

A painting of a landscape featuring a figure in the foreground, possibly a woman in a white dress, standing near some trees. The background shows rolling hills or mountains under a cloudy sky.

Semantic Web and Digital Humanities

Eero Hyvönen, Prof., Director
Aalto University, Semantic Computing Research Group (SeCo)
<http://seco.cs.aalto.fi/>

University of Helsinki,
HELDIG – Helsinki Centre for Digital Humanities
<http://heldig.fi>

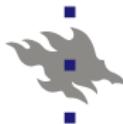
Greetings from



Developing the Digital World Together



Most Important Applications of Computing?

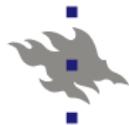


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Web!

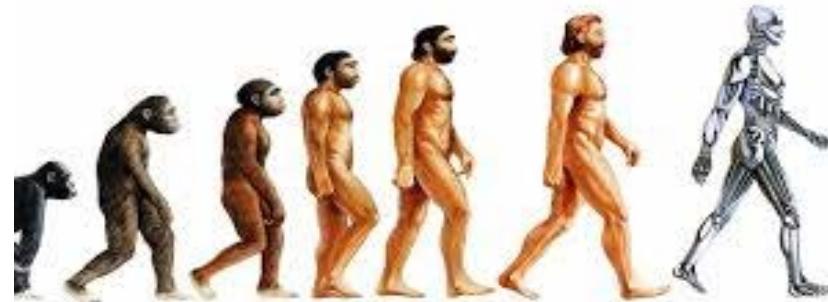


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Artificial Intelligence!

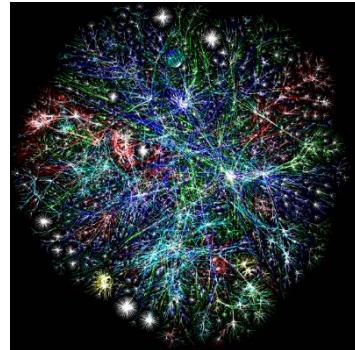


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Semantic Web = Web + Artifical Intelligence



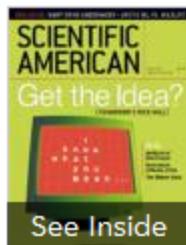
Semantic Web Activity at W3C Starts 2001

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Home » Scientific American Magazine » May 2001

Feature Articles |



The Semantic Web

A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities

By Tim Berners-Lee, James Hendler and Ora Lassila | May 17, 2001 | 10

Share Email Print



Happy 20th Birthday, World Wide Web

CERN on March 13 celebrates the 20th anniversary of a proposal entitled, "Information Management: A Proposal," by Tim Berners-Lee, which would become the blueprint for the World Wide Web »

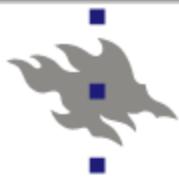
March 12, 2009



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2001

Department of Computer Science

Department information

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Semantic Web Kick-Off in Finland

Vision, Technologies, Research, and Applications

Eero Hyvönen (editor)

May 19, 2002

Helsingin yliopisto - Tietojenkäsittelytieteen laitos

[Koti](#) [Yhteystiedot](#) [Laitos](#) [Ilyhyesti](#) [Henkilöt](#) [Palvelut](#) [Opiskelu](#) [Tutkimus](#)
[Uutiset](#) ja [Tapahtumat](#)

SEMANTIC WEB KICK-OFF IN FINLAND - ÄLYKÄS WWW SUOMESSA



Helsingin yliopisto, Porthania, sali P3

Perjantai 2.11.2001, klo 9:00-16:30



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2002

SeCo Research Group is Born



Web of Data = WWW + GGG

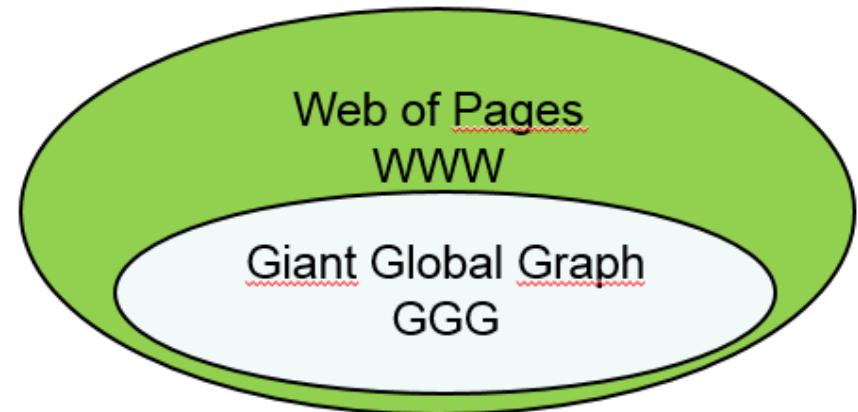
WWW = Web of Pages (for humans)

- Search/browse with a web browser
- Links connect pages

GGG = Giant Global Graph = Web of Data (for machines)

- Search/browse with a semantic web application
- Links connect data (e.g., parrot → bird)

