



# Construction of a legal domain ontology for multilingual legislative drafting: the DALOS Project

E. Francesconi, D. Tiscornia

*Institute of Legal Information Theory and Techniques  
(ITTIG-CNR)*

Workshop on Legal Ontology Building – October 18<sup>th</sup>, 2007 Barcelona



# Overview

- EU eParticipation framework;
- DALOS service as support for multilingual legislative drafting;
- DALOS ontological approach;
- Conclusions



# eParticipation

- 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;



# 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 the “*common attitude to indiscriminately mixing domain knowledge and knowledge on the process for which it is used*” (drafting, reasoning, searching, etc.) [Breuker and Hoekstra, 2004]
- Such a mixing prevents knowledge representations from being automatically reusable outside the specific context for which it was originally developed

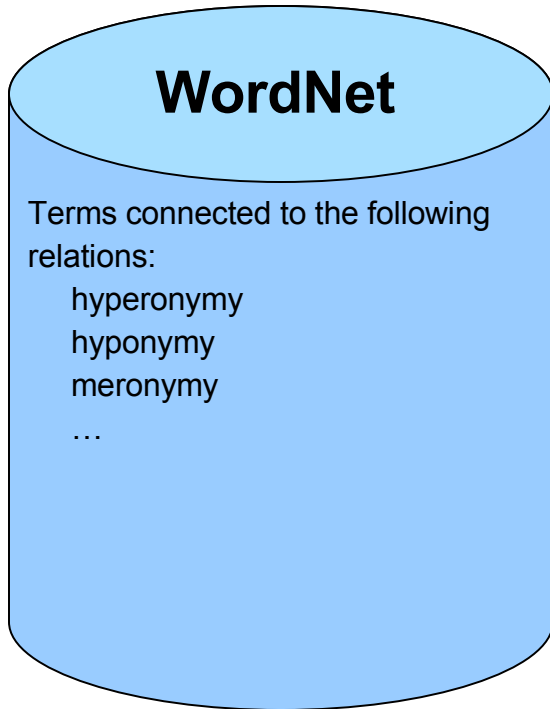


# Knowledge Organization System (KOS) Specifications

- KOS Specifications are being released
- They are part of the Macro Design
  - Definition of the standards
  - KOS (Knowledge Organization System)
  - Application architecture design
    - specification of communication interfaces between application components and external systems.

