

Finto Ontology and Vocabulary Services at the National Library of Finland

DARIAH Aalto Day 2022

Mikko Lappalainen

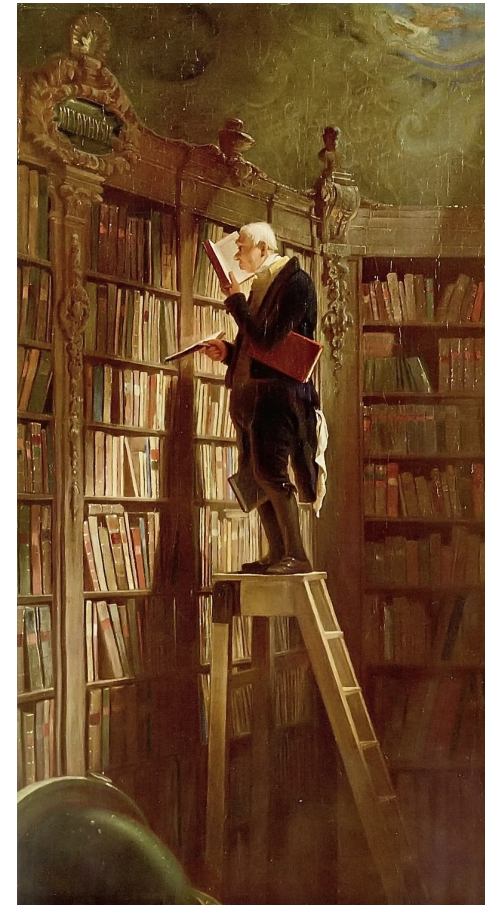
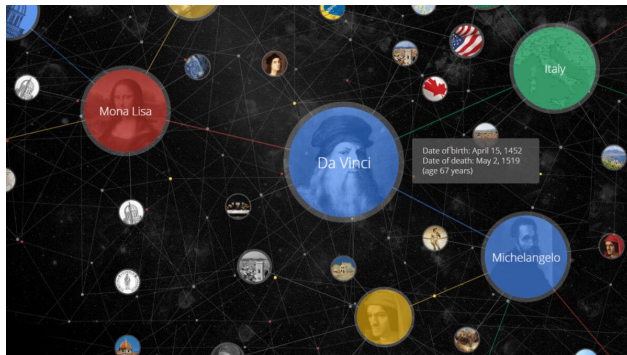
Development Manager, National Library of Finland



THE NATIONAL LIBRARY OF FINLAND

Libraries and Linked data

- Libraries have a long tradition in information curation and a lot of resources and tools, that can be useful to web at large (with some modification)
- FinnONTO (2003-2012) research project laid the foundation for library based vocabularies as building blocks for a national level knowledge graph



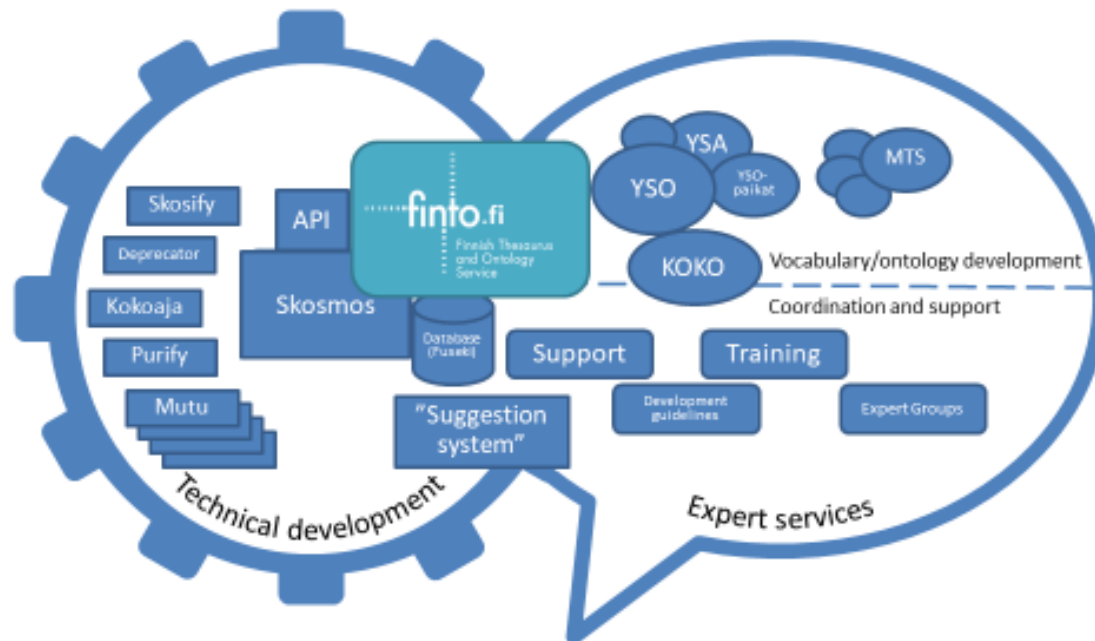
Finto service in the National Library of Finland

