



ESCO developments and content management

ETF Training Big Data for Labour market intelligence

15 June 2021

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Project Coordinator ESCO

European Commission

DG Employment, Social Affairs and Inclusion

Unit E2 – Skills and Qualifications

EU goals in a digital labour market

Better link education-training to labour → ensure access to the best opportunities

Ensure transparency of information on skills through systems' interoperability

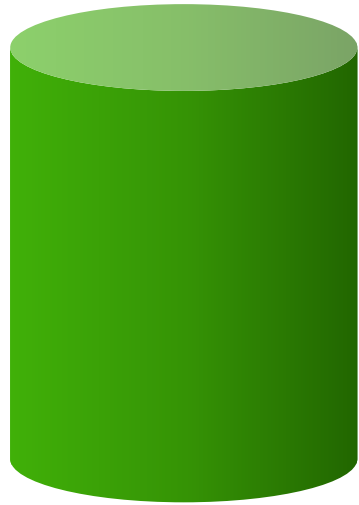
Allow open-fair access to information on skills, qualifications, jobs and training

→ avoid monopolisation of data in digital labour market

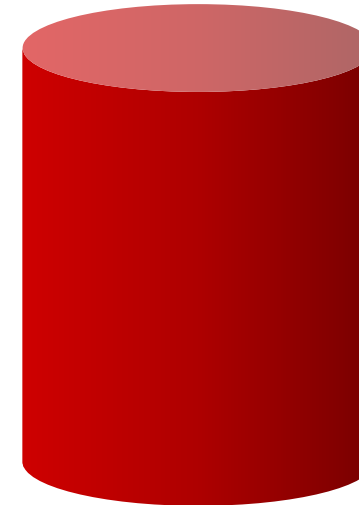
→ European open standards to counteract risks of proprietary standards

ESCO

European Skills, Occupations and Qualifications



3 000
Occupations



13 500
Skills + Knowledge

OCCUPATIONS

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

Occupations

2942
occupations

The occupations pillar is one of the three pillars of ESCO. It organises the occupation concepts in ESCO. It uses hierarchical relationships between them, metadata as well as mappings to the International Standard Classification of Occupations (ISCO) in order to structure the occupations.


Each occupation concept contains one preferred term and any number of non-preferred terms and hidden terms in each of the ESCO languages.

Each occupation also comes with an occupational profile. The profiles contain an explanation of the

 **OCCUPATIONS**

- › 0 - Armed forces occupations
- ✓ 1 - Managers
 - › 11 - Chief executives, senior offi...
 - ✓ 12 - Administrative and commer...
 - › 121 - Business services and ...
 - ✓ 122 - Sales, marketing and ...
 - › 1221 - Sales and marketi...
 - › 1222 - Advertising and p...
 - ✓ 1223 - Research and dev...
 - › 1223.1 - product man...
 - ✓ 1223.2 - research an...
 - › 1223.2.1 - produc...
 - ✓ 1223.2.2 - researc...
 - 1223.2.2.1 - ICT r...
 - › 13 - Production and specialised ...
 - › 14 - Hospitality, retail and other...

research manager

[Discuss this topic in the Online Forum](#) 

Code

1223.2.2

Description

Research managers oversee the research and development functions of a research facility or program or university. They support the executive staff, coordinate work activities, and monitor staff and research projects. They may work in a wide array of sectors, such as the chemical, technical and life sciences sector. Research managers can also advise on research and execute research themselves.

Alternative label

reserach managers
chief science officer
head laboratory analyst
scientific director
principal research scientist
head of laboratory
research scientist



Essential skills and competences

communicate in English in a competent way

cope with challenging demands

discuss research proposals

estimate duration of work

manage operational budgets

manage research and development projects

manage staff

perform scientific research

provide project information on exhibitions

report analysis results

respect cultural differences in the field of exhibition

study a collection

study topics

work independently on exhibitions

Essential Knowledge

project management

- 0 - Armed forces occupations
- ▼ 1 - Managers
 - 11 - Chief executives, senior offi...
 - 12 - Administrative and commer...
 - ▼ 13 - Production and specialised ...
 - 131 - Production managers i...
 - 132 - Manufacturing, mining...
 - 133 - Information and comm...
 - ▼ 134 - Professional services ...
 - 1341 - Child care service...
 - 1342 - Health services m...
 - 1343 - Aged care service...
 - 1344 - Social welfare ma...
 - 1345 - Education manag...
 - 1346 - Financial and insu...
 - ▼ 1349 - Professional servi...
 - 1349.1 - airside safety m...
 - 1349.2 - airspace manager
 - 1349.3 - archive manager
 - 1349.4 - artistic director
 - 1349.5 - aviation commu...
 - 1349.6 - aviation surveill...
 - 1349.7 - book publisher
 - 1349.8 - chief fire officer

[Discuss this topic in the Online Forum](#) 

Code

1349.18

Description


Museum directors oversee the management of the art collections, artefacts, and exposition facilities. They secure and sell works of art on the one hand, and strive to preserve and maintain the art collection of a museum on the other hand. Moreover, they also manage finances, employees, and marketing efforts of the museum.

Alternative label

museum manager
 museum and heritage director
 art gallery director
 head of museum
 director of collections
 art collection director

Regulatory aspect

To see if and how this occupation is regulated in EU Member States, EEA countries or Switzerland please consult the Regulated Professions Database of the Commission. Regulated Professions Database:

http://ec.europa.eu/growth/single-market/services/free-movement-professionals/qualifications-recognition_en 

Hierarchy

- ▼ 1 - Managers
 - ▼ 13 - Production and specialised services managers



- 1349.13 - environmental ...
- 1349.14 - front of house ...
- 1349.15 - interpretation ...
- 1349.16 - library manager
- 1349.17 - medical labora...
- 1349.18 - museum direct...
- 1349.19 - publications co...
- 1349.20 - rescue centre ...
- › 1349.21 - service ma...
- 1349.22 - sport administ...
- 1349.23 - translation age...