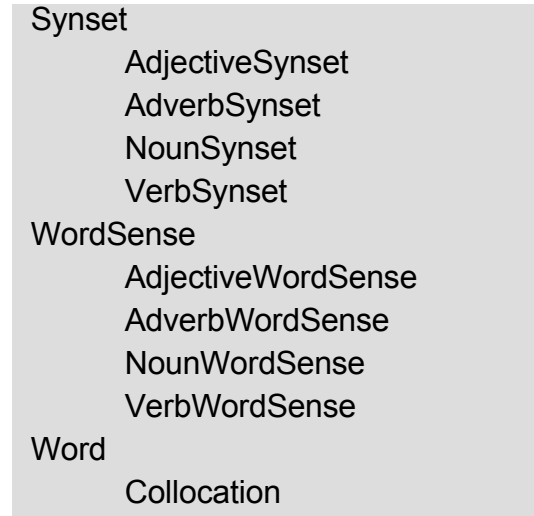


# KOS example: WordNet



**CNR-ITTIG  
past activity**

## RDF/OWL WordNet Data Model

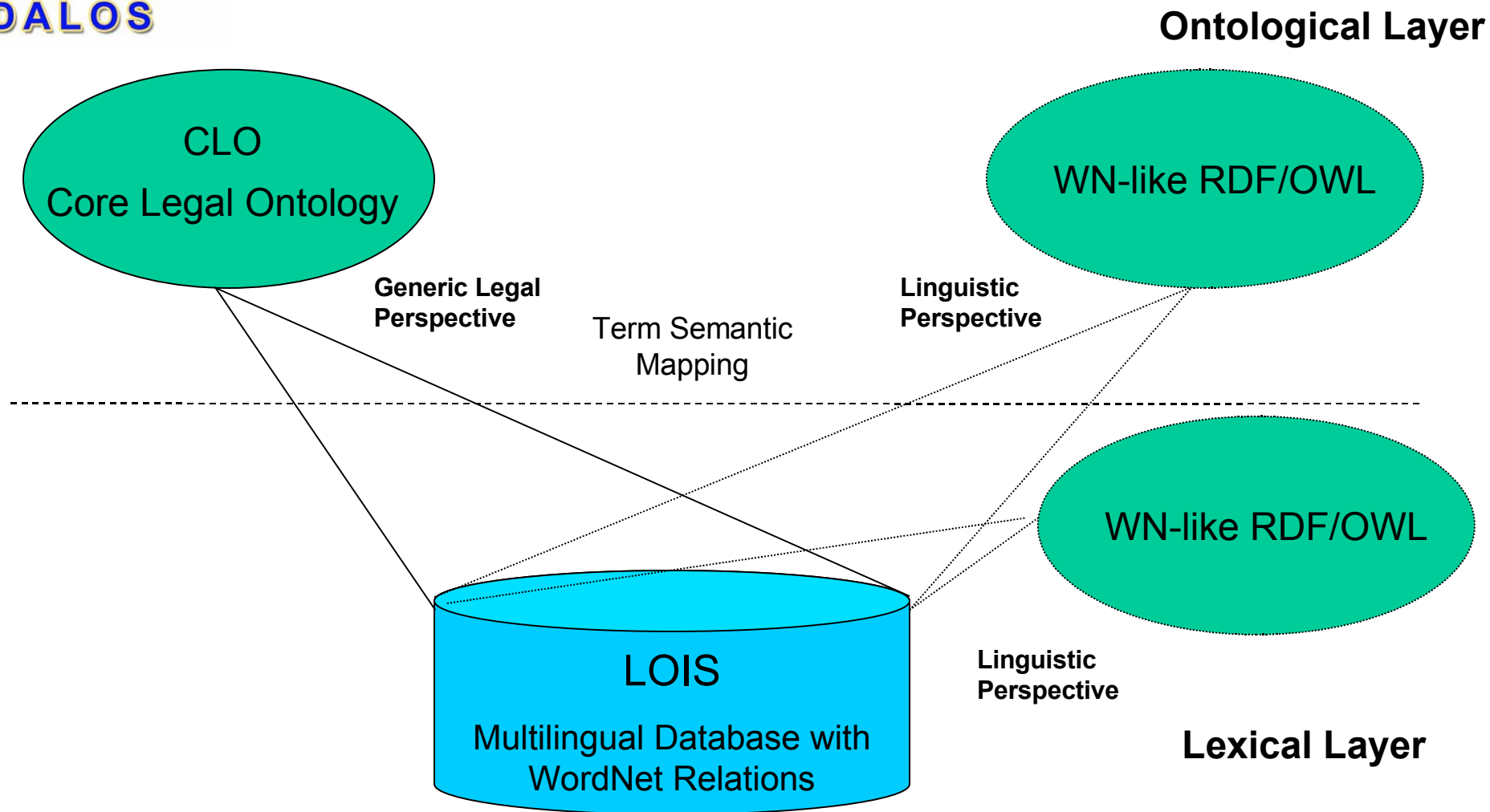


(vanAssem, Gangemi, Schreiber (W3C, 2006))

- WordNet RDF/OWL representation contains classes and relations of the linguistic domain



# LOIS linguistic and ontological resources





# Analysis of the LOIS linguistic and ontological resources

- The role of 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 Knowledge Features

- DALOS addresses legislative drafting
  - provision creation on specific domains
- What is needed is a knowledge and linguistic support giving a description
  - of concepts
  - their lexical manifestations in different languages in specific domains to be regulated

*(Domain Knowledge*

“consumer protection” for the pilot case)



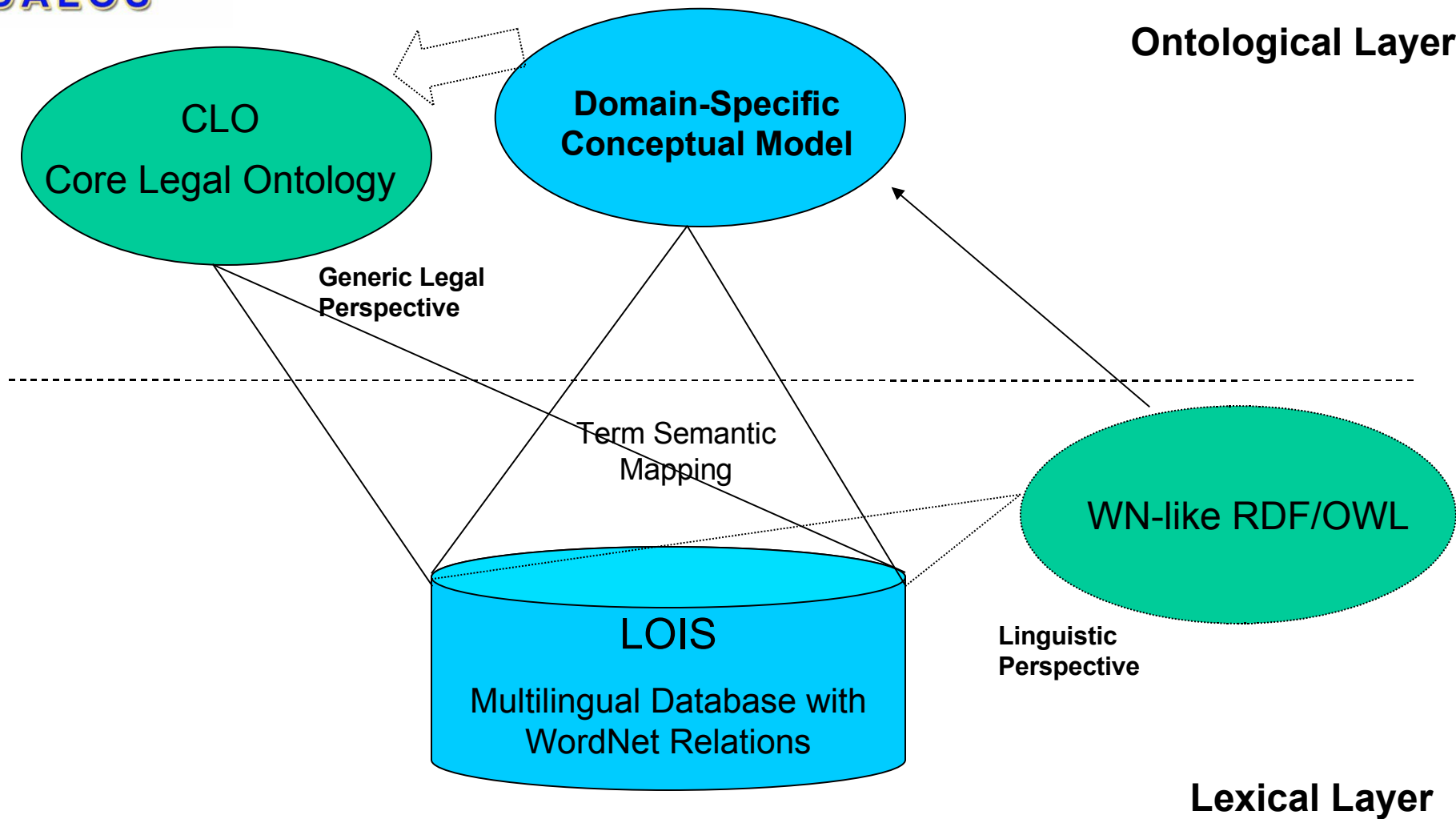
# DALOS knowledge properties

- As legal drafting support, the DALOS knowledge resource should not contain concepts according to a normative perspective (what is obliged, allowed, sanctioned, etc.);
- A domain normative perspective will be the result of a legal drafting over a domain of interest



