

# ESCO: TOWARDS A SEMANTIC WEB FOR THE EUROPEAN LABOUR MARKET

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# Agenda

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An overview of ESCO

ESCO: an ecosystem of vocabularies

ESCO as Linked Open Data

Next steps

# ESCO: Overview

A multi-lingual classification of European Skills, Competences, Occupations and Qualifications

Developed by the E.C.:  
DG Employment, Social Affairs and Inclusion and  
DG Education and Culture  
in collaboration with stakeholders  
(CEDEFOP, EQF, ...)

Already on its 4<sup>th</sup> development year

Currently: 10.000 concepts, 25  
languages, >200K terms

Final: 25.000 concepts, >500K terms

<https://ec.europa.eu/esco/home>



The screenshot shows the ESCO website homepage. At the top, there's a navigation bar with links for 'Legal notice', 'Cookies', 'Contact', 'Search on Europa', and a language dropdown set to 'English (en)'. Below this is the ESCO logo and the full name 'European Skills, Competences, Qualifications and Occupations'. A breadcrumb trail reads 'European Commission > ESCO > Home'. The main navigation bar includes 'Home', 'ESCOpedia', 'Browse ESCO', 'Download ESCO', and 'Get involved'. A search bar is located below the navigation. The main content area features three large images: 'Occupations' (a group of professionals), 'Skills/competences' (a person writing 'Leadership' on a chalkboard with related terms like 'decision', 'strategy', 'ethic', 'vision', 'integrity', 'contribution', 'communication', 'motivation', 'influence'), and 'Qualifications' (people throwing graduation caps). Below these images are three news articles:

- 30-05-2014**  
**New expression of interest to join one of ESCO's Reference Groups**  
Currently, ESCO is being developed together with stakeholders and experts grouped according to their professional expertise around 11 Sectoral Reference Groups and the Cross-sector Reference Group. Another 16 Sectoral Reference Groups will be established...
- 07-05-2014**  
**Welcome to the new ESCO portal**  
The Commission has made an overhaul of the ESCO portal since it was launched in October 2013 with the release of the ESCO classification v0. Maintaining a similar style and colour scheme, the revamp makes it easier for users to...
- 11-12-2013**  
**ESCO Goes live Conference – success shared with 350 participants**  
On 23-24 October, the European Commission launched the classification of European Skills, Competences, Qualifications and Occupations (ESCO) during the conference...
- 14-11-2013**  
**ESCO v0 new features**  
The new public ESCO v0 is a classification of skills and competences, occupations and qualifications. In total the classification contains more than 200 000 terms...
- 14-11-2013**  
**New Sectoral Reference Groups from 2014**  
ESCO is being developed by the European Commission together with the support of the European Centre for the Development of Vocational Training (Cedefop) and with stakeholders...

# Objectives

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EU-wide set of multi-lingual vocabularies