Linked Data



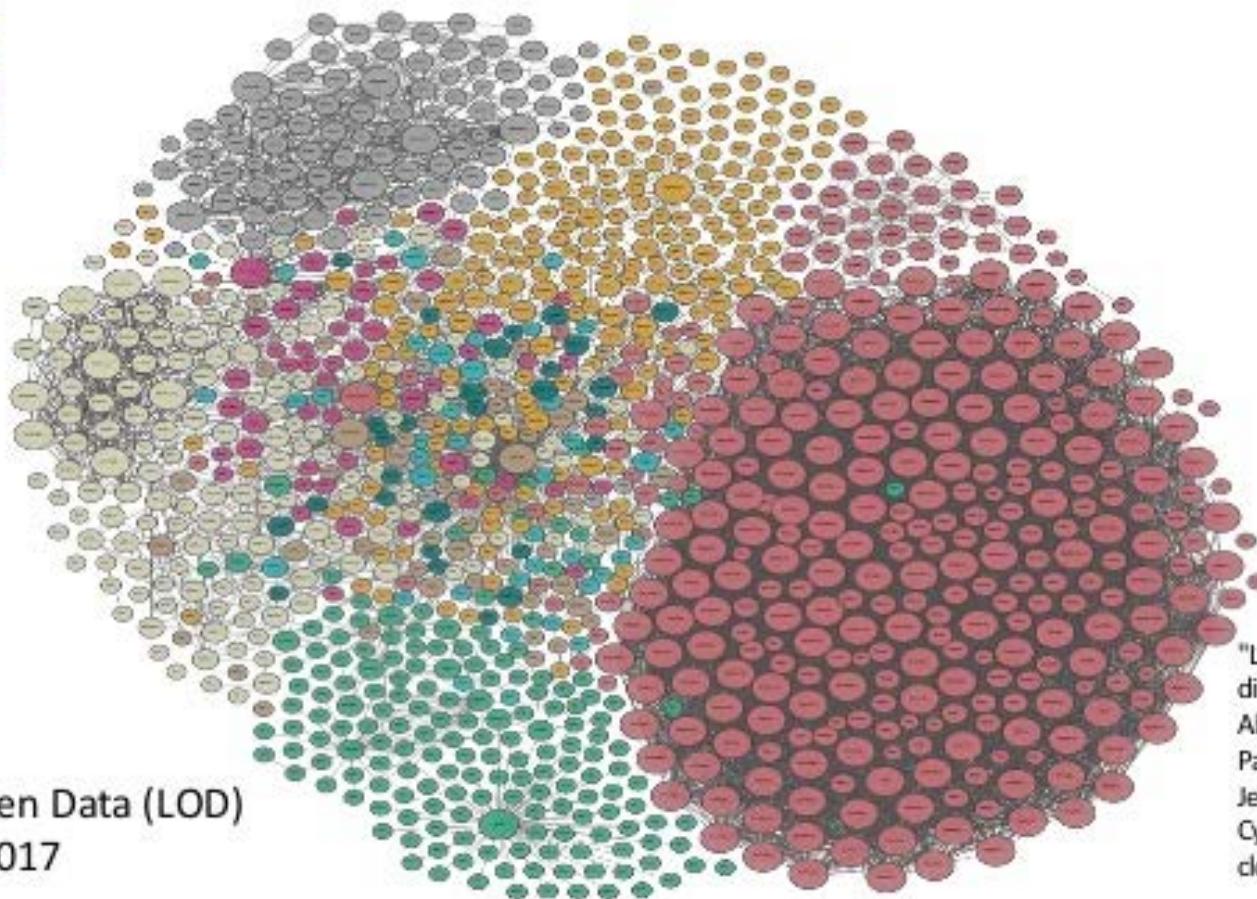
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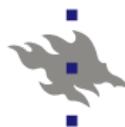
<http://linkeddata.org>

Legend
Cross domain
Geography
Governance
Life Sciences
Linguistics
Media
Publication
Social Networking
User Generated
Incoming Links
Outgoing Links



Linked Open Data (LOD)
Cloud in 2017

"Linking Open Data cloud
diagram 2017, by Andrejs
Abele, John P. McCrae,
Paul Buitelaar, Anja
Jentzsch and Richard
Cyganiak. <http://lod-cloud.net/>"



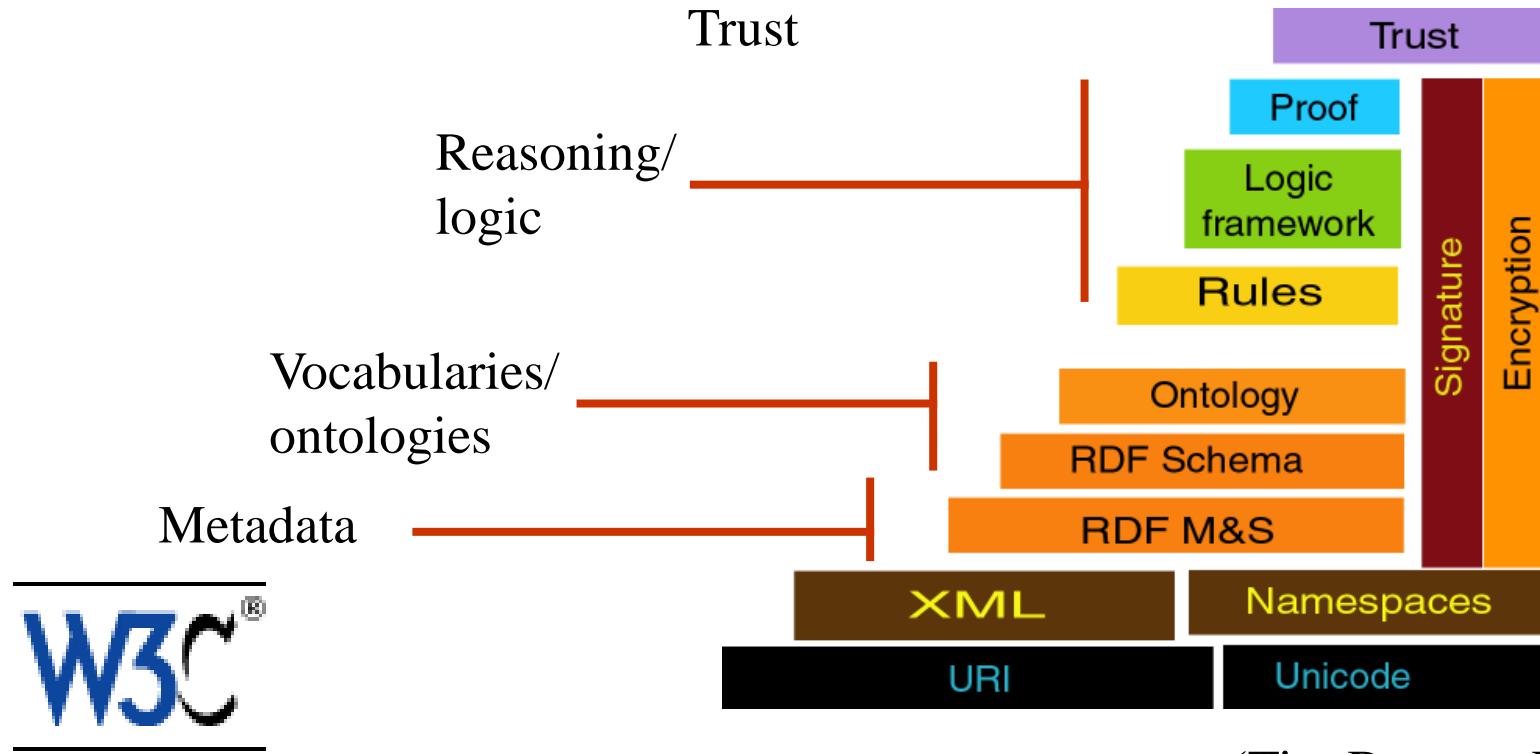
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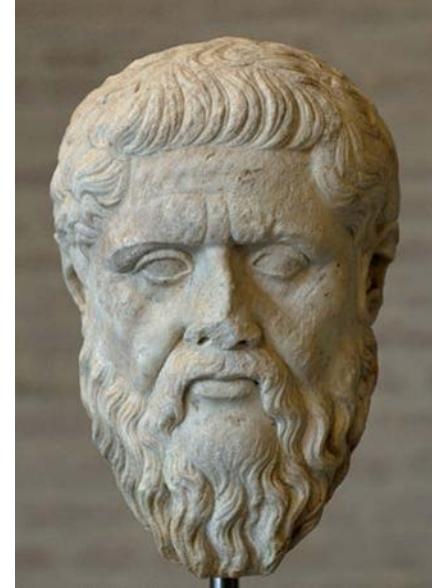
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Technology

