



# **The European classification of Skills, Competences, and Occupations (ESCO): news, use cases & AI applications**

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ESCO Secretariat**

Session 3 – Module 2: Big data analysis for labour market  
intelligence online training  
15 November 2022

slido



**How familiar are you with ESCO?**

① Start presenting to display the poll results on this slide.

slido



**What type of skills are included in ESCO?**

① Start presenting to display the poll results on this slide.

slido

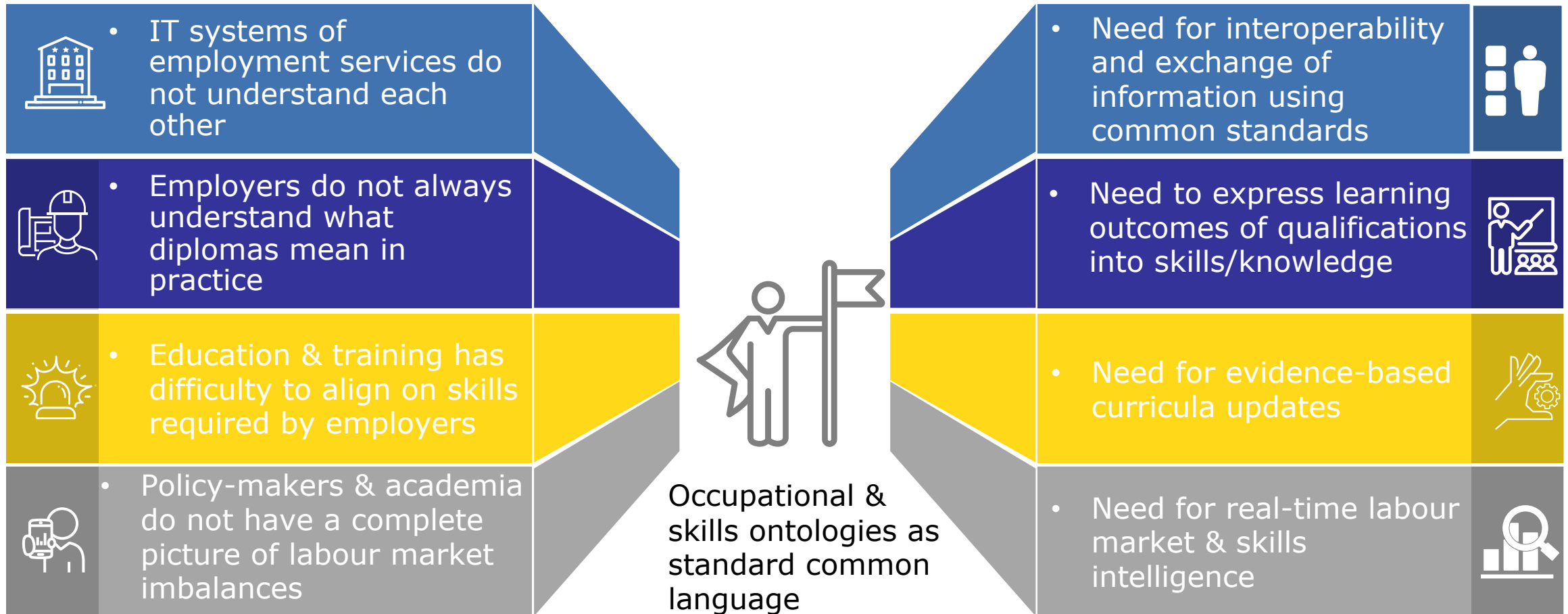


**To what extent taxonomies like ESCO  
contribute to the analysis of labour market  
data?**

① Start presenting to display the poll results on this slide.



# A common language for a better functioning labour market



# The European Classification of Skills, Competences and Occupations

ESCO works as a dictionary, describing, identifying and classifying professional occupations, skills, and competences relevant for the EU labour market and education and training.



Free of charge

Machine readable

28 Languages

# Target audience

**ESCO**



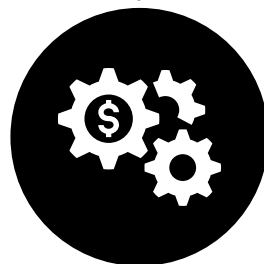
Public, private  
employment  
services & job  
portals



HR departments  
of companies



Software providers & IT  
companies



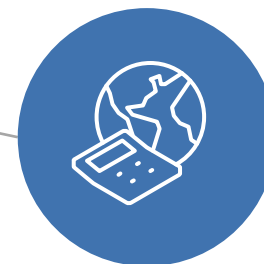
Researchers & statisticians



Education institutions



Policy- makers



EU &  
international  
organisations



European  
Commission

# Structure of ESCO

Search occupations

Search: economist Find

Hierarchy view

- 0 - Armed forces occupations +
- 1 - Managers +
- 2 - Professionals +
- 3 - Technicians and associate professionals +
- 4 - Clerical support workers +
- 5 - Service and sales workers +
- 6 - Skilled agricultural, forestry and fishery workers +
- 7 - Craft and related trades workers +
- 8 - Plant and machine operators and assemblers +
- 9 - Elementary occupations +

**economist**

Discuss in the forum  
Download

Professionals >  
Legal, social and cultural professionals > Social and religious professionals > Economists >  
economist >

**Description**

**Code**  
2631.2

**Description**  
Economists perform research and develop theories in the field of economics, whether for microeconomic or macroeconomic analysis. They study trends, analyse statistical data, and to some extent work with economic mathematical models in order to advise companies, governments, and related institutions. They advise on product feasibility, trend forecasts, emerging markets, tax policies, and consumer trends.

**Alternative Labels**

**OCCUPATIONS PILLAR**  
3008 Occupations

Search ... Find

- K - knowledge +
- L - language skills and knowledge +
- S - skills -
- S1 - communication, collaboration and creativity +
- S2 - information skills +
- S3 - assisting and caring +
- S4 - management skills +
- S5 - working with computers +
- S6 - handling and moving +
- S7 - constructing +
- S8 - working with machinery and specialised equipment +
- T - transversal skills and competences +

**apply statistical analysis techniques**

transversal skills and competences >  
core skills and competences > working with numbers and measures > carry out calculations > skills >  
information skills > analysing and evaluating information and data >  
analysing and evaluating information and data > apply statistical analysis techniques >

**Description**

**Description**  
Use models (descriptive or inferential statistics) and techniques (data mining or machine learning) for statistical analysis and ICT tools to analyse data, uncover correlations and forecast trends.


**Alternative Labels**  
apply numerical analysis to data apply statistical analysis techniques

**Skill type**  
skill


**SKILLS PILLAR**  
13890 Skills/Competences

# ESCO portal showcase


**Find** in the ESCO portal



OCCUPATIONS



SKILLS



QUALIFICATIONS

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

# ESCO v1.1 (launched Febr.2022)

2<sup>nd</sup> ESCO major version

**Green  
transition**

Green skills

**Digital  
transition**

Digital skills

**Emerging  
technologies**

Researchers  
skills

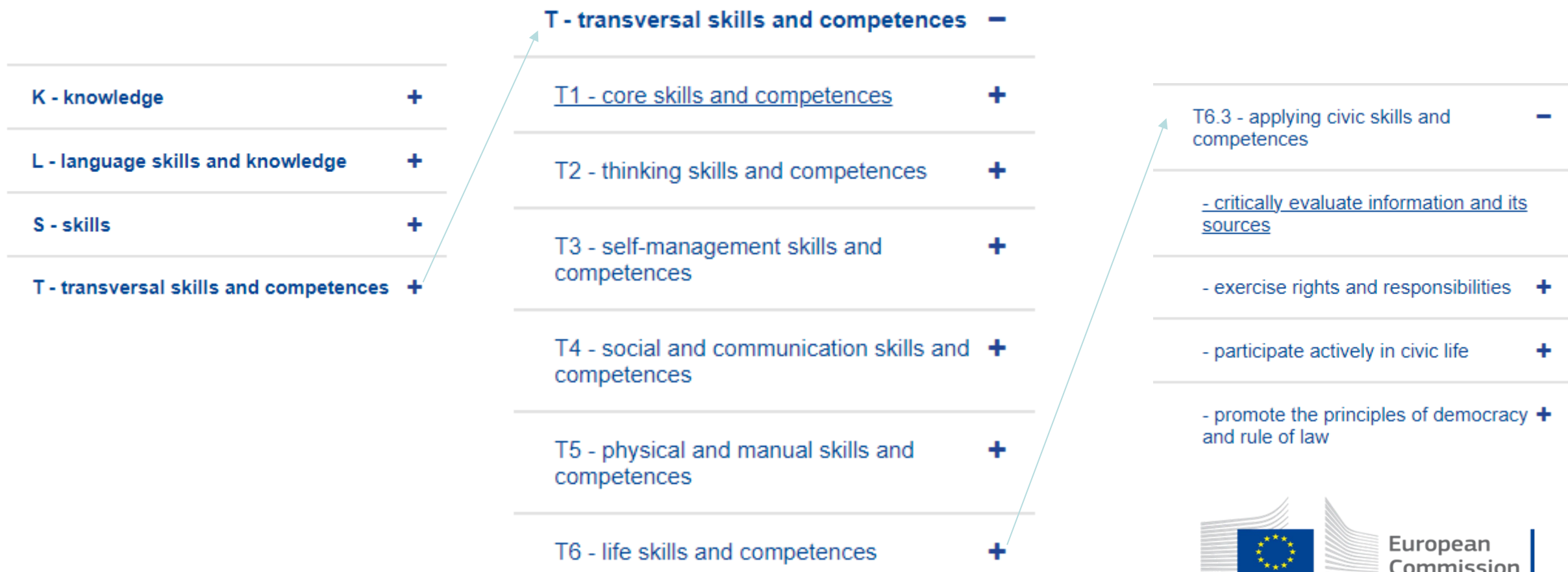
**Transversal  
skills**

New model for  
transversal  
skills

Application of AI to manage the classification

# Transversal skills & skills hierarchy

Transversal skills are not directly linked to Occupations, as they are relevant across-sectors and occupations





# Digital & green skills for the twin transition

The green transition involves: technical (occupationally specific skills) and generic skills (soft skills).

ESCO labels the green and digital skills to highlight them out of the ~14.000 exiting skills

## ESCO Green skills & knowledge labels

571 concepts

- measure sustainability of tourism activities
- sustainable installation materials
- emission standards
- educate on hazardous waste
- train staff on recycling programs

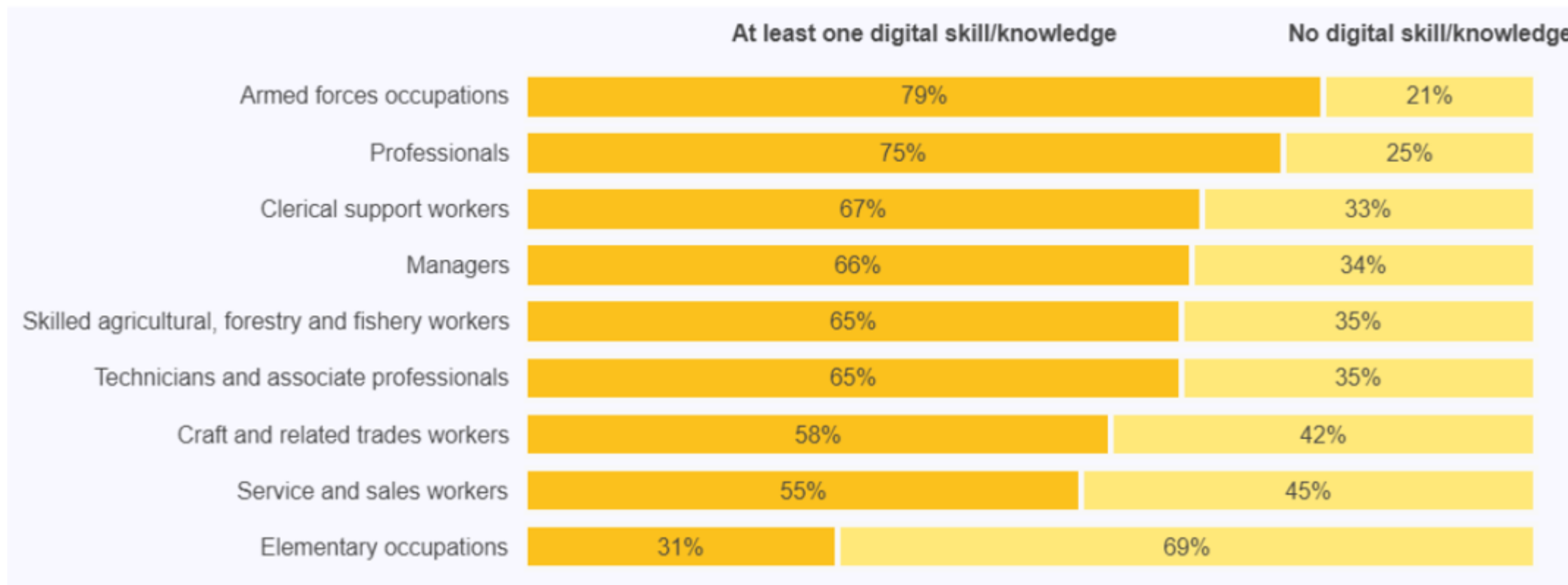
## ESCO digital skills & knowledge labels

1201 concepts

- manage IT security compliances
- assess integrated domotics systems
- deliver online training
- assistive technology in education
- conduct web searches