# WP2 Objectives

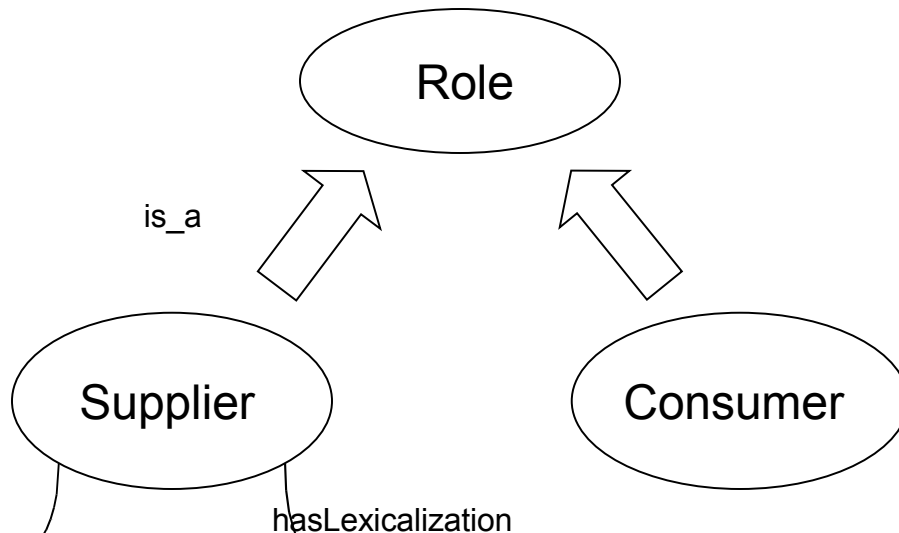
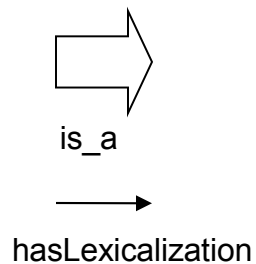
## DALOS linguistic and ontological resources



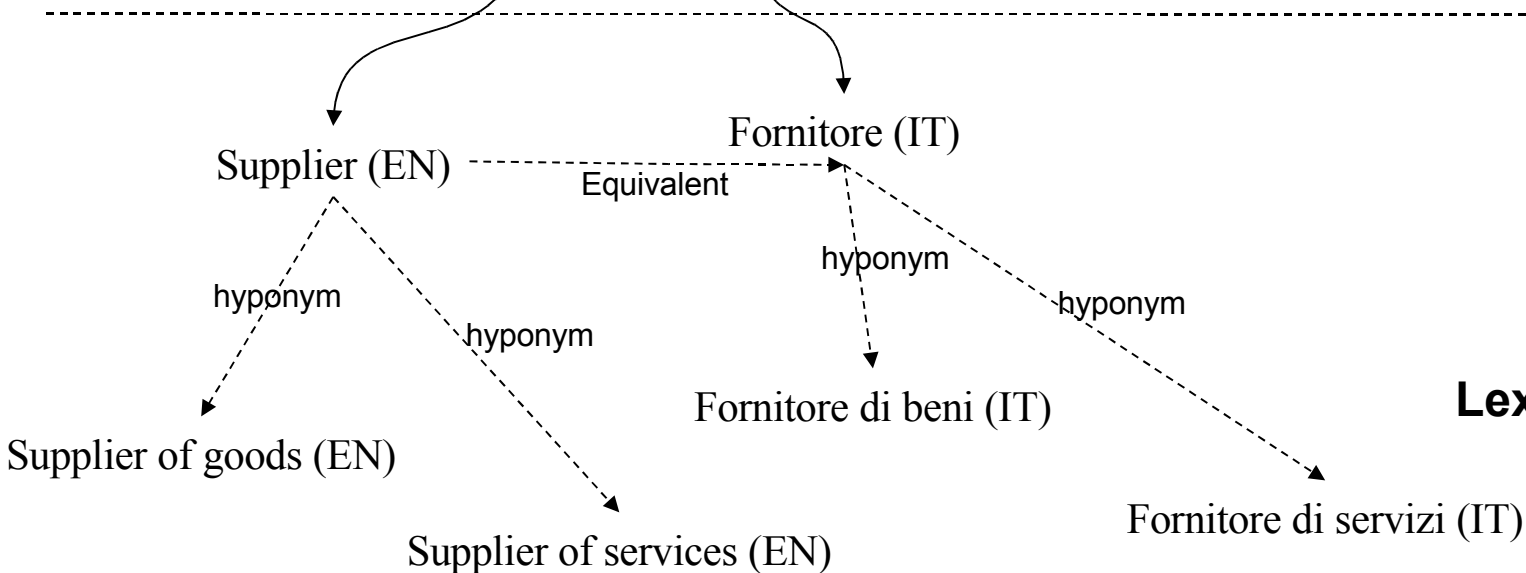


# KOS Proposal

**Ontological Layer**



**Lexical Layer**





# How the DALOS Knowledge is being built

- Using LOIS collaborative editor to update the LOIS linguistic resources (Lexical layer)
- Construction of a Domain Ontology of the Consumer Law (Ontological layer)
- 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;

