Taxonomy Oversight Group (TOG) - Taxonomy Evaluation Document

RAG Status Explanation

- **Green** – on schedule for the milestone to be met.
- **Amber** – challenges exist, but they are realistically manageable, and the milestone should be met.
- **Red** – the milestone will not be met or are unlikely to be met
- **Blue** – Complete
- **Black** – not started

Named Taxonomy	ESCO
Background	ESCO (European Skills, Competences, Qualifications and Occupations) is the European multilingual classification of Skills, Competences and Occupations. ESCO works as a dictionary, describing, identifying and classifying professional occupations and skills relevant for the EU labour market and education and training. ESCO provides descriptions of 2942 occupations and 13,485 skills linked to these occupations, translated into 27 languages (all official EU languages plus Icelandic, Norwegian and Arabic). The most recent version ESCO 1.1.0 was published 27/01/2022. More information on ESCO is available at https://ec.europa.eu/esco/portal
Task Group	Skills

	RAG	Go to Green action required
		RAG (date)

1. Definition A taxonomy is the process of naming and classifying items into groups within a larger system according to their similarities and differences. The resulting structure of terms which can be either flat or hierarchical in nature, is used to provide a conceptual framework for discussion, analysis or information retrieval.	In ESCO, each occupation is mapped to exactly one ISCO-08 code. ISCO-08 can therefore be used as a hierarchical structure for the occupations pillar. ISCO-08 provides the top four levels for the occupations pillar. ESCO occupations are located at level 5 and lower. 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 13,890 concepts structured in a hierarchy which contains four sub-classifications. Each sub-classification targets different types of knowledge and skill/competence concepts: • Knowledge • Skills • Transversal skills • Language skills and knowledge In addition to the hierarchy, subsets of skills can be accessed through: • A transversal skill hierarchy • A collection of languages • A collection of digital skills
2. Purpose There must be clarity about the role of the taxonomy in a specific circumstance. What is the problem that the taxonomy is trying to resolve? A good taxonomy should be built with the end user in mind. It must be up-to- date, relevant and	People change jobs and employers more frequently than in the past, new skills are regularly needed and geographical and occupational mobility is increasing. The aim of ESCO is to support job mobility across Europe and therefore a more integrated and efficient labour market, by offering a "common language" on occupations and skills that can be used by different stakeholders on employment and education and training topics. Whilst the purpose of ESCO is clear, it was not primarily developed for UK use. Some of the skills listed in ESCO are considered not distinct enough. This makes defining and comparing

sufficiently detailed to be fit for purpose. If end users find that the taxonomy fails to meet their requirements, they may amend or substitute categories for their own purposes, thereby reducing the overall comparability and relevance of the taxonomy.	jobs and an individual's transferable skills much harder. For UK use as a skills taxonomy we need it to be non-overlapping. Whilst this may be overcome in future this is a current weakness of the ESCO taxonomy.
3. Complexity The level of complexity must adequately reflect end user requirements with challenge given to any additional level of detail within the taxonomy that doesn't have a compelling purpose. An unnecessarily complex taxonomy has the potential to negatively impact adoption. "Everything should be made as simple as possible, but no simpler." (Einstein)	The occupations pillar of ESCO is currently significantly more complex than SOC 2020 which contains 412 occupational groupings. The development of a crosswalk would be necessary to align the two taxonomies. The skills pillar of ESCO contains 13,485 concepts structured in a hierarchy which contains four sub-classifications. The current duplication of skills terms within ESCO makes the taxonomy messier than it needs to be e.g., ESCO currently contains 17 terms related to the arranging of music therapy sessions. The latest version changes have however sought to tackle deduplication through a combination of machine and manual updates. This is moving in the right direction but there remains further work to be done. A noted benefit of ESCO is that the level of detail and complexity provided in the description was felt to help address criticism around the lack of identified skill level.
4. Balance Does the taxonomy have a sense of balance? If some high-level groupings have just two or three sub-categories whilst other have considerably more, this could reflect user need or may be a sign that the balance	The ESCO structure complies in the provision of an overarching sense of balance. ISCO-08 provides the top four levels for the occupations pillar. ESCO occupations are located at level 5 and lower. The structure is split across 10 occupational groups. The skills pillar of ESCO contains 13,485 concepts structured in a hierarchy which contains four sub-classifications.