- An upcoming **standard** in the EU job labor market

Facilitate EU job market transparency and mobility

- ESCO is developed in **25 languages**

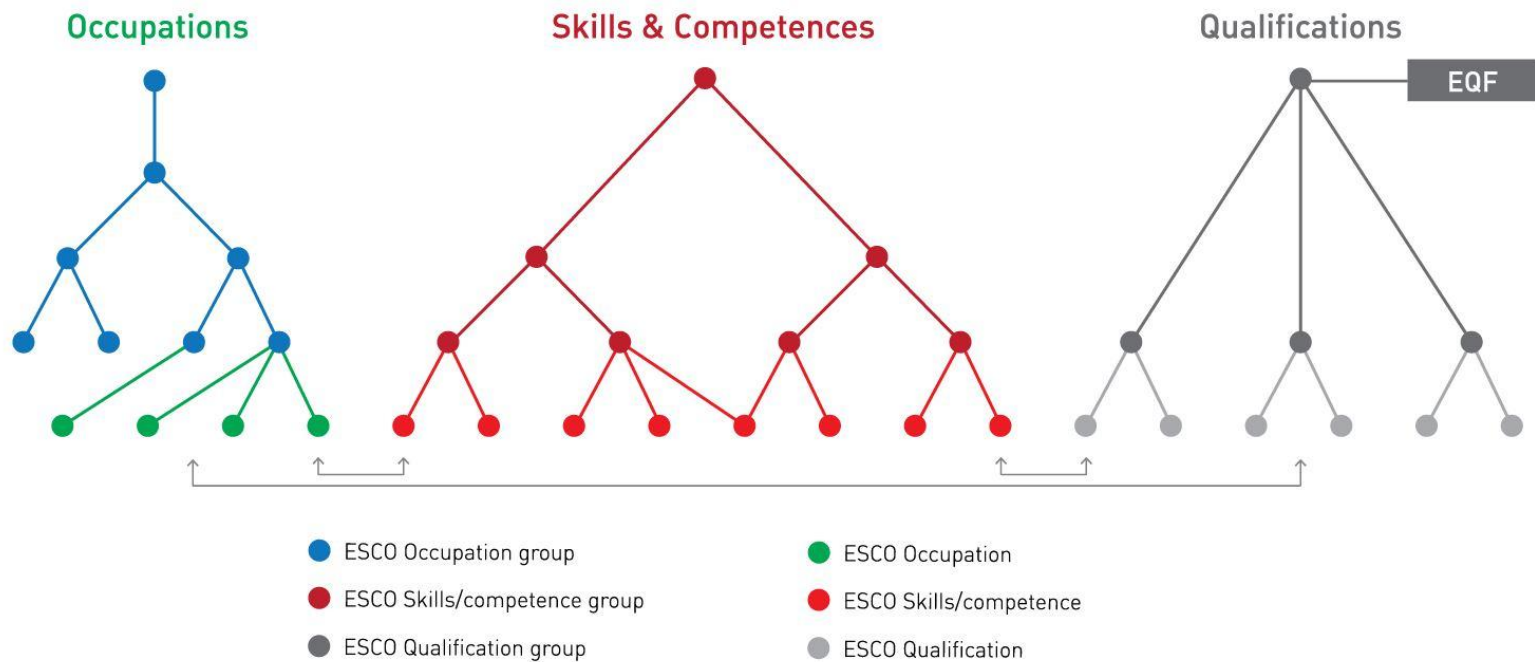
Facilitate **matching**: supply (CVs) vs. demand (Job Vacancies)

- Applications can be built on top of the classification

ESCO classification as a **hub taxonomy** (in SKOS) for the job labor market

- Will be mapped to National Job Labor Market classifications
- Public/Private Employment Services

# The 3 main ESCO pillars (the core)



# Relations

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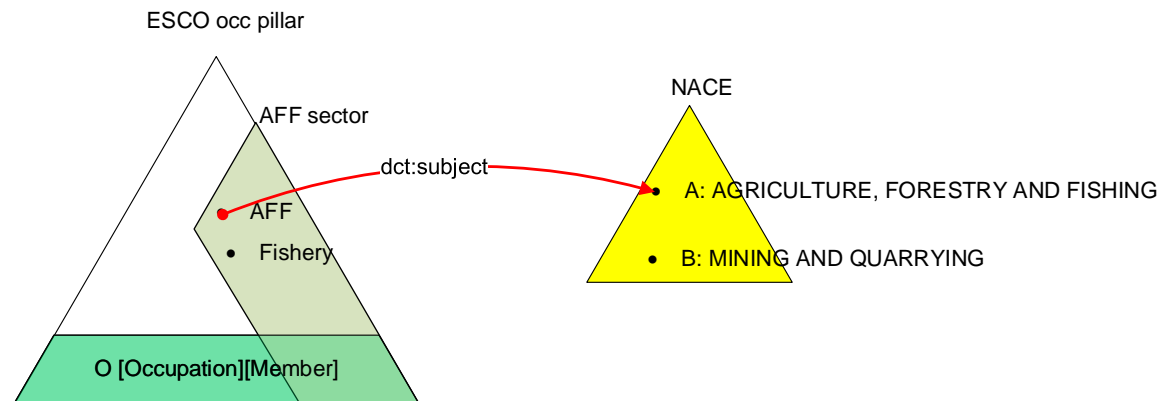
The concepts in the pillars are related