- Finto started as a project in 2013, financed by Ministry of Finance and the Ministry of Education and culture
- Service and infrastructure of linked data subject indexing vocabularies for the *whole Finnish Public Sector* (not just libraries, museums and archives)
- Permanent service at the National Library of Finland since 2019



Finto service in general

- Finto service develops
 - Technical tools for publishing of LOD ontologies and vocabularies
 - A network of linked multilingual indexing ontologies of various domains



Ontology development

- [General Finnish Ontology YSO](#) forms a basis and structure for the linked ontology system
 - YSO is based on an old library thesaurus YSA
 - Machine readable hierarchical structure
 - Multilingual (finnish, swedish, english) terms
 - Linked to Finnish domain ontologies and international sources (LCSH, Wikidata)
 - Persistent identifiers (URIs) for each concept
 - Natively in Linked Data format (SKOS/RDF)
 - Not tied to a library format



YSO - General Finnish ontology

Content language English ~

✕ Search

A-Z

Hierarchy

Groups

New and
Deprecated

- crown transportation service
- cultural institutes
- customs (organisations)
- customs unions
- day care centres
- deemed partnerships
- driving schools
- drying plants
- dynasties
- educational institutions
 - adult education centres
 - art schools
 - boarding schools
 - correspondence schools
 - course centres
 - folk academies
 - folk high schools
 - free workers' institutes
 - institutes of adult education
 - institutions of higher education
 - institutes of higher education in technology
 - institutes of higher education in fine arts
 - national defence universities
 - open academy
 - police academies
 - schools of economics and business administration
- universities**
 - open university
 - summer universities
 - universities of technology
 - virtual universities
 - universities of applied sciences
 - universities of veterinary medicine
- learning centres
- military schools
- schools (educational institutions)
- schools of sports education
- teacher training institutions
- translation schools
- vocational institutions
- workers' institutes
- electoral coalition
- enterprises
- European economic interest groupings
- experimental stations
- expert organisations
- extremist movements
- faculties (educational organisations)
- feudal system
- fire services
- fishery collectives
- fleet
- foreign representation
- foundations (organisations)

... > systems of a society > organisations (systems) > educational institutions > institutions of higher education > universities

PREFERRED TERM

universities 

TYPE

General concept

BROADER CONCEPT

[institutions of higher education](#)

NARROWER CONCEPTS

[open university](#)
[summer universities](#)
[universities of technology](#)
[virtual universities](#)

RELATED CONCEPTS

[continuing education centres](#)
[graduate schools](#)
[open academy](#)
[university consortiums](#)

BELONGS TO GROUP

57 Upbringing. Teaching. Education

IN OTHER LANGUAGES

yliopistot	Finnish
universitehtat	Northern Sami
universitet	Swedish

URI

<http://www.yso.fi/onto/ysop10895> 

DOWNLOAD THIS CONCEPT:

[RDF/XML](#) [TURTLE](#) [JSON-LD](#) Created 11/1/86, last modified 10/13/22

Ehdota muutosta käsitteeseen

BROADER MATCHING
CONCEPTS

[Universities and colleges](#)