of the taxonomy requires further consideration. Exceptions to this may include e.g. Country, and other unambiguous long lists which can be presented alphabetically. Care must also be taken to ensure that there are no 'empty' categories within the taxonomy.	
5. Ownership and Governance There must be a clear owner of the taxonomy and governance policies in place for maintaining and updating the structure. It is the responsibility of the owner or custodian to maintain the classification in line with any agreed national or international process for revision, update and amendment. This responsibility includes maintaining any supporting materials associated with the taxonomy. Governance policies should define who does which tasks, procedures for performing tasks, and feedback mechanisms for suggesting changes and improvements.	ESCO clearly has well defined ownership and governance in place. DG Employment, Social Affairs and Inclusion is managing the development and updating of the ESCO classification. To this end, it is supported by external stakeholders and the European Centre for the Development of Vocational Training (Cedefop). ESCO is a European Commission project, run by Directorate General Employment, Social Affairs and Inclusion (DG EMPL). It is available in an online portal and can be consulted free of charge. More information on ESCO governance can be found at https://ec.europa.eu/esco/portal/escopedia/ESCO_governance

The taxonomy is currently missing is a UK point of contact for anyone interested in learning more about ESCO and for disseminating relevant information to interested UK parties. It is proposed that going forward this should be a role fulfilled buy the ONS. |

6. Accessibility	ESCO along with supporting documents and materials is available in 26 European languages as well as Arabic. The ESCO classification is published in SKOS-RDF and CSV formats, in order to enable users to integrate it into their applications and services.	
The taxonomy and supporting materials must be hosted in an appropriate location with clear sign posting to direct users to its location. It should be available in accessible downloadable formats that are suitable for user needs. Materials should be provided in plain English and use language appropriate to user needs.	The provision of ESCO in so many languages has led to the identification of some minor language inconsistencies within the skills taxonomy. Most notably with a mixture of singular and plural phrasing. from a UK perspective there is a sense that the inconsistency could be a barrier to usability and would need to be addressed prior to adoption.	
7. Interoperability	ESCO works as a dictionary, describing, identifying and classifying professional occupations and skills relevant for the EU labour market and education and training. Those concepts and the relationships between them can be understood by electronic systems, which allows different online platforms to use ESCO for services like matching jobseekers to jobs based on their skills, suggesting trainings to people who want to reskill or upskill etc.	
The taxonomy must, where possible, adopt/align to existing national and international standards. A new taxonomy should have the ability to map to existing sources enabling the accurate, effective, and consistent exchange of data between sources. Detail should also be provided where any instances of overlap with alternative taxonomies occur.	The ESCO classification is composed of modules that contain elements such as occupations, knowledge, skills and competences, qualifications, and the International Standard Classification of Occupations (ISCO) hierarchy. When combined and interrelated, these modules make up the whole classification. There are three main types of module: •Core modules hold the actual ESCO concepts (occupations, skills, etc.) along with their Unique Resource Identifiers (URIs). •Linking modules provide links between two or more modules, at least one of which is a core module. An example is the relationship between occupations and skills.	

