map footer: POWERED BY Google, Karttadot ©2011, Karttadot

**Keywords:**

**Place of use:**

KOKO Ontology

Ontology browser Information about the ontology Language English

**Concept Search**

0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Å Ä Ö [All]

[Abaca fibers](#)  
[Abacavir sulfate](#)  
[Abacus or counting frames](#)  
[Abciximab](#)  
[Abdominal binders](#)  
[Abdominal retractors](#)  
[Abrasion resistant castable](#)

**Acetylene**

URI: <http://www.yso.fi/onto/unspsc/C15111506>

**Context**

- UNSPSC
  - Raw materials
    - Fuels and Fuel Additives and Lubricants and Anti corrosive Materials
      - Gaseous fuels and additives
        - Gaseous fuels
          - Acetylene [Show 9 coordinate concepts](#)

**Properties**

- Label (en): Acetylene
- Label (fi): Asetyleeni
- Broader term: [Gaseous fuels](#)

# Why we want to participate in OOR

- Sharing and developing best practices
  - APIs, specifications
  - Tools, components
- Improving our national ontology repository ONKI with content from international ontology repositories
- Networking and building a global community
- Benchmarking our work

# There is no "one-size fits all" solution

- Different use cases
    - metadata creators ("annotators")
    - end-users that benefit from ontologies in e.g. information retrieval
    - ontology developers
    - developers of ontology-enhanced applications
    - ...
  - Users with different background skills
    - non-expert library customers vs. subject specialists
  - Different types of ontologies need for different kind of user interfaces
    - E.g. thesaurus-like concept ontology vs. geographical ontologies
  - Different kinds of ontology service providers
    - E.g. corporate internal use vs. public service
- ⇒ Is it possible to implement a single OOR server that addresses these needs? (and needs that we don't know)

# Status now: non-interlinked repositories addressing different needs => What could we do together?

Bioportal

Cupboard

...