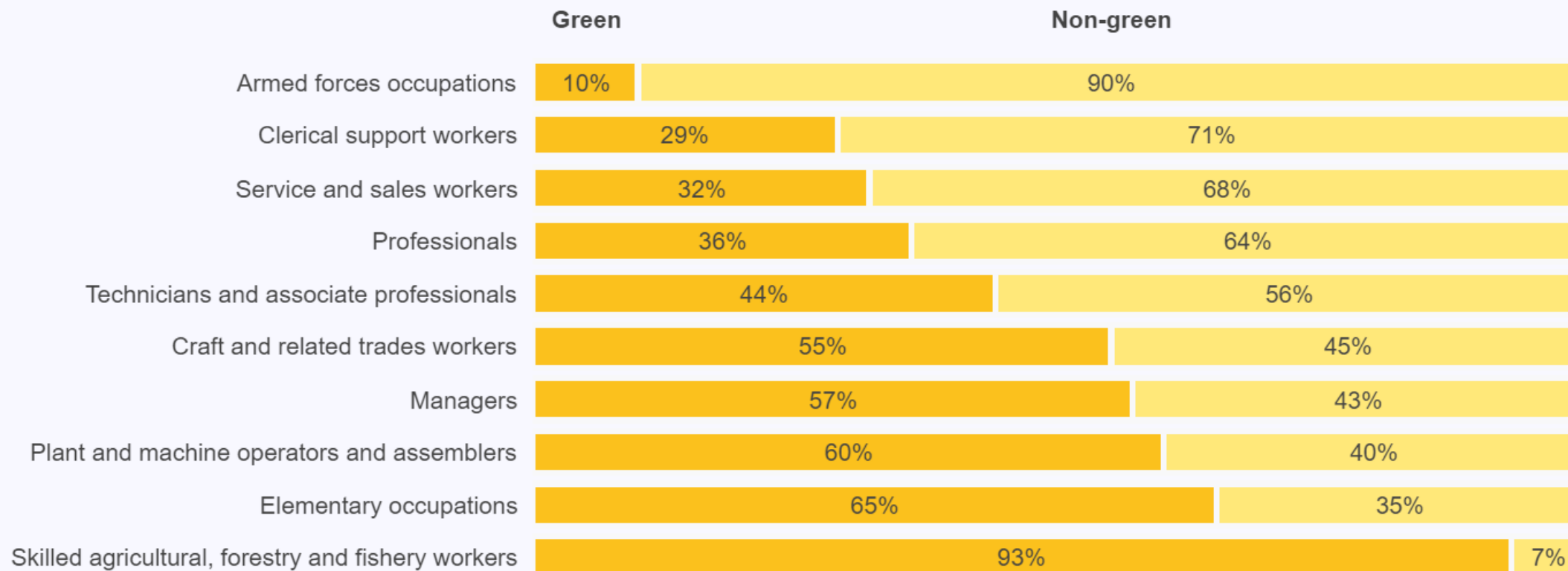


# Skills composition of Occupations



Share of digital skills per ISCO level 1

# Skills composition of Occupations



Share of green skills per ISCO level 1

# Skills composition of Occupations

- 23% green skills
- 18% digital skills

🔍 wind turbine

Find

Hierarchy view ↗

## Search result

3131.2 - onshore wind farm technician  
3119.11 - offshore renewable energy technician  
2149.9.5 - offshore renewable energy engineer  
2149.9.6 - onshore wind energy engineer  
2149.9.7 - renewable energy engineer  
8151.4 - winding machine operator  
8142.6 - filament winding operator  
8142.8 - insulating tube winder  
7232.3 - aircraft gas turbine engine overhaul technician  
3131.3.9 - steam turbine operator  
7312.7 - wind musical instrument maker  
7115.6 - window installer  
3131.1 - offshore renewable energy plant operator  
3131.3.3 - fossil-fuel power plant operator

## offshore renewable energy technician

Discuss in the forum

Download

Technicians and associate professionals >  
Science and engineering associate professionals > Physical and engineering science technicians >  
Physical and engineering science technicians not elsewhere classified >  
offshore renewable energy technician >

## Description

### Code

3119.11

### Description

Offshore renewable energy technicians install offshore energy farms and equipment. They ensure the equipment operate in compliance with regulations and assist the offshore renewable energy engineers in the construction of energy devices such as wind turbine blades, tidal stream and wave generators. They also react to system problems, and repair faults.

### Alternative Labels

offshore renewable energy installer

marine renewable energy installer

ORE technician

offshore wind turbine technician

MRE installer



European  
Commission

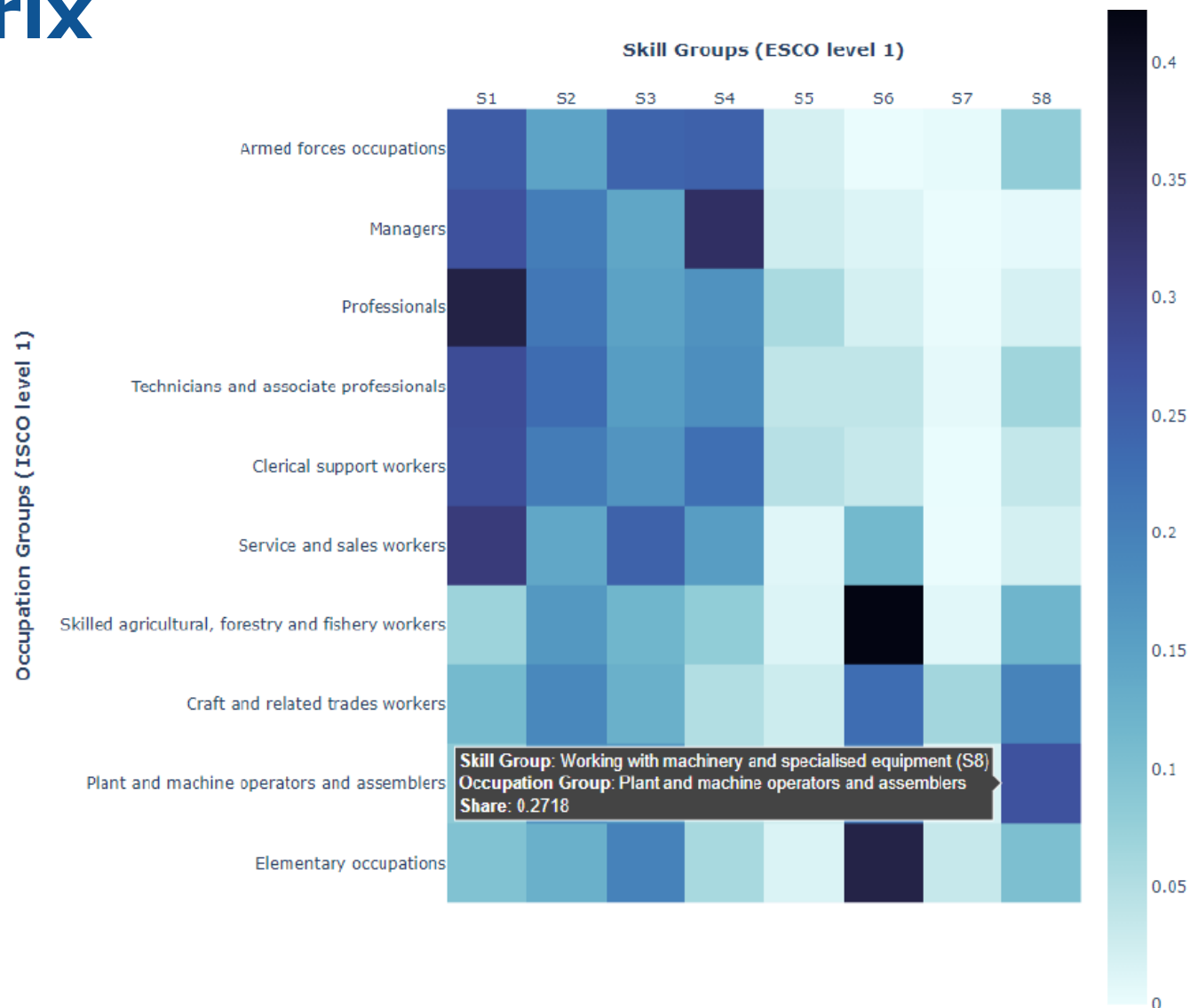
# Occupations-Skills matrix

**Connect ISCO-08 occupation groups** (rather than one single occupation) **to ESCO skills hierarchical groups** (rather than one single skill)

Skills groups collect skills that are sector-independent and differ in terms of

- tools and equipment used
- type of object on which the work is performed, and
- the function or outcome of the task or activity.

Dataset available on [our portal](#)



# ESCO's use cases

## Job-matching & searching

*Compare vacancies and CVs and suggest best matches*

## Curricula reform

*Based on LM evidence, adapt the learning outcomes of qualifications and training provided*

## Big data analysis of labour market

*Detect demand of skills and occupations from online job advertisements*

## Validation of informal/non-formal learning

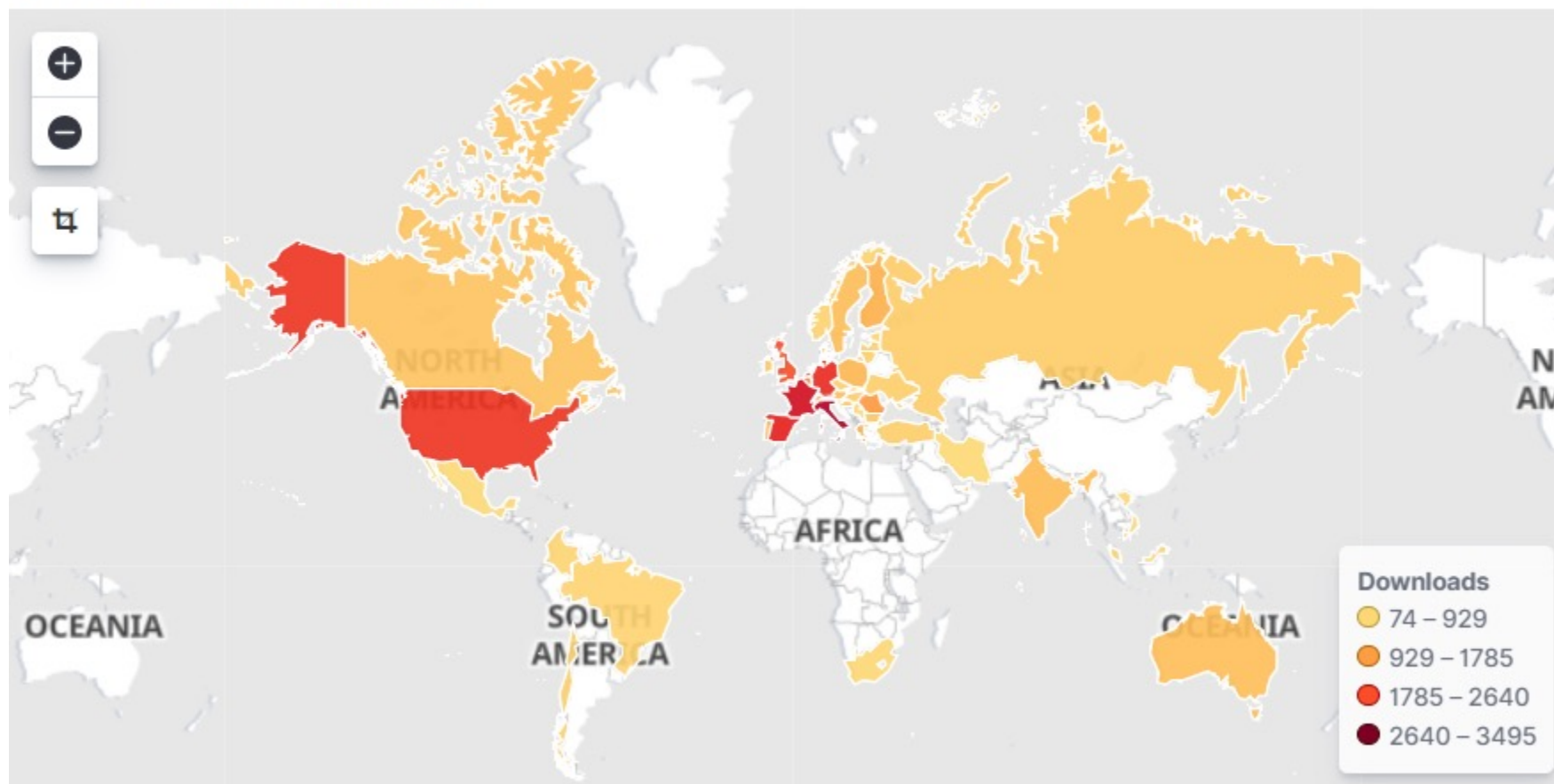
*Identify, assess and certify knowledge & skills acquired outside of formal learning*

## Graduate tracking

*Assess skills mismatches over time*

# ESCO's usage

ESCO portal downloads per country

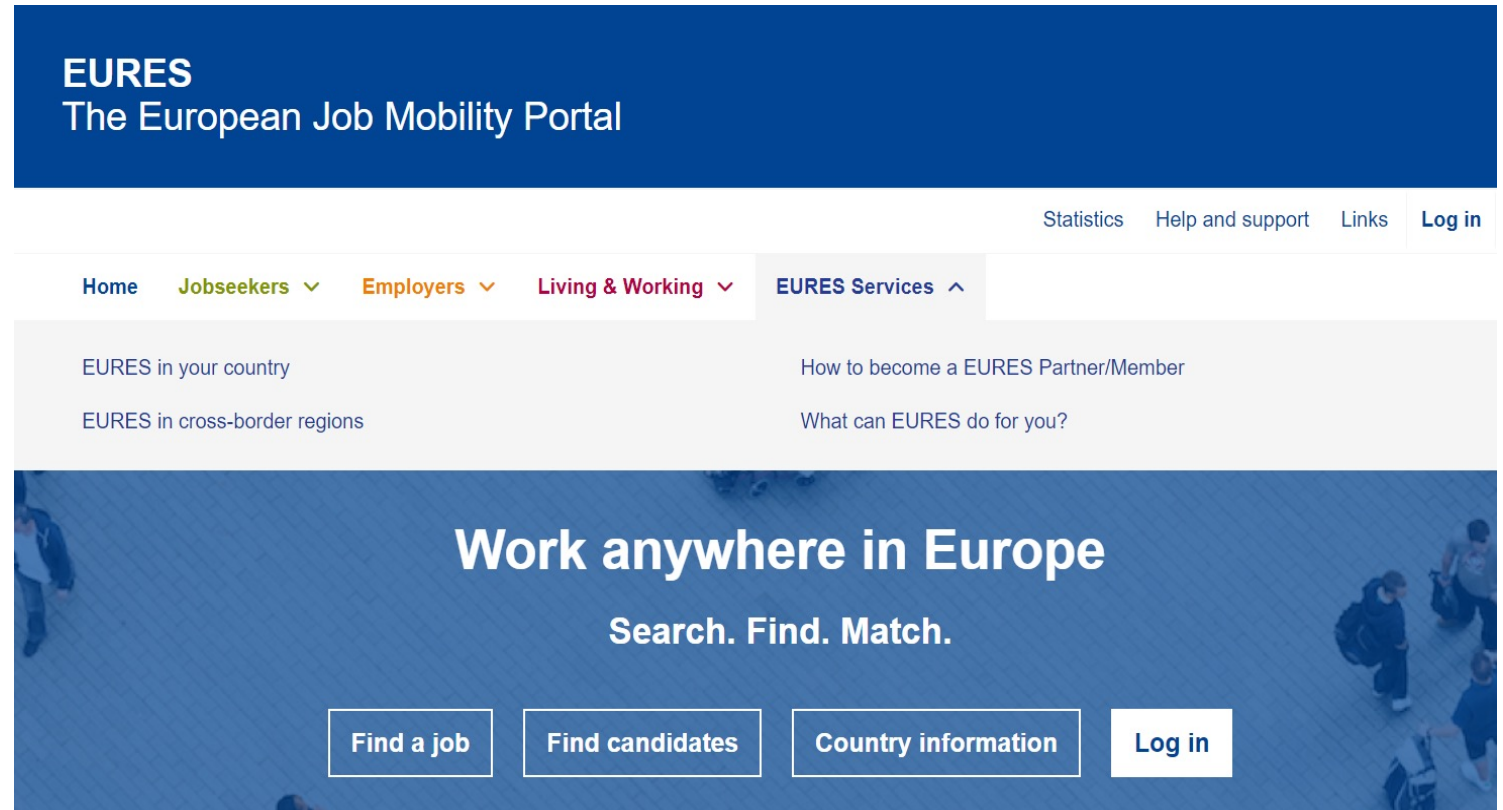


EU & international reach



# ESCO's implementers- EURES

- **Exchange labour market information** across the EU according to the EURES Regulation
- Facilitate the **design of job vacancies and job profiles** in different languages
- One of the components for improved **skills-based job matching results**



# ESCO's implementers- EUROPASS

- Facilitate the **creation of e-profiles** in different languages
- EURES-EUROPASS interoperability on job offers
- **Refined job search possibilities**

## Find a job

This is an introductory text to explain what is "Find a job" and how it will help the user to find better opportunities.