Library of Congress Subject Headings

EXACTLY MATCHING
CONCEPTS

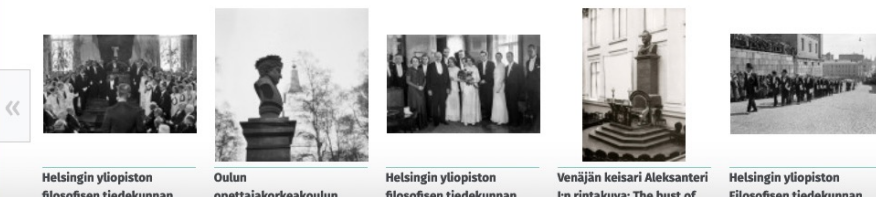
[universitet](#) (sv)
[universities](#)
[yliopistot](#) (fi)

Allärs - General thesaurus in Swedish
 KOKO Ontology
 YSA - General Finnish thesaurus

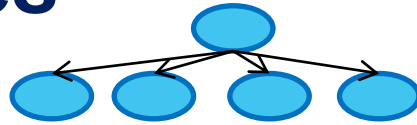
Images indexed with the term in Finna 101

Image ^

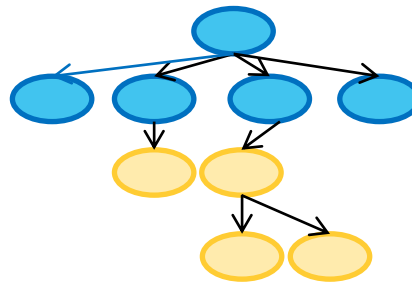
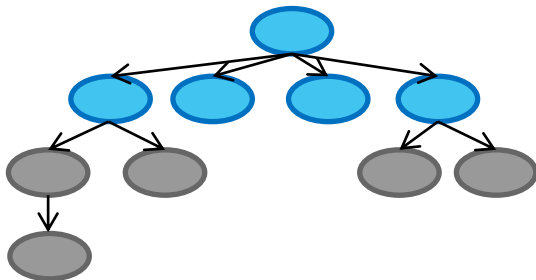
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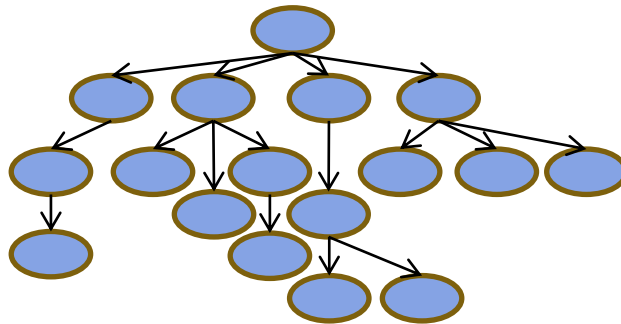
Linked Finto ontologies



General Finnish Ontology YSO contains general concepts and hierarchical structure for linked ontologies

