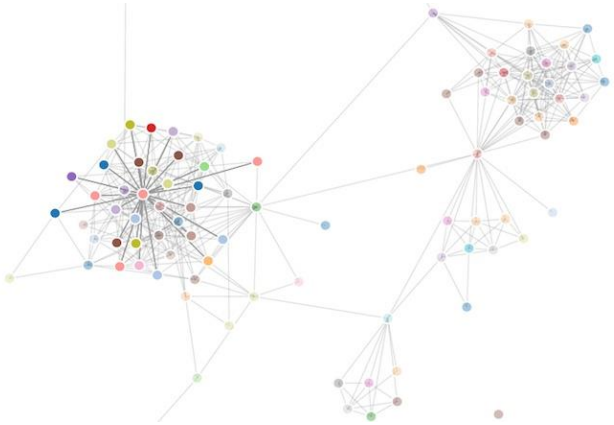
e-Procurement Ontology

Publications Office – Unit C2

7th Working Group Meeting: 2018-06-21



1. **Roll call**
2. Glossary
3. Conceptual Data Model
4. Development of the PoC
5. Future work
6. Any other business

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2. Glossary

- The ePO Glossary is being perfected on the basis of the weekly meeting with Members of the WG (every Friday from 10:00 to 12:00 hrs.);
- Terms and definitions agreed by the attendants are published on the GitHub;
- The revision of the ePO glossary has fed relevant insights that contributed to perfect the ePO Conceptual Data Model;
- The result is that the ontology is right now quite aligned to the terms of glossary reviewed up now.
- The glossary is being updated weekly with the help of WG members. To see which terms and definitions have been approved by the WG see the column D (“WG Approval Date”) of the online spread-sheet (just click on the GitHub/wiki ePO Glossary menu link and then on one entry of the glossary.

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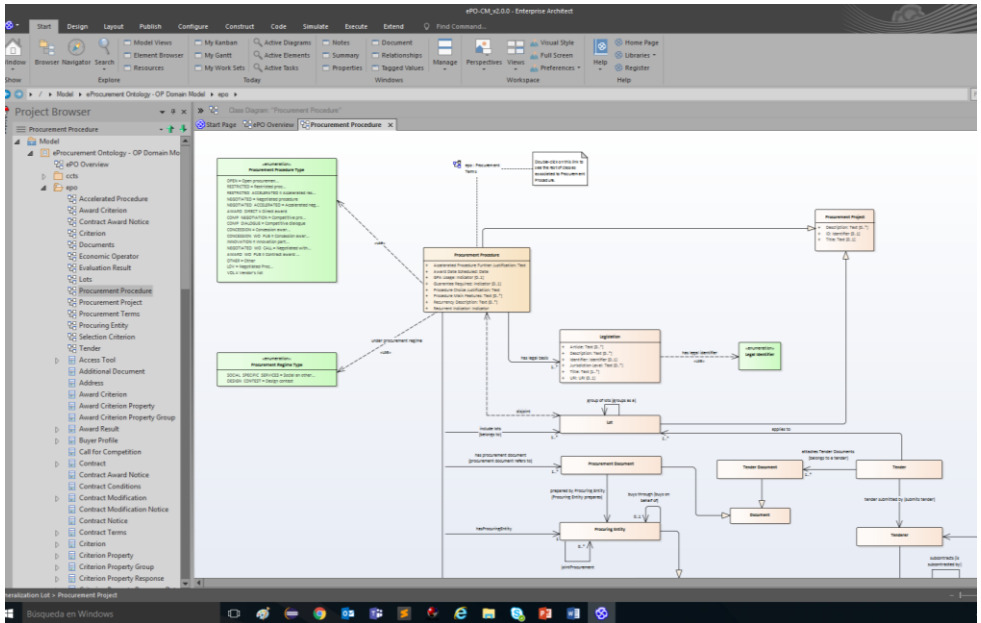
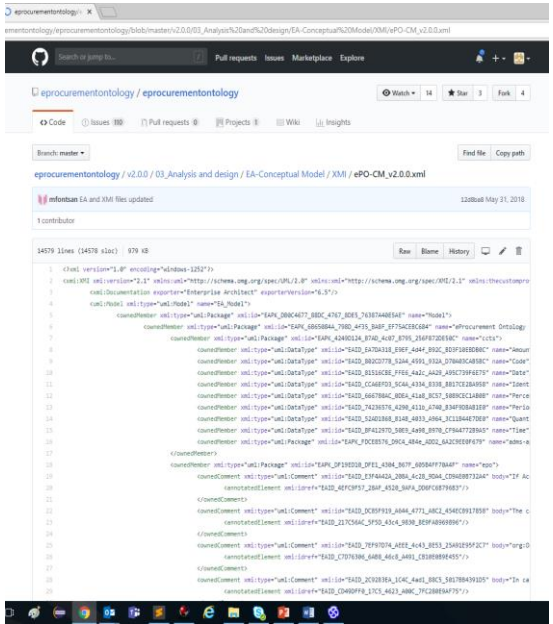
2. Conceptual Data Model

