



Brussels, 22 January 2019

**MEMBER STATES WORKING GROUP ON ESCO
9TH MEETING 6-7 February 2019**

MSWG 9-03

Measuring the success of ESCO

Update on the ESCO KPI and Study visits to ESCO implementers

1. Introduction

The purpose of the document is to present a status update of the ESCO KPI framework and inform about the Commission's structured approach on collecting feedback from the organisations using the classification (so-called ESCO implementers), in order to assess the impact of ESCO in their services and particular use cases. The document presents the objectives of the visits, the expected outcomes, the set of metrics used in this exercise and the results from the first visits organised namely to Textkernel and EURES.

2. State of play of ESCO KPI framework

The ESCO KPI framework has been presented in the 7th MSWG meeting¹ and included the five dashboards that the Commission is planning to develop in the course of 2019 to keep track of how ESCO is used and with what results:

#1. Acceptance of ESCO as a de facto standard

#2. ESCO in EURES

#3. Evolution of the ESCO qualifications pillar

#4. Conceptual and terminological coverage

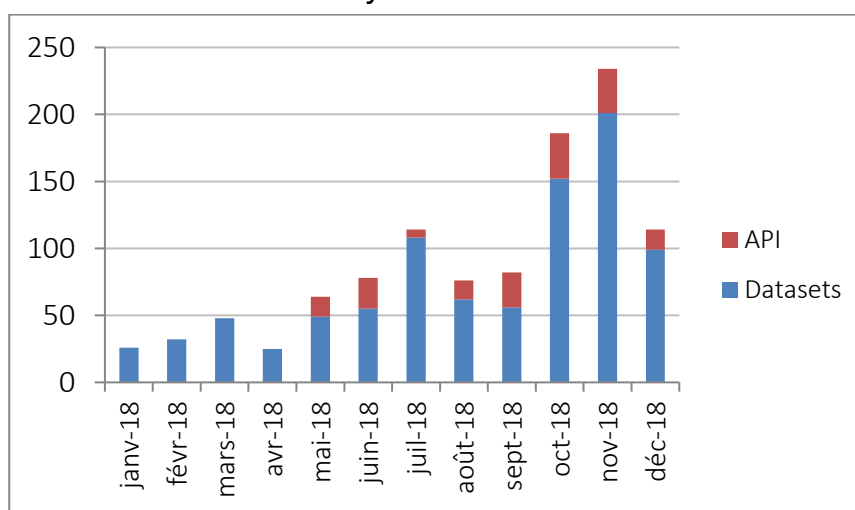
#5. Level of granularity of ESCO

For the moment, the Commission has data available on dashboard #1 and #3, as follows:

¹ https://ec.europa.eu/esco/resources/escopedia/20181213_145926/80e4c2b6-4aae-4710-89f3-010c21c07787KPI_Dashboard_mockups_MS WG.pdf

1. ESCO acceptance as de facto standard

Downloads of ESCO API and datasets

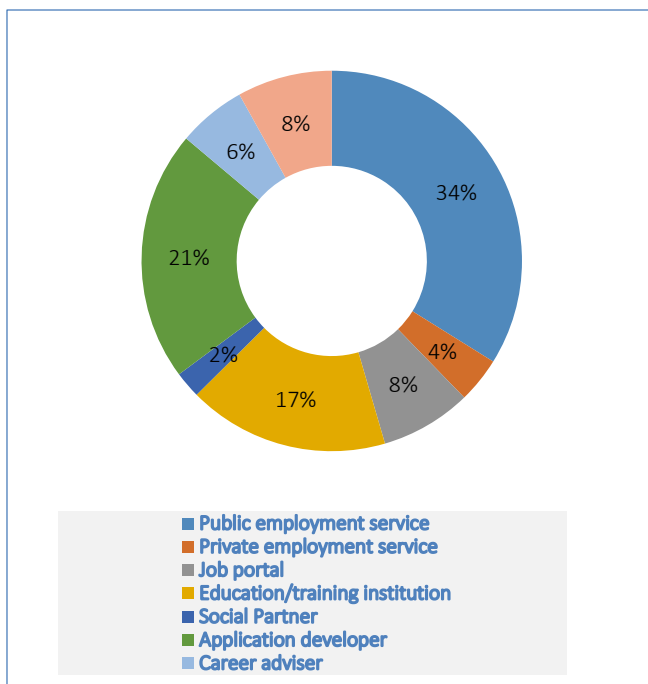


How to interpret the data:

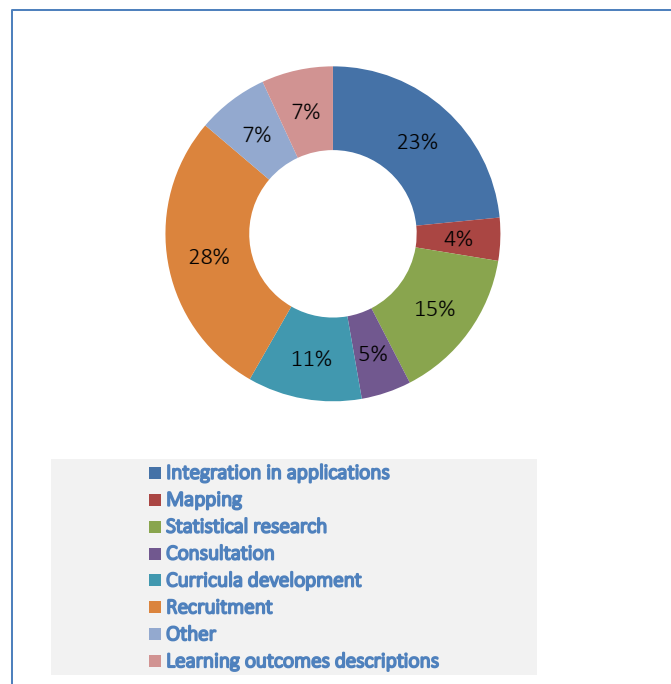
- For each month, the ESCO team will keep track of the number of downloaded datasets and the local ESCO service API from the ESCO portal. The calls made to the ESCO service API (found online) will also be traceable in the near future. This measurement will indicate which technical solution (downloading the dataset or using the API) is mostly used and what the peak moments are.

Success indicators:

- To have at least a 10% increase of downloads on a quarterly basis



Downloads by user type



Downloads by purpose

How to interpret the data:

- Similarly, for each download, the ESCO team is keeping track of who are the users, what type of organisation they represent and for which purpose they download the classification. This will provide an idea of which stakeholders are mostly using ESCO and to what end.

Success indicators:

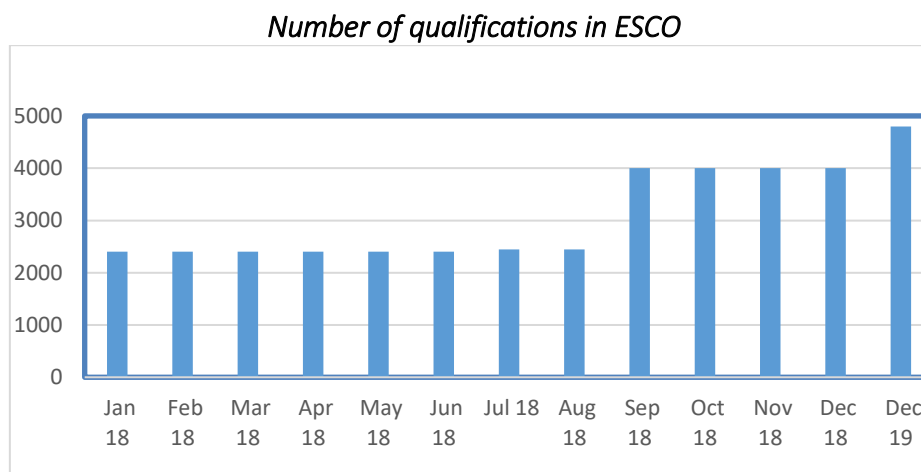
- To have a balance between the private and public users, with a good mix of using ESCO for integration in applications and curricula/ learning outcomes descriptions.

List of known organisations or services using ESCO

- EURES
- Cedefop Big Data Analysis of Job Vacancies
- Skills Profile Tool for Third Country Nationals
- PES Ireland (JobsIreland)
- PES Iceland (under development)
- OPENSKIMR
- Transparency in Art Levels and Qualifications (TALQ)
- E-Skills Match
- ACROSS: “green your skills“
- Textkernel
- Docebo

- Milch & Zucker (JobStairs)
- Skilllab.io
- Boost.rs

3. Evolution of the ESCO qualifications pillar



How to interpret the data:

- The Commission monitors the actual number of qualifications existing in the ESCO classification, to trace the inclusion of more qualifications from different Member States.