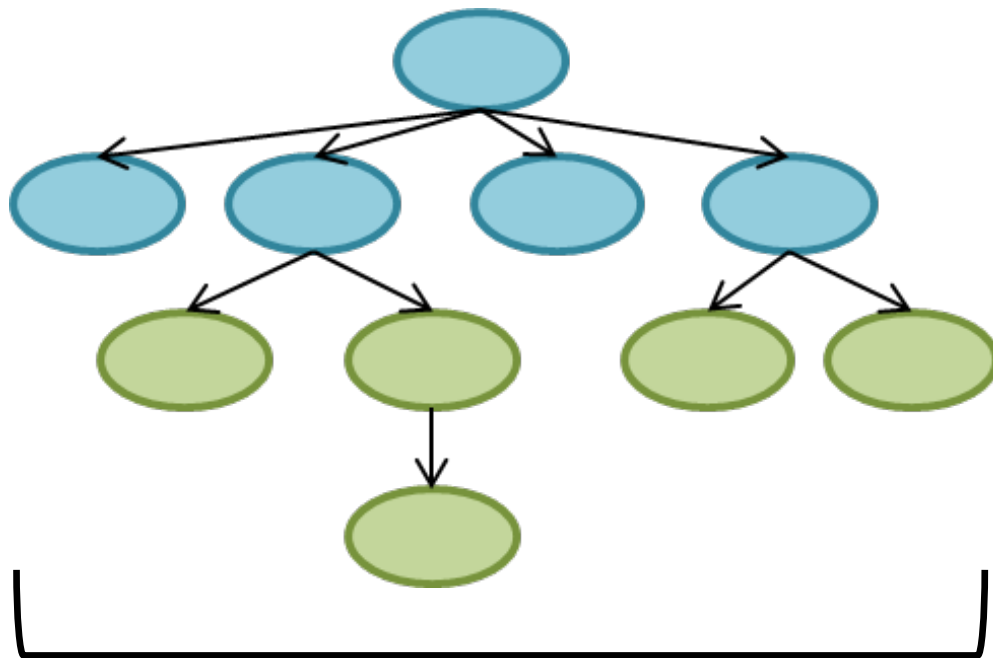


Domain ontologies extend the general concepts of YSO



YSO and domain ontologies together form **KOKO ontology cloud**

The Coordination of the national Linked ontology development: CASE Public administration ontology JUHO



Finto at NLF in charge of YSO general concepts



JUHO-development group at the Prime Minister's Office in charge of public sector concepts

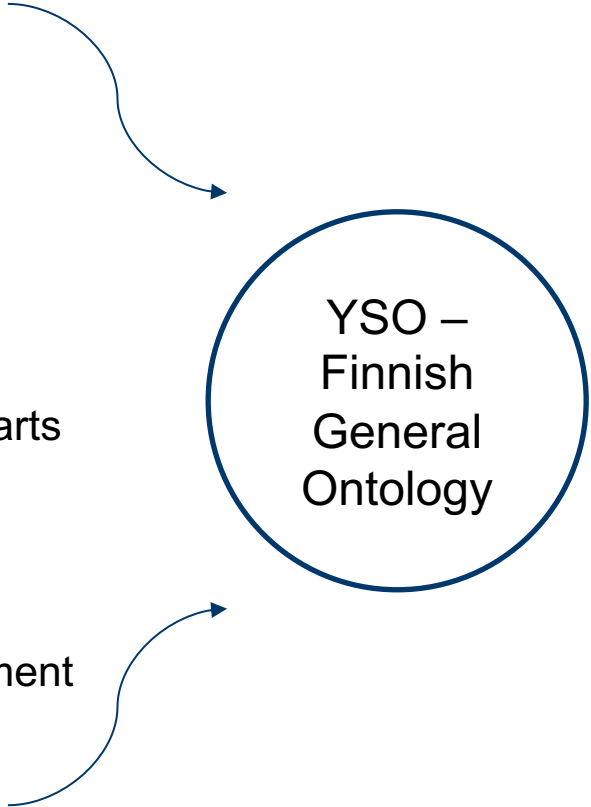


PRIME MINISTER'S OFFICE

Collaboration group for ontology development
(coordinated by Finto) responsible for shared development guidelines

KOKO domain ontologies

- AFO - Natural resource and environment ontology
- JUHO – Ontology for public sector and administration
- KAUNO - Ontology for fiction
- KITO – Ontology for literature studies
- KTO – Ontology for linguistics
- KULO – Ontology for cultural studies
- LIITO – Ontology for business
- MAO/TAO - Ontology for museum domain and applied arts
- LIIKO – Ontology of transportation
- MUSO - Ontology for music
- TERO - Finnish Ontology of Health and Welfare
- TSR ontology – Ontology of The Finnish Work Environment Fund
- VALO - Finnish Ontology of Photography



YSO –
Finnish
General
Ontology

The diagram illustrates the relationship between various domain-specific ontologies and a central general ontology. On the left, a list of 13 domain ontologies is provided. Two curved arrows originate from this list: one from the top half (AFO to MAO/TAO) and another from the bottom half (LIIKO to VALO), both pointing towards a large circle on the right. This circle contains the text 'YSO – Finnish General Ontology', indicating that these domain ontologies are specialized instances or extensions of the general YSO ontology.

- Finto's ontologies are used widely at libraries, archives and museums in Finland
 - Melinda library union catalogue
 - Kookos and Collecte Systems in museums
 - AHAA system for archives etc.
- A lot of users also in
 - Ministries
 - Public sector organizations like Digital and Population Data Services Agency
 - Media houses like Finnish Broadcasting Company Yle etc.