The classical "layer cake model"





Digital Humanities?

<http://whatisdigitalhumanities.com/>

What Is Digital Humanities?

As I said on my blog: Digital Humanities is the discipline born from the intersection between humanities schools and technologies. It aims at investigating how technologies can be used to enhance research in disciplines.

Languages, Art History, Music, Culture... For this project we are grateful that Digital Humanities holds a very strong impact and relationship with specific disciplines.

What Is Digital Humanities?

Humanities- the interdisciplinary field of study characterized by critical analysis of the relationship between the produced surfaces of digital media and the information structures and cultural structures that produce them; alternatively (or additionally) it is characterized by a critical interest in how humanities scholarship is produced, consumed, and transformed in and through digital media.

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JULIA FLANDERS

What Is Digital Humanities?

DH is the inevitable future at which we thought to have arrived decades ago. Never quite living up to its own hype and underestimated nonetheless.

What Is Digital Humanities?

What Is Digital Humanities?

I think I said last year that I dislike that question, an interesting case. Its boundaries are continually shifting and elusive. Even something as simple as 'Using computers to do research in the Humanities' can have caveats. I recognise what definition of DH might be desirable, but still: I dislike the question.

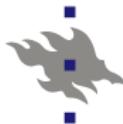
DH, standing for Digital Humanities. It

What Is Digital Humanities?

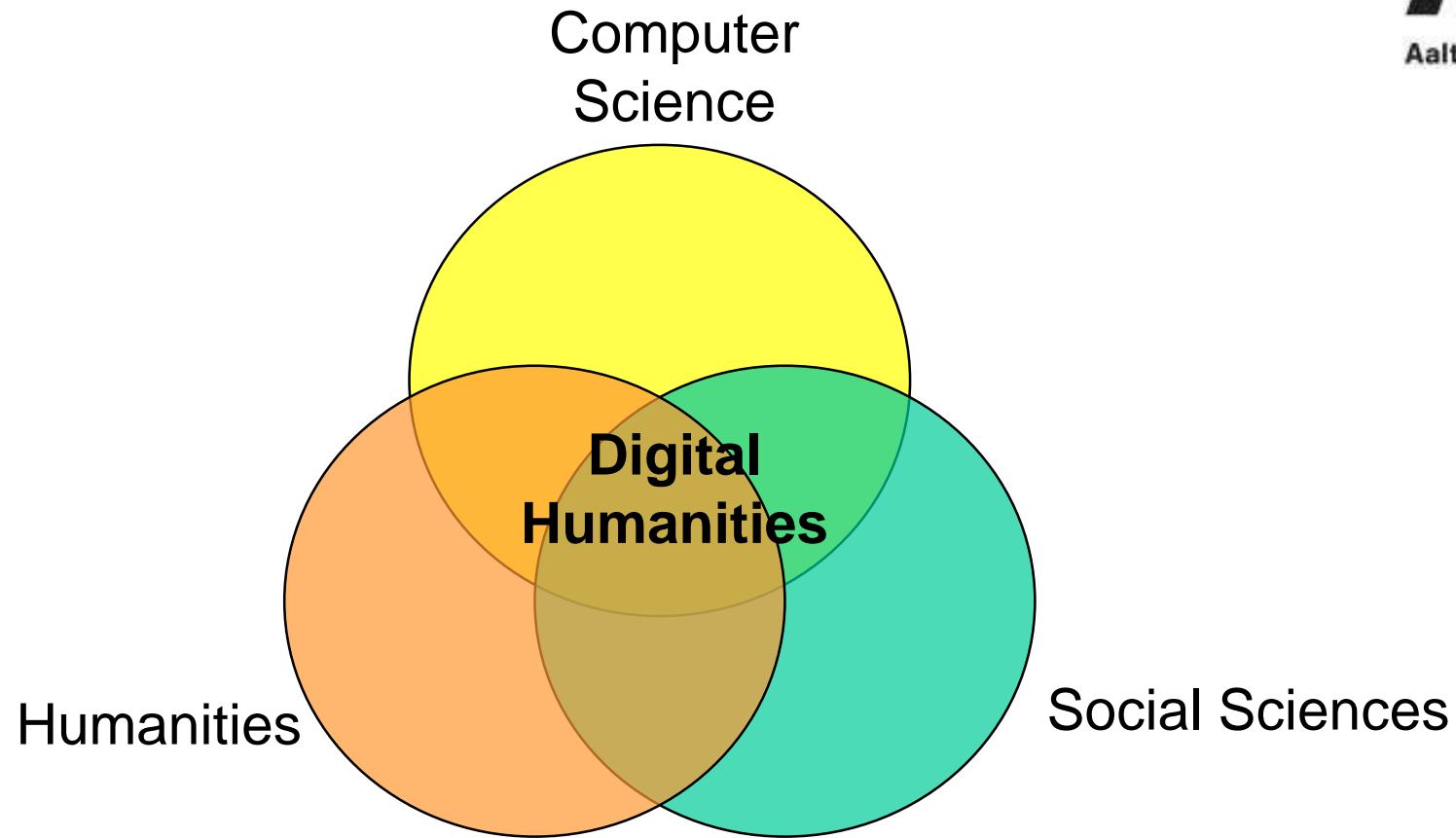
An obscure association famously made up of isolated people jointly concerned about the materiality of digital surrogates, the virtual qualities of physical relationships between avatars, and the creation of their own simulated utopia.