- The Conceptual Data Model is being improved taking into account the inputs from the ePO Glossary and, also, the development and results of the PoC;

- One general overview and fourteen topic-diagrams show all the classes and properties designed until now (in the scope of eNotification and eAccess);

- These diagrams are represented in the EAP file and as a standard XMI file





2. Conceptual Data Model

- Each diagram of the Conceptual Data Model contains a short description of how to read the diagram in a business-comprehensible manner.

Procuring Entity
Version 1.0
estaromi created on 21/03/2018. Last modified 06/06/2018

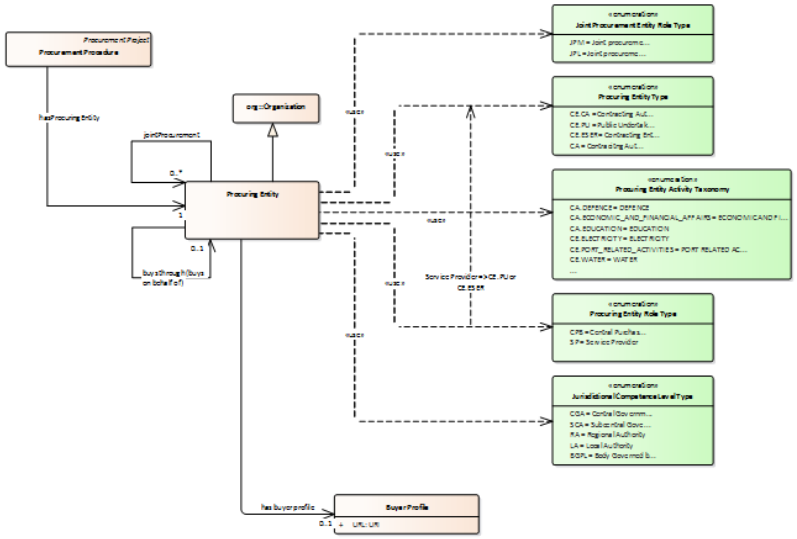


Figure 12: Procuring Entity

Procuring Entity diagram

Class diagram in package 'epo'

1. In any Procurement Procedure, there is at least one Procuring Entity;
2. Procuring Entities are "Organizations", appropriately identified and described (IDs, Names, Addresses, Contact Points, etc.);
3. Depending on its nature and main activity a Procuring Entity may be identified simply as a Contracting Authority (general procurement) or as a Contracting Entity pursuing the procurement of gas and heat, electricity, water, transport services, ports and airports, postal services and extraction of oil and gas and exploration for, or extraction of, coal or other solid fuels. A Contracting Entity may in turn be a Contracting Authority, a Public Undertaking or entities with special or exclusive rights (Procuring Entity Type code list);
4. For some Procurement Procedures, a Procuring Entity can join other Procuring Entities (Joint Procurement)
5. In these cases, the Procuring Entities participating in the Joint Procurement may adopt one role (Procuring Entity Role Type code list), e.g. the lead of the group.
6. Procuring Entities are in general responsible for the management of the procurement procedure and the management of the purchase, but this is not always the case as the purchase may be relied on another Procuring Entity (see property "buys through" and code list "Procuring Entity Role Type").