Search by keyword	Location
<input type="text" value="Chef"/>	<input type="text" value="Search"/>
<div><div>Chef Assitant</div><div>Design Chef</div><div>Sous Chef</div><div>Head Chef</div></div>	<div><div>Cataluña</div><div>Barcelona</div><div>Girona</div><div>Lleida</div><div>Tarragona</div></div>

### My Skills

Build your skills profile by confirming or rejecting skills suggestions from your personal profile. Update your personal profile to get more accurate suggestions or try the search.

#### Suggestions

protect health and well-being while...

use learning strategies

support company plan

apply quality standards

support cultural diversity

follow environmentally-sustainable...

attend to detail

accept constructive criticism

support gender equality

persist

photography

advice customers on photography

work with the director of photography

commercial photography

research new photographic procedures

Edit mode

View mode

## Application of knowledge

### Digital competences

protect ICT devices | implement ICT safety policies | implement a firewall | implement spam protection |  
implement a virtual private network |

### Numeracy and mathematics

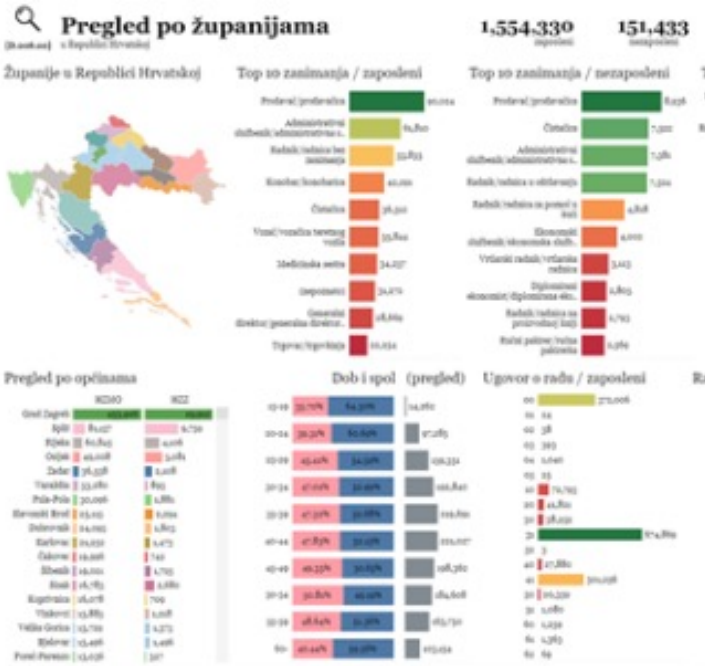
carry out work-related calculations | carry out work-related measurements |



# ESCO's implementers- big data analysis

- **Nine EU public employment services** intend to use or already use ESCO for big data analysis.
- Other international stakeholders use ESCO for this type of analysis

*National Platform for Advanced Analytics of Labour Market's Mechanics and Dynamics, Croatia*



Data61 Australian Skills Dashboard (Beta)

This Dashboard uses data kindly provided by Adzuna Australia

**Demand** for skills in the Australian labour market.

Data61 is Australia's leading digital research network, we're here to help you create your data-driven future.

# How ESCO facilitates big data analysis



## Rich source of metadata

ESCO contains descriptions, alternative labels and relations between concepts

Following trends & terminology in the labour market

## Multilingual & Language independent

Machines can interpret its concepts based on semantic similarity & build LM language models

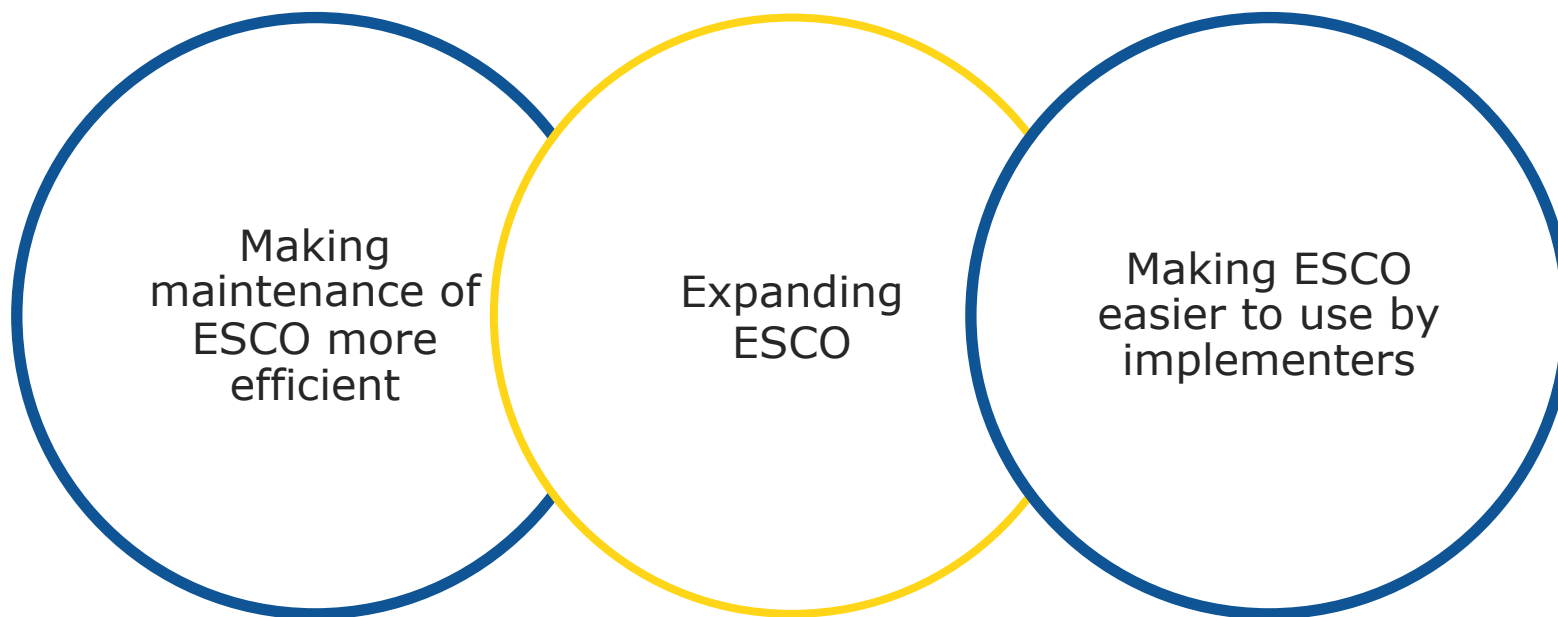
~4000 publications on Google scholar using ESCO

## Supports interoperability

Existing mappings to other taxonomies (ISCO, ISCED-F, O\*NET, *NACE*, national EU taxonomies)

# Use of artificial intelligence in ESCO

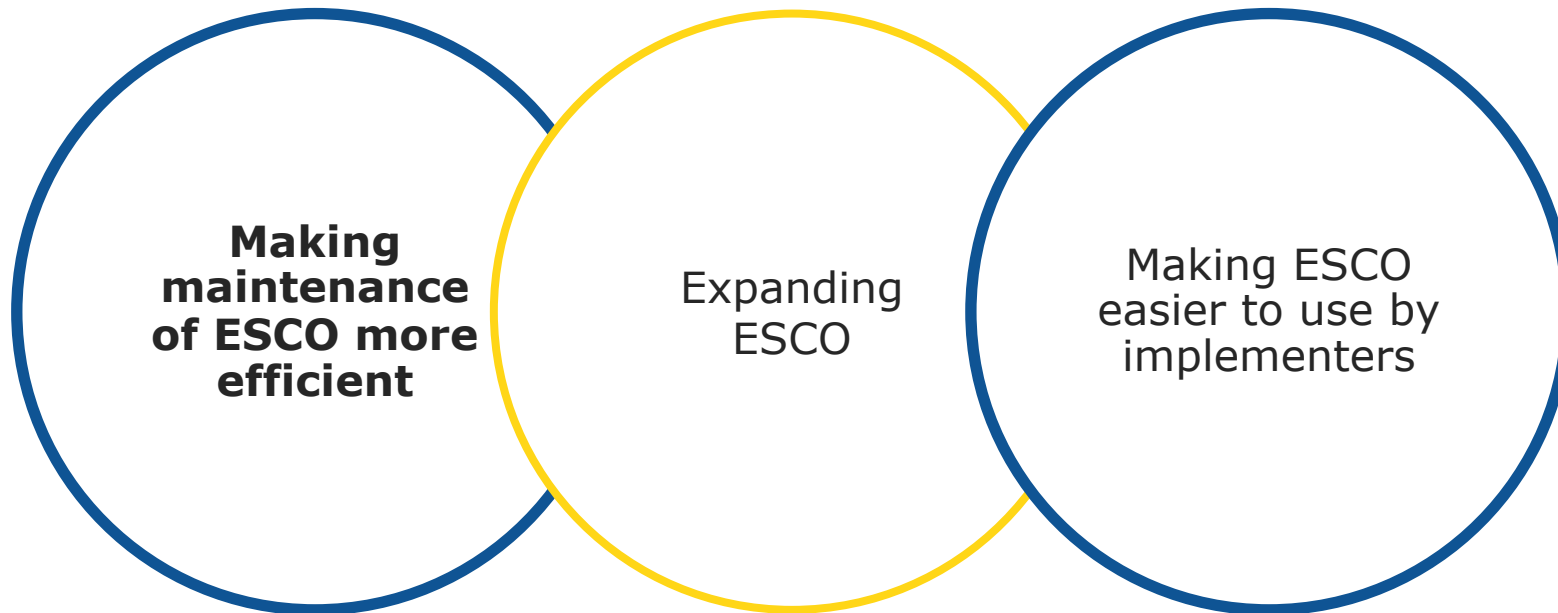
Use an analytical approach based on statistical analysis, data science and machine learning to assist in:





# Use of artificial intelligence in ESCO

Use an analytical approach based on statistical analysis, data science and machine learning to assist in:





# Detect potentially duplicate skills

**Goal:** avoid skills with identical meaning in ESCO

Methodology: machine learning (ML) model to detect duplicate skills in the classification

1. Input: single ESCO skill
2. Output: ranked ESCO skills based on the semantic similarity score
3. Filter the highest scores and manually validate the result: one person validates, another person reviews. Further discussion and a third validator in case of disagreement.
4. Remove duplicates and consider the output skill as obsolete

Input Preferred Term	Input Description	ML Score	Output Preferred Term	Output Description
Accept criticism and guidance	Handle negative feedback from others and react openly to criticism, trying to identify in it potential areas for improvement.	0,97	Accept constructive criticism	React to valid and well-reasoned opinions about one's work in a positive manner.
		0,92	Demonstrate enthusiasm	Display great effort driven by an interest or enjoyment in work itself, in the absence of external pressures.
		0,92	Demonstrate consideration	Act in an understanding and supportive manner that is sensitive to others' needs and feelings.

# Identify relations between skills and occupations

**Goal:** avoid orphan ESCO skills, i.e. skills not linked to any ESCO occupation

Methodology: analyse relation between ESCO skills and occupations in online vacancies, support by ML model

1. Dataset with relations between skills and occupations from the EURES platform (i.e. ESCO skills and ESCO occupation within the same job vacancy)
2. Set orphan skill as input and rank occupations based on their frequency in the EURES vacancies & semantic similarity score
3. Filter the highest frequencies and scores and manually validate the result: one person validates, one person reviews. Further discussion and a third validator in case of disagreement. Take in consideration other skills linked to the suggested occupations.
4. Link the orphan skill to the occupation

Input Preferred Term	Input Description	ML Score	Output Preferred Term	Frequency (#vacancies)
Implement a firewall	Download, install and update a network security system designed to prevent unauthorized access to a private network.	0,78	ICT network administrator	297
		0,73	ICT network architect	267
		0,61	Radio technician	1



# Identify relations between skills

**Goal:** link new transversal skills to non-transversal skills

Methodology: analyse existing relations between ESCO skills and use ML model to detect appropriate matches with non-transversal skills

1. Build a ML model trained on existing relationships between ESCO skills
2. Set one new transversal skill as input, rank non-transversal skills based on the ML results and additional set of rules (e.g. existing relationships with other skills, etc.)
3. Filter the highest scores and manually validate the result: one person validates, one person reviews. Further discussion and a third validator in case of disagreement.
4. Link the transversal skills to non-transversal skills

Input Preferred Term	Input Description	ML Score	Output Preferred Term	Output Description
Participate actively in civic life	Actively engage in activities for the common or public interest such as civic, community or neighbourhood initiatives, volunteering opportunities and non-governmental organisations.	0,99	Raise awareness on local community's priorities	Intervene and implement programs or activities that raise awareness of issues relevant for the respective local community, such as social or economic inequality, gender issues, violence, and drug abuse.
		0,98	Promote inclusion in organisations	Promote diversity and equal treatment of genders, ethnicities and minority groups in organisations in order to prevent discrimination and ensure inclusion and a positive environment.
		0,98	Perform street interventions in social work	Conduct outreach activities by providing direct information or counselling services to individuals in their neighbourhood or in the streets, usually targeted at youth or homeless people.