- **Within**
  - (hierarchical broader/narrower)
- **Between**
  - (domain relations like essential and optional skills related to an occupation),
- **and outside**
  - (tagging and mapping relations)

# Tagging Relations

Adding a tag to an ESCO concept for context information

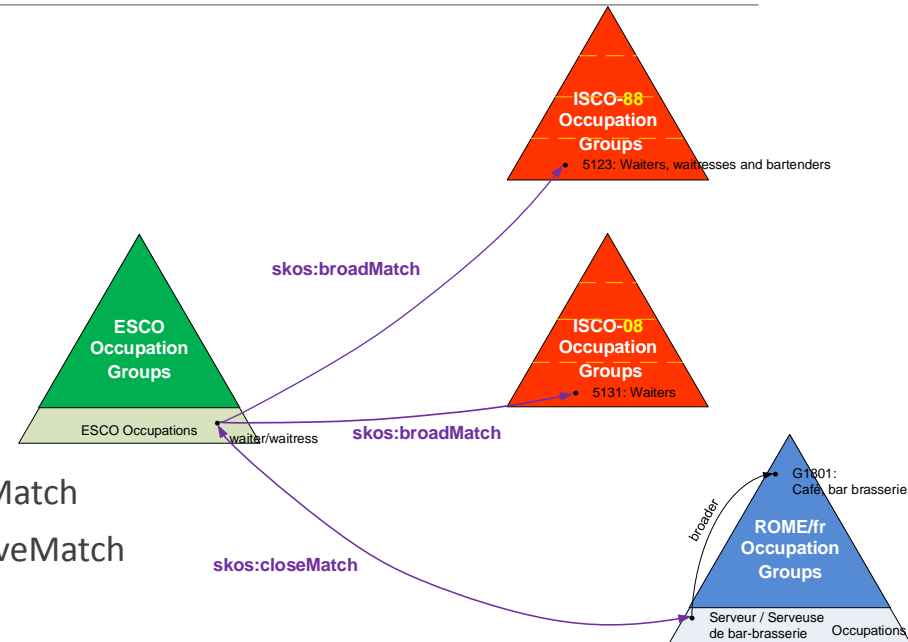
- E.g. a NACE code for an Occupation Group



# Mapping Relations

## Compose

- exactMatch **o** exactMatch
- exactMatch **o** closeMatch
- exactMatch **o** broadMatch
- broadMatch **o** exactMatch
- exactMatch **o** narrowMatch
- narrowMatch **o** exactMatch
- broadMatch **o** broadMatch  $\supset$  esco:broadTransitiveMatch
- narrowMatch **o** narrowMatch  $\supset$  esco:narrowTransitiveMatch