	•Supporting modules enrich the core modules with supporting classification schemes such as ISCO-08. The web-based service API is designed to support interoperable machine-to-machine interaction over the World Wide Web. It provides applications with access to the different versions of the ESCO classification. The functionalities of the ESCO Web Services API covers the majority of ESCO business cases. More info can be found here https://ec.europa.eu/esco/portal/api Again, the issue of duplication within the skills pillar has been identified as a potential challenge to interoperability. Also noted as something to be mindful of is the fact that ESCO uses a full stop as a delimiter which can cause an issue with some software.	
8. Supported The taxonomy should be supported by additional materials such as detailed scope notes. This will ensure that new terms that are synonyms for existing categories are correctly recorded and not otherwise added as new categories. A single term with a definition overlapping that of another term, or a misplaced hierarchy, can disrupt the whole taxonomy. Therefore, no new term should be added to a taxonomy without a formal approval or review process.	ESCO provides everything required to fully support the use of the taxonomy. Detailed documentation is provided including the detailed structural underpinning of the taxonomy. A detailed description is provided for each identified skill along with a list of alternative terms. https://ec.europa.eu/esco/portal/technicaldocumentation TOG may want to consider the development of more accessible supporting guidance which could be hosted on the public facing repository to aid those less familiar with the taxonomy and provide a broad overview of what materials are available. The principle specifies that there should be no overlapping definitions - again the issue of duplication in the skills provided by ESCO is raised as something that would need to be addressed for UK use.	

9. Well defined terms The terms within the taxonomy should strive to be unambiguous and mutually exclusive. The taxonomy must also provide a structured way of handling terms that do not fit into a prescribed category. This includes the provision of adequate space in which to attribute those entries classified as n.e.c. (not elsewhere classified) or n.o.s. (not otherwise specified). Failure to do so may result in an inability to assign data or an unmanageable 'miscellaneous' category containing dissimilar entries.	Unique concept identifiers: each occupation, knowledge, skill and competence in ESCO is identified by a string of characters that follows a specific syntax: the URI. Backward compatibility: URIs remain consistent over a prolonged period. The duplication encountered in some of the identified skills acts as a current barrier to UK adoption as a skills taxonomy however this is not considered to be insurmountable. Additionally, the richness of information supplied within the skill descriptions adds considerable strength to the taxonomy.	
10. Revision and Maintenance A successful taxonomy must have a regular revision and maintenance process in place. This must be undertaken in a timely manner to account for change. An ongoing commitment of resources will be required to ensure that it remains relevant and fit for purpose. All changes should go	ESCO needs to be continuously improved to remain an added value for the labour market and the education and training systems, as new emerging occupations and skills are regularly requested by employers and changes in curricula and in terminology are also regularly introduced in education and training programmes. The Commission services have set up a process to continuously improve the ESCO classification and keep it up-to-date when new versions are released. Through this process, the Commission can see how the classification behaves in different business cases (e.g. job matching, big data analysis, CV creation), identify what needs to be improved and implement changes.	

through a defined review process. There should be no ad-hoc or knee jerk reactions to user requests for changes to the taxonomy. Any and all changes must be clearly labelled and communicated to enable accurate cross reference.	Shaping ESCO into an up-to-date, practical tool is achieved from the bottom up, through the active involvement of people from the education and training sector as well as from the labour market. Stakeholders contributing to the development of the classification include: • employment services • providers of job boards, social media, HR software or career guidance services • social partners • education and training organisations • statistical organisations, researchers and big data analysts • Skills councils and networks The ESCO Maintenance Committee consists of technical classification experts. It contributes to the development and quality assurance process More information is available on the governance process here: https://ec.europa.eu/esco/portal/escopedia/ESCO_governance	
11. Metadata Metadata is a set of data that describes and gives information about other data. It is crucial that appropriate metadata is recorded about the taxonomy. Metadata provides a structured reference and can cover a wide range of topics. Typical examples would be: Title, Subject, Description, Coverage, Date, Creator, Format etc.	ESCO is Linked Open Data (LOD). Provides opportunity to share and reuse. Simple Knowledge Organisation System (SKOS) is the format designed for capturing and representing thesauri, classification schemes, subject heading systems and taxonomies. SKOS is a W3C recommendation within the Semantic Web vision of the Web of linked data https://www.w3.org/2004/02/skos/intro https://pdfs.semanticscholar.org/fe9f/63fcdb7adf5f8abffddb8dc43f37ce9b506a.pdf It can be argued that the concepts of class, subclass, data property, object property, and individual lacks a clear definition. Schema browser consists of the following: Classes, Properties, Thing and properties, Uses Simple Knowledge Organisation System (SKOS) "broader and narrower". One of these resources can be part of a classification. *Assessment under review from ONS metadata team	