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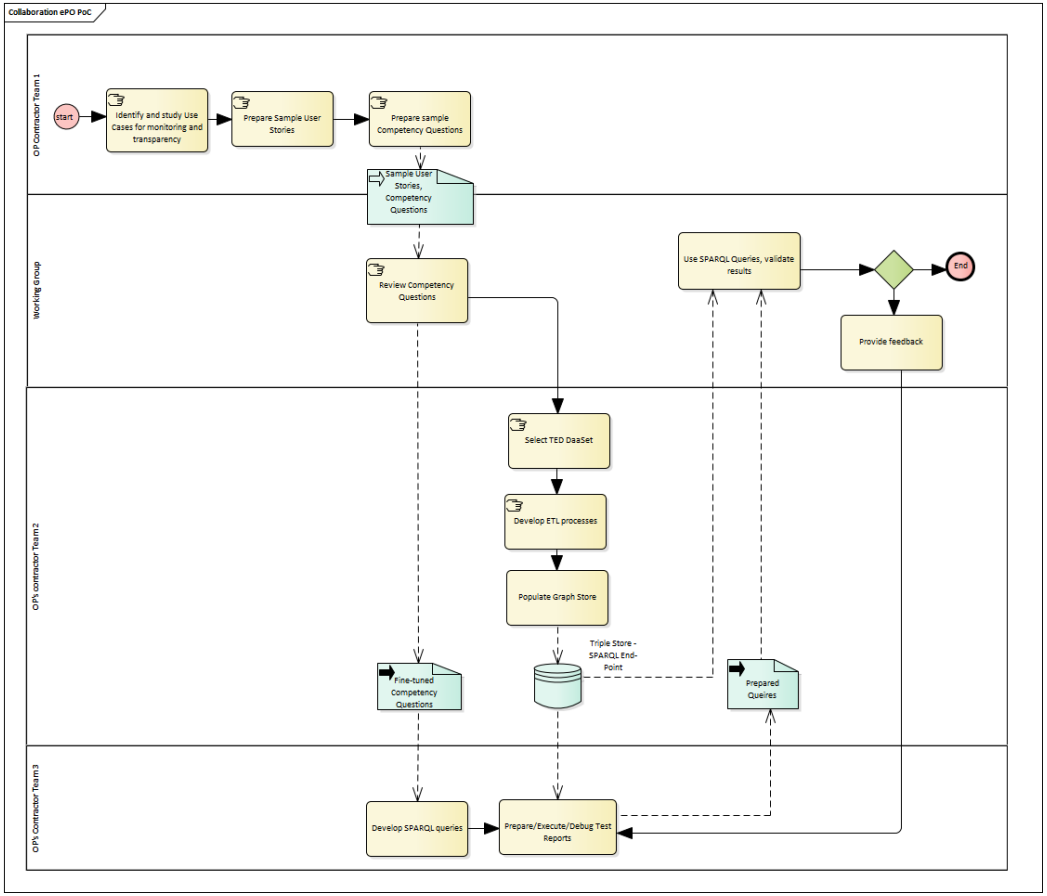
3. Development of the PoC