Success indicators:

- To integrate qualifications from at least 20 Member States by 2020 and to have an increased progression of the included qualifications.

On the remaining dashboards, the Commission is working together with EURES and CEDEFOP teams to identify the best ways of sharing the data and incorporate it into our metrics. By Q2 of 2019 the Commission is planning to have this data available for reporting to our stakeholders.

3. Short term strategy to collect feedback from ESCO implementers

The Commission aims at meeting with several private market stakeholders who have already implemented ESCO in their systems in order to better understand the impact and concrete results it brings to each specific business case. For this reason, the Commission is planning to conduct a first round of in-depth study visits with the following stakeholders until March 2019 (visits to Textkernel and Eures were already organised in November and December 2018):

- Textkernel
- Docebo

- Milch & Zucker
- Jobboost.io
- EURES

These stakeholders represent different ESCO use cases (such as job-matching and recruitment, career development and training, etc) and they have been previously in contact with the Commission to get support with implementing ESCO in their applications. It is thus very relevant to engage with them in a more detailed dialogue about how exactly ESCO is performing in the delivery of their services.

The ESCO team will use a set of metrics outlined further in this document, in order to capture and quantify the feedback received from the ESCO implementers.

The study visits results will feed into the ESCO KPI framework developed so far and will ensure that the KPIs are encompassing all relevant indicators.

3.1 Purpose of the study visits and metrics used in the assessment

The goals of the visits are to:

- get a more in-depth understanding of how ESCO is used in the market, in particular services and business cases;
- put the current KPI in practice by collecting data from the current implementers of ESCO and assess ESCO's performance;
- potentially, improve the KPI framework with additional indicators suggested by the implementers of ESCO;
- get any additional feedback on how ESCO could be improved.

Following the visits, the data gathered from the visits will be incorporated into the ESCO KPI framework and can be regularly updated. At the same time, the reporting on the results will be fed into the ongoing discussions with Maintenance Committee and the Member States Working Group on ESCO. The findings of the visits will be documented in a report by the ESCO team. All data gathered will be aggregated and published anonymously in the ESCO dashboards.

The concrete list of metrics is described in detail in Annex I. A summary of the findings from the first two visits organised is presented in Annex II.

3.2 Community fora: addressing feedback from ESCO implementers

There are two ways in which the ESCO team can receive feedback from ESCO implementers: either during the study visits or through the online community fora dedicated specifically to the ESCO implementers.

In the first case, the Commission has foreseen a structured workflow to address such feedback, in line with ESCO's continuous improvement process², as exemplified in the following figure:

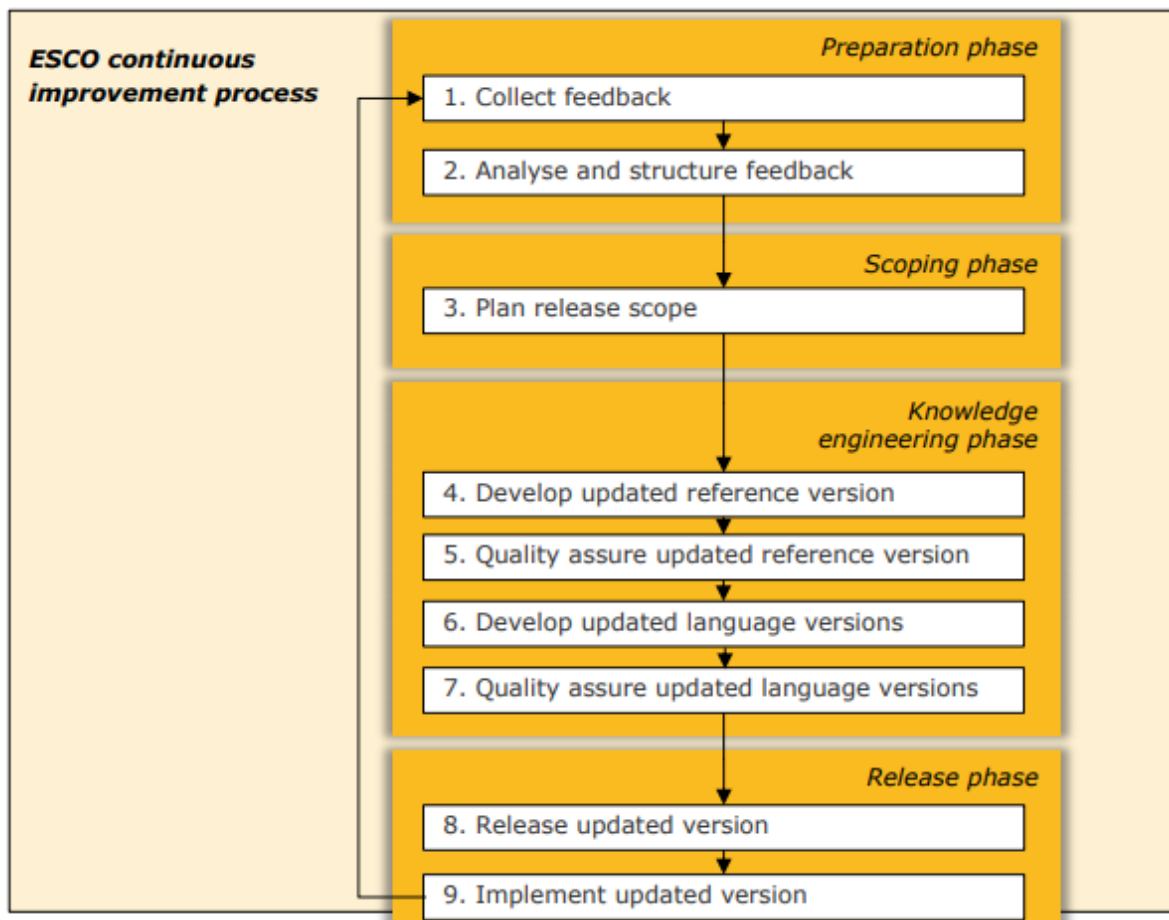


Figure 1. ESCO continuous improvement process

In the first preparation phase, the Commission will collect all the feedback from the visited implementers and record them in a ticketing system. Secondly, each suggestion or comment will be analysed and given priority according to the changes required to the classification and the version affected. The ESCO team will then perform a value analysis in order to determine which potential updates would have the highest added value in relation to the effort and costs for these updates (scoping phase).

For example, minor changes such as spelling mistakes or changing relations between concepts can be easily planned and implemented. On the other hand, more serious changes such as creating new occupations and skills, correcting translations, rationalising the attribution of skills throughout the classification, etc. need to be properly assessed, planned for and quality-assured. In cases where the feedback received is more general and it involves structural changes to the classification (e.g

² <https://ec.europa.eu/esco/portal/document/en/f834e202-0ebf-461a-9249-a00e91d86e94>

change the structure of occupations in a specific sector), the implementation process will be more lengthy and will require evidence from the labour market to support the change required.

Once this assessment is done, the result is a list describing candidate groups of issues (bundles) that can be treated in one ESCO update cycle. Once the scope of a new ESCO version is decided, the team will determine the quality requirements and how quality will be managed during the improvement process.

In any case, the ESCO implementers will be informed via the interview guide on how the ESCO teams plan to tackle their concrete feedback of the classification or if further clarifications are needed in order to proceed to implementation.

Moreover, once the community forum for ESCO implementers will be functional, the ESCO team will put up as discussion points the feedback received from stakeholders that needs further evidence or consensus from the community and the labour –market experts. The document *MSWG 9-7 “State of play of the ESCO community fora”* further details the role of the fora and how ESCO stakeholders can help us to improve the classification and give us feedback on its quality.

3.3 Next steps

The Commission is planning to develop the KPI dashboard by the end of 2019. In the meantime, any data available ad-hoc that is relevant for the KPI framework will be collected and stored in preparation for the dashboard.

ANNEX I

Metrics used in the assessment of the ESCO study visits

The metrics to be assessed during the study visits to ESCO implementers are grouped around three criteria: impact, efficiency and relevance.

Impact	refers to how ESCO is performing in attaining its goals as well as the goals of its implementers per each use case.
Efficiency	refers to how easy it was for stakeholders to implement ESCO in their services and tries to assess the cost-benefit dimension.
Relevance	refers to the terminological and linguistic coverage of ESCO in different scenarios.