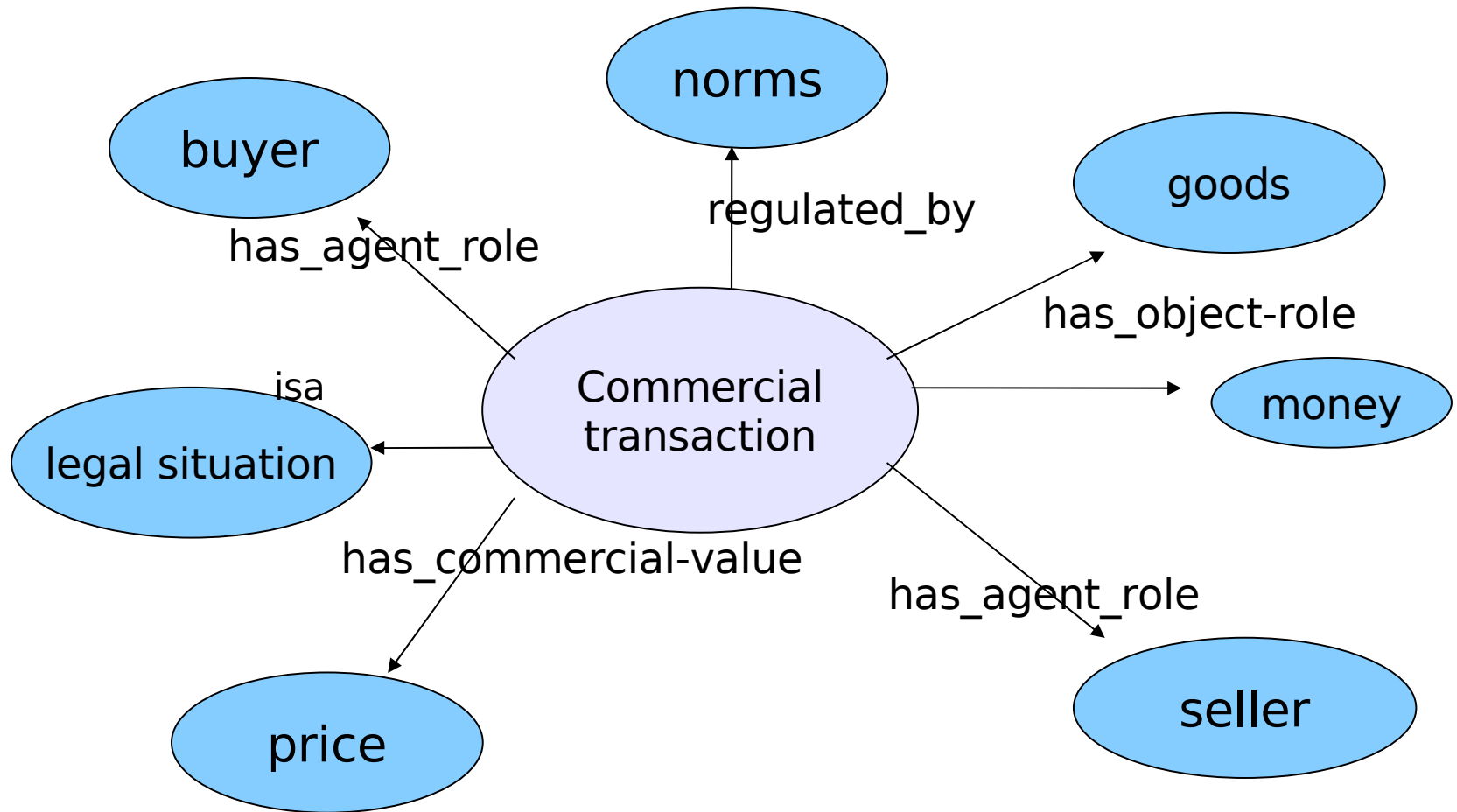
### **3. Connection between ontological and lexical layer**

- 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;