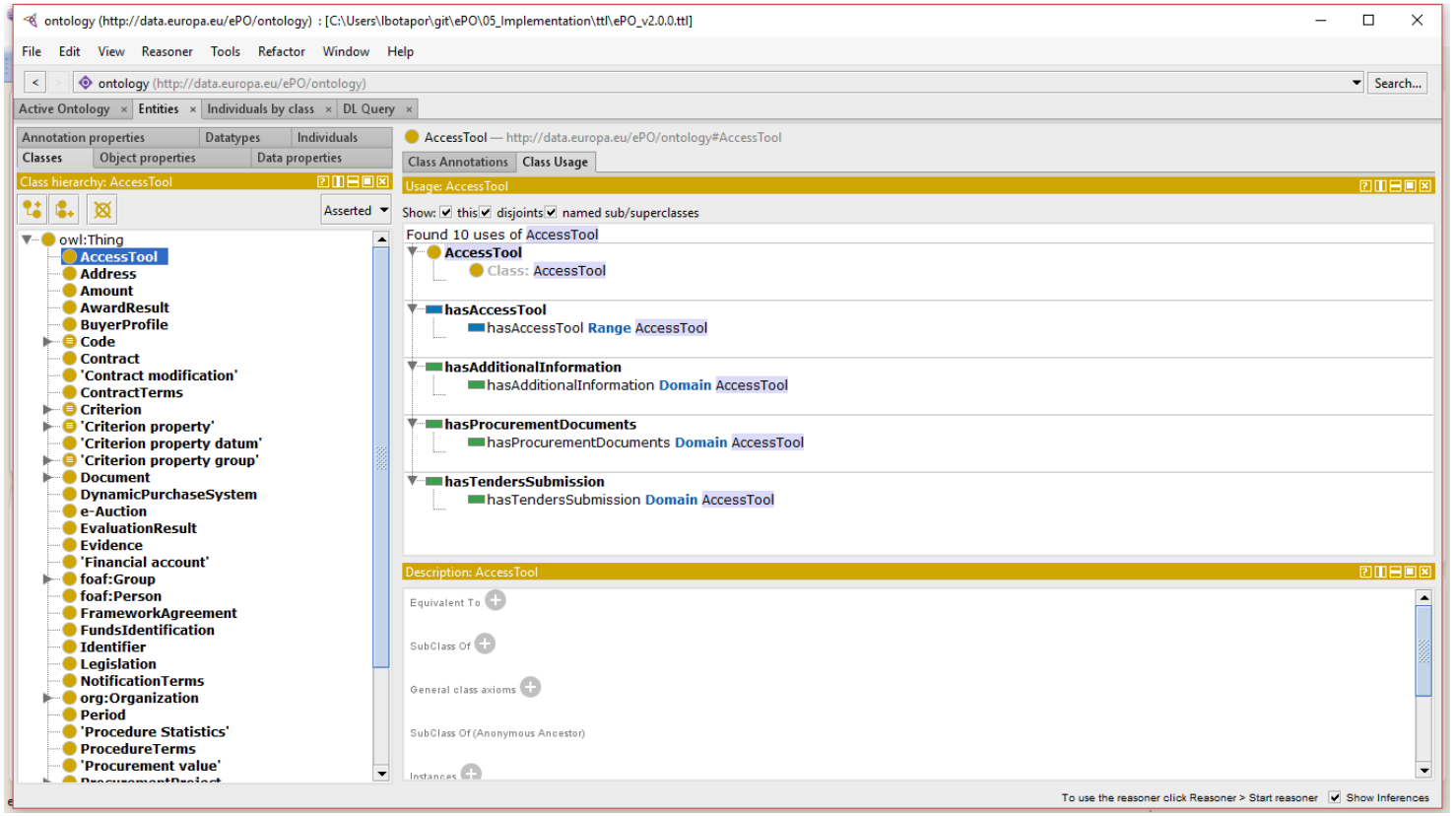
- The main goals of the PoC are:
  - To come up with the OWL (Turtle) implementation of the ePO Conceptual Data Model (CM). This was done manually using Protégé (the DED has not been used to generate the OWL automatically because the CM is still being improved);
  - To test the model and improve it;
- The OWL implementation has implied:
  - An exhaustive mapping between the source of the data (TED XML) and the ePO CM;
  - The development of an ETL process (Extraction of the data from TED, the Transformation of the XML elements into Turtle syntax and the Loading of the data into a Graph store.
- The way of executing the PoC consists in:
  - Based on the Competency Questions, proposed as examples, SPARQL Queries are produced.
  - The Graph store populated with the data from TED is publicly available;
  - The SPARQL Queries can be edited in the public SPARQL endpoint, and executed.