- › 14 - Hospitality, retail and other...

- › 2 - Professionals
- › 3 - Technicians and associate profe...
- › 4 - Clerical support workers
- › 5 - Service and sales workers
- › 6 - Skilled agricultural, forestry and...
- › 7 - Craft and related trades workers
- › 8 - Plant and machine operators an...
- › 9 - Elementary occupations

Essential skills and competences

- advise on art handling
- advise on loans of art work for exhibitions
- document museum collection
- handle art
- implement risk management for works of art
- liaise with colleagues
- liaise with educational institutions
- liaise with managers
- liaise with shareholders
- maintain catalogue collection
- maintain museum records
- manage budgets
- manage staff
- monitor museum environment
- plan art educational activities
- sell art
- supervise art gallery staff

Essential Knowledge

- art collections
- art history
- art-historical values
- museum databases

Optional skills and competences

- advertise an art collection
- analyse packaging requirements
- collaborate in the development of marketing strategies
- conduct scholarly research
- coordinate marketing plan actions
- develop classification systems
- ensure special requirements for goods in storage



ESCO

European Skills/Competences, qualifications and Occupations

European Commission > ESCO > Skills/competences



ABOUT ESCO

CLASSIFICATION

TOOLS & RESOURCES

FORUM



Occupations

Skills/competences

Qualifications

Search



SKILLS/COMPETENCES

- > A - attitudes and values
- > K - knowledge
- > L - language skills and knowledge
- > S - skills

Skills

13485 skills / competences

The ESCO skills pillar distinguishes between i) skill/competence concepts and ii) knowledge concepts by indicating the skill type. There is however no distinction between skills and competences. Each of these concepts comes with one preferred term and a number of non-preferred terms in each of the 27 ESCO languages. Every concept also includes an explanation in the form of

 **SKILLS/COMPETENCES**

- › A - attitudes and values
- › K - knowledge
- › L - language skills and knowledge
- ✓ S - skills
 - › S1 - communication, collaborati...
 - › S2 - information skills
 - › S3 - assisting and caring
 - › S4 - management skills
 - › S5 - working with computers
 - › S6 - handling and moving
 - › S7 - constructing
 - › S8 - working with machinery an...

Skills

13485
skills /
competences

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The skills pillar of ESCO contains 13,485 concepts structured in a hierarchy which contains four sub-classifications. Each sub-classification targets

SKILLS/COMPETENCES

- › A - attitudes and values
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 - › S4 - management skills
 - › S5 - working with computers
 - ✓ S6 - handling and moving
 - › S6.0 - handling and moving
 - › S6.1 - sorting and packaging...
 - › S6.2 - moving and lifting
 - › S6.3 - transforming and blen...
 - › S6.4 - tending plants and cr...
 - › S6.5 - assembling and fabric...
 - › S6.6 - making moulds, casts...
 - ✓ S6.7 - using hand tools
 - › S6.7.0 - using hand tools
 - ✓ S6.7.1 - cutting material...
 - adjust paper cutter
 - › adjust properties of cut
 - build up rubber plies
 - › create cutting plan
 - create rough cut
 - › cut carpet
 - cut fabrics
 - cut filament

create cutting plan

Description

Draw up plans to show how the material will be cut into functional pieces to minimise loss of material.

Alternative label

creation of cutting plan
draw up cutting plan
drawing up cutting plan
drawing up of cutting plan
cutting plan creation
cutting plan drawing
creating cutting plan

Skill type

skill

Skill reusability level

cross-sector skills and competences

Broader skills/competences

[S6.7.1 - cutting materials and drilling holes](#)

Narrower skills/competences

[plan carpet cutting](#)

Essential skill/competence of

[sawmill operator](#)
[table saw operator](#)
[stonemason](#)
[wood router operator](#)
[band saw operator](#)

Optional skill/competence of

[carpenter](#)
[carpenter supervisor](#)
[staircase installer](#)

SKILLS/COMPETENCES

- > A - attitudes and values
- > K - knowledge
- > L - language skills and knowledge
- ✓ S - skills
 - ✓ S1 - communication, collaborati...
 - > S1.0 - communication, colla...
 - > S1.1 - negotiating
 - > S1.2 - liaising and networking
 - > S1.3 - teaching and training
 - > S1.4 - presenting information
 - ✓ S1.5 - advising and consulting
 - > S1.5.0 - advising and co...
 - > S1.5.1 - advising on lega...
 - > S1.5.2 - providing financi...
 - ✓ S1.5.3 - advising on prod...
 - advise clients on interior ...
 - advise clients on moving ...
 - > advise customers
 - advise customers on acce...
 - advise customers on alco...
 - advise customers on audi...
 - advise customers on audi...
 - advise customers on bicy...
 - advise customers on bod...
 - advise customers on boo...
 - advise customers on buil...
 - advise customers on clocks
 - advise customers on crafts
 - advise customers on deli...
 - advise customers on elec...

advise on art handling

Description

Advise and instruct other museum professionals and technicians on how to manipulate, move, store and present artifacts, according to their physical characteristics.