ALEJANDRO GIACOMETTI

JUSTIN TONRA



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1. Using & developing computational methods in H & SS
2. Studying digitalization as a phenomenon

Developing the Digital World Together

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How Does Linked Data Work in Practise?



Intelligence



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Why Semantics?

```
<artifact>
  <id>NBA:H26069:467</id>
  <target>cup and plate</target>
  <material>porcelain</material>
  <creationLocation>Germany</creationLocation>
  <creator>Meissen</creator>
</artifact>
```



- This metadata cannot answer the following questions:
 - Find all vessels?
 - Find all ceramic products?
 - Find artifacts manufactured in Europe?
 - Does the city of Meissen manufacture ceramics?

NBA-H26069-467

```
:object "cup and plate" ;
:object_concept object:cup ;
:object_concept object:plate ;

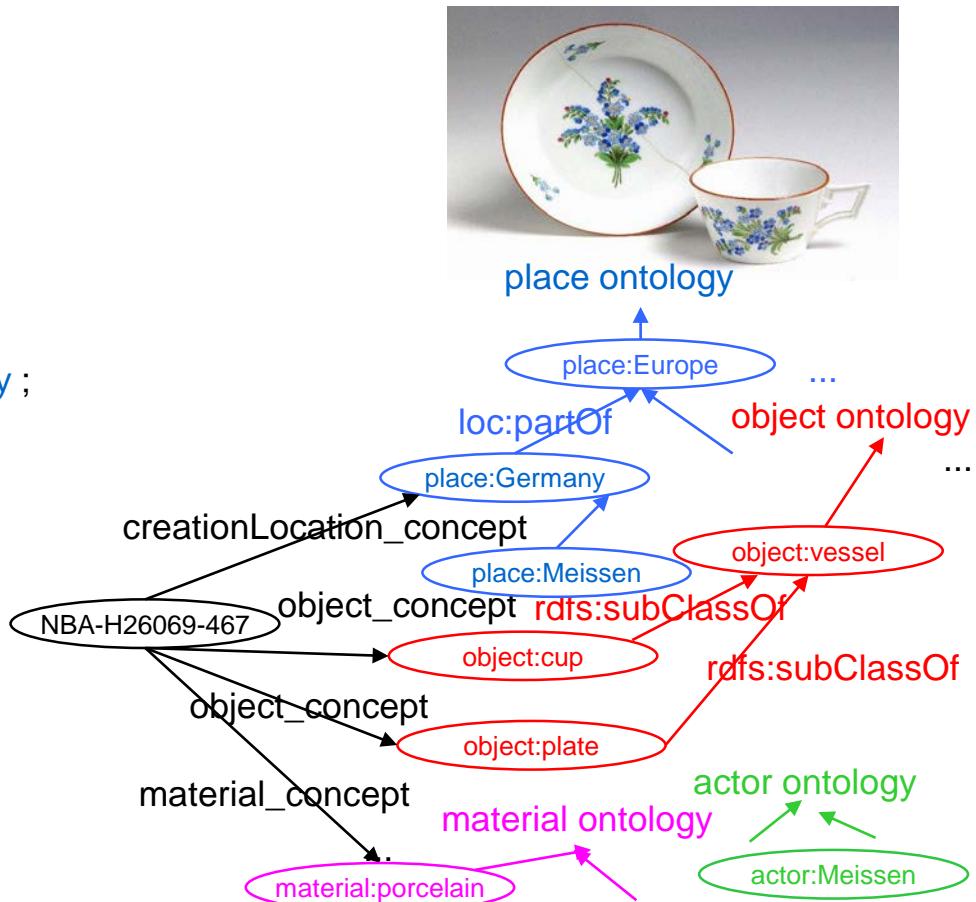
:material "porcelain" ;
:material_concept object:porcelain ;

:creationPlace "Germany" ;
:creationPlace_concept place:Germany ;

:creator "Meissen"
:creator_concept actor:Meissen .
```



Find all vessels?
Find all ceramic products?
Find artifacts manufactured in Europe?
Does the city of Meissen manufacture ceramics?



Case Rijksmuseum Amsterdam

```
rijks:artefactSK-C-K
vra:type vra:Work ;
vra:title "The Night Watch" ;
vra:date "1642" ;
vra:creator: 500011051 ;           # Rembrandt
vra:subject iconclass:45F31 ;     # Call to arms
vra:culture tgn:7006952 ;         # Amsterdam
vra:material aat:30015050 .       # Oil paint
```

(Aroyo et al., 2007)



A resource in the TGN
ontology / vocabulary

Amsterdam in TGN

The image displays two side-by-side screenshots of web browser windows. On the left, a screenshot of Internet Explorer shows the 'Thesaurus of Geographic Names Results List' at http://www.getty.edu/vow/TGNFullDisplay?find=Amsterdam&place=&nation=&prev_page=1&english=Y&. A red arrow points from the top of this window towards the right-hand window. On the right, a screenshot of Internet Explorer shows the 'TGN Full Record Display, English (Getty Research)' at the same URL. This window provides detailed information about Amsterdam, including its coordinates (52°21'00"N 004°54'00"E), history as a center of diamond trade, names (Amsterdam, Amstel-dam, Amstel), and place types (inhabited place, city, capital, port). It also lists sources and contributors like Orbis Latinus and Encyclopædia Britannica.