PoC Workflow (reminder)

3. Development of the PoC

- Developing the TTL file from the Conceptual Map



Protégé

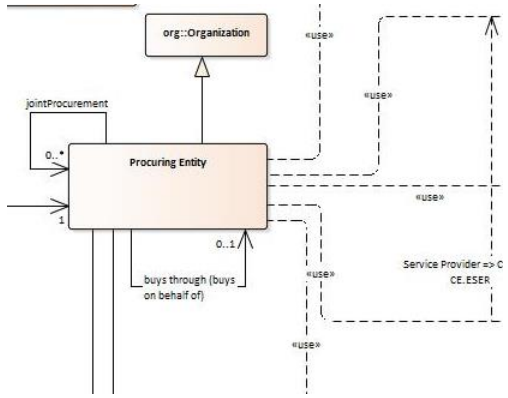
3. Development of the PoC

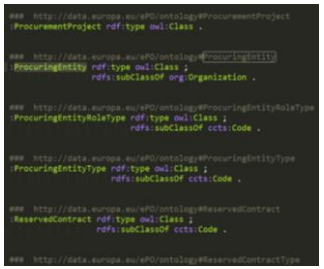
- Mapping TED into ePO (summary)

TED XML

```
<?xml version="1.0" encoding="UTF-8"?>
<TED_EXPORT xmlns:xlink="http://www.w3.org/1999/xlink"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns="ted/R2.0.9.S02/publication"
   xmlns:n2016="ted/2016/nuts" xsi:schemaLocation="ted/R2.0.9.S02/publication TED_EXPORT.xsd"
   VERSION="R2.0.9.S02.E01" DOC_ID="196078-2018" EDITION="2018087">
   <TECHNICAL_SECTION> [5 lines]
   <LINKS_SECTION> [7 lines]
   <CODED_DATA_SECTION> [51 lines]
   <TRANSLATION_SECTION> [192 lines]
   <FORM_SECTION>
      <NOTICE_UUID>fd47edc7-0a01-4657-8f9b-45116d68d0c7</NOTICE_UUID>
      <F03_2014 CATEGORY="ORIGINAL" FORM="F03" LG="EN">
         <CONTRACTING_BODY>
            <ADDRESS_CONTRACTING_BODY>
               <OFFICIALNAME>Business Services Organisation, Procurement and Logistics Service on
                  behalf of Health and Social Care in Northern Ireland</OFFICIALNAME>
               <ADDRESS>The Cottage, 5 Greenmount Avenue, Ballymena</ADDRESS>
               <TOWN>Ballymena</TOWN>
               <POSTAL_CODE>BT43 6DA</POSTAL_CODE>
               <COUNTRY VALUE="UK"/>
               <E_MAIL>sourcing.palsballymena@hscni.net</E_MAIL>
               <n2016:NUTS CODE="UK"/>
               <URL_GENERAL>https://etendersni.gov.uk/epps</URL_GENERAL>
               <URL_BUYER>https://etendersni.gov.uk/epps</URL_BUYER>
            </ADDRESS_CONTRACTING_BODY>
            <ADDRESS_CONTRACTING_BODY_ADDITIONAL> [10 lines]
            <ADDRESS_CONTRACTING_BODY_ADDITIONAL> [10 lines]
            <ADDRESS CONTRACTING BODY ADDITIONAL> [10 lines]
```

ePROCURement Ontology





3. Development of the PoC

- Mapping TED into ePO (summary)