Alternative label

advise on art handling
advising on art handling
give recommendations on art handling
counsel on art handling
offer suggestions on art handling

Skill type

skill

Skill reusability level

sector specific skills and competences

Broader skills/competences

[give advice to others](#)
[S1.5.3 - advising on products and services](#)

Optional Knowledge

[art collections](#)
[art history](#)
[conservation techniques](#)
[fine arts](#)

Essential skill/competence of

[exhibition registrar](#)
[museum director](#)
[art handler](#)

Status

released

Concept URI

<http://data.europa.eu/esco/skill/9427e576-743c-4e36-bd73-5f1cb273daf7>

Early stage 2011-2017

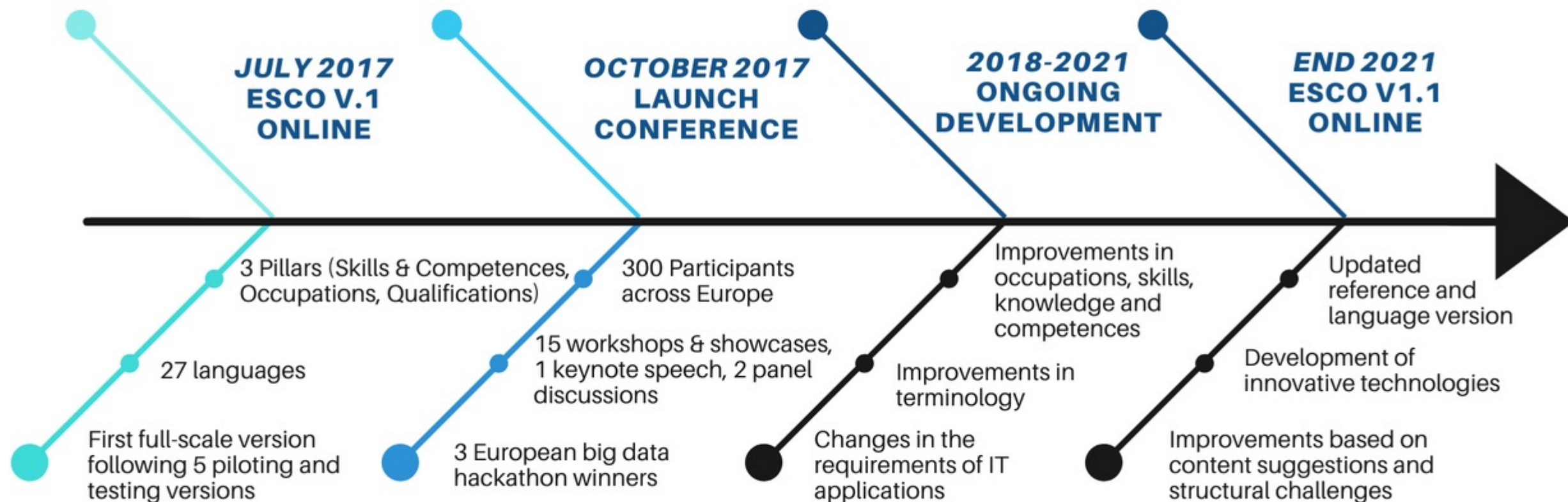
Development of version 1.0, for use in systems providing services to end users

Close collaboration with stakeholders and Member State experts

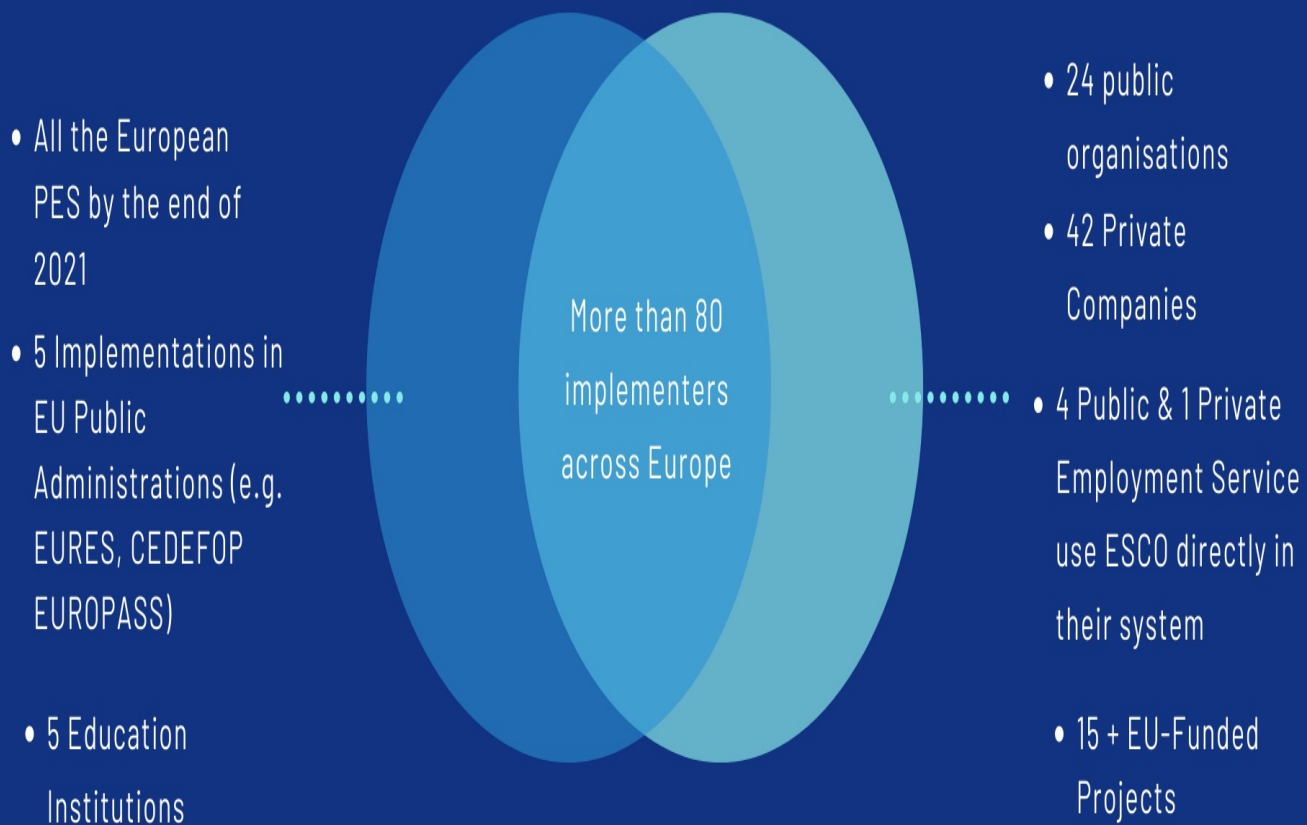
Reference Groups for sectoral expertise and online consultation