# Identify potential NPTs for occupations

## Goal:

Extract NPT candidates from labour market data

## Methodology :

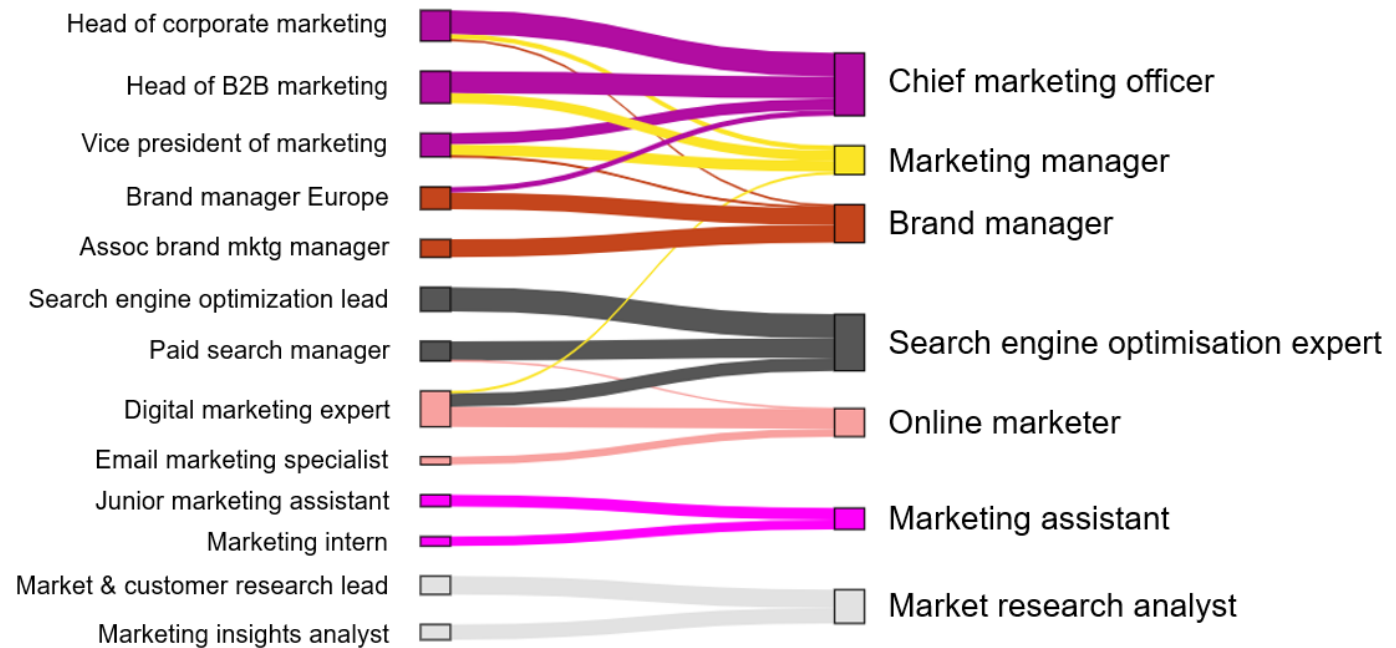
Model to compare multilingual data from ESCO and external sources

## Data:

- ESCO, QDR qualifications, EURES online job advertisements
- 35 million data points
- 28 ESCO languages

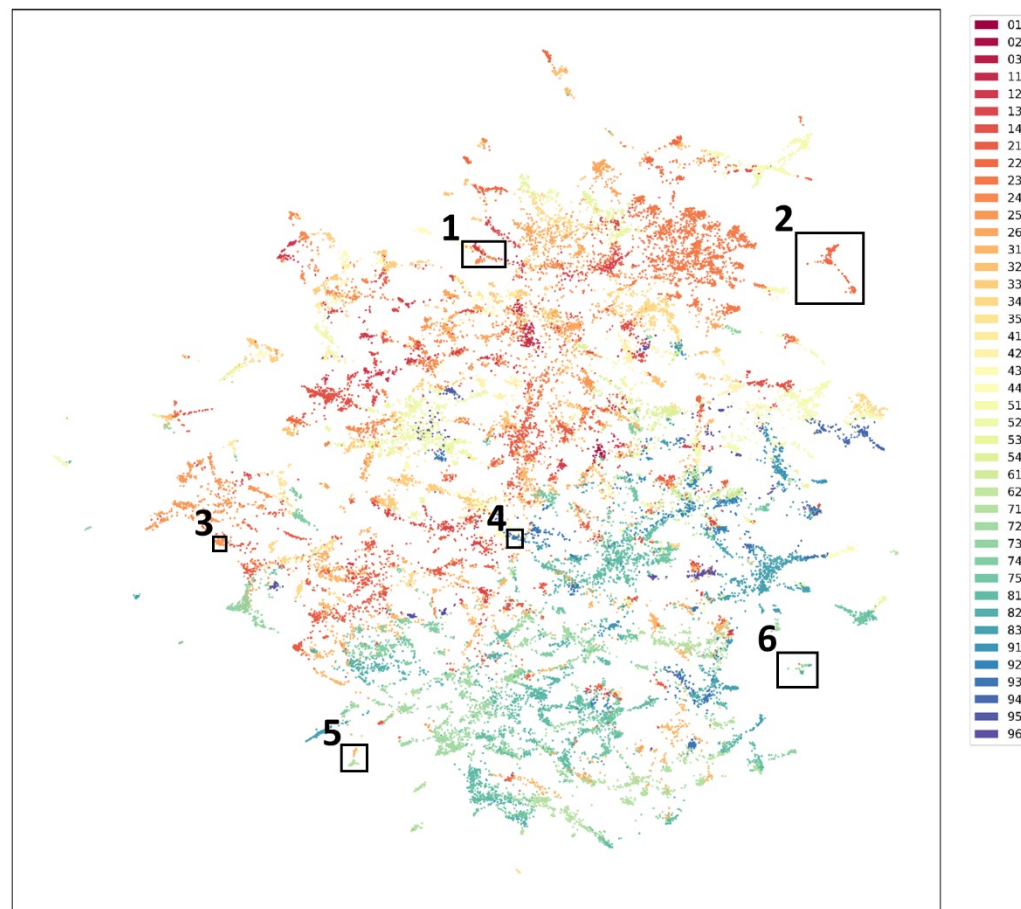
## Approach:

- Finetune XLM-RoBERTa language model
- Align embedding space across 28 ESCO languages
- Compare text and ESCO concepts in embedding space

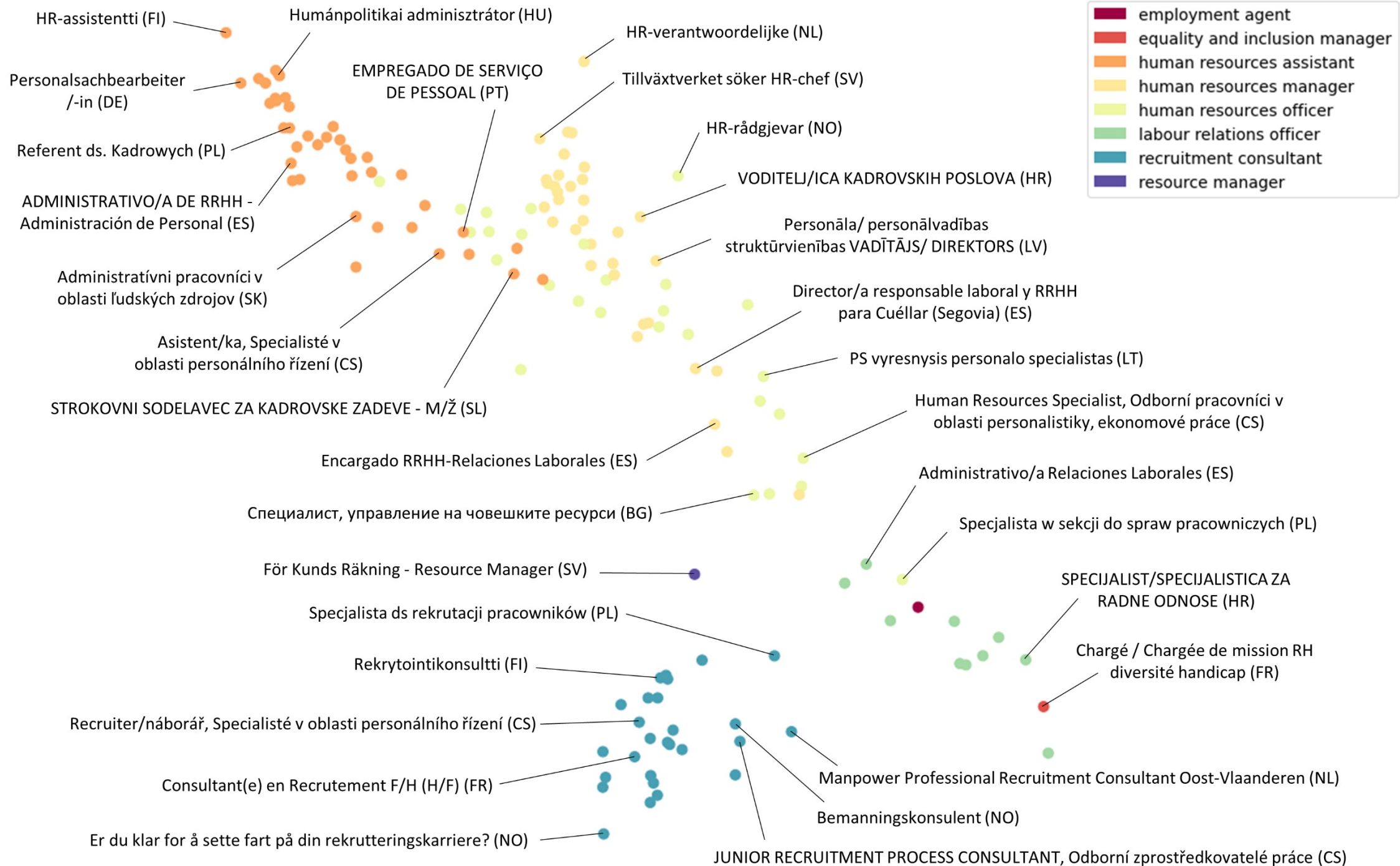


# Identify potential NPTs for occupations

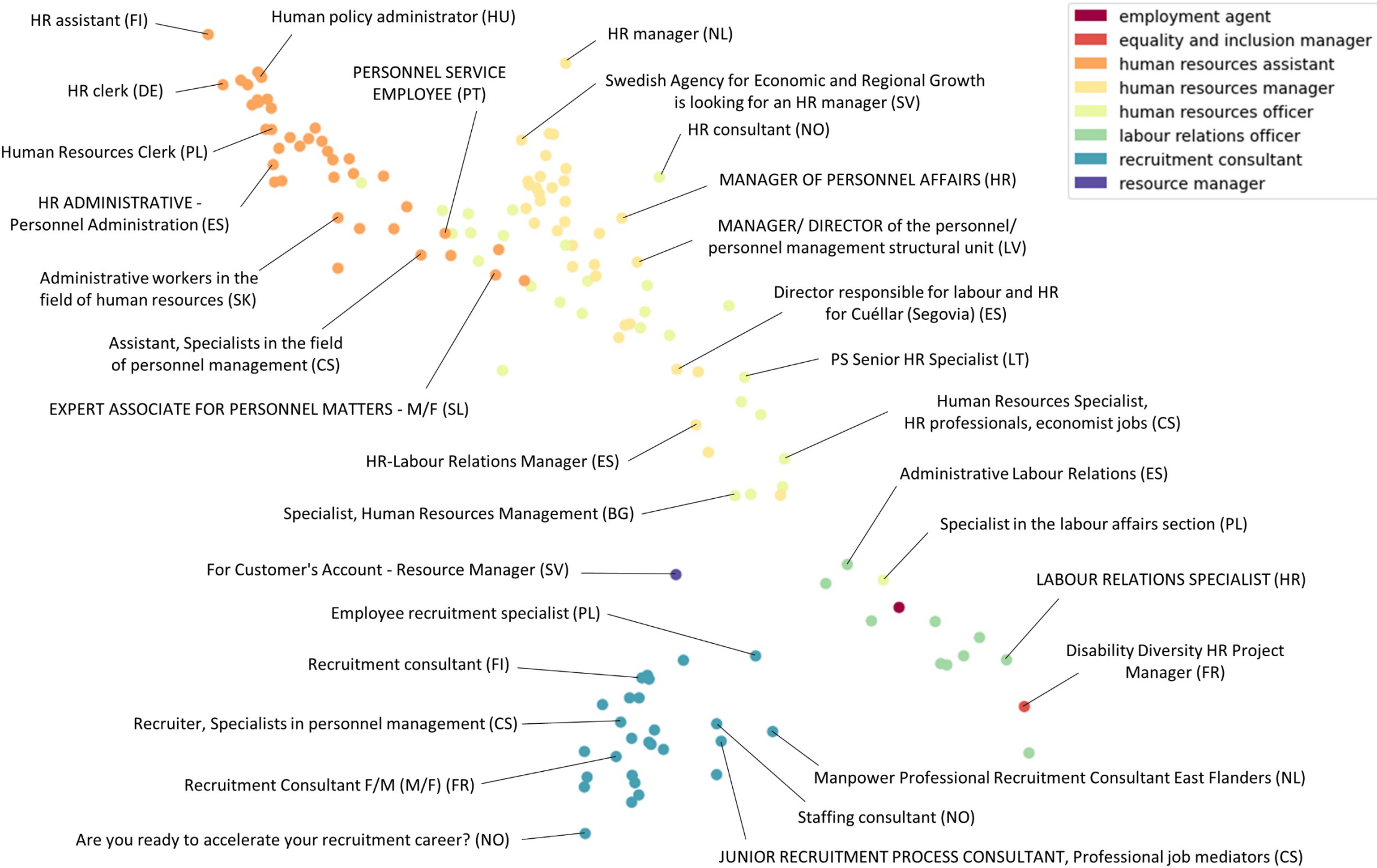
Multilingual embedding space with 35K unique job titles from online job advertisements:



# Area 1



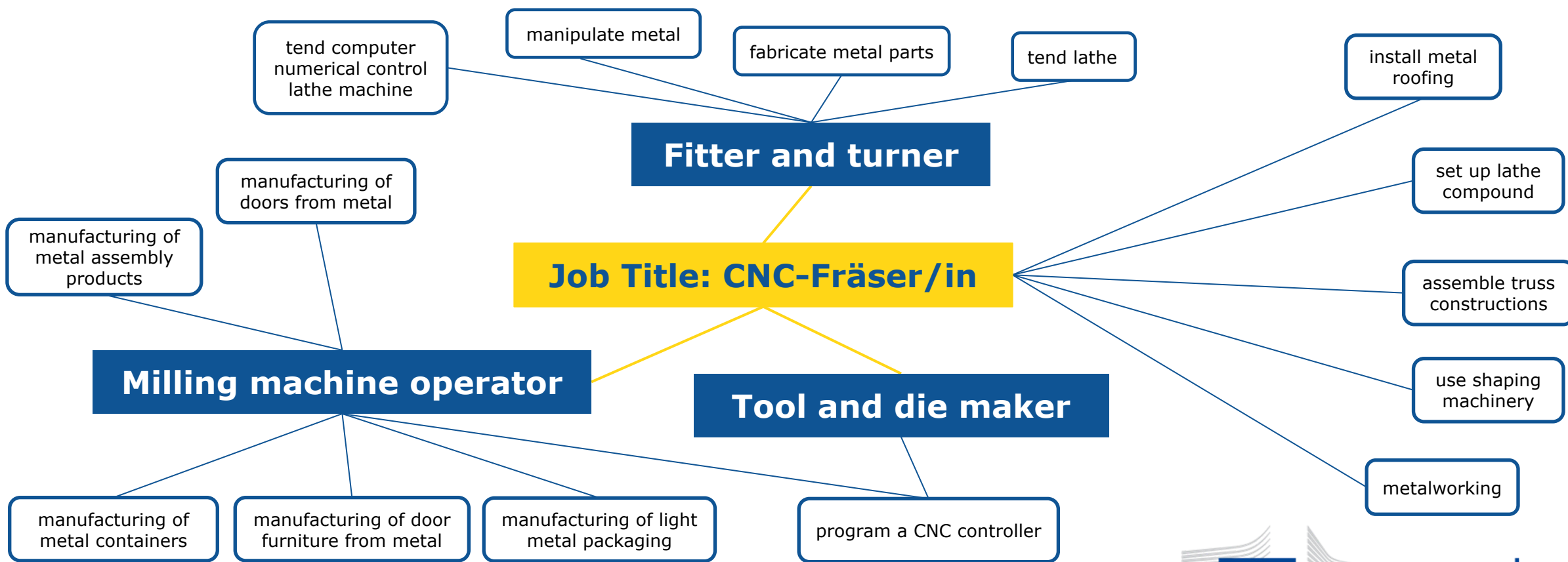
Area 1





We are a medium-sized metal construction company and manufacture individual items, prototypes, tools and devices. In July 2021 we will move into new company premises (easily accessible by public transport) and continue to expand our offer for our customers. To do this, we definitely need reinforcement in the team now. We are looking for you as a CNC milling cutter. Your task is to manufacture individual pieces, prototypes, tools and devices using CNC milling. The operation and programming of our Heidenhain or Siemens controlled machines is the focus of your independent, responsible work. The prerequisite is a completed vocational training in the machining sector or as a tool mechanic and thus initial basic experience in programming CNC machines. We are also happy to give career starters a chance. Basic knowledge: metal construction, metalworking, turning. Advanced knowledge: CNC knowledge, CNC programming, milling