Finto-palvelun käyttäjiä

Created by Tuomas Palonen, last modified by Osmo Suominen on Jun 24, 2021

Esimerkkejä Finto-palvelun käyttäjistä



Valtioneuvoston kanslia, OKM, VM, STM, MMM, TEM, SM ja OM käyttävät Finton sanastoja verkkosivuilleen tiedotteiden ja muun ajankohtaisaineiston sisällönkuvaussissa. Kuvailijan käytöillä hyödyntää sanastoja näyttämällä valitun käsitteen kaikki tiedot ja kieliversiot, mikä auttaa sopivan käsitteen valinnassa. Sanastojen käsitteet ohjaavat sisältöjen näkymistä verkkosivuille ja jakelua muuhin kanaviin (mm. RSS-syötteet ja sähköpostitilaukset). Hakukone palauttaa hakutuloksia valittujen käsitteiden mukaan ja haku hyödyntää ontologian hierarkiaa. Verkkosivuille on myös nostettu tiettyjä käsitteitä linkeiksi, jotka ohjaavat ko. käsitteellä kuvailtujen sisältöjen hakutulokseen.

Pilkkuina Brandt, valtioneuvoston kanslia: "Valmis sanasto ja ontologia on yksi merkittävä laatu- ja kehittämisaskeleita verkkopalvelun ylläpidossa ja kehittämisessä. Sanastot tarjoavat mahdollisuuksia sisältöjen monipuoliseen ja dynaamiseen esittämiseen. Niiden avulla on myös mahdollista hallinnoida suurta ja tiuhaan päivitystä sisältöä mielekkäästi ja melko vaivattomasti."



suomi.fi käyttää Finton sanastoja (YSO, JUPO, JUHQ, LIITO, TERO, TSR) suomi.fi-verkkopalvelussa sekä palvelutietovarannossa (PTV). PTV:ssä sadat eri organisaatiot asiansaantavat palvelukuvauksensa sanastojen käsitteillä, ja verkkopalvelun puolella niitä käytetään alihisivuilla ja toimitetun sisällön moduuleissa. Ontologiahierarkia näkyy PTV:n sisällöntuottajille, mikä helpottaa kuvailemista. Loppukäyttäjät voi hakea sanastojen termeillä sisältöä verkkopalvelusta.

Marko Latvanen, Väestörekisterikeskus: "On hienoa, että julkisen sektorin voi tarjota yhteiseen käyttöön tämän resurssin."



UNESCO on julkaissut tesaursuksensa käyttäen Finton kehittämää Skosmos-ohjelmistoa. UNESCO käyttää tesaursustaan UNESDOC-tietokannassa, Multimedia Archives-tietokannassa sekä Aineettoman kulttuuriperinnön luettelossa sisällönkuvaus hyödyntäen Skosmos-käyttöliittymää ja sen SPARQL-päätepiistettä. Lisäksi UNESCO:n Skosmos-sovelluksella on 23000 käyttäjää kuukaudessa maailmanlaajuisesti. UNESCO päätyi käyttämään Skosmosia, koska se on haku- ja navigointitoiminnolltaan käyttäjäystävällinen ja mahdollistaa sanastojen semanttisen webin standardien mukaisesti.



Yle käyttää Finton sanastoja kaikissa sisältöjensä tuottavissa arkistointijärjestelmissä ja suunnittelujärjestelmissä. S hakuomella. Sanastoja hyödynnetään yle.fi-haussa, ja navigoida Ylen sisällöissä, personoida uutisvirtaa ja saa Pia Virtanen, Yle: "Finto-ontologiapalvelu on ainoa tuotteen maiden edustajat yleensä toteamaan, että heidän maassaan



Ministeriöt käyttävät Finton sanastoja, erityisesti Julkisen julkaisukäytännön, VÄHVA-asianhallintajärjestelmässä se ulkoasiainministeriö käyttää Finton sanastoja omassa A

Henri Ryhänen, valtioneuvoston kanslia: "Finto on palvelu"