Sources: national classification systems, reports, research papers, job vacancies

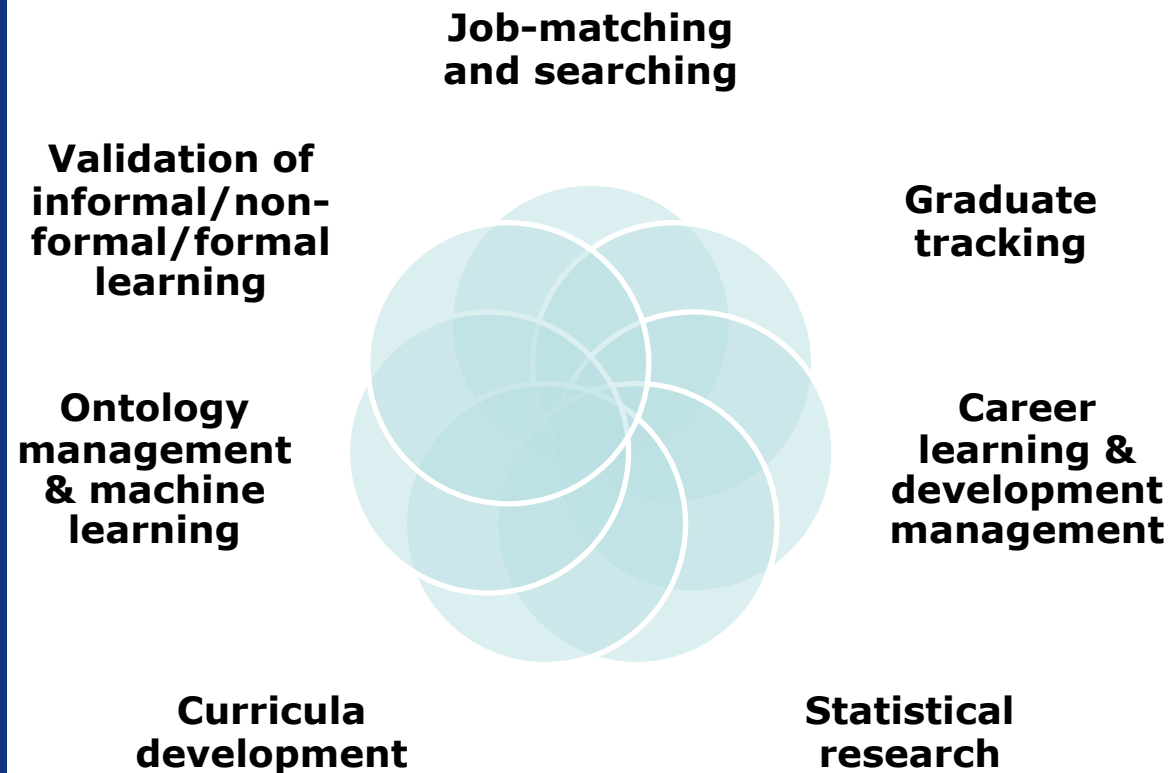
THE EVOLUTION OF ESCO



CURRENT ESCO IMPLEMENTATION- OCTOBER 2020



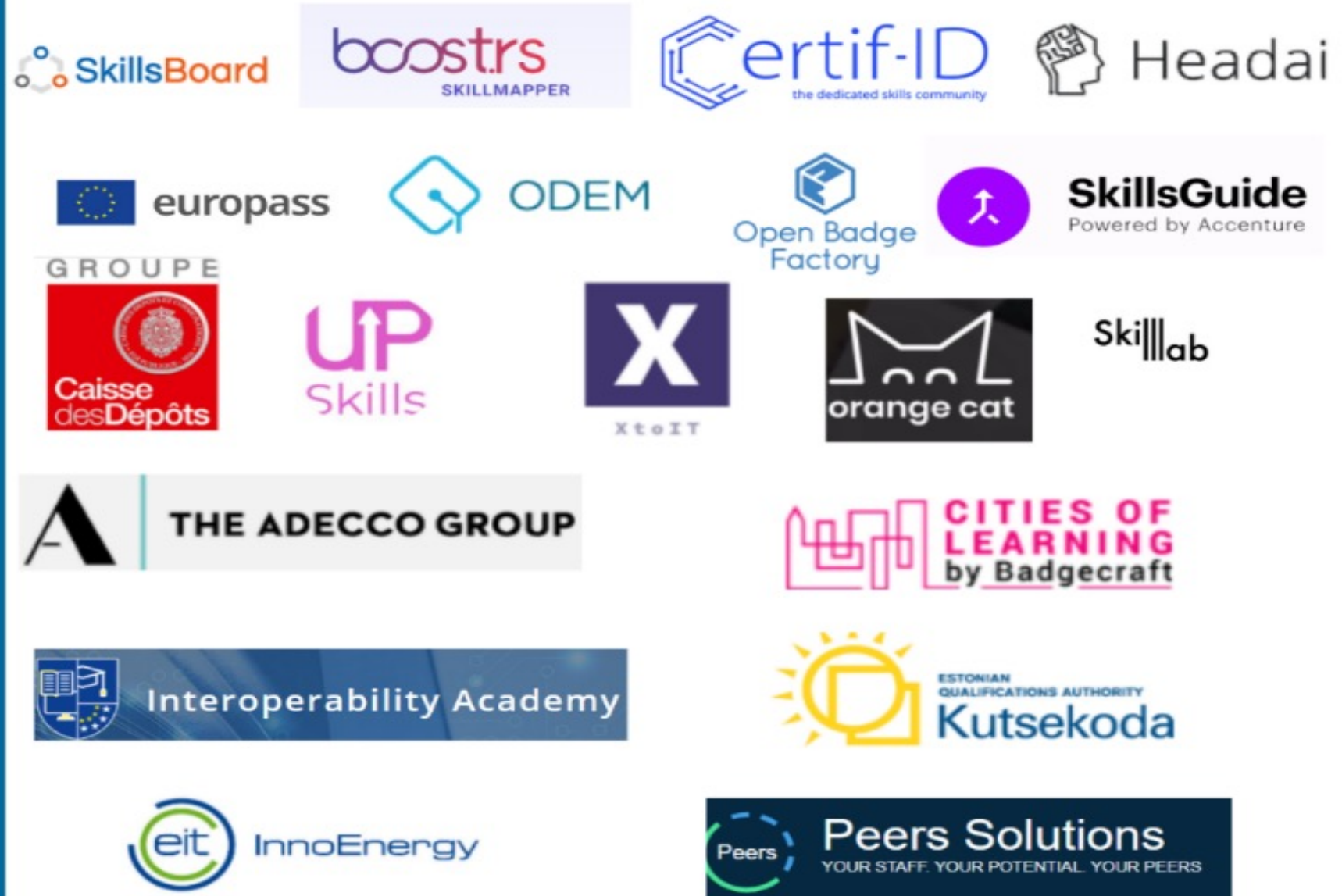
<https://ec.europa.eu/esco/portal>



Career learning and development management

ESCO
IMPLEMENTERS:

CAREER LEARNING &
DEVELOPMENT
MANAGEMENT



Job-matching and job-searching

ESCO
IMPLEMENTERS:

JOB-MATCHING &
JOB SEARCHING



XLEARN



AGJENCIA KOMBËTARE E
PUNËSIMIT DHE AFTËSIVE



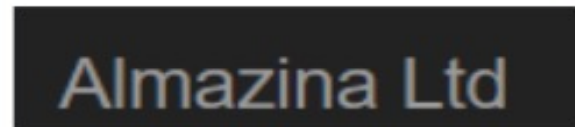
WE KEEP
YOU POSTED.



Connecting Employers and Jobseekers



Un ponte fra Università e mondo del lavoro e delle professioni



Statistics and big data analysis

ESCO
IMPLEMENTERS:

STATISTICS AND BIG
DATA ANALYSIS OF
LABOUR MARKET



Deloitte.



CEDEFOP

European Centre
for the Development
of Vocational Training



**UNIVERSITY OF
CAMBRIDGE**



ELF EUROPEAN
LUNG
FOUNDATION

**Etil research
group**



burningglass®
TECHNOLOGIES



IDB Improving lives

CRISP

centro di ricerca interuniversitario
per i servizi di pubblica utilità

nesta



WOLLYBI



**UNIVERSITY of INFORMATION
TECHNOLOGY and MANAGEMENT**
in Rzeszow, POLAND



**Universitatea de Vest
din Timișoara**

Main ESCO developments

Development of skills hierarchy

Mapping of national taxonomies to ESCO

Communication and outreach

Preparation of ESCO version 1.1

ESCO's future

Main purposes of the skills hierarchy

Search for and retrieve systematically the 13,485 ESCO skill and knowledge concepts to facilitate

- **Compilation of CVs and job vacancies**
- **Annotation of qualifications**
- **Mapping national classifications to ESCO**
- **Creation of skill (self-)assessment tools**
- **Provision of targeted career guidance**
- **Matching jobseekers with job vacancies based on skills**

The skills hierarchy

A new structure

- Developed by **experts** in 2019 and published in May 2020
- Structured in **8 groups** and **3 levels**
- **Sector-independent:**
 - Tools and equipment used,
 - Type of object on which the work is performed
 - The function or outcome of the task or activity