## Feedback on ESCO on a European scale from millions of online job advertisements

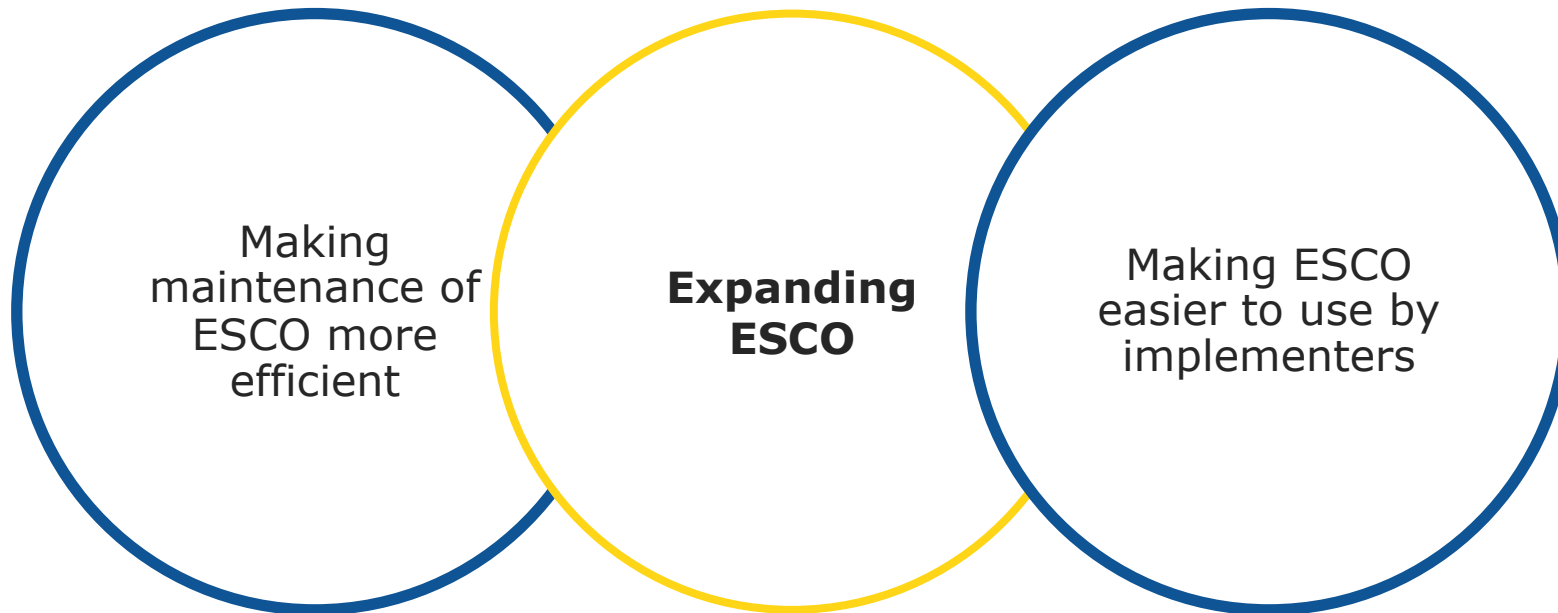






# Use of artificial intelligence in ESCO

Use an analytical approach based on statistical analysis, data science and machine learning to assist in:



# Identify alternative terms for new occupations

**Goal:** enrich ESCO occupations with alternative labels used in the labour market

Methodology: collect job titles from online vacancies and use ML model to detect similarities with ESCO occupations

1. Dataset of job titles from the EURES platform
2. Set new occupation as input and rank EURES job titles based on semantic similarity score
3. Filter EURES job titles already suggested by experts
4. Filter the highest scores and manually validate the result: one person validates, one person reviews. Further discussion and a third validator in case of disagreement.
5. Include the job titles as alternative labels for the new ESCO occupation

Input Preferred Term	Input Description	ML Score	Output Preferred Term	Suggested by experts?
Mobility services manager	Mobility services managers are responsible for the strategic development and implementation of programs that promote sustainable and interconnected mobility options, reduce mobility costs and meet the transportation needs of customers, employees and the community as a whole such as bike sharing, e-scooter sharing, carsharing and ride hailing and parking management. [...]	0,95	Mobility manager	YES
		0,82	Mobility program coordinator	NO
		0,81	Campus mobility planning manager	NO



## Feedback on ESCO on a European scale from millions of 'experts'

**Suggestions**

think analytically ✓ ✕ work as a team ✓ ✕ develop strategy to solve problems ✓ ✕ use microsoft office ✓ ✕

work in an international environmen... ✓ ✕ use online communication tools ✓ ✕ create solutions to problems ✓ ✕

think creatively ✓ ✕ project management ✓ ✕ prioritise tasks ✓ ✕ use presentation software ✓ ✕

### My Skills

#### Information skills

##### Analysing and evaluating information and data ^

apply statistical analysis techniqu...

##### Calculating and estimating ^

execute analytical mathematical cal...

##### Documenting and recording information ^

report analysis results

##### Processing information ^

process data

#### Working with computers

##### Accessing and analysing digital data ^

analyse big data | perform data analysis | perform data mining

##### Programming computer systems ^

utilise machine learning

Edit mode

### Digital skills

List your digital skills here and group them.

#### Digital skills



MXnet

Add

Tensorflow,Keras,Pytorch,MXnet, Chainer, Theano  
Mxnet  
MXNet  
python pandas seaborn sklearn cvxpy mxnet  
PyTorch,Chainer,MXNet  
Pytorch, Tensorflow, Keras, Horovod, ONNX, TensorRt, MXNet.  
MxNet

Add to your digital skills from the list below. Click on the skill and drag it to the left.

Microsoft Word + ✕

Microsoft Excel + ✕

Microsoft Office + ✕

Microsoft Powerpoint + ✕

Outlook + ✕

Google Drive + ✕

### Work experience

Describe all your work experiences. You can include paid work, volunteering, internships, apprenticeships, freelancing and other activities.

#### New work experience

Occupation or position held

Data

Data scientist  
Data analyst  
Data centre operator  
Data entry supervisor  
Data entry clerk  
Data warehouse designer  
Data quality specialist

☐ Ongoing

Main activities and responsibilities

**B** **I** U

Describe your tasks and responsibilities.



European  
Commission



SV.OJA

Erfaret Cafébiträde till långhelger fred-lörd-sönd-mån (SV)

Om jobbet Vi söker en person som kan jobba fredag-lördag-söndag-måndag 9-17. **Caféet är öppet** från morgon till kväll. Vi **serverar frukost, lunch och fika**. Vi lagar nästan allt från grunden. Vi söker dig som tycker att det är kul och givande att prestera på toppen av din förmåga och samtidigt känner uppskattning för att servera mat och dryck när den är som bäst. För att kunna bidra i detta lagarbete krävs att du ställer mycket höga krav på dig själv i din yrkesroll. Vett, etikett, genuint intresse för service, hög stressresistens och god ton är egenskaper som vi vill ska spegla din personlighet. Du skall vara glad, positiv och serviceminded samt obehindrat kunna uttrycka dig i tal och skrift. Dina arbetsuppgifter innefattar: **Enklare matlagning Barista Servering Beställning Kassa** Vi söker endast personer med **vana av café/restaurant**. Möjlighet till arrende/delägarskap finns för den drivne vid goda resultat. Välkommen!

NO.OJA

Barista til xxx - Sommerjobb 2022

Om stillingene: I sommer ønsker vi å ansette en **person som barista hos oss** på xxx. I første omgang ser vi etter en medarbeider for sommeren 2022 med oppstart juni, og med gode muligheter for fortsattelse til høsten. Stort sett vil man jobbe alene, men i begynnelsen og når det trengs kan vi være flere til stede. Vi er flere i kollektivet som er innom og tar i et tak. Arbeidstid er fleksibel men hovedsakelig minst 4 timer i ukedagene. Hva består jobben av: Vanlig daglig **drift av kafe, bl.a. baristaoppgaver, servering, oppvask, og kundeservice**. Du liker å prate med gjester og bidrar med å skape god stemning. Hovedsakelig vil oppgavene bestå i å **lage forskjellige kaffedrikker, daglige rengjøringsrutiner**, og styre Instagramkontoen for å publisere åpningstider og legge **ut fine kaffebilder**! Vi ser etter: Personene vi søker bør ha ordenssans og være opptatt av renhold og god hygiene. Du må beherske et nordisk språk, i tillegg til engelsk. Personlig egnethet vil bli vektlagt. Vi oppfordrer spesielt lokal ungdom til å søke på stillingen. Hva kan vi tilby: \* Betalt opplæring. \* Et godt, trivelig og humørfyllt arbeidsmiljø. \* Lønn etter tariff. \* Den flotteste utsikten! Søknad: \* Søknad og CV sendes på e-post til xxx@xxx.com \* Ved spørsmål om stillingen kan xxx xxx kontaktes på e-post xxx@xxx.com \* Søknadsfrist: Snarest. \* Intervju vil skje fortløpende. Om arbeidsgiveren: xxx er en forening som driver **en liten kaffebar ytterst i havgapet. Kaffeentusiasme langt til havs!**

DE.OJA

Barista (m/w/d) für das xxx in xxx gesucht

Stellenangebotsbeschreibung: Stellenbeschreibung Wir sind xxx, ein **Café-Deli** auf der wunderschönen xxx in xxx. Wir schenken Liebe durch Essen, daher ist bei xxx alles frisch und handgemacht. Genauso bieten wir **unseren Gästen Barista-Kaffee auf höchstem Niveau** an. Obwohl wir gerade mal seit kurzem eröffnet haben, wird immer **wieder unser Kaffee** in den Rezensionen gelobt. Darauf sind wir stolz, und wollen das Niveau auch weiterhin halten und ausbauen. Daher suchen wir einen erfahrenen **und engagierten Barista (m/w/d)**, der/die uns beim Auf- und Ausbau unserer Erfolgsgeschichte hilft und von Anfang an dabei ist. Mehr Infos & Details zu xxx und Konzept gibt es im persönlichen Gespräch oder schau auch gerne mal auf unserer Homepage [www.xxx.de](#) oder auf unseren sozialen Kanälen (Instagram / Facebook / Google) vorbei. Nun zu Deiner **Tätigkeit als Barista: Kaffee, Coffee, Café in allen Variationen**..... Was wir von Dir erwarten: Du bist nicht nur **ein(e) hervorragende(r) Barista und bist** in Deinem Fach ein Vollprofi, bleibst auch in Stresssituationen stets freundlich und gelassen Du hast mehrere Jahre Erfahrung **als Barista und kennst** Dich nicht nur mit Siebträgermaschinen aus, sondern bist Experte in **Sachen Kaffeebohne** Wir freuen uns auf Deine aussagekräftigen Bewerbungsunterlagen und auf das persönliche Kennenlernen. Dort werden wir Dir unser Konzept vorstellen und Dir ganz viele Insights geben, sowie all Deine (noch) offenen Fragen klären. Dein xxx Team Ergänzende Informationen: Anforderungen an den Bewerber: Erweiterte **Kenntnisse: Kaffeekunst, Kaffee (Röstmischung)** Expertenkenntnisse: Getränke zubereiten und anrichten.

FR.OJA

Barista bar à chocolat (H/F)

Les missions: **Tenue d'un bar à chocolat avec service du café, thé, chocolat, et divers softs Savoir faire le service en salle, service crêpes, glaces et pâtisseries** Savoir nettoyer et garder son poste propre selon les règles d'hygiène en vigueur. Soigner son image car elle représente l'entreprise Polyvalence en vente et conditionnement en **partie boutique de chocolats** Amplitude horaire : 8h à 14h ou 8h à 19h selon les jours, possible travail le dimanche avec majoration de 25%. Planning à définir avec le/la candidat/e

LT.OJA

Barmenas - padavėjas (-a)

**Darbas kavinėje 'xxx'**, pagrindinės funkcijos: - sutikti, aptarnauti lankytojus salėje ir priimti užsakymą; - rekomenduoti lankytojui gėrimus prie patiekalų; - **pateikti maistą ir gėrimus lankytojams**; - paaiškinti lankytojui patiekalų ruošimo technologiją; - palaikyti švarą ir tvarką kavinės salėje; - **paruošti kavines patalpas lankytojams aptarnauti: paruošti stalo indus, įrankius, stiklo indus ir stalo aptiesalus**. - maloniai, kultūringai aptarnauti lankytojus.

(2)

Extract titles (T) and key phrases (KP)

Erfaret Cafébiträde till långhelger fred-lörd-sönd-mån	SV.T
Barista til xxx - Sommerjobb 2022	NO.T
Barista (m/w/d) für das xxx in xxx gesucht	DE.T
Barista bar à chocolat (H/F)	FR.T
Barmenas - padavėjas (-a)	LT.T
Ayudante de barra	ES.T
Caféet är öppet	SV.KP1
Vi serverar frukost, lunch och fika	SV.KP2
Enklare matlagning Barista Servering Beställning Kassa	SV.KP3
vana av café/restaurant	SV.KP4
person som barista hos oss	NO.KP1
drift av kafe, bl.a. baristaoppgaver, servering, oppvask, og kundeservice	NO.KP2
lage forskjellige kaffedrikker, daglige rengjøringsrutiner	NO.KP3
ut fine kaffebilder	NO.KP4
en liten kaffebar ytterst i havgapet	NO.KP5
Kaffeentusiasme langt til	NO.KP6
xxx, ein Café-Deli auf	DE.KP1
unseren Gästen Barista-Kaffee auf höchstem	DE.KP2
wieder unser Kaffee in	DE.KP3
und engagierten Barista (m/w/d), der/die	DE.KP4
Tätigkeit als Barista: Kaffee, Coffee, Café in allen	DE.KP5
ein(e) hervorragende(r) Barista und bist	DE.KP6
als Barista und kennst	DE.KP7
Sachen Kaffeebohne	DE.KP8
Kenntnisse: Kaffeekunst, Kaffee (Röstmischung)	DE.KP9
Expertenkenntnisse: Getränke zubereiten und	DE.KP10
Tenue d'un bar à chocolat avec service du café, thé, chocolat, et	FR.KP1
faire le service en salle, service crêpes, glaces et pâtisseries	FR.KP2
partie boutique de chocolats	FR.KP3
Darbas kavinėje 'xxx'	LT.KP1
- pateikti maistą ir gėrimus lankytojams	LT.KP2
ir tvarką kavinės salėje;	LT.KP3
- paruošti kavines patalpas lankytojams aptarnauti: paruošti stalo indus	LT.KP4
ayudante de barra, para trabajar en restaurante en pleno centro	ES.KP1
ciudad se barcelona, tendra que servir y preparar las bebidas, limpiar y secar copas	ES.KP2
indefinido para barra horario 12:30	ES.KP3

(1)

Titles (T) and key phrases (KP) semantic relatedness

(3)

Online job advertisement (OJA) to ESCO occupations

(4)

ESCO

European Skills, Competences, Qualifications and Expertise

# Labelling green ESCO skills and knowledge concepts



**STEP 1**  
Manual labelling



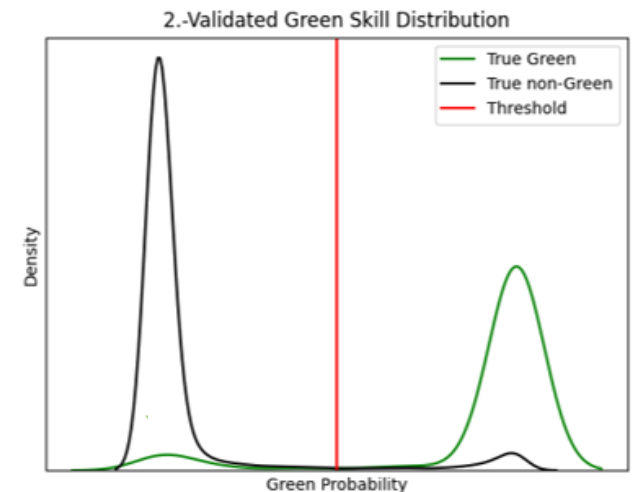
**STEP 2**  
Machine learning  
classifier



**STEP 3**  
Comparison and manual  
validation

The knowledge, abilities, values and attitudes needed to live in, develop and support a society which reduces the impact of human activity on the environment (Cedefop, 2012).