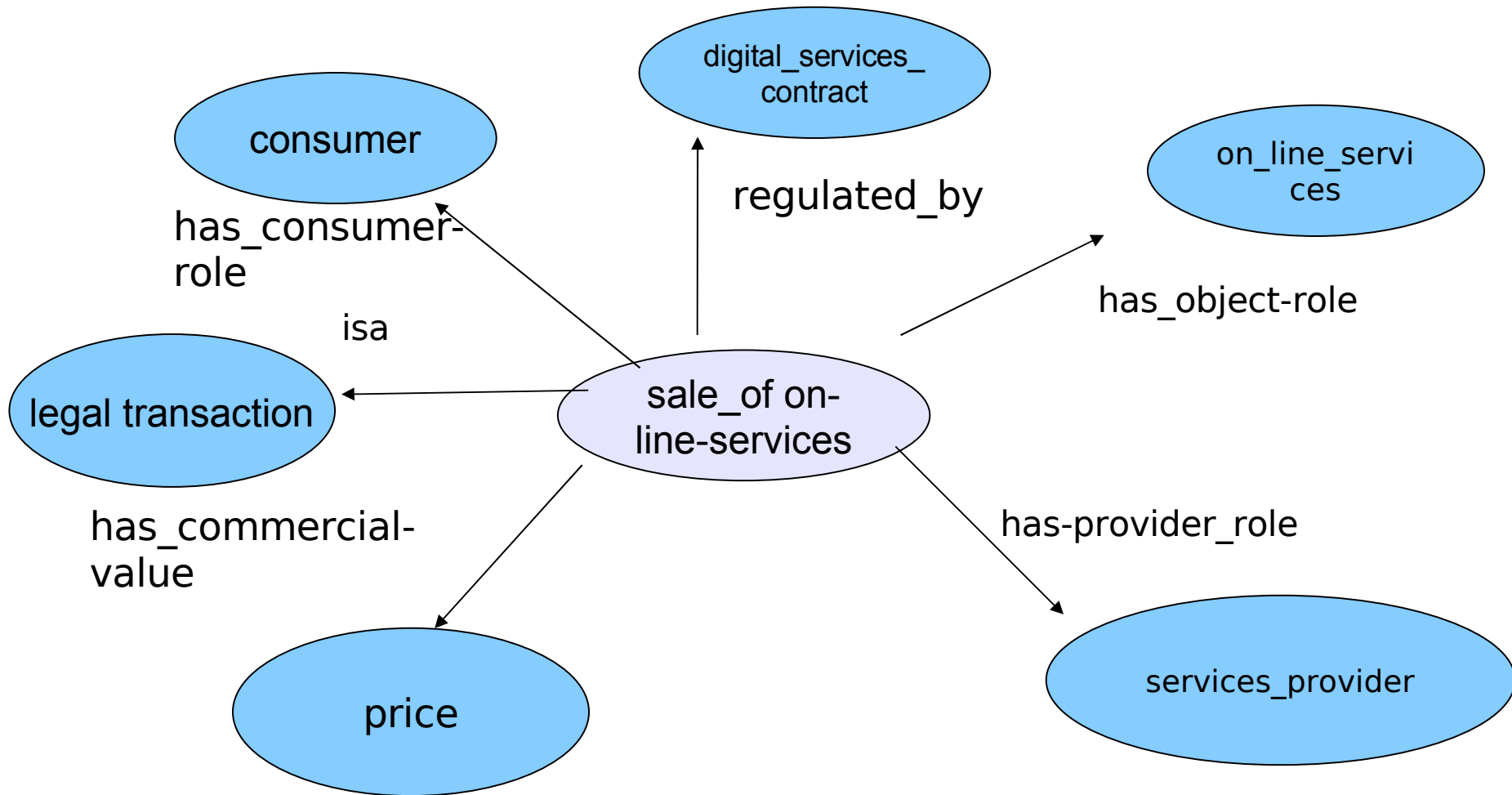
# Ontology Features

- more *description* than *representation*- oriented
- description of *normative dispositions* (definitional and regulative dispositions) not of *norms*
- reasoning mechanism for classification and comparison, not for legal reasoning
- links among legal texts, (instances of) lexicon and ontological classes
- bottom-up construction (automatic term extraction from texts and multilingual alignment based on parallel corpora)

