The ESCO platform for NKOS integration

Invited European NKOS-2014 Workshop contribution

by

johan.de-smedt@tenforce.com

agis.papantoniou@tenforce.com

ESCO: European Skills, Competences and Occupations
NKOS: Networked Knowledge Organization Systems
Part 1: What is ESCO
ESCO main reference

• ESCO
  • https://ec.europa.eu/escob/home
  • European Skills, Competences, Qualifications and Occupations
    • DG Employment, Social Affairs and Inclusion and DG Education and Culture of the European Commission develop ESCO in collaboration with stakeholders and with the European Centre for the Development of Vocational Training (Cedefop). An H2020 initiative.
ESCO objective (1/2)

• Provide the EU with a set of cross borderer multi-lingual vocabularies to facilitate EU job market transparency by using the ESCO thesauri as a hub for translating and encoding CV and Job Postings.
  • A set of thesauri/taxonomies (three “pillars”):
    • Occupations
    • Skills and competences
    • Qualifications (certifications)
  • Semantic relationships between concepts of the three pillars
    • Occupations and Skills/Competences: essential and optional skills for an Occupation
    • Occupations and Qualifications: Qualifications required for an Occupation
    • Qualifications an Skills/Competences: Skills asserted by a Qualification (certificate)
ESCO objective (2/2)

- A hub taxonomy for labor market players
- Compose
  - exactMatch $\circ$ exactMatch
  - exactMatch $\circ$ closeMatch
  - exactMatch $\circ$ broadMatch
  - broadMatch $\circ$ exactMatch
  - exactMatch $\circ$ narrowMatch
  - narrowMatch $\circ$ exactMatch
  - broadMatch $\circ$ broadMatch $\supset$ esco:broadTransitiveMatch
  - narrowMatch $\circ$ narrowMatch $\supset$ esco:narrowTransitiveMatch

ESCO is a hub thesaurus for mapping like classification system about either of:
- occupation
- skill
- qualification

ISCO, PES,...
ESCO Current Status

• ESCO versions
  • Version 0 is currently published
  • Version 1 is currently ongoing and will make partial upgrades (v0.1, v0.2 ...) until v1 is established (from end 2013 until early 2017).
  • Version 0.1 is targeted for publication on 2015-02.
    • Improvements for 3 sectors:
      • Agriculture, Forestry and Fishery;
      • Hospitality and tourism;
      • Veterinary
ESCO v0 on the Web

- Home
  https://ec.europa.eu/esco/home
Part 2: ESCO as an NKOS system
ESCO KOS

• Three main taxonomies
  • Top structure is a hierarchy of classes or groups
  • Lower structure is a hierarchy of instances

• Two registers
Occupation

- Example of other used vocabularies
  - Languages (Publication Office, Library of Congress)
  - CERF (Common EU reference framework for languages)
  - Countries
  - NUTS (Eurostat EU regions)
  - EQF (European Qualification Framework)
  - FoET (Unesco Fields of education and training)

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ESCO v1 Tagging Occupations with one or more dct:subject ranging over NACE codes

ESCO occ pillar

AFF sector

Aff

Fishery

O [Occupation] [Member]

NACE

A: AGRICULTURE, FORESTRY AND FISHING

B: MINING AND QUARRYING

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ESCO v1
Mapping relationships

Accuracy is sometimes problematic
- different scope of concepts in different concept schemes
Inconvenience

• When mapping concepts in different skos:ConceptScheme, the rdfs:subPropertyOf between
  • skos:mappingRelation (skos:broadMatch, skos:narrowMatch) properties and the respective
  • skos:semanticRelation (skos:broader, skos:narrower) properties

Typically gets problematic as it makes a dependency between the hierarchies in the different concept schemes

• Proposal
  • Make the mentioned property hierarchy not a required part of SKOS or SKOS-XL, but use them as a possible SKOS extension.
Part 3: Versioning
Versioning – modelling

• Dataset versioning based
  • DCAT (http://www.w3.org/TR/vocab-dcat/),
  • ADMS (https://joinup.ec.europa.eu/asset/adms/home) for dataset and resource versioning

• Versioning ontology for thesaurus or dataset versions
  • Development: https://github.com/JohanDS/Dataset-versioning--for-KOS-data-sets
  • Availability: http://purl.org/iso25964/DataSet/Versioning

• Publication Office of the EU
  (future work – see WS presentation Jean Delahousse)
  • Concept and Label versioning
    • PROV-O (http://www.w3.org/TR/prov-o/), ADMS, Dublin Core
DCAT – a catalog ontology

1. **Dataset register entry**
   - `dctype:Dataset`
   - `dct:title`
   - `dct:description`
   - `dct:issued`
   - `dct:modified`
   - `dct:identifier`
   - `dct:keyword`
   - `dct:language`
   - `dct:temporal`
   - `dct:spatial`
   - `dct:accrualPeriodicity`
   - `dct:landingPage`

2. **Dataset access details**
   - `dcat:Distribution`
     - `dct:title`
     - `dct:description`
     - `dct:issued`
     - `dct:modified`
     - `dct:license`
     - `dct:accessURL`
     - `dct:downloadURL`
     - `dct:mediaType`
     - `dct:format`
     - `dct:byteSize`

3. **Metadata about dataset register entry**
   - `dcat:Catalog`
     - `dct:title`
     - `dct:description`
     - `dct:issued`
     - `dct:modified`
     - `dct:language`
     - `dct:license`
     - `dct:spatial`
     - `foaf:homepage`

4. **Catalog**
   - `foaf:Agent`
     - `dct:publisher`
   - `skos:Concept`
     - `dcat:theme`
       - `dct:publisher`
       - `skos:inScheme`
   - `skos:ConceptScheme`
     - `dcat:themeTaxonomy`
   - `foaf:primaryTopic`
DCAT – a catalog ontology

Taxonomy Release

A dataset variant (csv, XML, TTL, ...)

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2014-09-11
DCAT Register Entry for ESCO

Dataset ESCO vX

Distribution zip of csv

Distribution rdf

Distribution war (API with indexed data)
DCAT register with entries for ESCO versions

- Two ESCO versions in the register
- Two versions of ISCO in the register
- The ESCO version control graph, a registered dataset.
Versioning taxonomy publications and taxonomy dependencies

- Per thesaurus, one dataset with fixed URI manages the taxonomy dataset releases, LOD access i.e. the VersionHistorySet.
- Each thesaurus dataset release is detailed by a DCAT dataset record i.e. the VersionHistoryRecord.
- A released thesaurus dataset holds an identifier (a URI) for its VersionHistoryRecord and to the VersionHistorySet.
Part 4: Thank you

• Q&A