Table 1- Evaluation criteria categories

The following metrics have been identified:

Evaluation Criterion: IMPACT		
Business use cases	Examples of indicators	Why these indicators?
Job-matching	Overall, how well does ESCO support job-matching in your services? What are its main benefits in your business model? What is the level of satisfaction of your clients/users towards your job-matching services?	They shed light on the strengths of ESCO viewed from the perspective of client satisfaction, business owners' perception of the usefulness of the tool in specific use cases.
Career guidance	Overall, how well does ESCO support career guidance/development in your services? What are its main benefits in your business model? What is the level of satisfaction of your clients/users towards your career guidance/development services?	
Curricula	Overall, how well does ESCO support	

design	<p>curricula design in your services?</p> <p>What are its main benefits in your business model?</p> <p>What is the level of satisfaction of your clients/users towards your curricula design services?</p>	
Big data analysis	<p>Overall, how well does ESCO support big data analysis of the labour market in your services?</p> <p>What are its main benefits in your business model?</p> <p>What is the level of satisfaction of your clients/users towards big data analysis services?</p>	

Table 2- Impact evaluation metrics

Evaluation Criterion: EFFICIENCY	
Examples of indicators	Why these indicators?
How high were the costs of implementing ESCO in your services? How many people worked to implement ESCO in your system? Could this cost have been reduced?	It shows the specific technical barriers the ESCO team can address to improve the user-friendliness of ESCO
To what extent were the costs and benefits of using ESCO in a reasonable proportion to each other?	
Did you receive feedback from users signalling misunderstandings or technical issues when using ESCO? If so, please explain.	

Table 3- Efficiency evaluation metrics

Evaluation Criterion: RELEVANCE/ APPROPRIATENESS

Supported functionality by ESCO	Examples of indicators	Sources of verification	Why these indicators?
<p>Concept extraction (parsing)</p>	<p>1. Frequency of occurrence of ESCO concepts per language compared with original dataset (structured or unstructured text).</p> <p>Evaluation question: Out of a database of x amount of CVs parsed using ESCO, what is the percentage of the concepts you could identify? How are they distributed per language and job industry?</p> <p>2. Matching frequency between an occupation and the skills declared by users when using ESCO concepts</p> <p>Evaluation question: Out of a database of x amount of CVs parsed with ESCO, what is the matching frequency between an occupation indicated by the user and the skills linked to it? What percentage of the ESCO skills are used by candidates to describe their jobs/occupations?</p>	<p>Analysis of CVs, Job vacancies, learning outcomes</p>	<p>It shows the coverage (completeness) of ESCO concepts in a given business case, a given language and sector of economy.</p> <p>It shows the accuracy and usefulness of the occupational profiles of ESCO (the link between the skills and the attached occupations)</p>
<p>Data entry Simple</p>	<p>3. % of ESCO preferred terms used when users search for or type their occupations and their</p>	<p>User behavior (search terms, log terms)</p>	<p>It shows the richness of ESCO</p>

<p>search</p> <p>Multi-lingual search</p>	<p>frequency of use per each language.</p> <p>Evaluation question: what is the mismatch between the terminology used by users when referring to their occupations and the concepts in ESCO?</p> <p>4. List of terms that users use but are not captured in ESCO (new occupations and skills) and their frequency of use per each language</p> <p>Evaluation question: What are the terms not covered by ESCO concepts/per each language and how frequently have they been used?</p> <p>5. % of relevant automated suggestions of skills and occupations per language</p> <p>Evaluation question: If you measure this, in how many cases the automated suggestions have been relevant for your users?</p> <p>6. % of concepts that have been identified by users as not relevant/too vague/difficult to understand</p>	<p>when users create their CV, job-vacancies or online profile</p>	<p>concepts, whether they reflect or not what users are searching for in the labour market. Also, on the quality of translations.</p> <p>It shows the new emerging skills that ESCO should capture</p> <p>It shows the relevance of the links between occupations and skills</p> <p>It shows areas of improvement at terminological</p>
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	<p>Evaluation question: If you measure this, how many concepts have been marked explicitly as non-relevant/too vague/difficult to understand by your users when creating their CV or job vacancies?</p>		<p>level (translations or concept level)</p>
<p>Semantic search and job-matching</p>	<p>7. % of relevant matches of candidates to jobs per language and economic sector/job level.</p> <p>Evaluation question: how successfully has ESCO contributed to identifying the right candidate for a job? In how many cases has the matching result been most relevant? How this is different based on language or job type (entry-level, management level, etc)?</p>	<p>As assessed using job matching algorithms, web semantic search engines</p>	<p>It shows the precision and relevancy of ESCO concepts (and translations) in the matching process</p>
<p>Profile comparison</p>	<p>8. % of relevant learning opportunities offered to candidates based on ESCO competencies</p> <p>Evaluation question: How adequate are the learning courses/training suggested to users compared to their desired career paths?</p> <p>9. Most commonly used skills and competencies across industries and occupations</p>	<p>End-Users' feedback</p>	<p>It shows the relevance of the links between occupations and skills</p> <p>It shows the coverage of ESCO in the labour market</p>