Data



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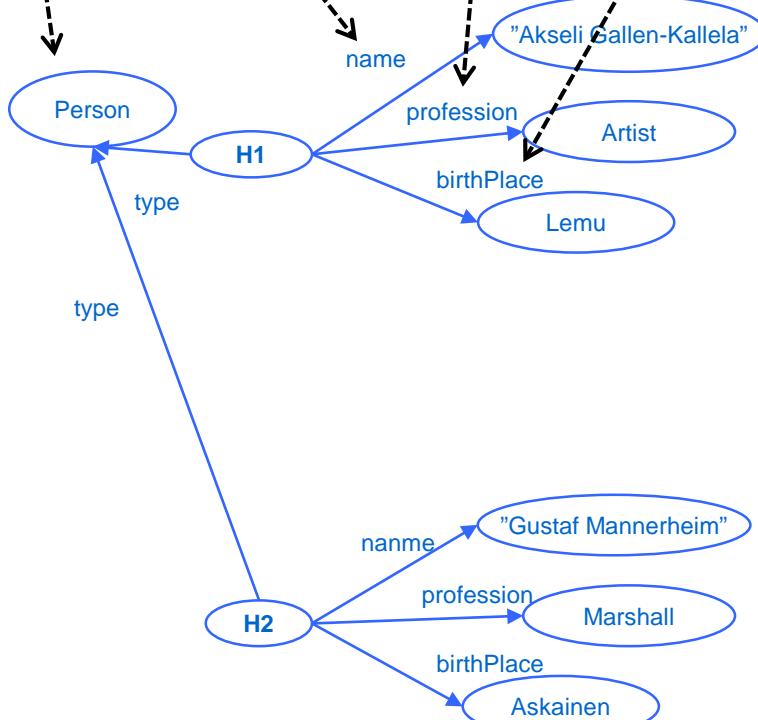


Biographical Registries Collect Data about Persons

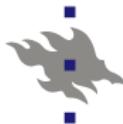
Person Name

Profession Birth Place

henkilö	nimi	ammatti	syntymapaikka	...
H1	Akseli Gallen-Kallela	taidemaalari	Lemu	
H2	Gustaf Mannerheim	marsalkka	Askainen	
..				



Biography Center

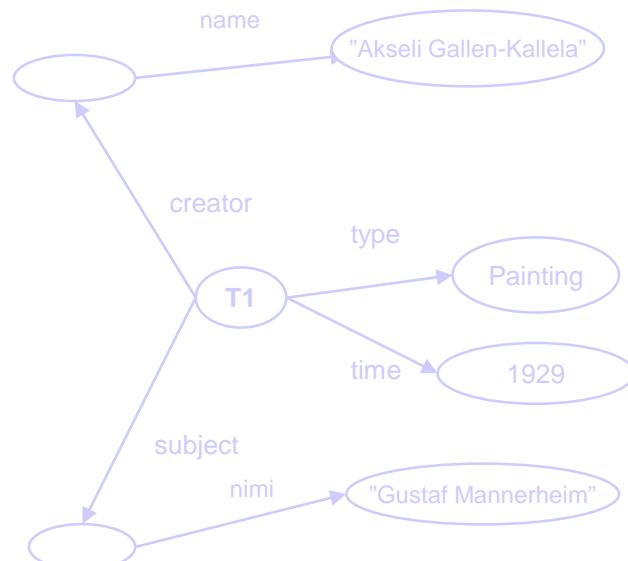


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Art Museum Catalogs Paintings

teos	nimi	tekijä	aika	aihe	...
T1	Mannerheimin muotokuva	Akseli Gallen-Kallela	1929	Gustaf Mannerheim	
T2	Aino-triptyyksi	Akseli Gallen-Kallela	1891	Aino, Kalevala	
...					