ONKI.fi

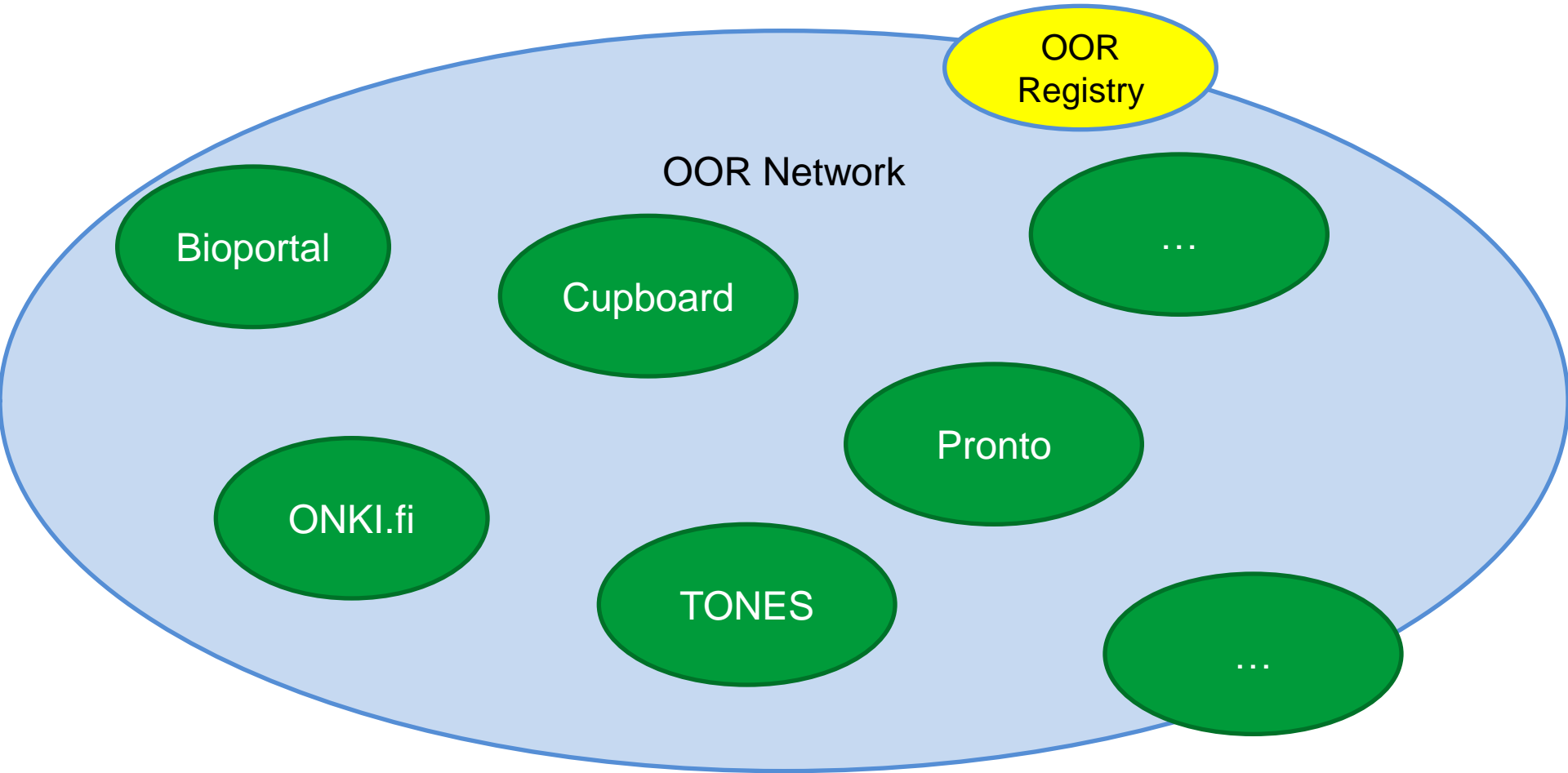
Pronto

TONES

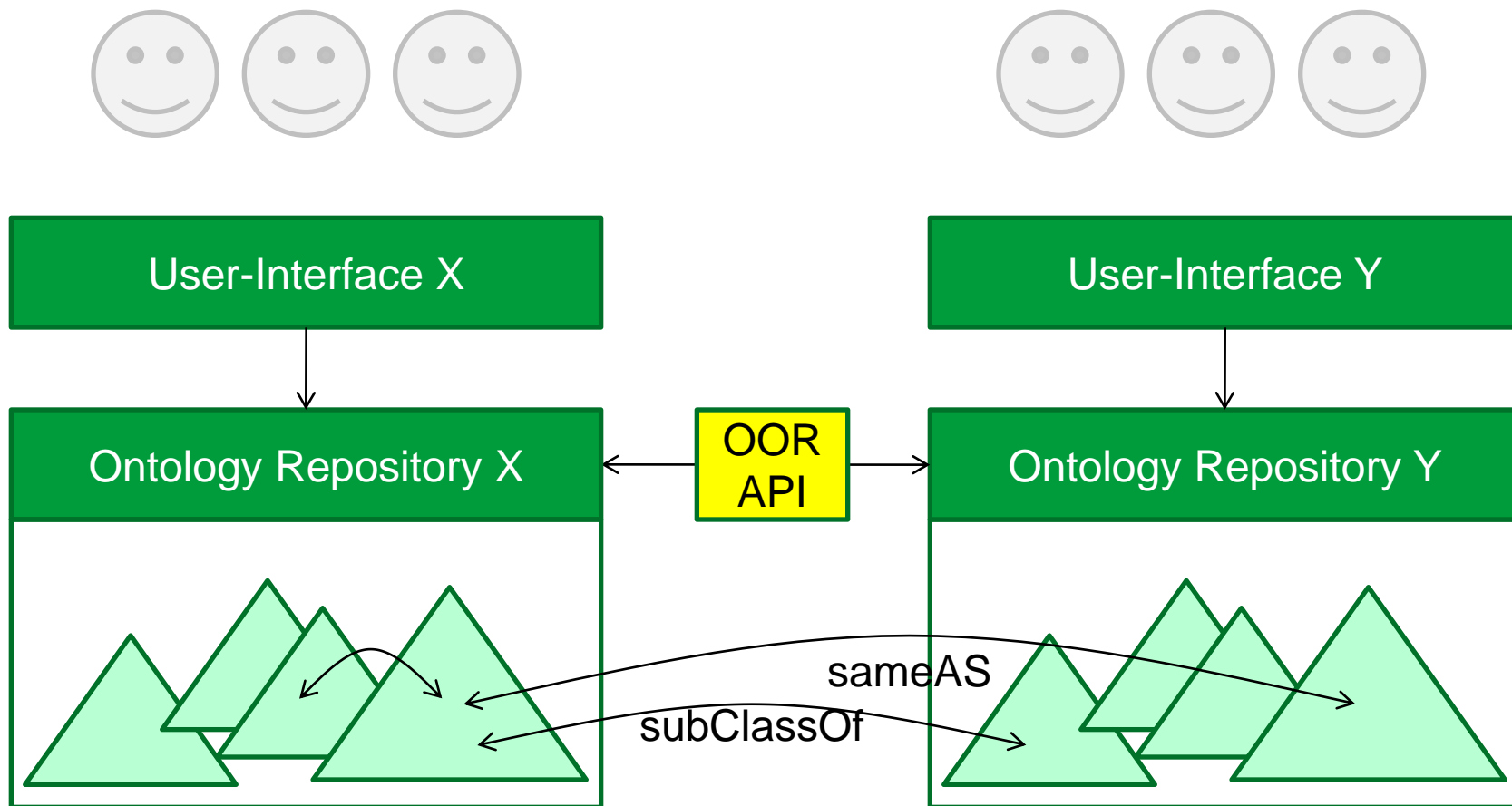
...