ePO TTL				TED XSD		Comments during the implementation
Subject	**Predictate**	**Object**				
AccessTool	hasAdditionalInformation	String				
AccessTool	hasProcurementDocuments	anyURI				
AccessTool	hasTendersSubmission	anyURI				
BuyerProfile	hasURI	anyURI				
FinancialAccount	hasAccountFormatCode	AccountFormat code				
FinancialAccount	hasAccountType	AccountType code				
FinancialAccount	hasAliasName	String				
FinancialAccount	hasCountryCode	Country code				
FinancialAccount	hasCurrencyCode	Currency code				
FinancialAccount	hasIdentifier	*Identifier*				
FinancialAccount	hasName	String				
FinancialAccount	hasPaymentNote	String				
Identifier	-					
org:Organization						
org:Organization/ProcuringEntity						
org:Organization/ProcuringEntity	buysTrough / buysOnBehalfOf	*Buyer*				To do once the CM is updated.
org:Organization/ProcuringEntity	hasJointProcurementEntityRoleType	Joint Procurement Entity Role code		If CONTRACTING_BODY/JOINT_PROCUREMENT_INVOLVED, then current RoleType = Joint Procurement Lead, Other CONTRACTING_BODY/ADDRESS_CONTRACTING_BODY_ADDITIONAL RoleType = Joint Procurement Member.	Done	
org:Organization/ProcuringEntity	hasProcuringEntityRoleType	ProcuringEntityRoleType		If CONTRACTING_BODY/CENTRAL_PURCHASING exists, then :CPB		Which one is Central purchasing?
org:Organization/ProcuringEntity	has ProcuringEntityType	Procuring Entity Type code		- :CA roots element: F01, F02, F03, F14, F21, F23, F24, F25 - CE root elements: F04, F05, F06, F07, F22 - Both, root elements: F08, F12, F13, F15 F20?	Done	Procuring Entity Type depends on CE_* or CA_*
org:Organization/ProcuringEntity	hasProcuringEntityActivityTaxonomy	Procuring Entity Activity Taxonomy		If CONTRACTING_BODY/CE_ACTIVITY exists, mapping to CE.{CE_ACTIVITY value} CONTRACTING_BODY/CA_ACTIVITY exists, mapping to CA.{CA_ACTIVITY value}	Done. Except comment	When the activity in TED is expresed as other (CA_ACTIVITY_OTHER or CE_ACTIVITY_OTHER). We are not mapping it into ePO
	hasJurisdictionalCompetenceL	Jurisdictional Competence		CONTRACTING_BODY/CA_TYPE: - BODY_PUBLIC is :BGPL - EU_INSTITUTION is	Done. Except	No mapping when CA_TYPE_OTHER.

3. Development of the PoC

- Examples of Queries and how to execute them:
  - Go to the Graph store: http://34.245.181.248:7200/
  - Edit/paste the queries in the SPARQL endpoint query editor
  - Run the queries

3. Development of the PoC

- Example of execution of Competency Questions (CQ)

- CQ: For a given period of time, get the number of SMEs awarded

```
PREFIX : <http://data.europa.eu/ePO/ontology#>
PREFIX rov: <http://www.w3.org/ns/regorg#>
PREFIX dcterms: <http://purl.org/dc/terms/>
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

select (count(?Award_Date) as ?NUMBER_OF_AWARDED_SME) where {
                ?Award_Result :hasWinner ?Winner ;
          :hasAwardResultDateOfConclusion ?Award_Date .
   ?Winner :usesEOIndustryClassificationType :SME .

   FILTER (?Award_Date > "2015-01-01"^^xsd:dateTime && ?Award_Date < "2018-12-31"^^xsd:dateTime)

}
```

3. Development of the PoC

- Example of execution of Competency Questions (CQ)

- CQ: The number of contracts awarded for each CPV

```
PREFIX : <http://data.europa.eu/ePO/ontology#>

SELECT ?cpv (COUNT(DISTINCT(?contract)) AS ?number_contracts) where {
                ?contract :refersToLot ?lot.
   ?lot :hasPurpose ?purpose.
   ?purpose :hasCPVCode ?cpv.
   ?contract a :Contract.
} group by ?cpv order by desc(?number_contracts)
```

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