Linked Open Data Science Service
Project Presentation

Prof. Eero Hyvönen
Aalto University
Semantic Computing Research Group (SeCo)
http://www.seco.tkk.fi/

Outline

- Vision
- Goals

Aalto University

SeCo
semantic computing

Aalto University

Vision

SeCo
semantic computing

Aalto University

Open your data so that it links with the others' data!

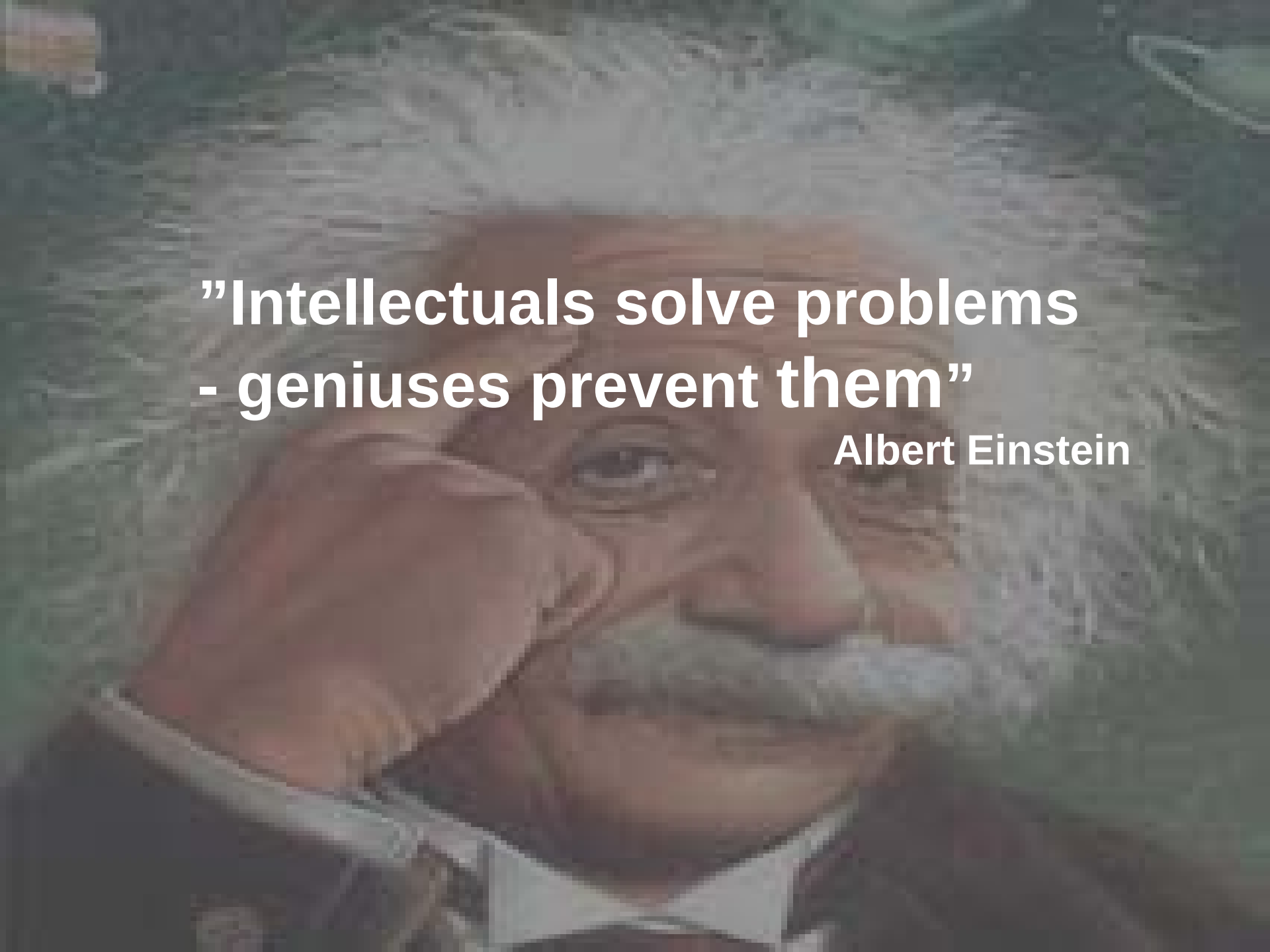
1. Everybody's **data is enriched** for "free"
2. Redundant **work is minimized** by collaboration
3. **Work can be shared** in better ways
4. **Data can be reused** in different applications

SeCo
semantic computing

Aalto University

Use Shared Infrastructure to Prevent Data Linking Problems!