# An ecosystem of vocabularies



ISCO: International Standard Classification of Occupations

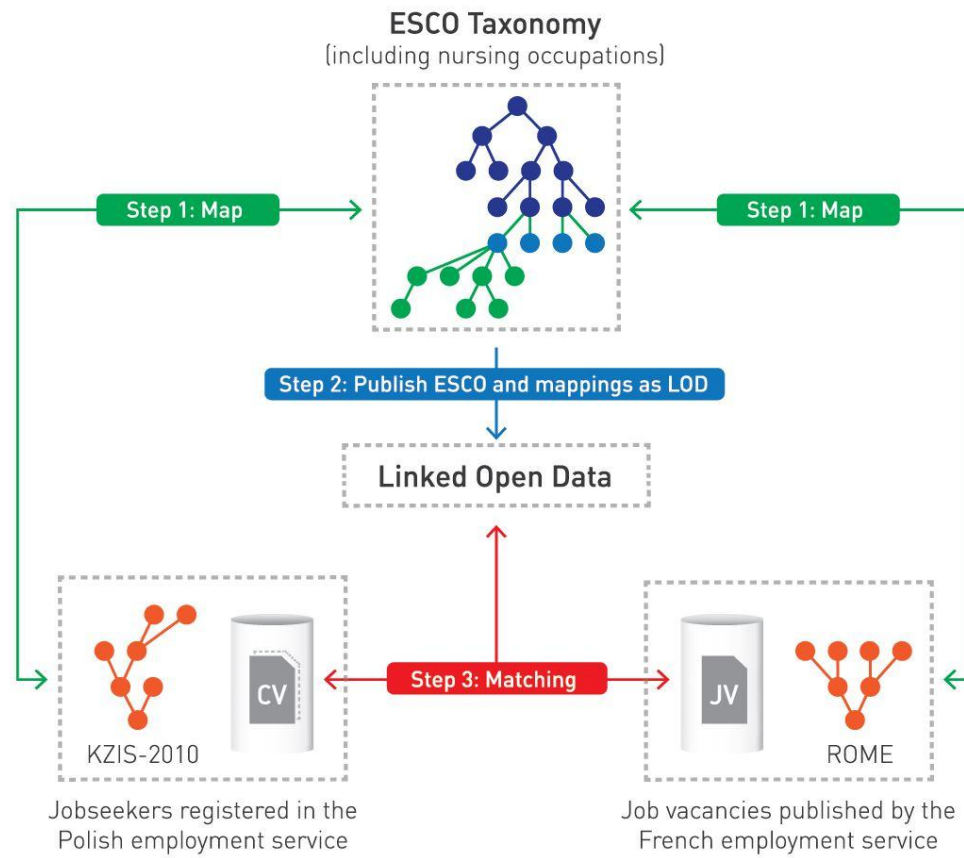
NACE: Statistical Classification of Economic Activities in the European Community