The screenshot shows the ESCO Skills/Competences hierarchy interface. At the top, there is a navigation bar with icons for Home, About ESCO, Classification, Tools & Resources, and Forum. Below the navigation bar, there are three main categories: Occupations, Skills/competences (highlighted in yellow), and Qualifications. A search bar is located on the left side. The main content area displays a list of skill groups, with 'S - skills' highlighted in red. Under 'S - skills', there are eight sub-groups: S1 - communication, collaborati..., S2 - information skills, S3 - assisting and caring, S4 - management skills, S5 - working with computers, S6 - handling and moving, S7 - constructing, and S8 - working with machinery an... (highlighted in red). Under S8, there are two sub-classifications: S8.0 - working with machine (highlighted in red) and S8.1 - operating mobile plant (highlighted in red). Under S8.1, there is one sub-classification: S8.1.0 - operating mobile pl (highlighted in red). Under S8.1.0, there is one sub-classification: S8.1.1 - operating earth... (highlighted in red). On the right side, there is a large yellow box with the word 'Skills' in blue. Below this, there is a large blue number '13485' followed by the text 'skills / competences'. To the right of this, there is a paragraph of text explaining the ESCO skills pillar. At the bottom right, there is the European Commission logo and the text 'European Commission'.

Occupations Skills/competences Qualifications

Search

SKILLS/COMPETENCES

- > A - attitudes and values
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- ✓ S - skills
 - > S1 - communication, collaborati...
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 - > S6 - handling and moving
 - > S7 - constructing
 - ✓ S8 - working with machinery an...
 - > S8.0 - working with machine
 - ✓ S8.1 - operating mobile plant
 - S8.1.0 - operating mobile pl
 - > S8.1.1 - operating earth...

Skills

13485 skills / competences

The ESCO skills pillar distinguishes between i) skill/competence concepts and ii) knowledge concepts by indicating the skill type. There is however no distinction between skills and competences. Each of these concepts comes with one preferred term and a number of non-preferred terms in each of the 27 ESCO languages. Every concept also includes an explanation in the form of description.