	<p>Evaluation question: Which skills and competencies are frequently used by candidates when changing from one career in one sector to another career in the same or different sector?</p>		
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Table 4- Relevance evaluation metrics

Additional KPIs tracked by ESCO implementers in their services	
Indicators/assessment questions	
X	
Y	
Z	

ANNEX II

Findings from study visits

The Commission already organised two study visits in the months of November and December 2018, to Textkernel and EURES. A summary of the findings from those study visits is presented below.

1. Findings from the visit to Tektkernel

Textkernel is an Amsterdam-based leader in artificial intelligence, machine learning and semantic technology fields. Their AI-powered solutions accelerate and improve the process of matching people and jobs via multilingual CV and vacancy parsing, semantic search, bi-directional matching, lead generation and labour market analytics.

The first HR technology provider to support ESCO in products, Textkernel uses ESCO as background knowledge and training data for ontology mining to enrich its own knowledge resources. This results in more effective parsing, searching and matching, and the ability to offer the technology in additional languages.

Key benefits from Textkernel's perspective:

Textkernel has created and uses its own ontology which is larger than ESCO and stems from scrawling the web; thus, it includes terms deriving directly from job vacancies. Nevertheless, Textkernel:

- benefits from the multilingual aspect of ESCO, i.e. they use ESCO for those languages they do not cover and
- has performed a mapping between terms of their ontology and ESCO in order to be interoperable with the PES systems.

Feedback on improving ESCO:

1. Linguistic terminologies should be regularly checked and, if needed, updated.
2. Some ESCO skills can be shortened to accommodate for users' needs, e.g. "create a work atmosphere of continuous improvement", "use customer relationship management software".
3. A few occupations do not exist in ESCO, e.g. "kitchen sales adviser", the closest to which in ESCO is "kitchen and bathroom shop manager".
4. Compound ESCO concepts tend to focus on one aspect of the occupation, e.g. "kitchen and bathroom shop manager", i.e. the skills listed under this occupation refer to the shop, not to the kitchen neither to the bathroom.
5. Several skills can be seen as being relevant to the same concept, e.g. "project management", "manage projects", "perform project management", "manage several projects", which could affect mapping.
6. The documentation on the ESCO data model could better describe provenance of data (e.g. criteria of setting different skills as essential or optional).

7. The distribution of essential and optional skills across the ESCO occupations change fast. This needs to be captured in the future versions of ESCO.

2. Findings from the visit to EURES

ESCO is perceived as an enabler of the EURES services, the European job mobility platform.

EURES is using ESCO for job-matching, search (for jobs and candidates) and career guidance purposes (creating jobseeker profiles). ESCO is also used in the European job days platform³, which contains around 400,000 users registered in the system.

Key benefits from the EURES perspective:

- Skills-based matching (improved JV & CV semantic matching).
- Multi-lingual matching and the opportunity to easily bridge language barriers in occupation and skills codes.
- Assisting jobseekers in describing better and more precisely their professional experience.
- Giving possibility to employers to search for candidates on the basis of more granular selection of skills under a certain job vacancy.
- Help employers to define better job vacancies and job descriptions.
- Process improvement benefits - efficiency and quality improvement.

Feedback on improving ESCO:

- Examine certain skills for possible duplications, e.g. 'office software', 'use MS office', 'use office systems'.
- Add more occupations to 'Essential skill/competence of' section, e.g. 'provide leadership' skill can be used in most of the occupations in all business sectors and not only in those occupations indicated such as 'chiropractor', 'physiotherapist' and 'fruit production team leader'.
- Aligning taxonomy elements across domains by introducing consistent cross-domain and sector-agnostic designing principles.

EURES is producing business intelligence reports on the basis of the EURES data (JV and CVs – around 3.5 million records monthly) and they intend to enlarge the type of statistics produced, including on different usage of ESCO. The ESCO team will further cooperate with the EURES team in the course of 2019 to discuss the timeline and the exchange of data on the ESCO KPIs that can be measured.

³ <https://www.europeanjobdays.eu/en>