BARTOC on Baselin yliopiston hanke, joka on toteutettu sovelluksen ja verkkosivun alle kaikki verkossa avoimessa sovelluksella on käyttäjiä maailmanlaajuisesti. Lisäksi m Skosmos-ohjelmistoa, koska se oli heidän tekemänsä se

<https://www.kiwi.fi/x/hgKEBw>

Finto.fi and Skosmos

- [Finto.fi](#) is a portal for the publication of LOD ontologies and vocabularies
 - Browsing and APIs
 - based on open source [Skosmos](#)-software
 - Skosmos is developed at the National Library of Finland, with an active user community from around the world

YSO - General Finnish ontology

Content language

English ▾

✕

Search

A-Z

Hierarchy

Groups

New

- events and action
- objects
 - abstract objects
 - physical objects
 - inanimate objects
 - abacuses
 - adhesive tapes
 - admission tickets
 - amigurumi
 - animal bodies
 - armours**
 - articles (inanimate objects)
 - artificial nails
 - artificial organs
 - audience areas
 - balloons
 - banderoles
 - baskets
 - bathtubs
 - bird tables
 - birdhouses
 - bits (bridles)
 - blinds
 - bookmarks
 - booms
 - braids and weaves
 - bridge floors
 - bridles
 - briquets
 - brooms and brushes
 - buckles
 - busses (computing)
 - buttons (clothing)
 - candles
 - candlesticks
 - cardboard
 - cards
 - cart structures
 - celestial bodies
 - ceramics
 - chains (objects)

objects > physical objects > inanimate objects > armours

PREFERRED TERM

armours ➔

TYPE

General concept

BROADER CONCEPT

inanimate objects

RELATED CONCEPTS

military uniforms

BELONGS TO GROUP

67 Warfare. Military Technology. Defence. Weapons

IN OTHER LANGUAGES

haarniskat

Finnish

harnesk

Swedish

URI

<http://www.yso.fi/onto/yso/p14728>

Download this concept:

RDF/XML TURTLE JSON-LD

Last modified 5/10/17

EXACTLY MATCHING

CONCEPTS

armours

haarniskat (fi)

harnesk (sv)

KOKO Ontology

YSA - General Finnish thesaurus

Allärs - General thesaurus in Swedish

Images indexed with the term in Finna 245

Image



Liivinmaan
kenraalikuvernööri,
sotamarsalkka, kreivi Eric
Da ...
Museovirasto



valtaneuvos Pontus De la
Gardieta esittävä
tuntemattoman tek ...
Museovirasto



Kustaa Eriksson Vaasa
taistelussa tanskalaisia
vastaan Bränn ...
Museovirasto



Ruotsin kuningas Kaarle XI
Museovirasto

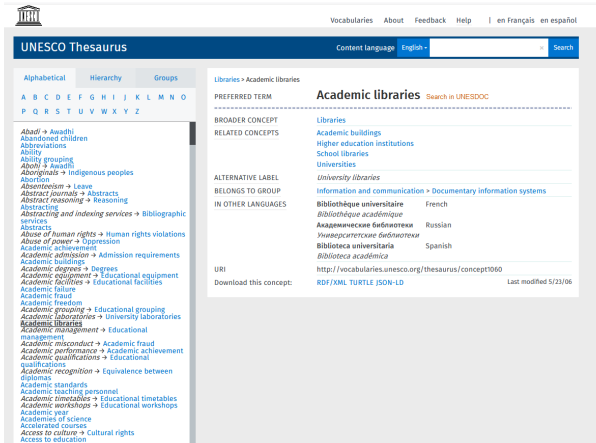


Ruotsin kuningas Fredrik I
Museovirasto

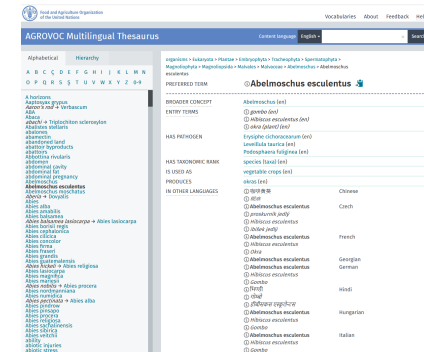
[See all the results in Finna](#)