SeCo
semantic computing


”Intellectuals solve problems
- geniuses prevent them”
Albert Einstein

Preventing Problems in Advance by Collaboration (and fixing problems already there)

Aalto University

- Sharing **Ontologies as services**
- Sharing **Metadata Schemas as services**
- Sharing **Linked Open Data as services**

SeCo
semantic computing

Aalto University

Goals

SeCo
semantic computing

Goals

- **Linked Open Data (LOD) Service for Researchers**
- Interactive **Learning Materials** about Publishing LOD
- **Pilot Case Studies**

Research Problems Addressed

- Data Linking and Fusion
- Data Quality
- Data Analysis and Visualization
- Knowledge Discovery

Aalto University

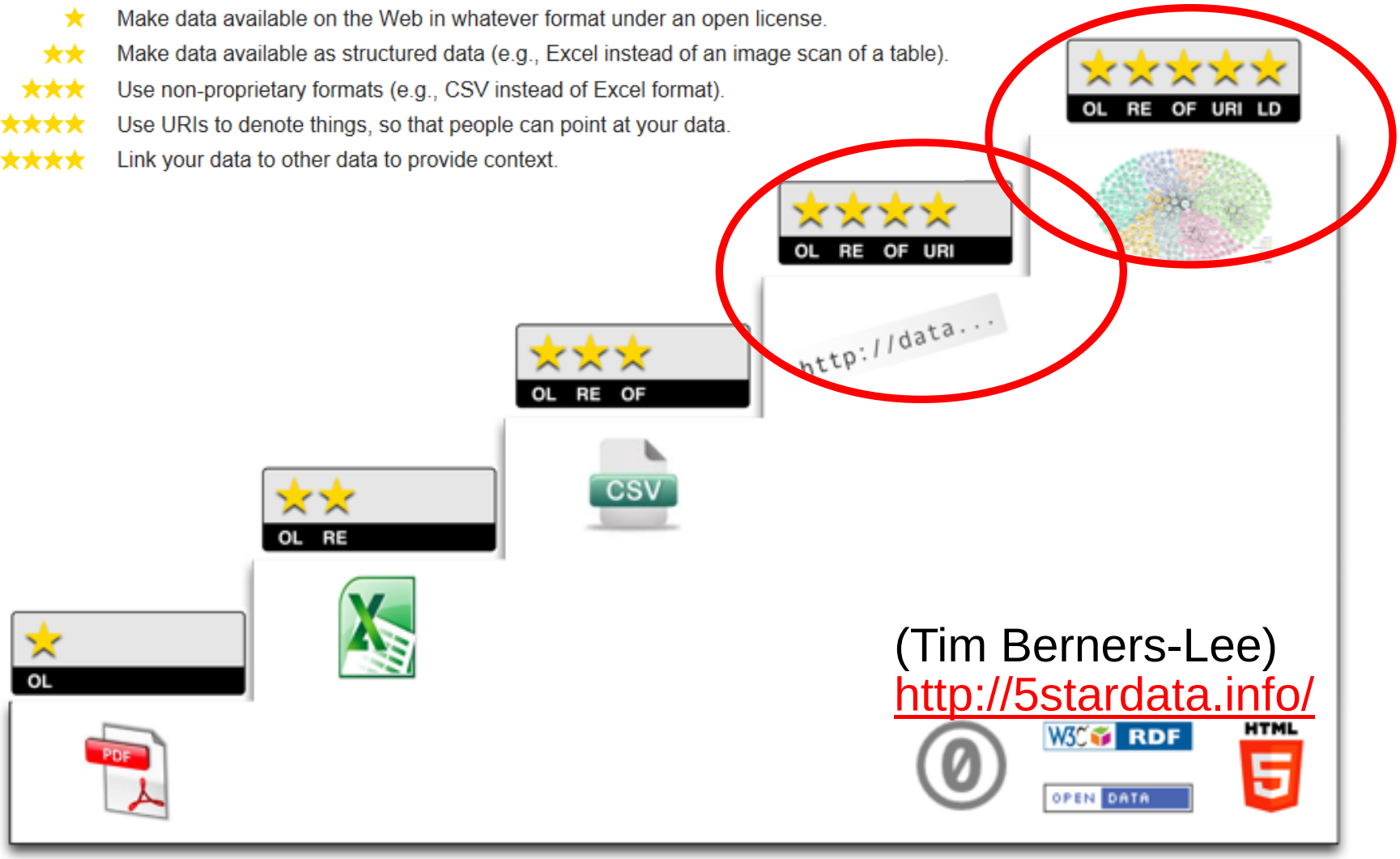
Goal 1
LOD Service for Researchers

SeCo
semantic computing

How to Publish Linked Data?
5-star Linked Data Model

Aalto University

- ★ Make data available on the Web in whatever format under an open license.
- ★★ Make data available as structured data (e.g., Excel instead of an image scan of a table).
- ★★★ Use non-proprietary formats (e.g., CSV instead of Excel format).
- ★★★★ Use URIs to denote things, so that people can point at your data.
- ★★★★★ Link your data to other data to provide context.