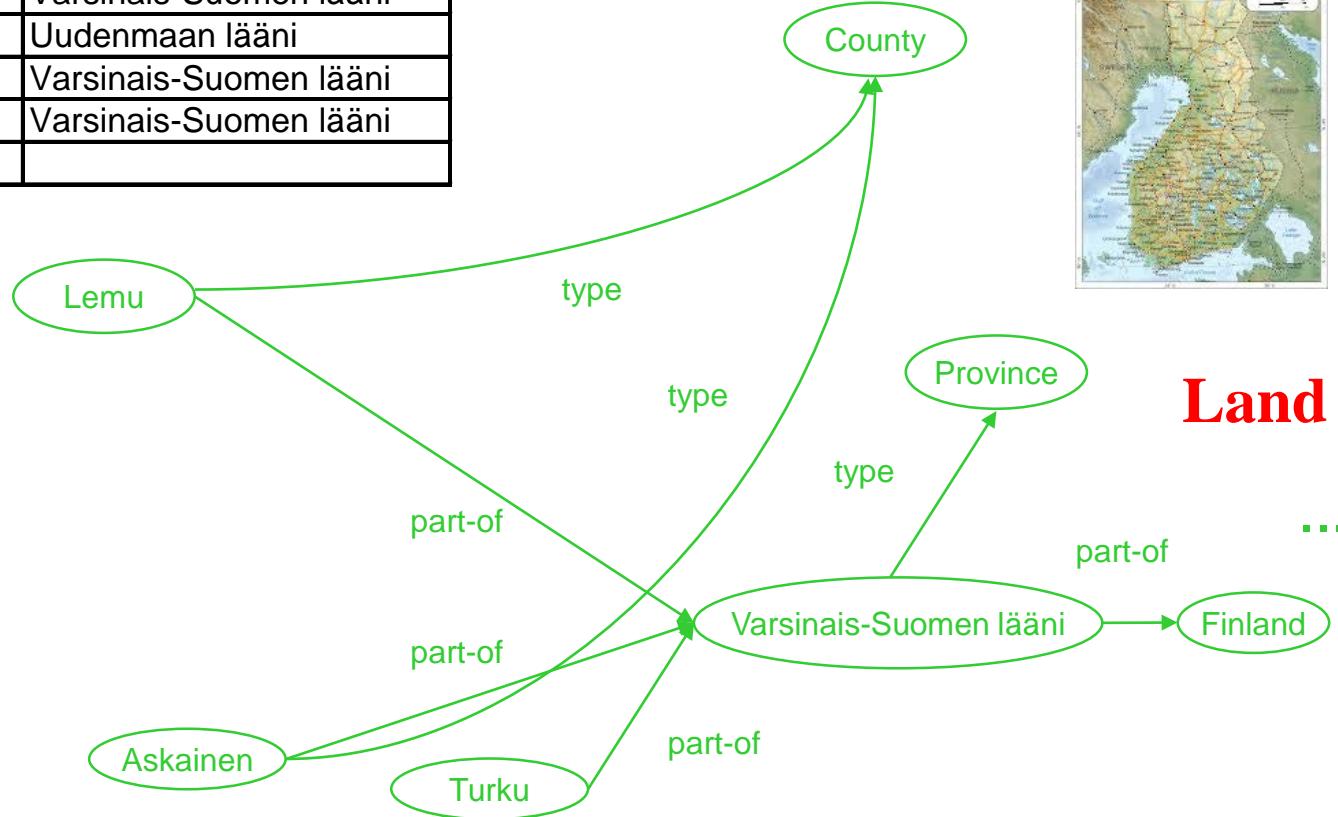


Art Museum Collection



Land Survey Organizations Know Places

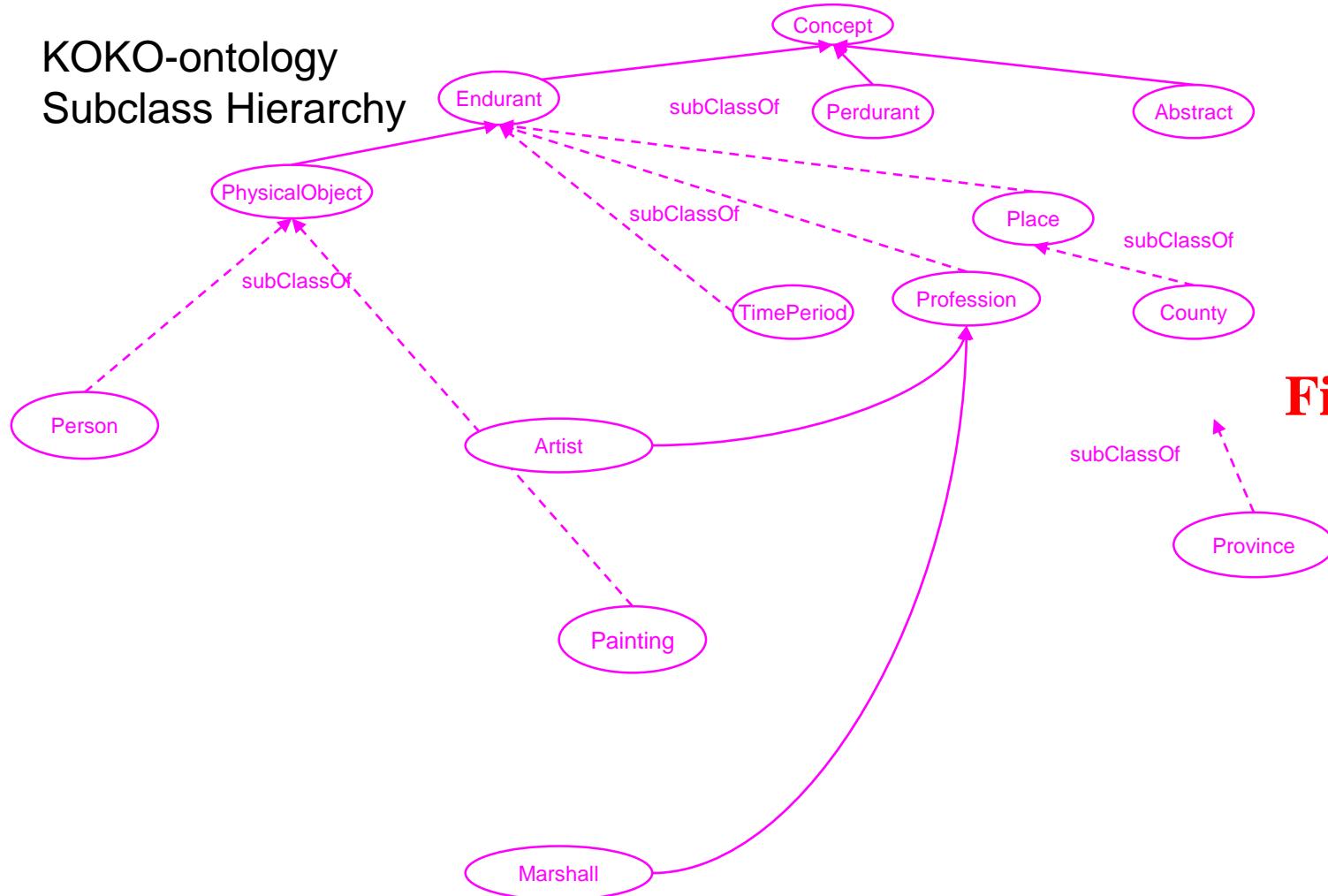
kunta	lääni
Askainen	Varsinais-Suomen lääni
Helsinki	Uudenmaan lääni
Lemu	Varsinais-Suomen lääni
Turku	Varsinais-Suomen lääni
...	