Skosmos installations around the world

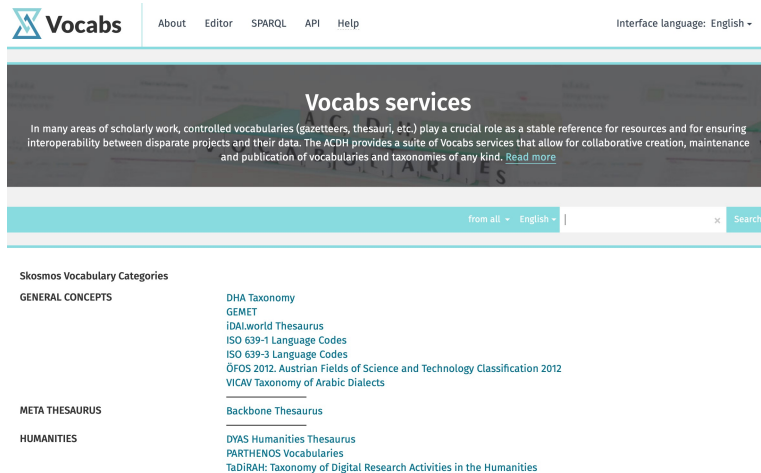
<http://vocabularies.unesco.org/>



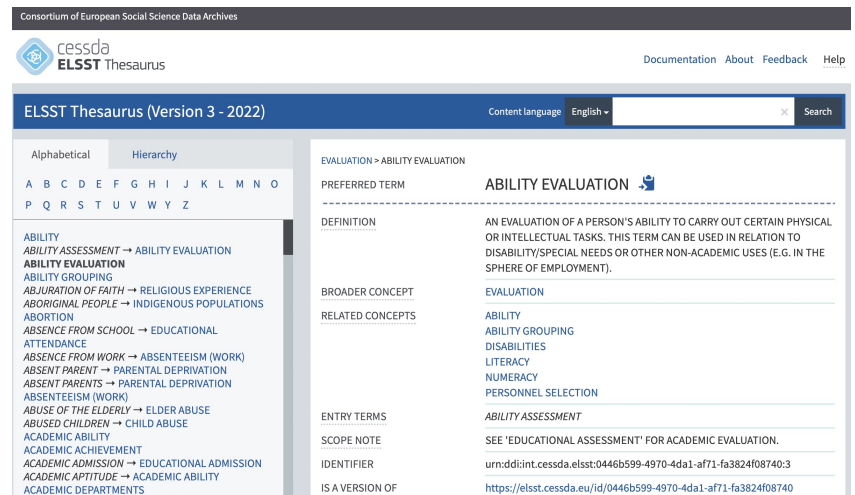
<http://aims.fao.org/standards/agrovoc/functionality/search>



<https://vocabs.dariah.eu/en/>



<https://thesauri.cessda.eu/elsst-3/en/>



Automated subject indexing services

- **Finto AI** is a service for automated subject indexing, utilizing Finto ontologies
- Finto AI is based on the open source software **Annif**, developed at the NLF

The screenshot displays the Finto AI web application. At the top, the 'fintoai' logo is on the left, and navigation links for 'About', 'Feedback', and language options 'suomeksi' and 'på svenska' are on the right. A brief description states: 'Finto AI suggests subjects for a given text. It's based on Annif, a tool for automated subject indexing. [Read more...](#)'. An 'API service' section notes that Finto AI is an API service integrated with other systems, with links for 'More information' and 'OpenAPI description'.

The main interface is divided into two panels. The left panel, titled 'Enter text to be indexed', contains a text area with the following content:
Introduction: DARIAH and Aalto University

The Aalto University joined in DARIAH-EU in 2016 as a co-operative partner. The agenda for the collaborations has been related to building the Finnish Linked Open Data (LOD) infrastructure for Digital Humanities research (LODI4DH) and its use in real life applications, especially in the Sampo series of LOD services and semantic portals that have had millions of users on the Web. This work has been carried out by the Semantic Computing Research Group (SeCo) in collaboration with the Helsinki Centre for Digital Humanities HELDIG, University of Helsinki, and several Finnish and international memory and other organizations.