The training data is composed of text that describes activities considered as environmentally sustainable, polluting, or none of the two by official classifications, job vacancies, European or national legislation, and reports.



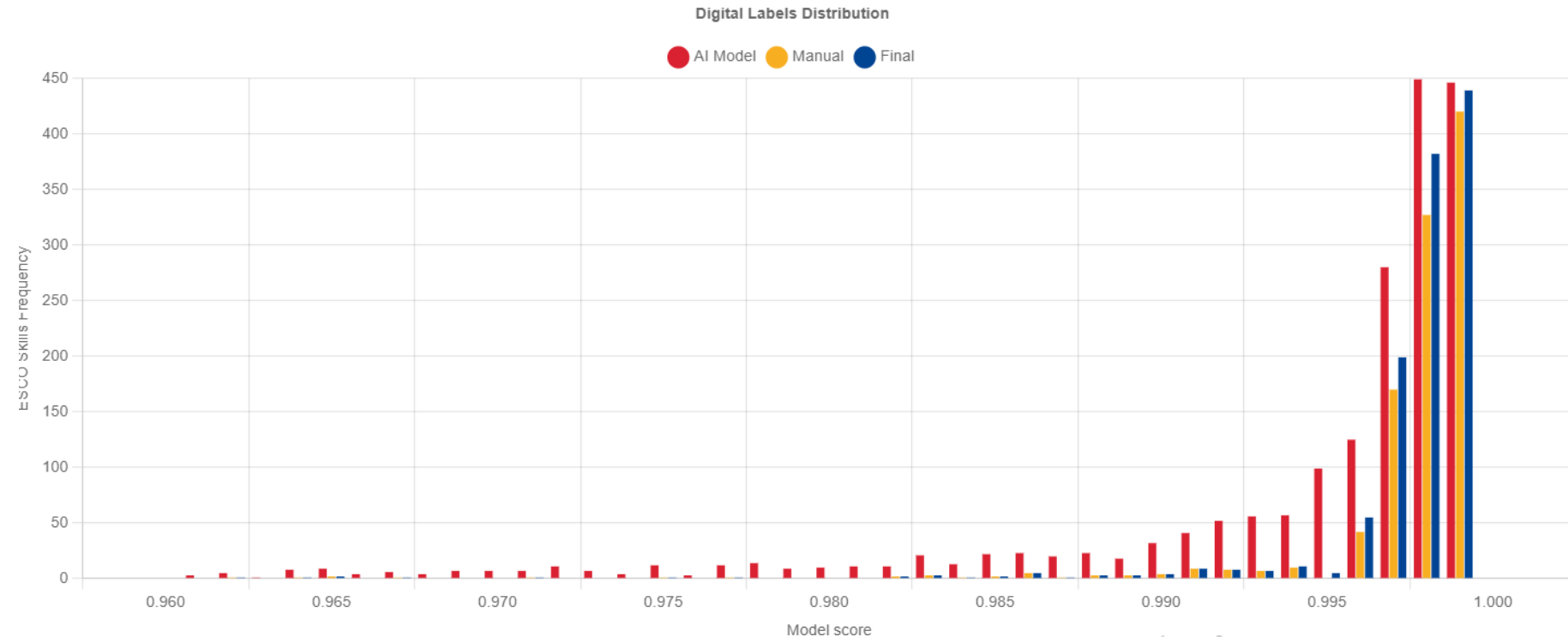
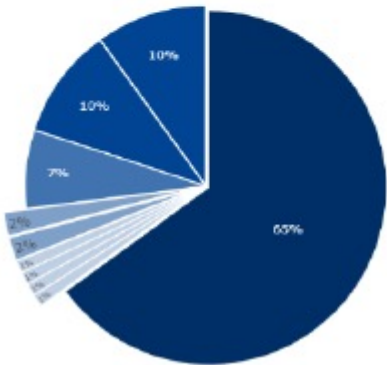


# Labelling digital ESCO skills and knowledge concepts

**Goal:** create and label the concepts in the Skills Pillar considered digital

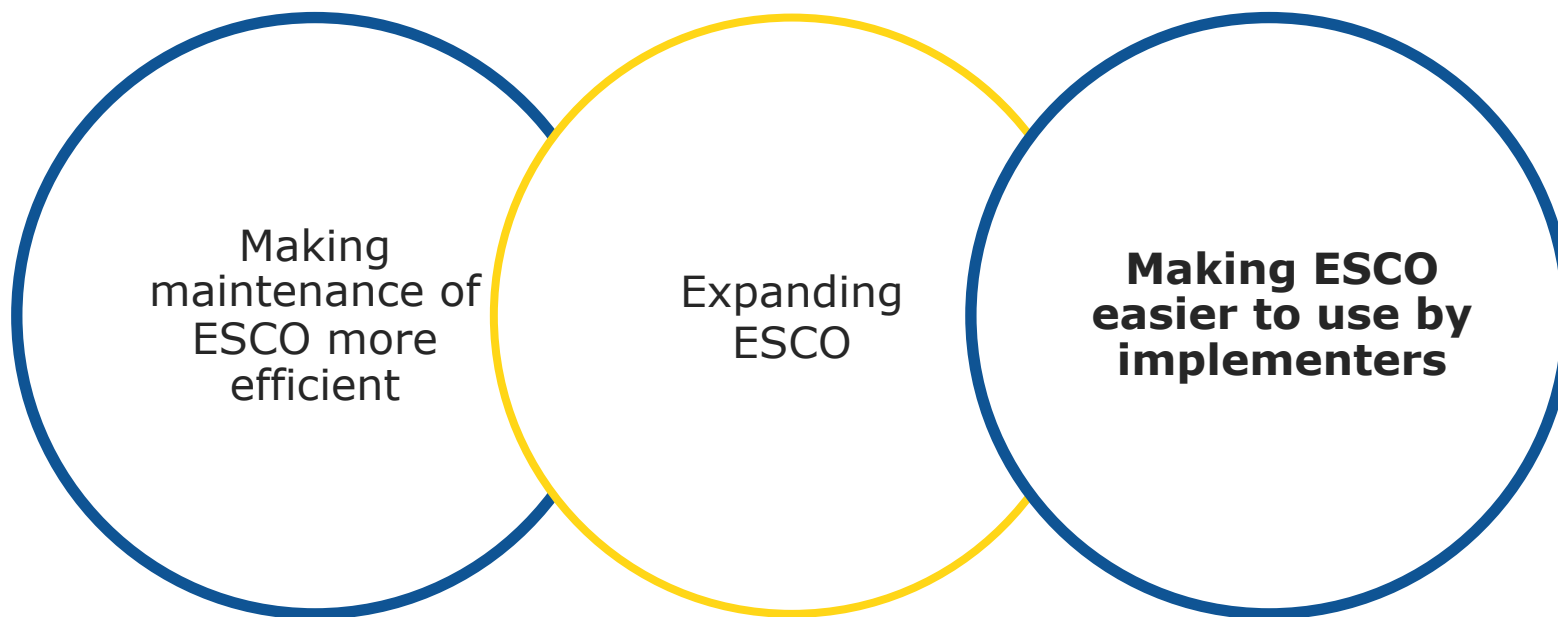
**Methodology:** manual labelling, ML classifier, human validation

- Information and communication technologies
- Engineering, manufacturing and construction
- Arts and humanities
- Business, administration and law
- Health and Welfare
- Services
- Agriculture, forestry, fisheries and veterinary
- Social sciences, journalism and information
- Education
- Natural sciences, mathematics and statistics



# Use of artificial intelligence in ESCO

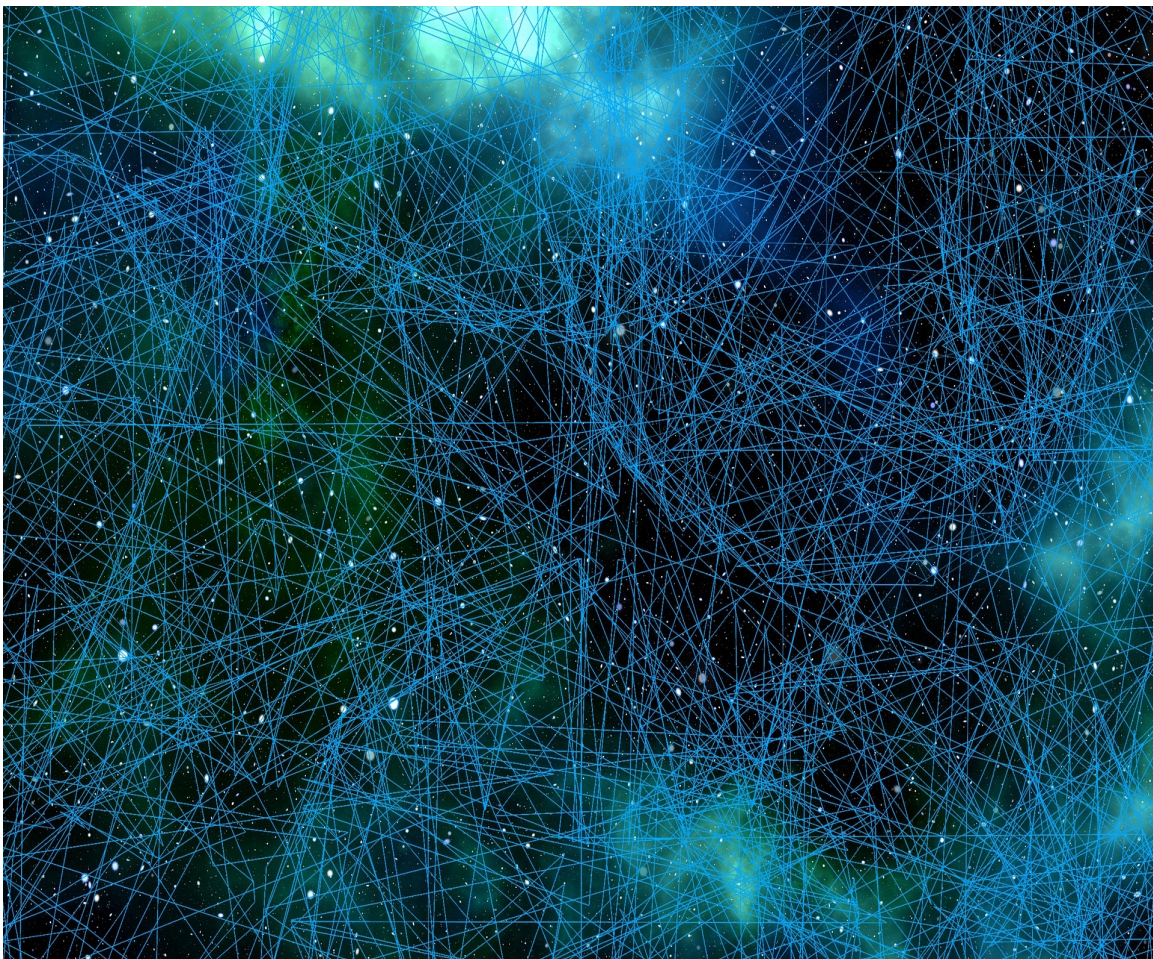
Use an analytical approach based on statistical analysis, data science and machine learning to assist in:







# Increasing interoperability in the labour market



## ESCO-O\*NET crosswalk

An official mapping that was **jointly developed and approved** by the owners of both classifications;

Use of machine learning suggestions and human validation;

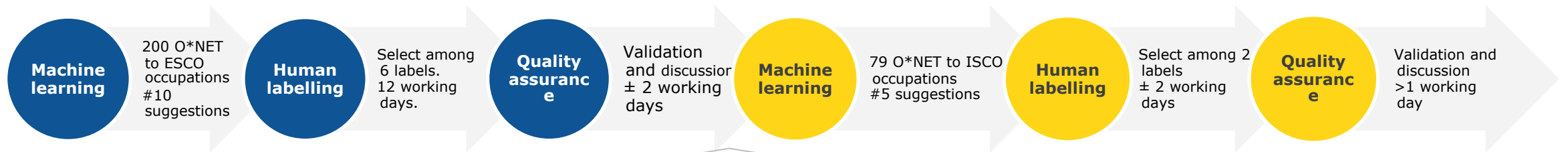
Results available on our website as free [download](#)

## EURES MS mapping tables

Results of the mapping of national taxonomies to ESCO;

Available on our website as [free download](#)

# Increasing interoperability: O\*NET crosswalk

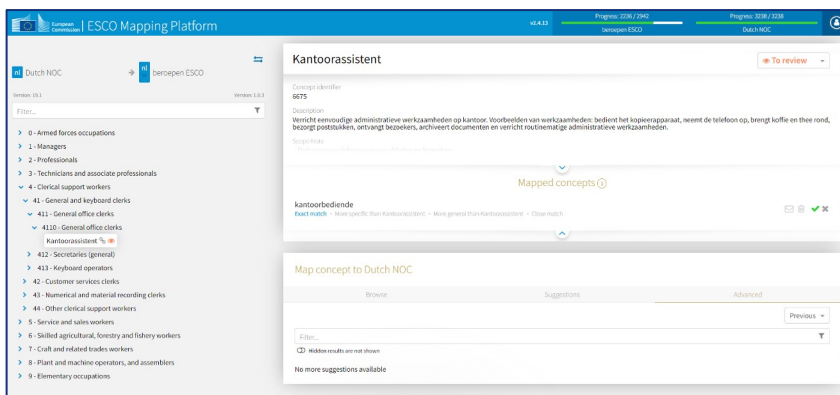


262	Foreign Language and Literature Teachers, Postsecondary														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
				ESCO concept match	ESCO concept			Past	ESCO concept	Exact	Onet NARROWER	Onet BROADER	Close	Wrong	
1	Id	ONET title	ONET description	score	ESCO concept PT	ISCO	mapping	URI	Match		than esco	than esco	Match	Relat	Match
52	19-403	Chemical Technicians	Conduct chemical and physical laboratory tests	0.9517837	chemistry technician	3111	[3111]	http://data.eur	x						
53	19-403	Chemical Technicians	to assist scientists in making qualitative and	0.9367534	chemical engineering technic	3116	[3111]	http://data.eur						x	
54	19-403	Chemical Technicians	quantitative analyses of solids, liquids, and	0.9364157	chemical tester	2113	[3111]	http://data.eur						x	
55	19-403	Chemical Technicians	gaseous materials for research and	0.9248056	analytical chemist	2113	[3111]	http://data.eur						x	
56	19-403	Chemical Technicians	development of new products or processes,	0.9146203	chemical application specialis	2113	[3111]	http://data.eur							x
57	19-403	Chemical Technicians	quality control, maintenance of environmental	0.9136518	chemist	2113	[3111]	http://data.eur						x	
58	19-403	Chemical Technicians	standards, and other work involving	0.9078607	scientific laboratory technicie	3141	[3111]	http://data.eur		x					
59	19-403	Chemical Technicians	experimental, theoretical, or practical	0.9051017	biochemistry technician	3141	[3111]	http://data.eur					x		
60	19-403	Chemical Technicians		0.8938918	chemical manufacturing qual	3116	[3111]	http://data.eur				x			