The skills pillar of ESCO contains 13,485 concepts structured in a hierarchy which contains four sub-classifications. Each sub-classification targets different types of knowledge and skill/competence concepts:

- Knowledge
- Skills

European Commission

Mapping to national skill and occupation classifications for interoperability

EURES platform operations for job mobility in Europe

3-year period - until August 2021

Mapping platform with suggested and manual matchings

Technical support with documentation, webinars and country visits

Online community forum for Member States

Communication and outreach

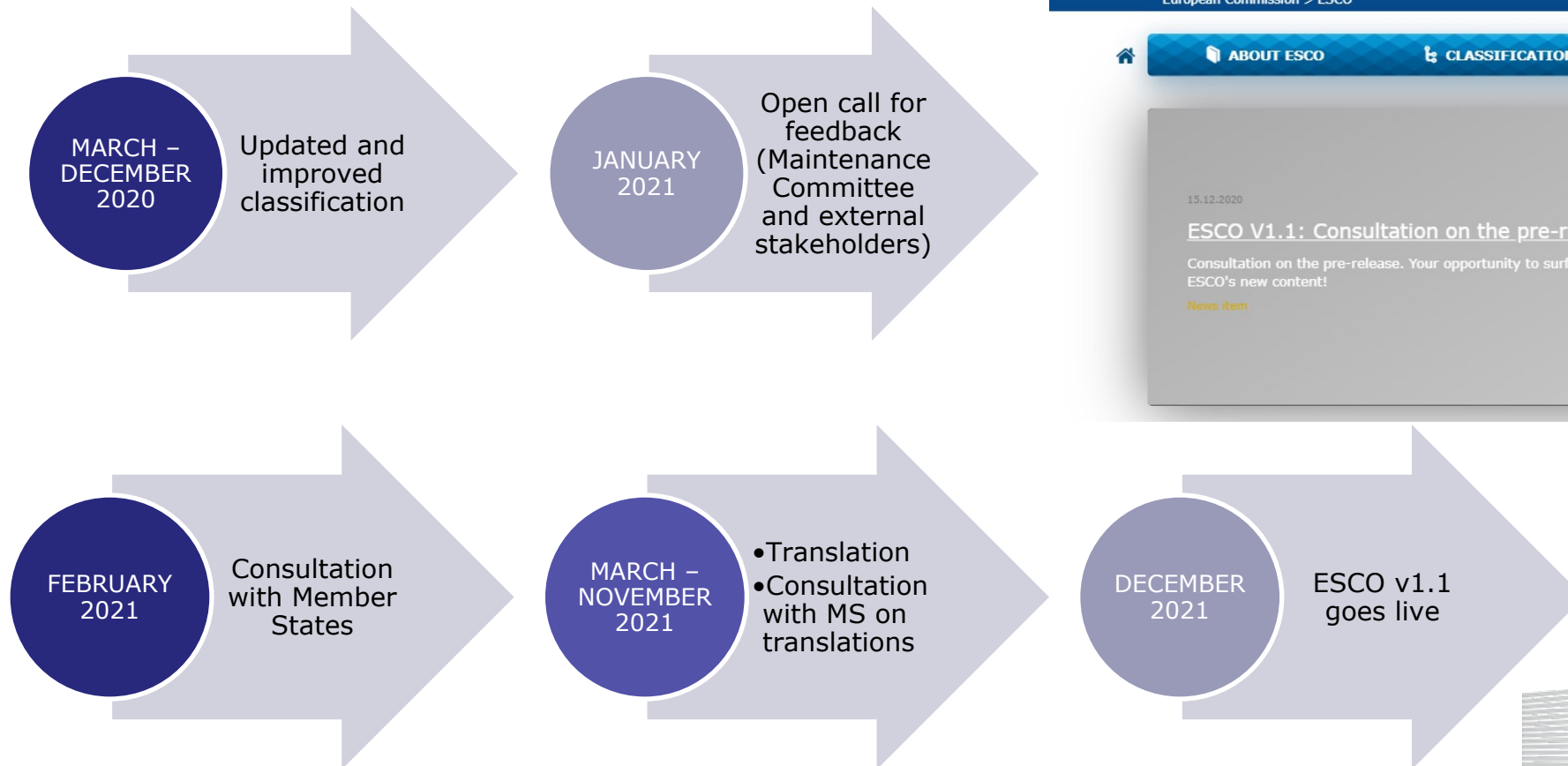
Five Country events in 2019: Greece, Slovenia, Poland, Cyprus and Italy

Study visits to ESCO implementers: Docebo, Boost.rs, Textkernel, Eures and Milch&Zucker