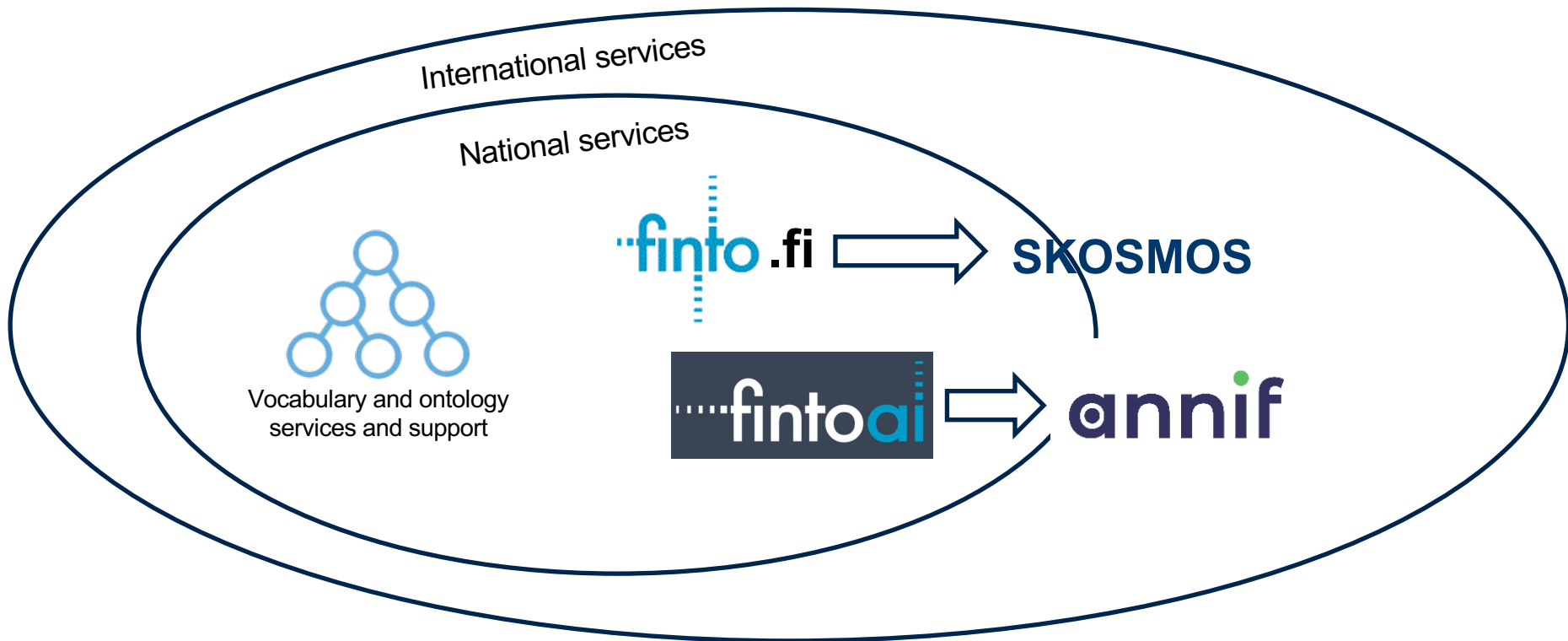
DARIAH Aalto Day 2022 summarizes this line of research on building LOD infrastructures and applications that were started in Finland by the "Semantic Web Kick-off in Finland" conference in 2001, and discusses next steps ahead in the new national DARIAH-FI initiative.

The workshop will a hybrid one with the possibility of participating the event physically at the Aalto University as well as through Zoom.

The right panel, titled 'Subject indexing', includes a dropdown for 'Vocabulary and text language' set to 'YSO English (2022-11-02)', a 'Maximum # of suggestions' selector set to '10', and a 'Suggestions language' dropdown set to 'same as text language'. A blue button labeled 'Get subject suggestions' is present. Below this, a 'Suggestions' table lists results:

Suggestions	term	URI	Copy
semantic web			
universities			
cooperation (general)			
infrastructures			
Finland			

National and international Finto services



Thank you!

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