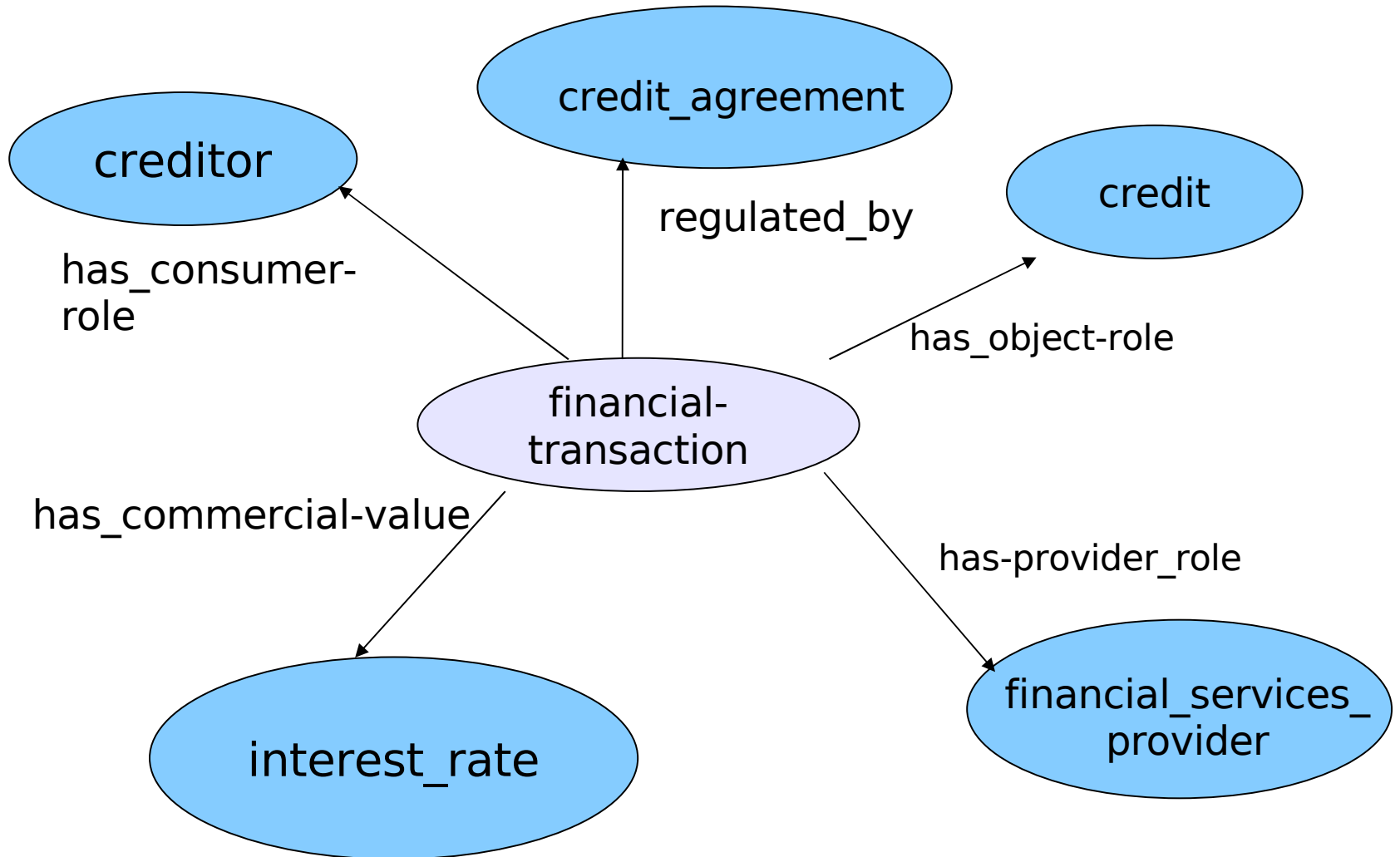
# Situation: commercial transaction



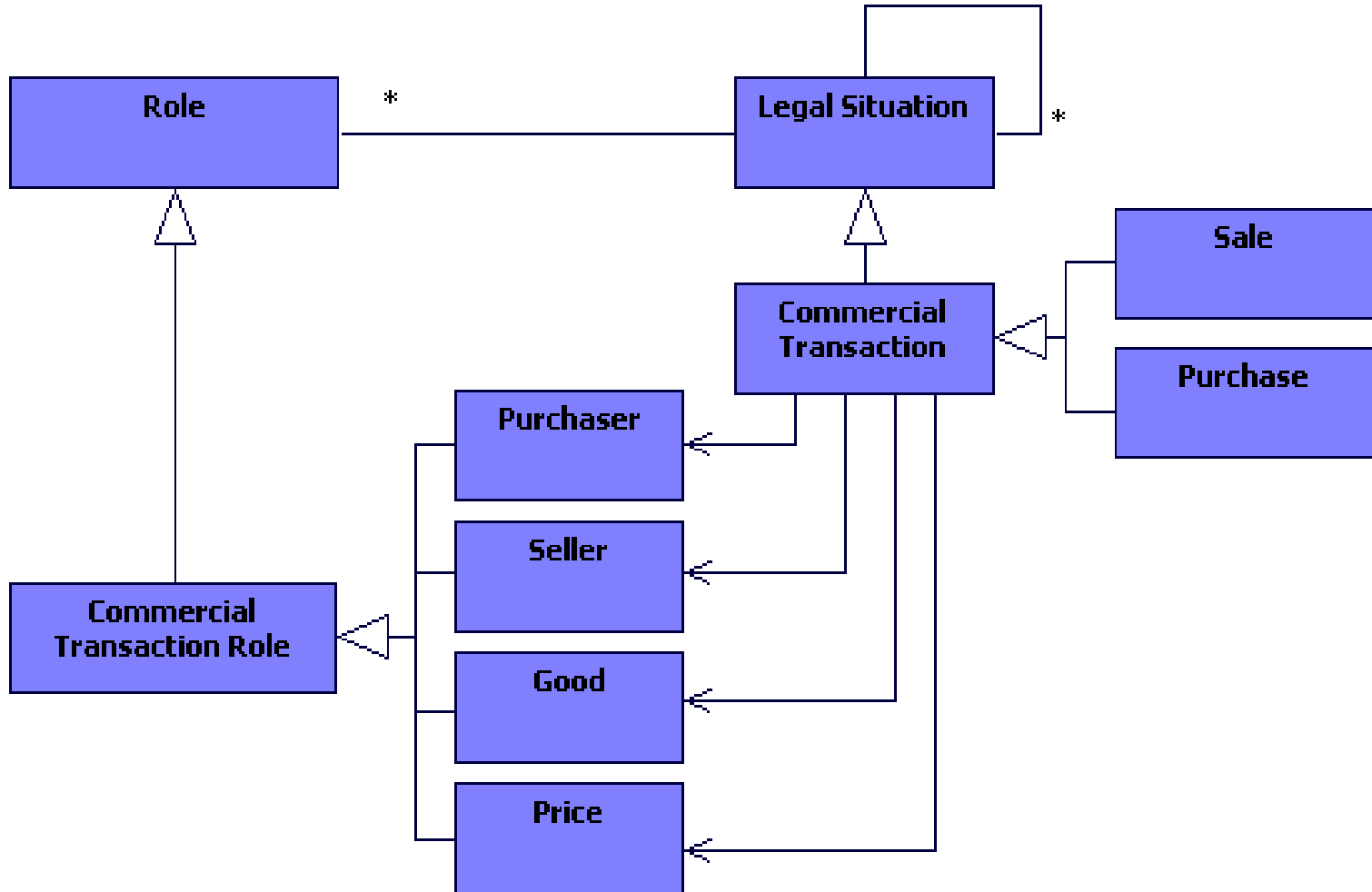