Our ”7-star” Model and LDF.fi Data Hotel

- Goals: enhance re-usability and data quality

7-star Linked Data Service

In addition to these services, we extend the 5-star model into a *7-star model* of our own with two additional requirements:

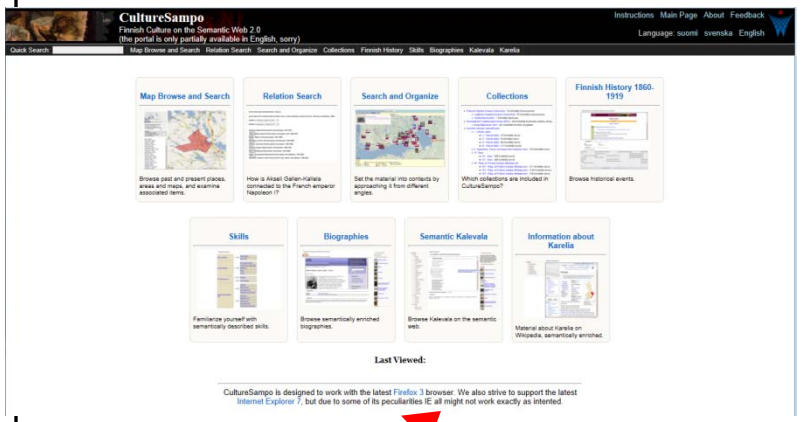
★★★★★★ Provide your data with a schema so that people can understand and re-use your data easily.

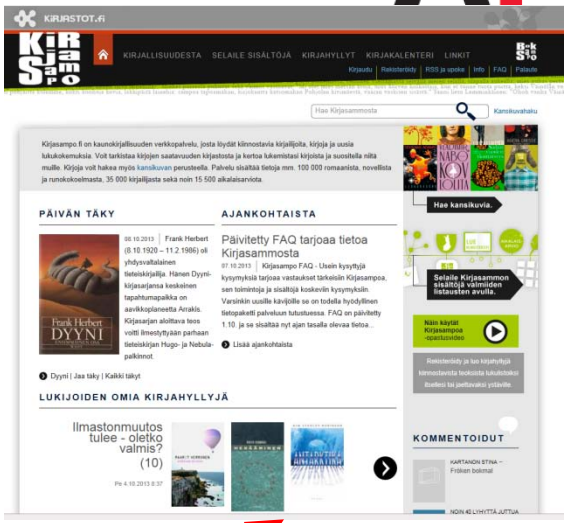
★★★★★★★ Validate your data against the schema so that people can trust the quality of your data.

Linked Data at the LDF.fi portal is published at different quality levels. Our goal is to get any useful data out quickly. The data can be made better by the community and more stars earned later.