Monitoring of ESCO use by implementers via video calls

ESCO v1.1

Timeline and activities



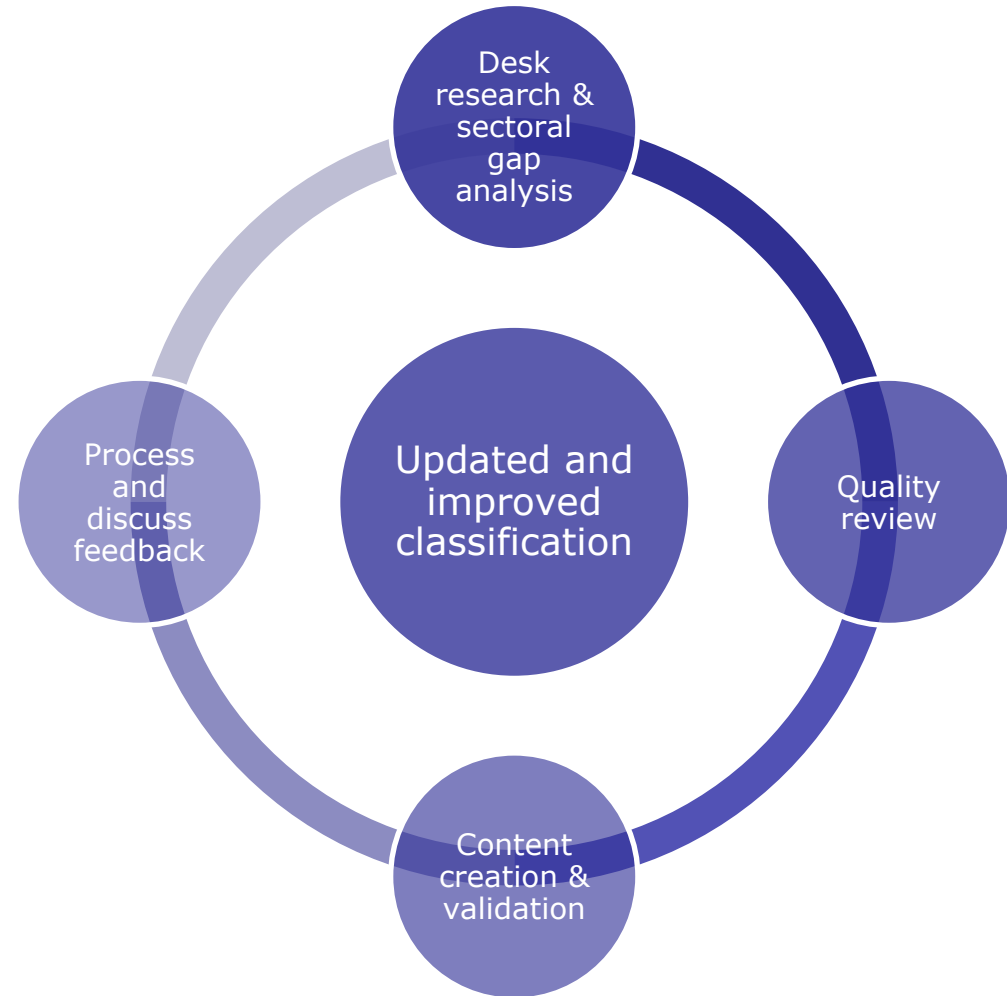
ESCO v1.1

Goals & approach

ESCO needs to be kept **up-to-date** to reflect new realities in the labour market

- Greening of the economy
- Digitalisation and new technologies
- COVID-19 changes

ESCO requires **quality assurance** activities (terminological issues, translations, etc.)



ESCO v1.1

Insights



Type	Label	Example
Digital	Occupation	Cloud engineer
Green	Occupation	Geothermal engineer
Other	Occupation	Contact tracing agent
Digital	Skill	Collect cyber defence data
Green	Skill	Apply procedures and regulations for eco-labelling
Other	Skill	Manage intellectual property rights
Digital	Knowledge	Advanced driver assistant systems
Green	Knowledge	Bioeconomy
Other	Knowledge	Social bonds

Examples of new occupations

Alternative fuels engineer: alternative fuels engineers design and develop systems, components, motors and equipment which replace the use of conventional fossil fuels as main power source of propulsion and power generation with the feature of using renewable energies and non fossil fuels. They strive to optimise energy production from renewable sources and reduce production expenses and environmental strain.

Digital marketing professional: digital marketing professionals contribute to the elaboration of the company's digital strategy in accordance with its global development plan through data driven methodologies and by measuring and monitoring digital marketing KPIs in order to promptly implement corrective action plans.

Examples of new knowledge concepts

Social entrepreneurship: the process of creating, managing and scaling-up a venture in order to address social and cultural challenges.

Bioeconomy: the production of renewable biological resources and the conversion of these resources and their waste streams into value added products, such as food, feed, bio-based products and bioenergy.

Health Technology Assessment: the assessment of the properties, performance and effects of health technologies aimed at detecting direct and indirect effects of health technologies and their desired and undesired consequences.

Examples of new skills

Install offshore renewable energy systems: install systems that generate electrical energy through offshore renewable energy technologies, ensuring compliance with regulations and the correct installation of the power system.

Reduce tanning emissions: adjust the formulation of finishing operations according to each type of leather market destination, avoiding VOC emissions.

Setup media storage and backup systems: set up and configure media storage systems and related backup systems to ensure maximum data safety, maximum accessibility and low latency of the used media.

Data Science in ESCO

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

- 1) Making maintenance of ESCO more efficient
- 2) Expanding ESCO
- 3) Making ESCO easier to use by implementers

Managed Classification or Machine Learning Driven?

Best of both worlds:

- Leverage expert prior knowledge
- Interpretable and transparent
- Quality assurance: Member States to verify
- Easy to control and adjust

- More efficiently process (large amounts of) data: faster/cheaper
- Discover new concepts and relations from data: near real-time
- Human-in-the-loop: iteratively improve based on human feedback

Beyond Experts: Mapping other Data Sources

Expert Data:

- Blueprints
- Projects
- European associations
- Companies

The image shows two screenshots from a project titled 'Updating ESCO'. The top screenshot is a document with a table of contents and a list of tasks. The bottom screenshot is a data table with columns for 'Task', 'Status', and 'Responsible'. A blue arrow points from the table to a central ESCO logo.

Vacancies

A screenshot of a job vacancy for 'Webdesigner med lidenskap for brukervennlighet og Design Thinking søkes til ledende webbyrå'. The job is at 'RAMSALT LAB AS AID OSLO'. It lists details such as 'Jobboversikt', 'Stillingdetaljer', and 'Arbeidsgiver'. The job is full-time and permanent, with a start date of 27/02/2021.