12. Methodology The method by which a taxonomy was derived must be freely available to users. Open code used to inform the taxonomy should be made available where possible as should details of individuals that contributed via committee to the taxonomy development.	ESCO is published as Linked Open Data (LOD) so it can be easily reused and linked to other data sources. The taxonomy is developed and published using a data model that complies with the following principles: •A clear scope: each occupation, knowledge, skill and competence in ESCO is clearly established and defined in its description and/or scope note. •Unique concept identifiers: each occupation, knowledge, skill and competence in ESCO is identified by a string of characters that follows a specific syntax: the URI. •Backward compatibility: URIs remain consistent over a prolonged period. Extensive information covering the development of ESCO, use cases and how it can be implemented are available via the website https://ec.europa.eu/esco/portal/documents
13. Engagement Strategy There must be a clear strategy in place to provide users with adequate opportunity to contribute to the revision cycle and communicate any changes in the taxonomy. All users should be made aware of the review or revision process and encouraged to participate in any stakeholder engagement. Updates must be provided regularly and should include details of any 'New Terms', 'Deleted Terms', 'Merged Terms', and 'Split Terms'. Any	ESCO engages the active involvement of stakeholders and experts for the continuous improvement of the taxonomy. Key stakeholders include employers' organisations, trade unions, employment services, education institutions, training organisations, job portals, sector skills councils, statistical organisations and various government bodies. Latest news is provided via the website https://ec.europa.eu/esco/portal/news Concern was expressed that Brexit may result in the UK lacking a voice at the table. Although possibly not able to formally contribute to the revision process it was considered that ESCO would still be willing to listen if we can provide quality considered outputs especially if these came from a credible organisation such as ONS. Those interested in learning more about ESCO or providing input for the continuous improvement of the classification can contact the ESCO Secretariat https://ec.europa.eu/esco/portal/contact. ESCO frequently shares feedback, suggestions and proposals on how to improve the content and management of the classification with organisations using ESCO and other ESCO stakeholders. For this the European Commission has organised several "ESCO community fora" to be regularly in touch with different ESCO stakeholders and gather information from them. These fora are accessible from the Forum page.

changes to the structure, content or methodology of the taxonomy should be communicated as early as possible to allow users sufficient time to prepare for implementation.		
14. Future Proof Over time new content will appear which will need to be assimilated into the taxonomy. A successful taxonomy must have the scope to incorporate new or emerging elements. Without sufficient forward planning in place the original, well-structured taxonomy may quickly become outdates. Careful consideration of each of the principles outlined, alongside expert, topic-specific knowledge will help to ensure the long-term effectiveness of the taxonomy.	ESCO needs to be continuously improved to remain an added value for the labour market and the education and training systems, as new emerging occupations and skills are regularly requested by employers and changes in curricula and in terminology are also regularly introduced in education and training programmes. To address these changes it is important to share frequently feedback, suggestions and proposals on how to improve the content and management of the classification with organisations using ESCO and other ESCO stakeholders. The initial version 0 was published in October 2013. This version contained 4,761 occupations and 5,640 skills/competencies. There have since been 11 further iterations. The latest version released in February 2022 is 1.1.0. All versions are available for comparison on the ESCO site. The most recent revision has sought to address some of the issues relating to duplication within the skills pillar and has sought to identify green skills and knowledge concepts within the framework.	
Final decision and recommendations:		

	TOG agreed to endorse ESCO at its meeting on 16th March 2022
Date:	