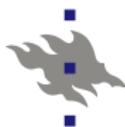
Land Survey

Ontologies are Developed by Semantic Web Researchers

KOKO-ontology
Subclass Hierarchy



FinnONTO

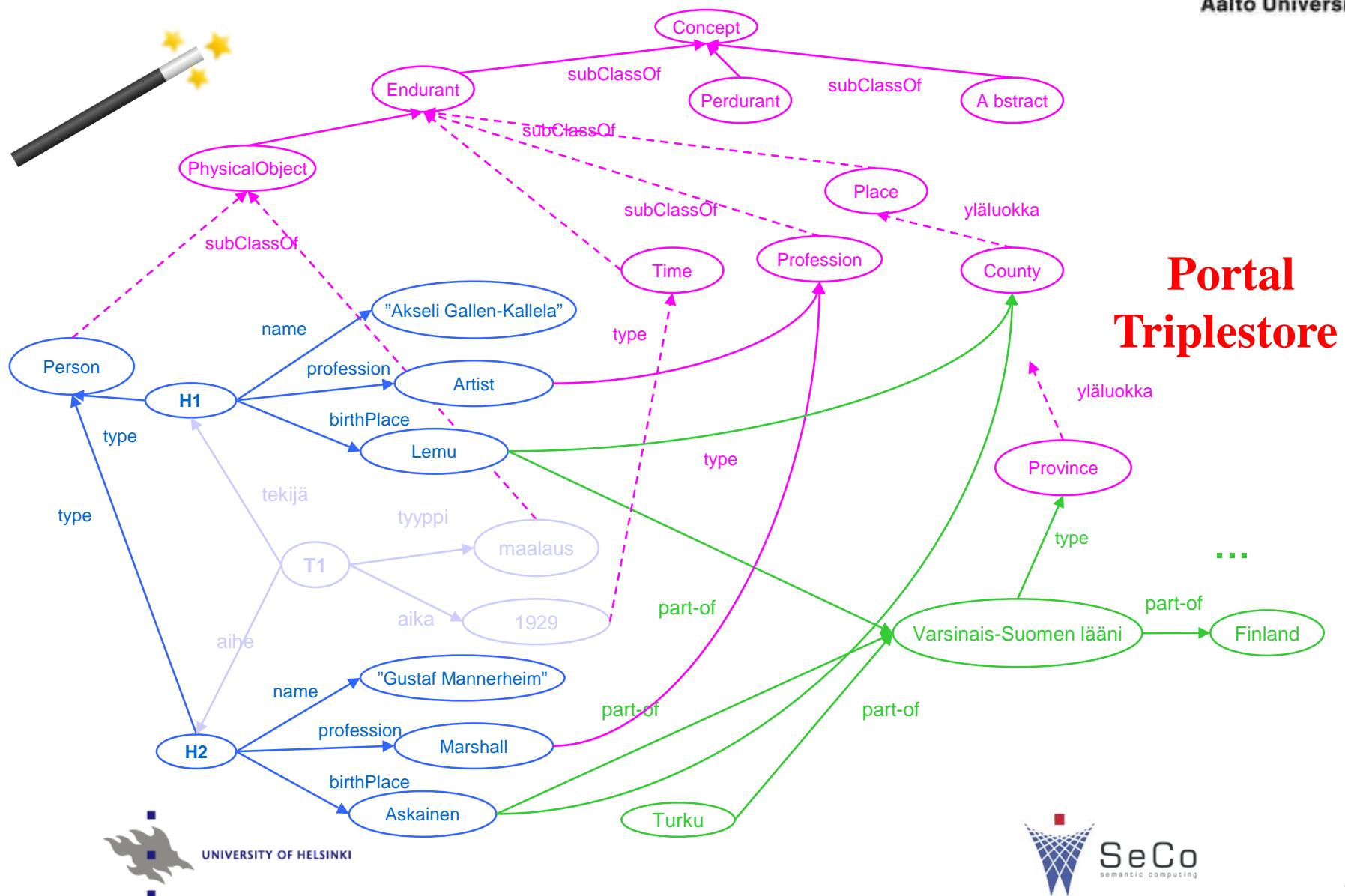


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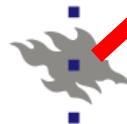
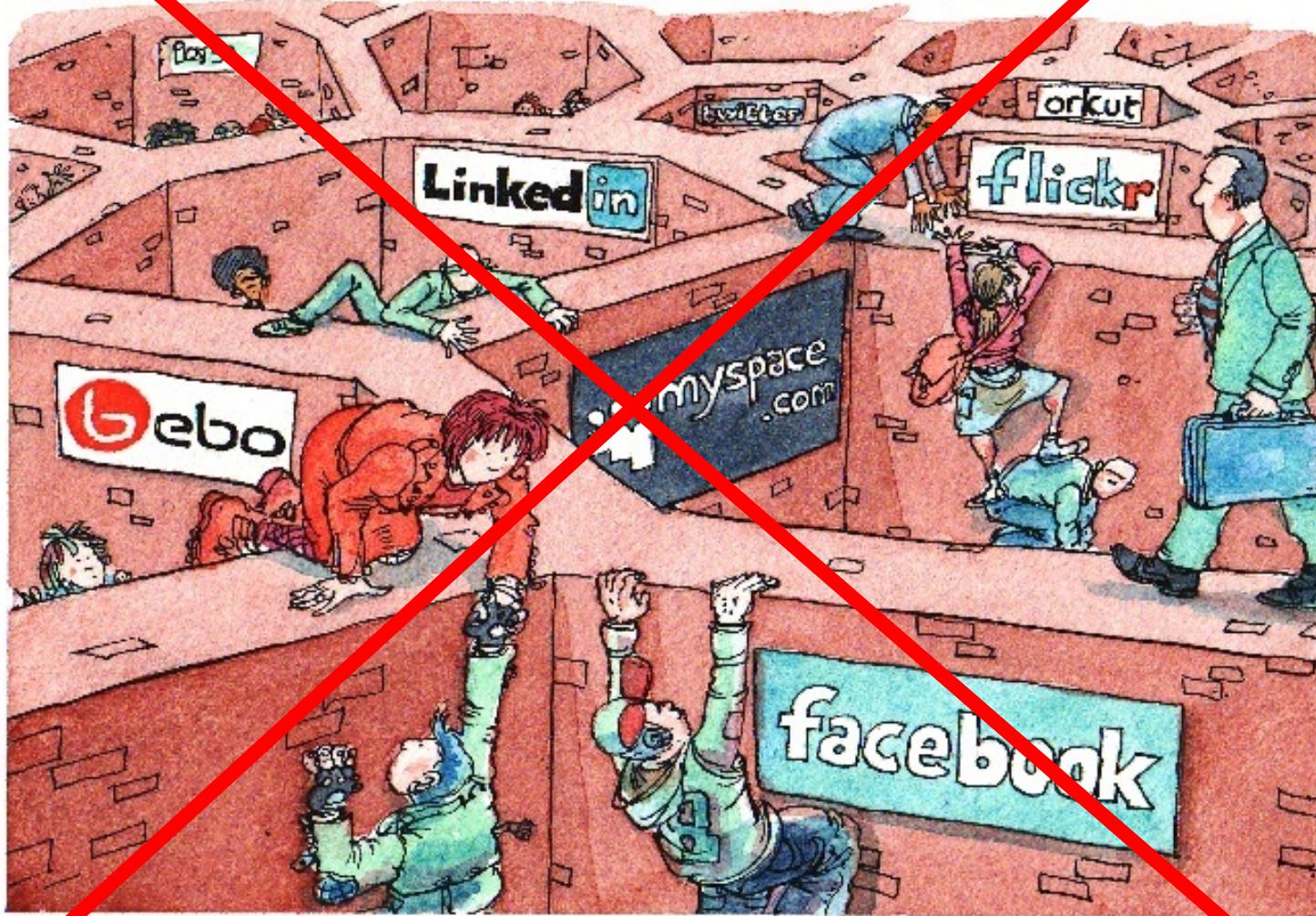
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RDF Connects and Harmonizes Linked Data into a GGG