Burj Al Arab

Linked Data Service in Applications



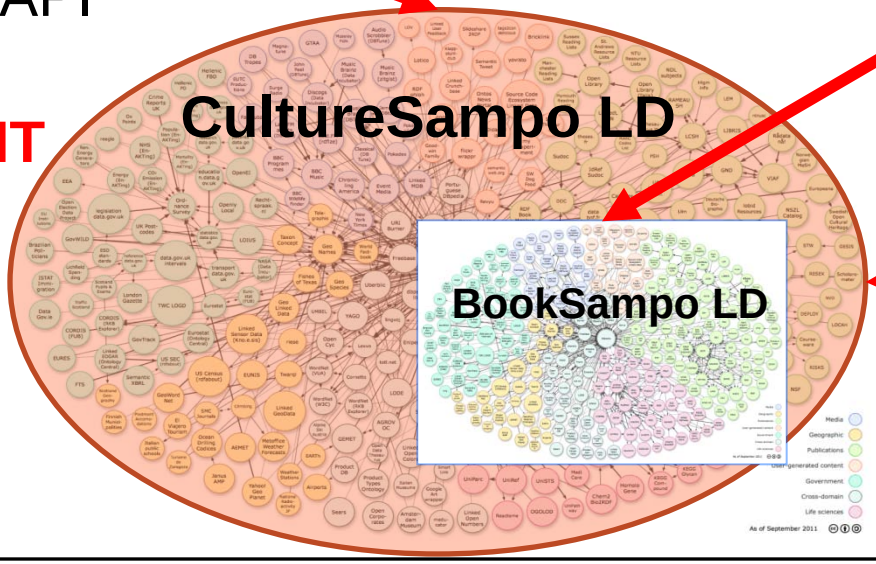


API

API

API

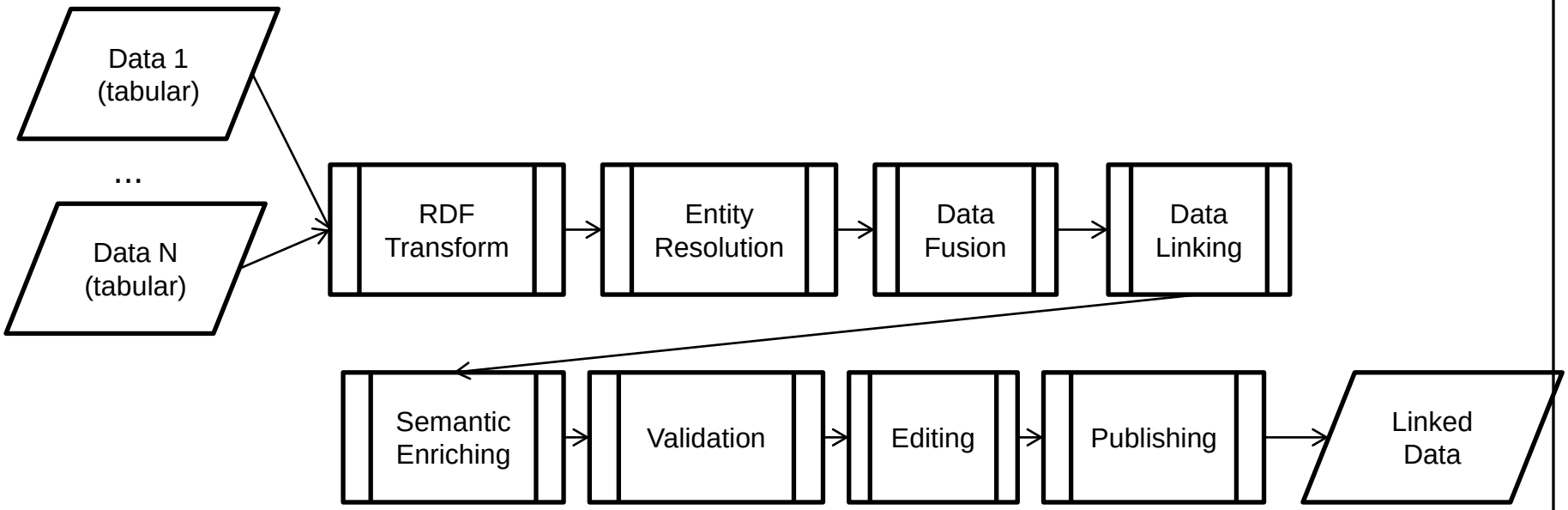
SPARQL END POINT



YOUR NEXT APPLICATION

SeCo
semantic computing

LOD Service for Researchers



Aalto University

Goal 2
Interactive Learning Materials about Publishing LOD

SeCo
semantic computing

- English Versin Based on Aalto University Materials
  - Semantic Web Course
  - Linked Data MOOC

Aalto University

Goal 3
Pilot Case Studies

SeCo
semantic computing

- Case1: Reassembling the Republic of Letters 1500-1800
- Case 2: Finnish WW2 History as Linked Open Data
- Case 3: Statistical Analysis of Ornithological Observations

Reassembling the Republic of Letters 1500-1800

Aalto University

- European Letter Data Related to Enlightment
  - Studying Europe's intellectual history
- Finding novel solutions to Digital Humanism research problems based on aggregated semantic data
  - Human problem solving
  - Computational problem solving
  - Hybrid problem solving, e.g., visualizations
- Collaboration with Oxford University and Stanford University
- Collaboration with 30+ European Organizations (EU COST)
  - http://www.republicofletters.net
- SeCo leads the Work Group "People and Networks"

SeCo
semantic computing

Finnish WW2 History as Linked Open Data

Aalto University

WarSampo

Finnish War History 1939-1945
as Linked Open Data
http://www.sotasampo.fi/

Supporting War History Research with Linked Open Datasets

Aalto University

- War Casualty Databases (90 000)
  - National Archives
- War Diaries (23 000)
  - National Archives
- Photographs and videos (160 000)
  - Military Museum, Finnish Defence Forces
- Kansa taisteli Magazine articles (3 600)
  - Bonniers, Association for Military History in Finland
- Karelia maps and places (30 000)
  - National Survey of Finland
- Elävä arkisto (?)
  - YLE Ltd

SeCo
semantic computing

Statistical Analysis of Ornithological Observations

- Based on Observational Data at Halias Station
  - 30-year data series of systematic bird observations
  - 30-year data series of weather data
  - Ornithological ontologies
- Joint work with Museum of Natural History and Tringa

Aalto University

?

SeCo
semantic computing