# Increasing interoperability: Member State crosswalks

## AI assisted mapping in 28 languages



1	<a href="http://data.europa.eu/esco/occupation/bf8925d-00a1-4794-b3b-2148c87a13">http://data.europa.eu/esco/occupation/bf8925d-00a1-4794-b3b-2148c87a13</a>	detailhandelaar	Bedrijfsleider / ondernemer verkoop gederkstelen	skosnarrowMatch
2	<a href="http://data.europa.eu/esco/occupation/d546d330-b0f1-44b6-90b6-21eab4b62066">http://data.europa.eu/esco/occupation/d546d330-b0f1-44b6-90b6-21eab4b62066</a>	restaurantmanager	Manager cateringbedrijf	skosnarrowMatch
3	<a href="http://data.europa.eu/esco/occupation/c3b2662-774a-4eef-841e-f12034470311">http://data.europa.eu/esco/occupation/c3b2662-774a-4eef-841e-f12034470311</a>	sergeant	Onderofficier logistieke dienst verzorging (lde) koninklijke marine	skosbroadMatch
4	<a href="http://data.europa.eu/esco/occupation/a79d938-30be-4e67-a4db-eac8f84405c">http://data.europa.eu/esco/occupation/a79d938-30be-4e67-a4db-eac8f84405c</a>	afdelingsmanager detailhandel	Afdelingsmanager verkoop herenkleiding	skosnarrowMatch
5	<a href="http://data.europa.eu/esco/occupation/8ec8d02-e9d5-43b7-9416-5848e0414ab">http://data.europa.eu/esco/occupation/8ec8d02-e9d5-43b7-9416-5848e0414ab</a>	vastgoedmakelaar	Verhuurmedewerker woonwoningen	skosnarrowMatch
6	<a href="http://data.europa.eu/esco/occupation/66f7426-8e4b-4d78-9f42-63669d71204">http://data.europa.eu/esco/occupation/66f7426-8e4b-4d78-9f42-63669d71204</a>	manager detailhandel muur- en vloerbekleding	Afdelingsmanager verkoop vloerbedekkingen	skosnarrowMatch
7	<a href="http://data.europa.eu/esco/occupation/81063e67-ac05-499a-6307-c55ea330059">http://data.europa.eu/esco/occupation/81063e67-ac05-499a-6307-c55ea330059</a>	ict information manager	Hoofd informatievoorziening en automatisering	skosexactMatch
8	<a href="http://data.europa.eu/esco/occupation/d792974a-077b-44a7-9421-b3ab70c7b4d0">http://data.europa.eu/esco/occupation/d792974a-077b-44a7-9421-b3ab70c7b4d0</a>	operator persmachine	CNC-foreur	skosbroadMatch
9	<a href="http://data.europa.eu/esco/occupation/9e811ade-9983-44fa-b74b-54d005b0fbd">http://data.europa.eu/esco/occupation/9e811ade-9983-44fa-b74b-54d005b0fbd</a>	winkelmanager	Bedrijfsleider / ondernemer verkoop parket en laminaat	skoscloseMatch
10	<a href="http://data.europa.eu/esco/occupation/54acdfef-423e-4a03-ba02-7147d9b37167">http://data.europa.eu/esco/occupation/54acdfef-423e-4a03-ba02-7147d9b37167</a>	manager bedrijfsveerheid	Algemeen directeur	skosbroadMatch
11	<a href="http://data.europa.eu/esco/occupation/c3b2662-774a-4eef-841e-f12034470311">http://data.europa.eu/esco/occupation/c3b2662-774a-4eef-841e-f12034470311</a>	sergeant	Marcheussie	skosnarrowMatch
12	<a href="http://data.europa.eu/esco/occupation/a9c6416-6a17-4a2f-a70d-6647c205480">http://data.europa.eu/esco/occupation/a9c6416-6a17-4a2f-a70d-6647c205480</a>	verkoopspecialist zorgartikelen en -hulpmiddelen	Verkoopspecialist zorgartikelen en -hulpmiddelen	skosexactMatch
13	<a href="http://data.europa.eu/esco/occupation/0368d04-94f1-4168-8849-283a25880e0d">http://data.europa.eu/esco/occupation/0368d04-94f1-4168-8849-283a25880e0d</a>	nanny	Kinderoppas particulieren	skosexactMatch
14	<a href="http://data.europa.eu/esco/occupation/711eac4d-0e4d-4e62-e059-101036c01831">http://data.europa.eu/esco/occupation/711eac4d-0e4d-4e62-e059-101036c01831</a>	medewerker huishoudelijke dienst	Huishoudelijke medewerker (hotel, instelling)	skosbroadMatch
15	<a href="http://data.europa.eu/esco/occupation/3c87440-1402-4757-9353-4b36a031c1d5">http://data.europa.eu/esco/occupation/3c87440-1402-4757-9353-4b36a031c1d5</a>	verhuurmedewerker autoverhuurbedrijf	Verhuurmedewerker autoverhuurbedrijf	skosexactMatch
16	<a href="http://data.europa.eu/esco/occupation/0368d04-94f1-4168-8849-283a25880e0d">http://data.europa.eu/esco/occupation/0368d04-94f1-4168-8849-283a25880e0d</a>	manager metaalproductie	Manager metaalbewerkingsbedrijf / constructiebedrijf	skosnarrowMatch
17	<a href="http://data.europa.eu/esco/occupation/77155559-e988-4793-b60f-2074eb2b0571">http://data.europa.eu/esco/occupation/77155559-e988-4793-b60f-2074eb2b0571</a>	manager recreatie-accommodatie	Manager recreatie-accommodatie	skosnarrowMatch
18	<a href="http://data.europa.eu/esco/occupation/a906894-ccc4-4cbb-9ac0-c20c7344594c">http://data.europa.eu/esco/occupation/a906894-ccc4-4cbb-9ac0-c20c7344594c</a>	betonwerker	Betonreparateur	skosnarrowMatch
19	<a href="http://data.europa.eu/esco/occupation/c6a26e11-b0f1-47a1-9496-1dcf8159458d">http://data.europa.eu/esco/occupation/c6a26e11-b0f1-47a1-9496-1dcf8159458d</a>	officier	Officier vlieger en loadmaster koninklijke luchtmacht	skosnarrowMatch
20	<a href="http://data.europa.eu/esco/occupation/de5e0e7-fa99-4771-9f1c-989585232a5">http://data.europa.eu/esco/occupation/de5e0e7-fa99-4771-9f1c-989585232a5</a>	generaal	Marcheussie	skosnarrowMatch
21	<a href="http://data.europa.eu/esco/occupation/0a8a4770-9f07-4baf-6a8f-51a0cb1230ba">http://data.europa.eu/esco/occupation/0a8a4770-9f07-4baf-6a8f-51a0cb1230ba</a>	bediener hydraulische smeedpers	Metalperser	skosnarrowMatch
22	<a href="http://data.europa.eu/esco/occupation/9ba746fa-c0c4-4228-9998-eb3c79c5c11f">http://data.europa.eu/esco/occupation/9ba746fa-c0c4-4228-9998-eb3c79c5c11f</a>	verkoopmedewerker	Verkoopmedewerker boeken, tijdschriften en kantoorartikelen	skosnarrowMatch
23	<a href="http://data.europa.eu/esco/occupation/1c323">http://data.europa.eu/esco/occupation/1c323</a>	leidinggevende functies in de bouwrijverheid	Bedrijfsleider / ondernemer kabel- en leidinginfra	skosnarrowMatch
24	<a href="http://data.europa.eu/esco/occupation/efc0f0b34-b0b0-47c0-9d63-5601a115990">http://data.europa.eu/esco/occupation/efc0f0b34-b0b0-47c0-9d63-5601a115990</a>	functionaris van een belangengroep	Bestuurder sportbond	skosnarrowMatch
25	<a href="http://data.europa.eu/esco/occupation/02a8f133-8e43-4446-804e-817d69ab4b32">http://data.europa.eu/esco/occupation/02a8f133-8e43-4446-804e-817d69ab4b32</a>	verklungelijke aandrijvingen	CNC-draaier (inclusief programmeren)	skosbroadMatch
26	<a href="http://data.europa.eu/esco/occupation/bbd1f66-1355-4357-9317-fc162311ab38">http://data.europa.eu/esco/occupation/bbd1f66-1355-4357-9317-fc162311ab38</a>	brigadegeneraal	Marcheussie	skosnarrowMatch
27	<a href="http://data.europa.eu/esco/occupation/9854047-36d7-4791-941a-2e149494a2a">http://data.europa.eu/esco/occupation/9854047-36d7-4791-941a-2e149494a2a</a>	biersommelier	Medewerker bediening horeca (luxe restaurant)	skosbroadMatch
28	<a href="http://data.europa.eu/esco/occupation/068c2787-58b1-46b6-b3b6-c845d5b9a822">http://data.europa.eu/esco/occupation/068c2787-58b1-46b6-b3b6-c845d5b9a822</a>	raadgevend actaris	Actuarius	skosexactMatch
29	<a href="http://data.europa.eu/esco/occupation/94e0b6d4-e56e-42be-45a4-b74a260f437c">http://data.europa.eu/esco/occupation/94e0b6d4-e56e-42be-45a4-b74a260f437c</a>	afdelingsmanager	Afdelingsmanager verkoop elektrotechnische artikelen en apparaten	skosnarrowMatch
30	<a href="http://data.europa.eu/esco/occupation/6e891708-d883-4475-954c-e241215a1318">http://data.europa.eu/esco/occupation/6e891708-d883-4475-954c-e241215a1318</a>	manager fotowinkel	Bedrijfsleider / ondernemer verkoop fotografische artikelen	skosexactMatch
31	<a href="http://data.europa.eu/esco/occupation/6426ad01-4d8c-4612-99e3-91b0c69020ee">http://data.europa.eu/esco/occupation/6426ad01-4d8c-4612-99e3-91b0c69020ee</a>	productiemanager	Chef textielindustrie	skosnarrowMatch
32	<a href="http://data.europa.eu/esco/occupation/5779a2b3-b32f-4517-9912-af50a2092621">http://data.europa.eu/esco/occupation/5779a2b3-b32f-4517-9912-af50a2092621</a>	verkoopmanager vles en vleeswaren	Bedrijfsleider / ondernemer verkoop vles en vleeswaren	skosexactMatch
33	<a href="http://data.europa.eu/esco/occupation/64e38e7-3901-4261-3fee-77c7a7779792">http://data.europa.eu/esco/occupation/64e38e7-3901-4261-3fee-77c7a7779792</a>	beleidsvaantwoordelijke	Manager organisatieadviesbureau	skosnarrowMatch

Source classification (Country)	Source concept	Score	ESCO suggestion	Expert validation
Latvijas Profesiju klasifikators (LV)	Bagarēšanas mašīnu operators (8342.01)	95	bagarēšanas mašīnu operators	exact
		91	ekskavatora vadītājs	
		89	buldozera vadītājs	
CO-SISPE 2011 (ES)	Entrevistadores/ Encuestadores (44301013)	93	encuestador/ encuestadora	exact
		87	encuestador de estudio de mercado/ encuestadora de estudio de mercado	broad
		77	responsable de estudios de campo	
		90	distributionschef	narrow
Swedish Standard Classification of Occupations (SE)	Distributionschef , logistik och transporter (TN3u_buC_wJF)	90	distributionschef, avfall och skrot	broad
		89	distributionschef, levande djur	broad

# Increasing interoperability: Member State crosswalks

## Benchmark analysis:

- Multilingual model to suggest ESCO occupations for concept from national classification
- Compare top  $k$  suggestions with EURES expert validation
- Map to source language / English ESCO variant
- Map from source concept title and title + description

Country (# mapped occupations)	Input	ESCO language	MRR		Accuracy					
			Micro	Top 1	Top 2	Top 3	Top 5	Top 10	Top 20	Top 30
LV (2747)	Title	EN	0.5719	0.4536	0.5784	0.6400	0.7153	0.7961	0.8591	0.8890
		LV	0.6231	0.5169	0.6298	0.6837	0.7543	0.8231	0.8824	0.9057
ES (2180)	Title	EN	0.6150	0.4982	0.6284	0.6890	0.7560	0.8326	0.8872	0.9101
		ES	0.6358	0.5266	0.6422	0.7064	0.7729	0.8413	0.8945	0.9142
SE (2292)	Title	EN	0.6033	0.4838	0.6143	0.6824	0.7426	0.8229	0.8866	0.9149
		SV	0.6689	0.5620	0.6837	0.7365	0.7958	0.8687	0.9136	0.9402
IT (814)	Title	EN	0.6666	0.5725	0.6806	0.7260	0.7789	0.8391	0.8821	0.8956
		IT	0.6930	0.6093	0.7052	0.7506	0.7887	0.8342	0.8894	0.9029
	Title, Desc	EN	0.7141	0.6278	0.7224	0.7617	0.8145	0.8796	0.9214	0.9447
		IT	0.7308	0.6413	0.7494	0.7887	0.8280	0.8907	0.9361	0.9558
O*NET (940)	Title	EN	0.8671	0.8128	0.8809	0.9106	0.9362	0.9553	0.9734	0.9819
	Title, Desc	EN	0.8811	0.8351	0.8915	0.9138	0.9415	0.9564	0.9755	0.9787



# Open access mapping tool: multilingual content to ESCO occupations

Launch early 2023 of a free tool for all our stakeholders:

Input (language)	Input – English translation	Score	ESCO suggestion
Sosiaalityöntekijä, Oulun kaupunki, Kiimingin lastensuojelu, Oulu (FI)	Social worker, City of Oulu, Kiiming child protection, Oulu	86	child welfare worker
Werkvoorbereider Tekenaar   AutoCad, Noordwijkerhout (NL)	Planner Draftsman   AutoCad, Noordwijkerhout	88	drafter
Майстер нігтьового сервісу (манікюр, педикюр) (UK)	Nail service master (manicure, pedicure)	93	manicurist
Sprzedawca-kasjer w stacji paliw 1/2 etatu (PL)	Salesperson-cashier at a gas station 1/2 time	91	fuel station specialised seller
Salvatore cerca una baby sitter a Fiano Romano (IT)	Salvatore is looking for a babysitter in Fiano Romano	90	babysitter

