A linguistic-ontological support for multilingual legislative drafting: the DALOS Project

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Overview

- EU eParticipation framework;
- ITTIG-CNR involvement in eParticipation;
  - DALOS and SEAL projects;
- DALOS service as support for multilingual legislative drafting;
- DALOS ontological approach;
- Conclusions.
European Commission call (2006):
- Improving the quality of the legislative process;
- Enhancing accessibility and alignment of legislation at European level;
- Promoting awareness and democratic participation of citizens to the legislative process;

ITTIG-CNR is involved into two projects:
- **DALOS** (DrAfting Legislation with Ontology-based Support)
  Coordinated by: ITTIG – CNR (Florence)
- **SEAL** (Smart Environment for Assisting the drafting and debating of Legislation)
  Coordinated by: Leibniz Center for Law – Univ. Amsterdam
  (ITTIG-CNR is one of the partners)
DALOS

• From January 2007 (18 months)
• Partners:
  • Academic/technical
    – ITTIG-CNR, ILC-CNR
    – European University Institute (EUI)
    – The Leibniz Center for Law – University of Amsterdam (UvA)
    – Leiden University
    – Institute of Law and Technology, Univ. Barcelona
    – Department of Computer Science - University of Sheffield
    – CELI (NLP company)
  • Institutions
    • Italian Parliament ("Chamber of Deputies" and the "Senate");
    • Italian Authority for Information Technology in PAs (CNIPA);
    • Dutch and Spanish Institutions
DALOS

• The purposes
  – improving the quality and the readability of legislative texts;
  – improving the accessibility of legislative texts for legal experts, decision-makers as well as citizens, thus promoting a democratic participation in the legislative process.

• The service
  – a multi-lingual linguistic-ontological resource to be used in the phase of legislative drafting.
Contribution to EU policies and institutions

• The DALOS service can be used
  – To facilitate the transfer European Directives into national laws;
  – To facilitate the alignment of concepts and terminology in national legislations;
  – As a source for coherent EU legal documents indexing.

• With respect to IATE and Eurovoc, DALOS lexicon will be enriched with
  – hierarchical and synonymy relations;
  – (near) equivalence and “part-of” relations;
  – other WordNet semantic relations.
Ontological Approach

- Ontological characterisation of legal language;
- Which kind of knowledge?
  - Based on LOIS project experience;
  - Different scenarios:
    - LOIS addresses multilingual legal information retrieval
    - DALOS is expected to support legislative drafting
- The aim is to avoid “epistemological promiscuity” (Breuker and Hoekstra, 2004)
  - Epistemological concepts (knowledge about a process, as the concept of “norm” which pertains to a type of reasoning);
  - Domain ontology (as knowledge about the problem domain).
Knowledge Organization System (KOS) Specification

- KOS specifications are expected to be released;
- It is part of the Macro Design:
  - Definition of the standard to be used;
  - KOS (Knowledge Organization System);
  - Application architecture design
    - specification of communication interfaces between application components and external systems;
WordNet RDF/OWL representation contains classes and terms connected to the following relations:

- hyperonymy
- hyponymy
- meronymy
- partonomy

Example of KOS for WordNet

RDF/OWL WordNet Data Model

(CNR-ITIG, vanAssem, Gangemi, Schreiber (W3C, 2006))
Analysis of the LOIS linguistic and ontological resources

CLO
Core Legal Ontology

LOIS
Multilingual Database with WordNet Relations

WN-like RDF/OWL
Lexical Layer

WN-like RDF/OWL
Ontological Layer

Linguistic Perspective

Generic Legal Perspective

Term Semantic Mapping
Analysis of the LOIS linguistic and ontological resources

- **CLO**
  - Generic Legal Perspective (it contains legal concepts)
  - Support for legal reasoning rather than for drafting

- **WN-Like RDF/OWL representation**
  - Linguistic Perspective
  - Support for natural language analysis or for searching rather than for drafting
DALOS Ontology: domain vs. epistemological knowledge

- DALOS addresses legislative drafting
  - (1) norm creation on (2) specific domains;

(1) Epistemological knowledge
  - knowledge on the process of drafting;
  - example of epistemological knowledge on legislative drafting process is the Model of Provisions (C. Biagioli (ITTIG-CNR))
    - rules (definition, obligation, prohibition, sanction, etc.)
    - amendments (insertion, repeal, substitution)

(2) Domain knowledge (DALOS purpose)
  - knowledge on a domain of interest
DALOS resource properties: knowledge on a problem domain

- As legal drafting support, DALOS needs:
  - A specific conceptual description of a domain to be regulated
    - Concepts and their lexical manifestations in different languages in specific domains before they are regulated (domain knowledge: “consumer protection” for the pilot case);
  - Such description should not contain concepts according to a normative perspective (what is obliged, allowed, sanctioned, etc.) (epistemological knowledge);
  - A domain normative perspective will be the result of a legal drafting over a domain of interest
WP2 Objectives
DALOS linguistic and ontological resources

CLO
Core Legal Ontology

Domain-Specific Conceptual Model

Generic Legal Perspective

Term Semantic Mapping

LOIS
Multilingual Database with WordNet Relations

WN-like RDF/OWL

Ontological Layer

Lexical Layer

Linguistic Perspective
KOS Proposal

Ontological Layer

Role

Supplier

Consumer

is_a

hasLexicalization

Supplier (EN) Fornitore (IT)

Equivalent

Supplier of goods (EN) Fornitore di beni (IT)

Supplier of services (EN) Fornitore di servizi (IT)

is_a

Supervisor

hasLexicalization

hyponym

hyponym

hyponym

Lexical Layer
How to build the DALOS Knowledge

1. Using LOIS collaborative editor to update the LOIS linguistic resources (Lexical layer)

2. Construction of a Domain Ontology of the Consumer Law (Ontological layer)

3. Semi-automatic connection between LOIS and Domain Ontology (hasLexicalization property implementation) (Lexical layer <-> Ontological layer)
1. Lexical layer implementation

- NLP tools
  - T2K (Text-to-Knowledge) addressed to process Italian texts (ILC-CNR)
  - GATE addressed to process English and other EU language texts (Univ. Of Sheffield)
2. Ontological layer implementation

- Intellectual activity which aims at describing the scenario to be regulated (“consumer protection”);

- Layer of concept alignment at EU level;

- OWL description of classes and relations;
3. Connection between ontological and lexical layer

- Legal concept alignment on the basis of their lexical manifestations in a multilingual environment;

- A tool to support such semi-automatic mapping is expected to be implemented;
Conclusions

- DALOS Project:
  - Linguistic-ontological resource for legislative drafting;

- Properties and Knowledge Organization System (KOS) of the DALOS resources;

- Such resource will be included within xmLegesEditor, the xml editor for legislative drafting developed by ITTIG-CNR.