CEFR: Common European Reference for Languages

FoET: Fields of Education and Training

EQF: European Qualifications Framework

# A “hub” Taxonomy – How will it work?



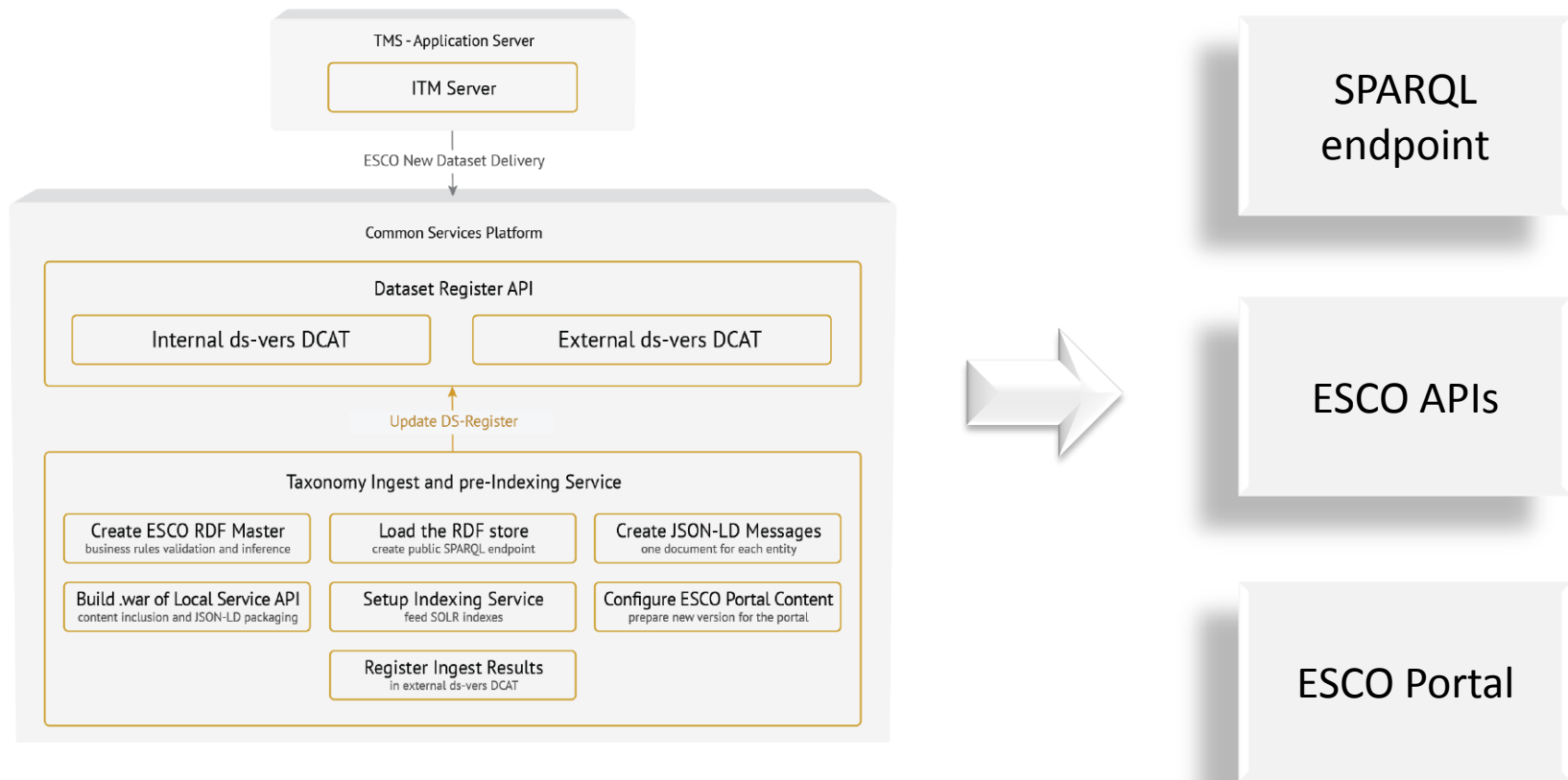
# Publishing ESCO as LOD

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The main drivers for LOD:

- Easy to link to other semantic assets
- Easy integration into existing ICT systems
- Ensure content is managed and quality assured before publication
- Ensure that continuous updates of the taxonomy do not impose an overhead for the EC
- Ensure that licensing, versioning and provenance are in place

# The ESCO architecture (snapshot)



# Current Status (software)

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Installed release in PROD

- Includes a 1<sup>st</sup> version of an LOD API with HTML content
- For example [data.europa.eu/esco/occupation/463](http://data.europa.eu/esco/occupation/463)

The ESCO Data Model (full LOD version)

- [data.europa.eu/esco/lod/model](http://data.europa.eu/esco/lod/model)

Next versions (currently in ACC)

- SPARQL endpoint
- Final LOD API with RDF and JSON-LD content
- In PROD in a few weeks

# Next steps

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Finalize the APIs (LOD, Central Service, Mapping, Versioning)

- Local service API under testing by Europass team and PrES

Finalize the ESCO content (the remaining 16 NACE sectors)

- Online consultation process

Prepare “fit-for-purpose” pilots, to assess the quality of the classification

Work on the Qualifications pillar (NQDs as Open Data, Registers of Awarding Bodies and Work Context)

Discussions with LinkedIn to use part of the content (ICT sector)

# Conclusions

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The only multi-lingual classification in the Labour Market

A hub for mappings to National Occupational Classifications

A standard for Labour Market stakeholders

Published as Linked Open Data

- “Vocabulary ecosystem” SKOS-ified and provided as LOD
  - (ESCO keeps internal copies)

# For more details

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## ESCOpedia

- <https://ec.europa.eu/esco/escopedia>

## Main publications and lectures

- Le Vrang, M.; Papantoniou, A.; Pauwels, E.; Fannes, P.; Vandenstein, D.; De Smedt, J., "ESCO: Boosting Job Matching in Europe with Semantic Interoperability," Computer , vol.47, no.10, pp.57,64, Oct. 2014, doi: 10.1109/MC.2014.283
- De Smedt J, Papantoniou A.– “The ESCO platform for a collaborative NKOS development” –13<sup>th</sup> Networked Knowledge Organization Systems (NKOS) – Digital Libraries 2014 Conference London, September 2014
- Le Vrang, M.; Papantoniou, A.- “ESCO - enhancing semantic interoperability in the labor market and in education/training throughout Europe”, European Data Forum 2014, Athens, Greece, March 2014.



# Thank You! – Questions?

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