Input (language)	Input – English translation	Score	ESCO suggestion
Djelatnik / ica za strojna čišćenja i hortikulturu (HR)	Employee for machine cleaning and horticulture	89	horticulture worker
Drømmer du om at blive selvstændig, og har du erfaring med enten rekruttering, salg, ledelse eller måske alle tre dele? (DA)	Do you dream of becoming self-employed and do you have experience in either recruitment, sales, management or perhaps all three parts?	80	recruitment consultant
Glad och busig kille på 13 år söker påhittig och ansvarfull assistent 75% (SV)	Happy and mischievous 13-year-old boy looking for resourceful and responsible assistant 75%	79	nanny
Boodschappen doen voor een oudere persoon (NL)	Grocery shopping for an older person	83	companion
Zorgen voor een oudere persoon (NL)	Caring for an older person	85	residential home older adult care worker

# Multilingual content to ESCO occupations: unseen languages

Flexible methodology to extend to other languages

Input (language)	Input – English translation	Score	ESCO suggestion
Šef smene u skladištu logistike mleka i mlečnih proizvoda (SR)	Head of the shift in the logistics warehouse of milk and dairy products	89	dairy products and edible oils distribution manager
Vozač drumskog vozila u domaćem i međunarodnom drumskom saobraćaju (SR)	Driver of a road vehicle in domestic and international road traffic	90	cargo vehicle driver
Zamenik poslovođe maloprodajnog objekta (SR)	Deputy manager of a retail store	87	department store manager
Per EKSELENTET! Internship/praktike: Kontabilitet/Fiskalitet VLORE (SQ)	For EXCELLENCES! Internship/practice: Accounting/Fiscal VLORE	78	accounting assistant
Zhvillues Software, Sektori i Zhvillimit IT (SQ)	Software Developer, IT Development Sector	83	software developer
ofroj vend pune Inxhinier Mjedisi ne degen e Energjetikes (SQ)	I offer a job as an Environmental Engineer in the Energy department	87	energy engineer

Input (language)	Input – English translation	Score	ESCO suggestion
마케팅전문가 (KO)	marketing expert	92	marketing consultant
제조업 사무직 자재구매 및 입출고 사무업무 (매입,매출전표관리) 거래처 발주 접수 및 거래명세서 작성 (KO)	Manufacturing office worker Material purchasing and warehouse/shipping office work (purchase and sales slip management) Receiving customer orders and preparing transaction details	81	purchaser
화학제품생산직(기계조작) 표면처리약품 제조 회사 입니다. 약품 원료를 가지고 배합하여 제조 및 말통 포장 하는 업무. 주 5 일 근무 9 시- 18 시 (KO)	Chemical product production job (machine operation) We are a manufacturer of surface treatment chemicals. Manufacturing and packaging of pharmaceutical raw materials by mixing them. Working 5 days a week 9:00 - 18:00	90	chemical mixer

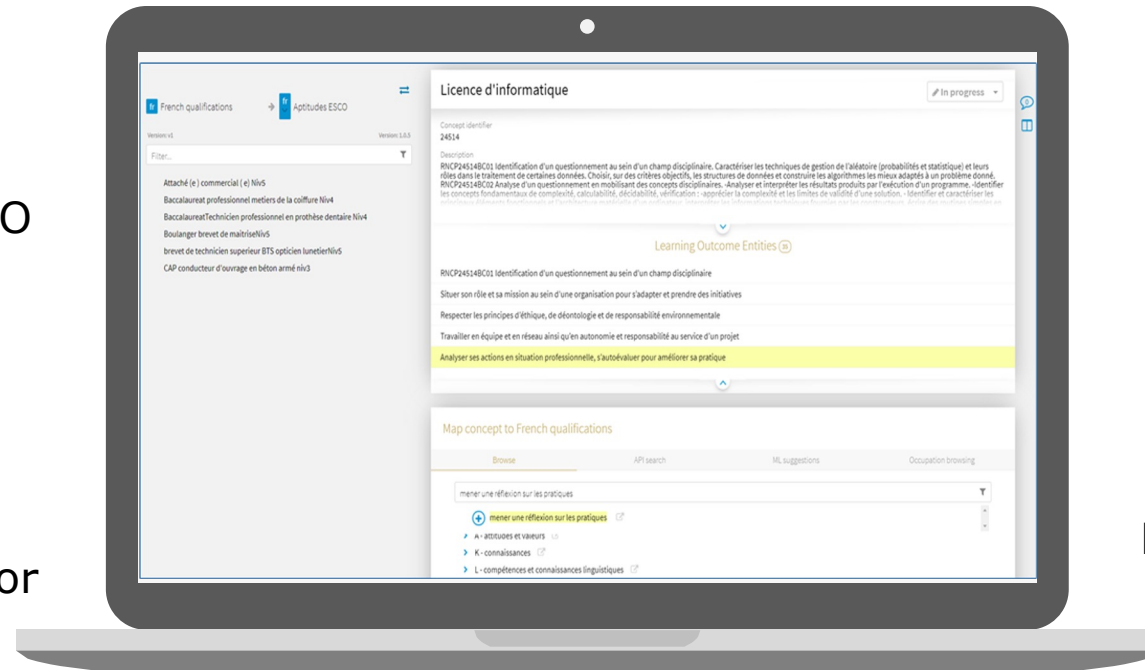
# Linking qualifications with ESCO skills

1

Linking learning outcomes of qualifications with ESCO skills

3

Using a platform that assists in the process for easier validation



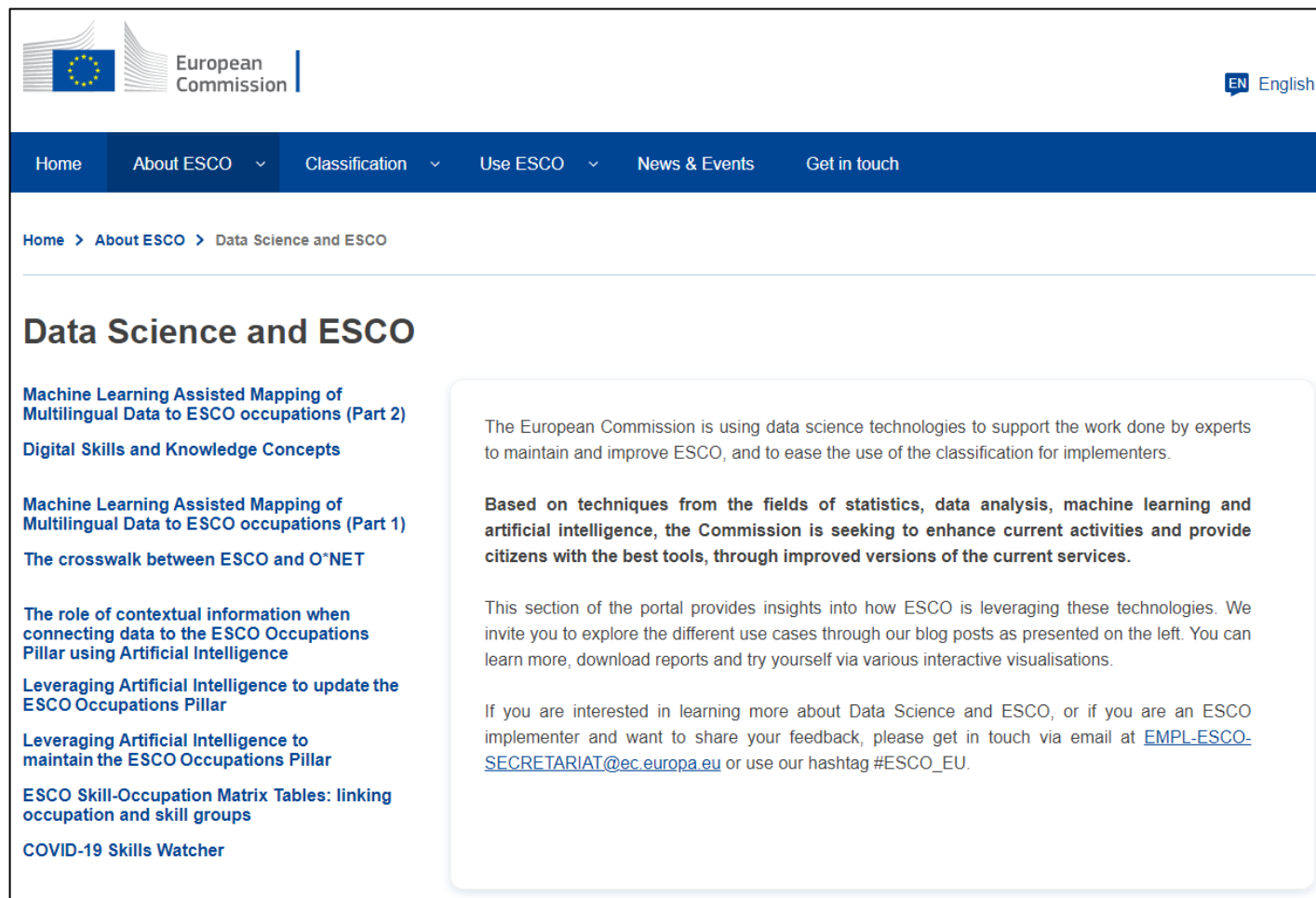
2

EU Member states, private training providers, social partners, ETF

4

Launch **early 2023** of a **free tool** for all our **stakeholders**

# ESCO Data Science Blog



The screenshot shows the ESCO Data Science Blog page. At the top, there is the European Commission logo and a language selector set to 'English'. Below the header is a navigation bar with links: Home, About ESCO, Classification, Use ESCO, News & Events, and Get in touch. The breadcrumb trail reads: Home > About ESCO > Data Science and ESCO. The main heading is 'Data Science and ESCO'. On the left, there is a list of articles: 'Machine Learning Assisted Mapping of Multilingual Data to ESCO occupations (Part 2)', 'Digital Skills and Knowledge Concepts', 'Machine Learning Assisted Mapping of Multilingual Data to ESCO occupations (Part 1)', 'The crosswalk between ESCO and O\*NET', 'The role of contextual information when connecting data to the ESCO Occupations Pillar using Artificial Intelligence', 'Leveraging Artificial Intelligence to update the ESCO Occupations Pillar', 'Leveraging Artificial Intelligence to maintain the ESCO Occupations Pillar', 'ESCO Skill-Occupation Matrix Tables: linking occupation and skill groups', and 'COVID-19 Skills Watcher'. On the right, there is a text box stating: 'The European Commission is using data science technologies to support the work done by experts to maintain and improve ESCO, and to ease the use of the classification for implementers. Based on techniques from the fields of statistics, data analysis, machine learning and artificial intelligence, the Commission is seeking to enhance current activities and provide citizens with the best tools, through improved versions of the current services. This section of the portal provides insights into how ESCO is leveraging these technologies. We invite you to explore the different use cases through our blog posts as presented on the left. You can learn more, download reports and try yourself via various interactive visualisations. If you are interested in learning more about Data Science and ESCO, or if you are an ESCO implementer and want to share your feedback, please get in touch via email at [EMPL-ESCO-SECRETARIAT@ec.europa.eu](mailto:EMPL-ESCO-SECRETARIAT@ec.europa.eu) or use our hashtag #ESCO\_EU.'

<https://esco.ec.europa.eu/en/about-esco/data-science-and-esco>



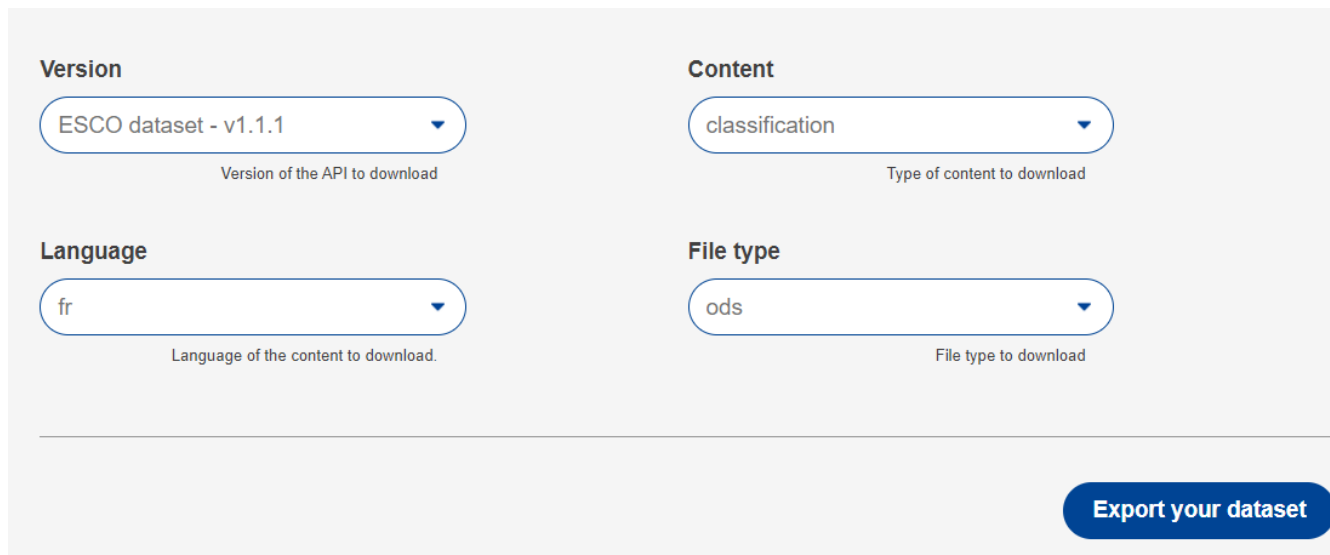


# Learn more about ESCO

# 1

## DOWNLOAD or API from the ESCO Portal

<https://esco.ec.europa.eu/en/use-esco/download>



The screenshot shows a web form for downloading an ESCO dataset. It contains four dropdown menus arranged in a 2x2 grid. The top-left dropdown is labeled 'Version' and has 'ESCO dataset - v1.1.1' selected, with the text 'Version of the API to download' below it. The top-right dropdown is labeled 'Content' and has 'classification' selected, with the text 'Type of content to download' below it. The bottom-left dropdown is labeled 'Language' and has 'fr' selected, with the text 'Language of the content to download.' below it. The bottom-right dropdown is labeled 'File type' and has 'ods' selected, with the text 'File type to download' below it. At the bottom right of the form is a blue button with the text 'Export your dataset'.

Version	Content	Language	File type
ESCO dataset - v1.1.1	classification	fr	ods

Version of the API to download

Type of content to download

Language of the content to download.

File type to download

Export your dataset

# 2

## UPON REQUEST

Technical support on how to use ESCO  
& knowledge exchange on AI

# 3

## CONTACT:

ESCO Secretariat:  
[EMPL-ESCO-SECRETARIAT@ec.europa.eu](mailto:EMPL-ESCO-SECRETARIAT@ec.europa.eu)  
[laura.visan@esco-support.eu](mailto:laura.visan@esco-support.eu)  
[jan.luts@esco-support.eu](mailto:jan.luts@esco-support.eu)

# Thank you!



Use our hashtag #ESCO\_EU



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<https://ec.europa.eu/newsroom/empl/user-subscriptions/1855/create>