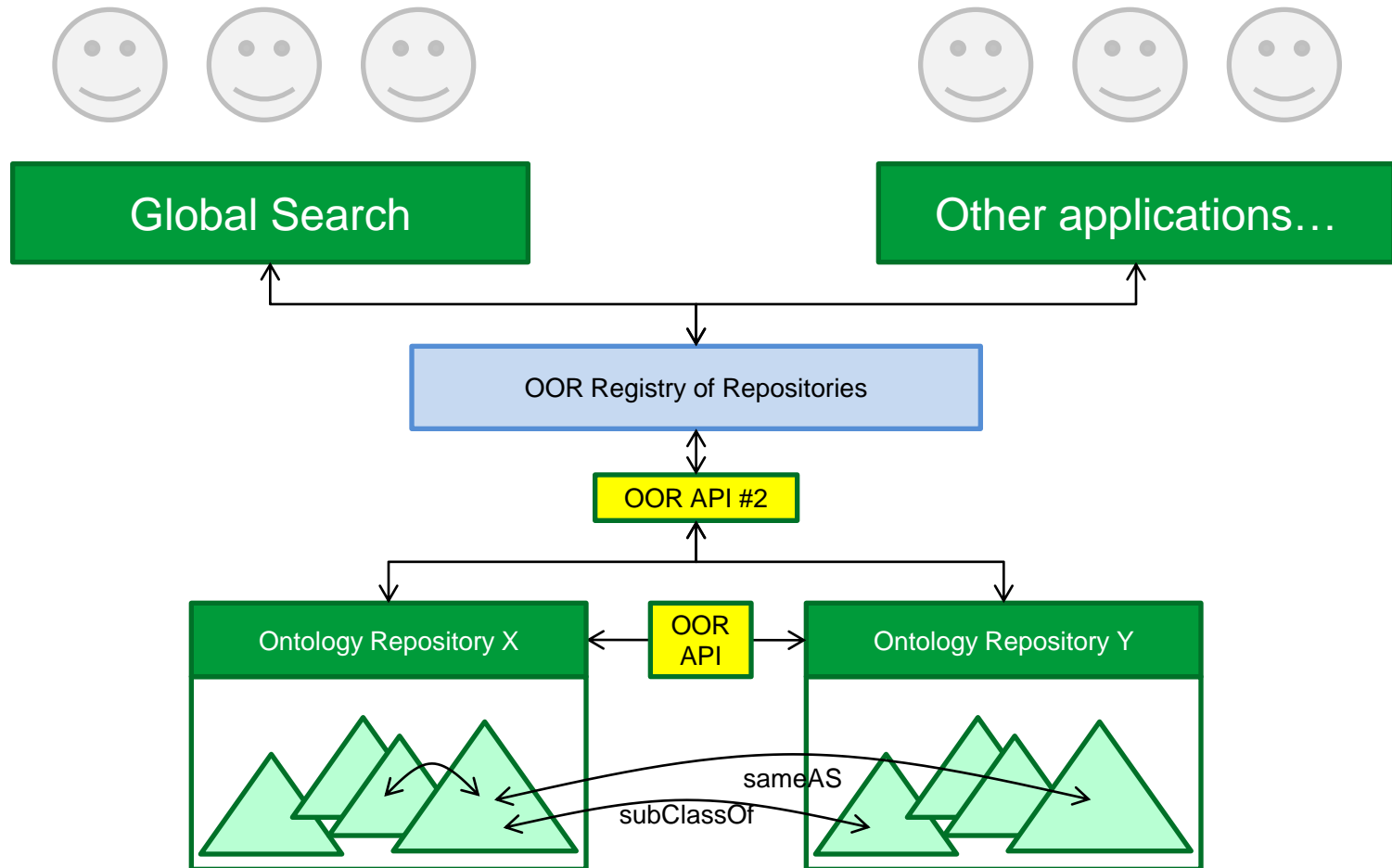
# OOR = Connecting repositories



# OOR Architecture: P2P



# OOR Architecture: Global



# So what should the OOR APIs be?

- There could be e.g. following APIs:
  - OOR Content – get the content of a specific concept/ontology/repository
  - OOR Search – keyword search for concepts, ontologies/repository
  - OOR Update – update concepts/ontologies/repository
  - OOR Network – inter-repository content sharing, e.g. indexes
- API design principles
  - **As simple as possible**
    - let the OOR implementators choose which functionalities they will implement
    - do not require to implement all APIs
  - **Support many technical solutions**
    - E.g., REST, Linked Data, Web Service, SPARQL...
    - Clients/backends may be implemented e.g. with Java, PHP, Python, JavaScript...
  - **A test suite for each API is needed**
    - To help API implementators validate that their API implementation works correctly
    - E.g. implementing OOR API to your existing Ontology Repository or your CMS

# LOOS API as an example

- search(query): supports keyword, type, etc.
- getLabels(conceptURI)
- getEquivalentConcepts(conceptURI)
- getConceptHierarchy(conceptURI)
- getOntologyOverview(ontologyURI)
- ...

# What next?

- Focus on APIs
  - Define APIs
  - Create test suites & baseline implementations
- Focus on enabling an ecosystem of Ontology Repositories (not on doing everything by ourselves)
  - Make a one-slide presentation on what are the benefits of joining the OOR network
  - Write a guide on implementing OOR compatible servers
    - In the spirit of Bizer et al. – How to Publish Linked Data on the Web
  - Should we organize a ESWC 2011 workshop on OOR?

# Could we have something like this?