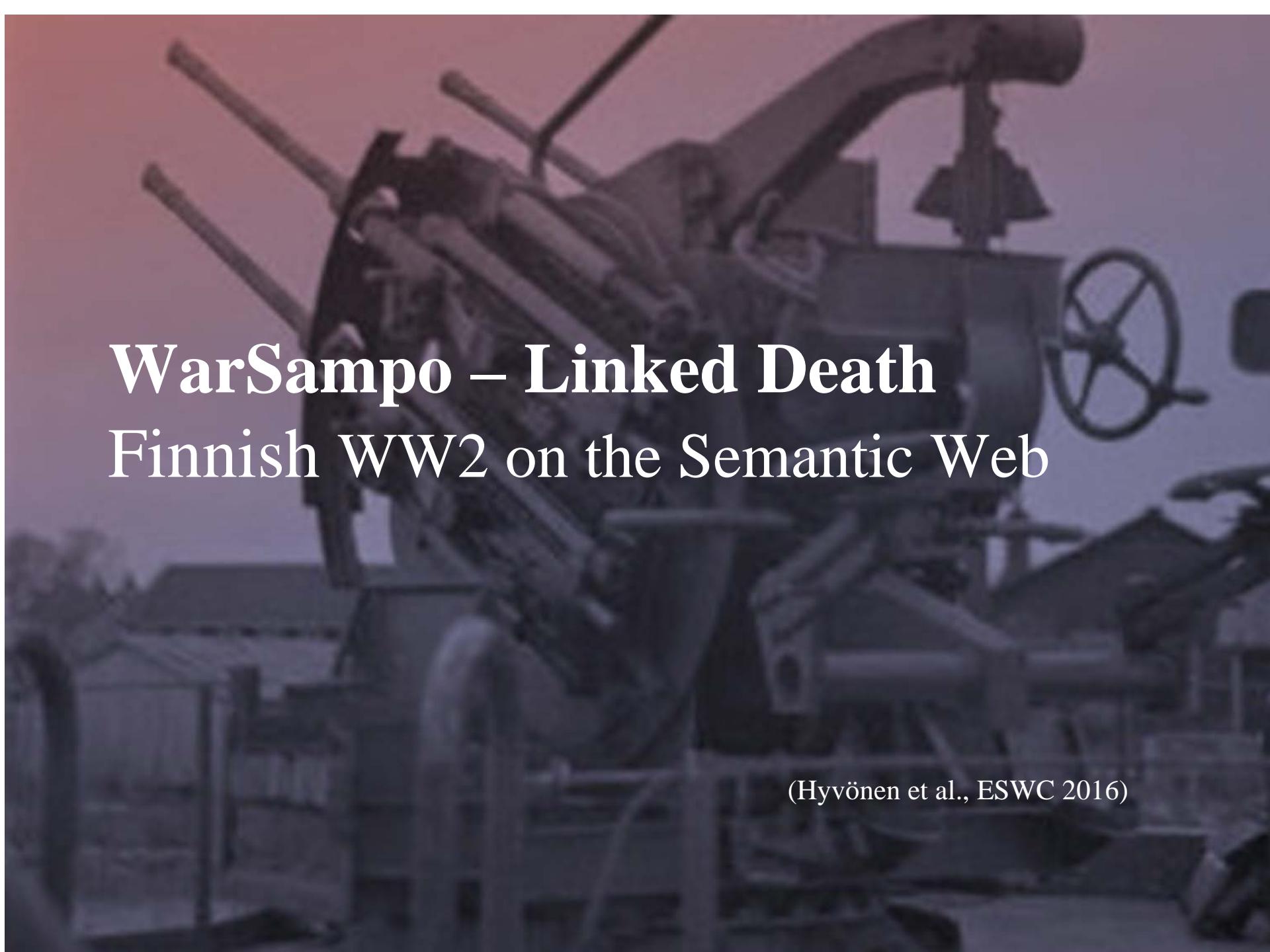
Goals: Interoperability + Intelligent Systems



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WarSampo – Linked Death

Finnish WW2 on the Semantic Web

(Hyvönen et al., ESWC 2016)



<https://vimeo.com/212249404>

A!



**"We learn from history, that
we learn nothing from history"**

Georg Wilhelm Friedrich Hegel

Conclusions

1 + 1 > 2



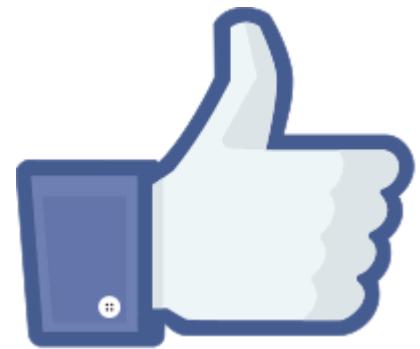
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AI

Semantic Web + Digital Humanities =





Research to be done available:
eero.hyvonen@aalto.fi

[Photo: Timo Väänänen]

Joint Work 2002-2017

Thanks



- Over 30 researchers at SeCo including Eetu Mäkelä, Tomi Kauppinen, Jouni Tuominen, Kim Viljanen, Tuukka Ruotsalo, Suvi Kettula, Kaisa Hypen, Erkki Heino, Petri Leskinen, Minna Tamper, Esko Ikkala, Mikko Koho, ...
- Some 50 funding organizations involved