# Sale



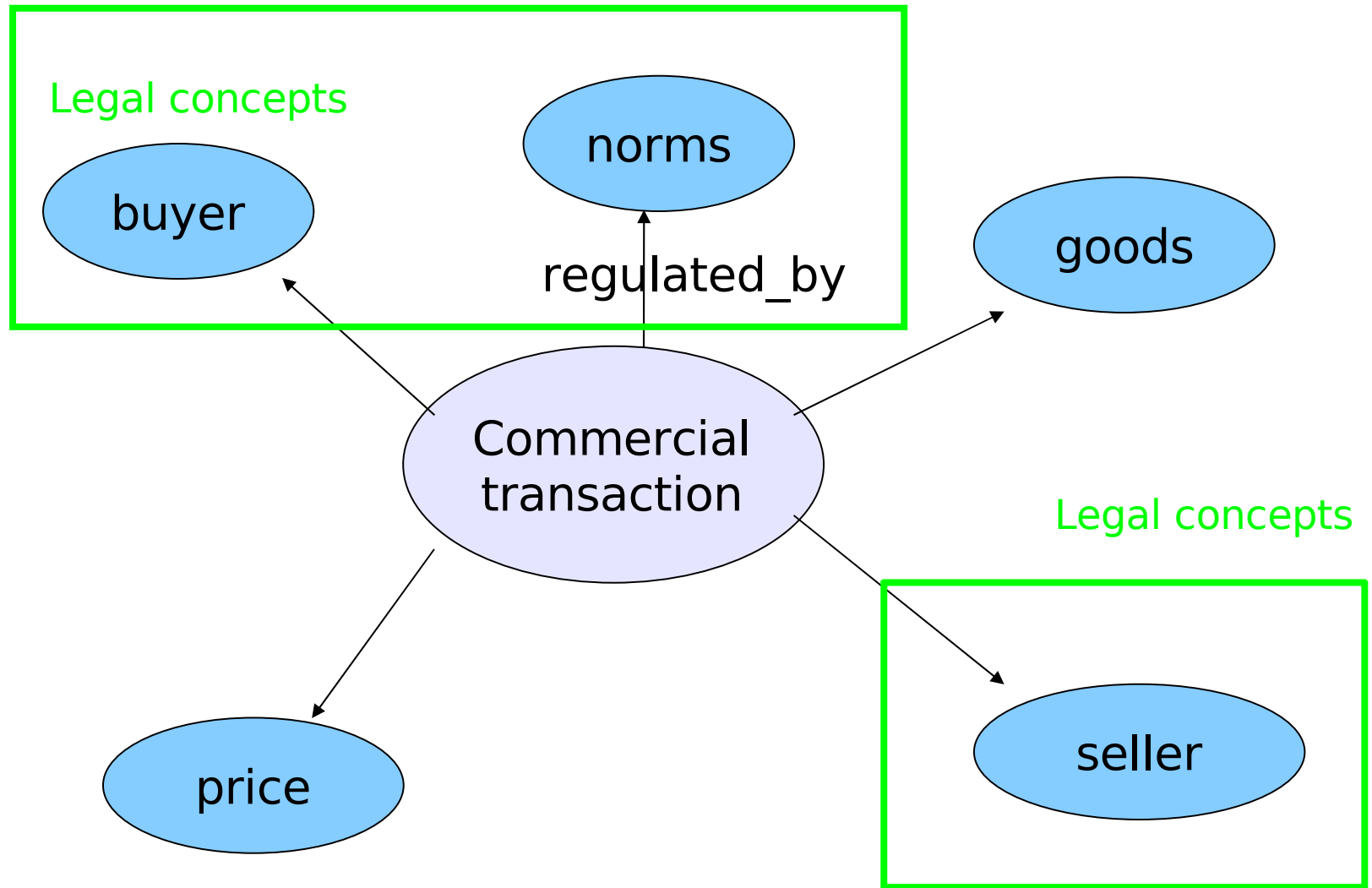
# financial-transaction



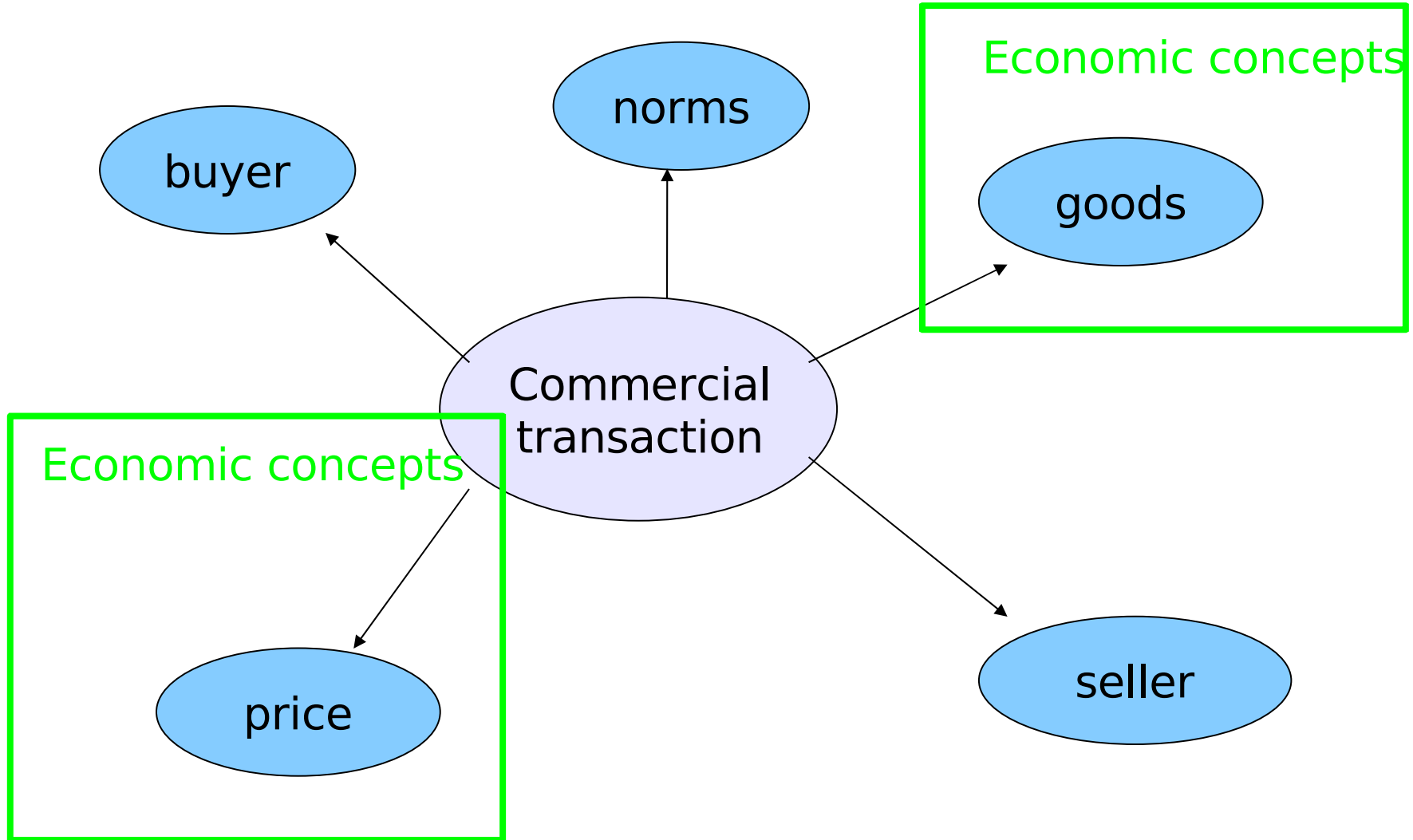