Taxonomies:

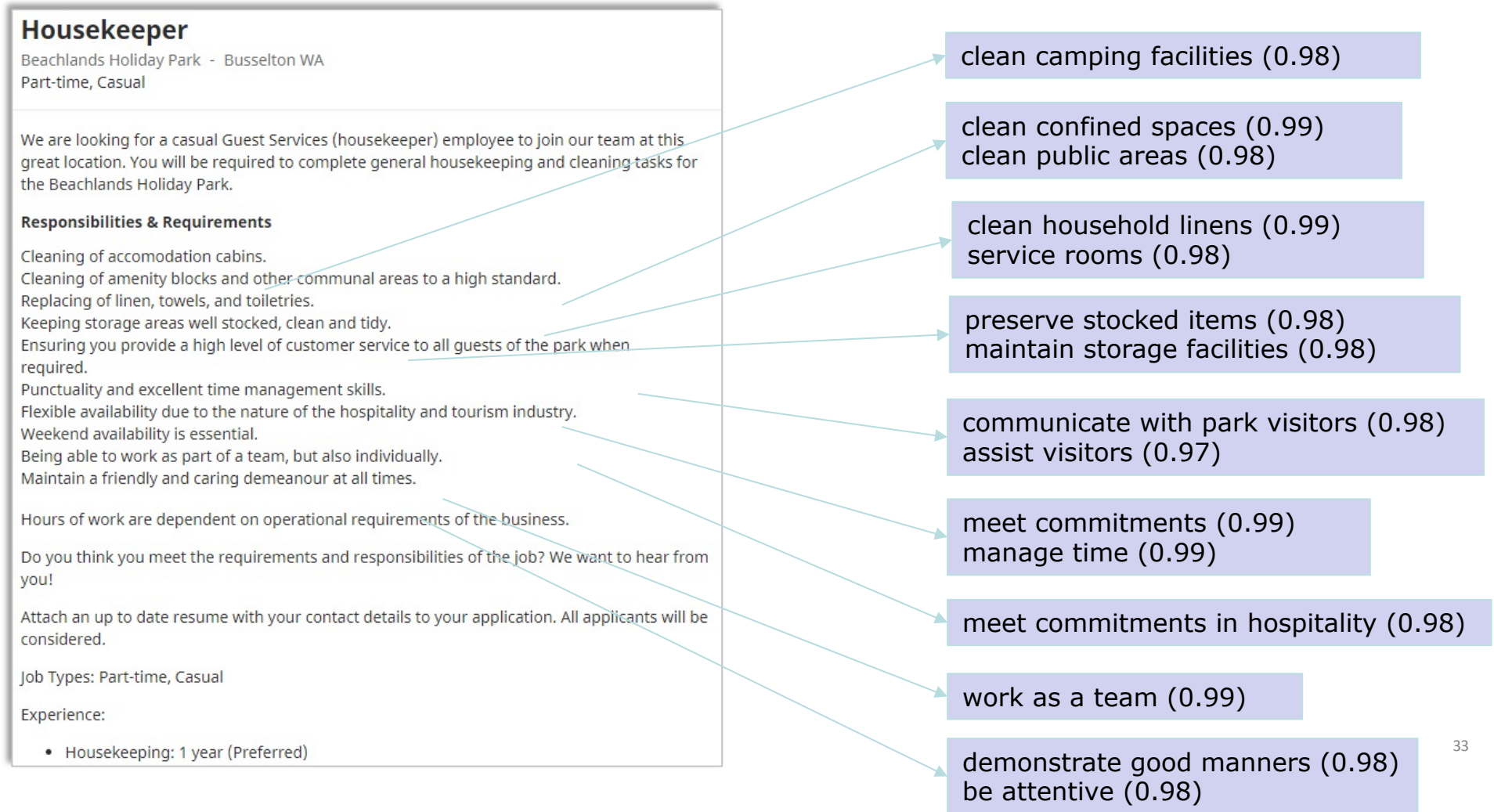
- Member States

A screenshot of the ESCO-Berufe interface. It shows a list of occupations under the heading 'Angehörige der regulären Streitkräfte'. The interface includes a search bar, filters, and a 'Mapped concepts' section.

A screenshot of the Mapping platform interface. It shows a list of qualifications under the heading 'Bachelier : instituteur préscolaire'. The interface includes a search bar, filters, and a 'Map concept to Belgium French Qualifications' section.

Qualifications

Vacancies: Skills and Tasks Linking to ESCO



Qualifications: Learning Outcomes Linking to ESCO

The screenshot shows a web application interface for linking French qualifications to ESCO learning outcomes. The interface is divided into several sections:

- Header:** "French qualifications" and "Aptitudes ESCO" with a version indicator "Version: 1.0.5".
- Filter:** A search bar labeled "Filter..." with a dropdown arrow.
- Qualifications List:** A list of French qualifications including "Attaché (e) commercial (e) Niv5", "Baccalaureat professionnel metiers de la coiffure Niv4", "BaccalaureatTechnicien professionnel en prothèse dentaire Niv4", "Boulangier brevet de maîtriseNiv5", "brevet de technicien superieur BTS opticien lunetierNiv5", and "CAP conducteur d'ouvrage en béton armé niv3".
- License d'informatique:** A detailed view for the "Licence d'informatique" (Concept identifier: 24514). It includes a description in French and a section titled "Learning Outcome Entities" with 35 items. One item, "Analyser ses actions en situation professionnelle, s'autoévaluer pour améliorer sa pratique", is highlighted in yellow.
- Map concept to French qualifications:** A section with tabs for "Browse", "API search", "ML suggestions", and "Occupation browsing". A search bar contains the text "mener une réflexion sur les pratiques". Below the search bar, a list of results is shown, including "mener une réflexion sur les pratiques" (highlighted in yellow) and "A - attitudes et valeurs", "K - connaissances", and "L - compétences et connaissances linguistiques".

Taxonomies: National Classifications

German Skill	EN translation	Mapped ESCO skill (EN)	Match type
Tierphysiologie	Animal physiology	physiology of animals	Exact
Tierphysiologie	Animal physiology	neurophysiology of animals	Broad
Tierphysiologie	Animal physiology	analyse animal locomotion	Close
Tierphysiologie	Animal physiology	use osteopathic techniques to improve health of animals	Close

Model
physiology of animals
examine animals
perform veterinary diagnosis
anatomy of animals
assess animal's condition
conduct experiments on animals
animal biology
fundamental veterinary sciences
neurophysiology of animals



#ESCO_EU



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THANK YOU