# Role and Situation



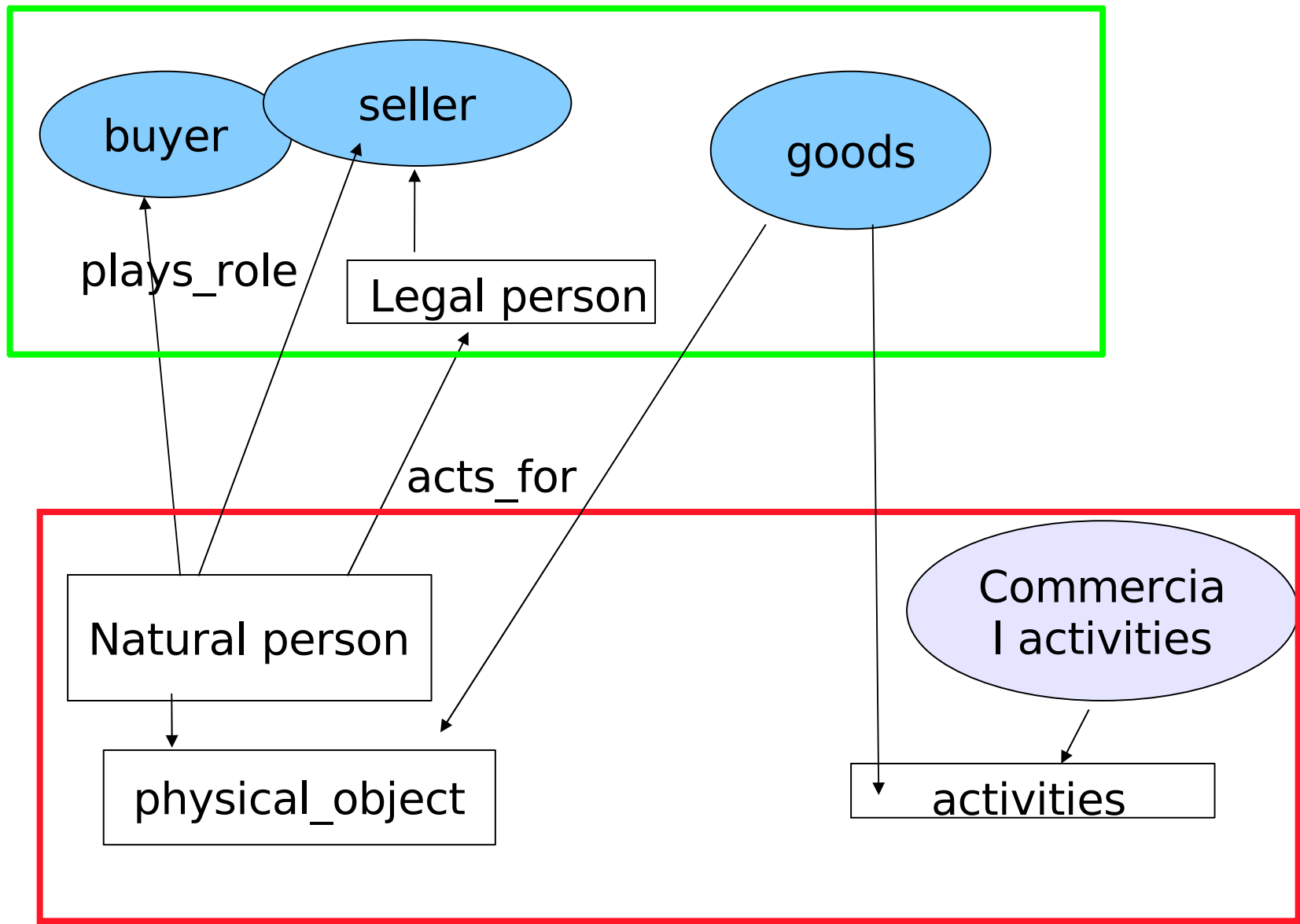
# legal concepts



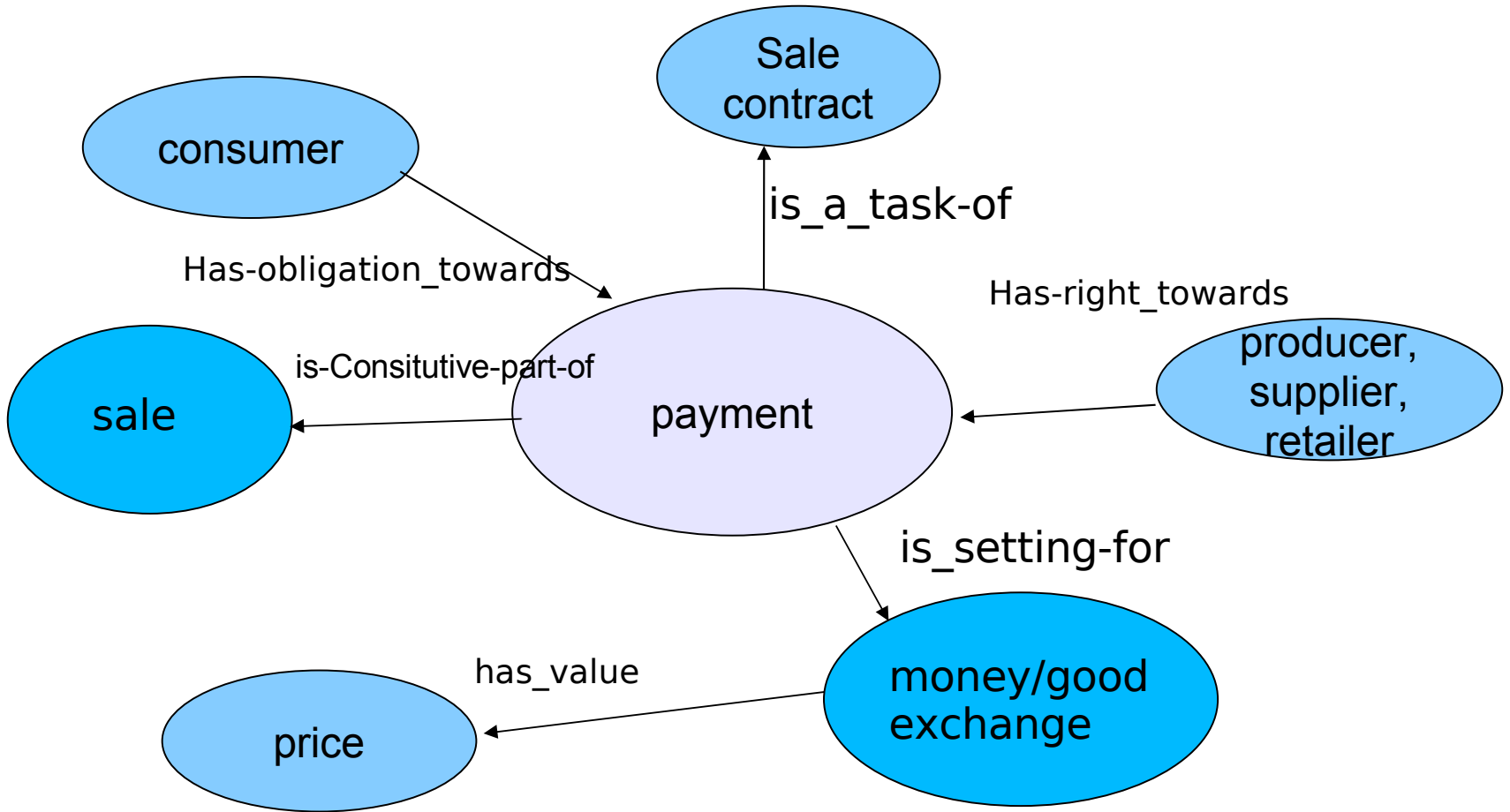
# economic concepts



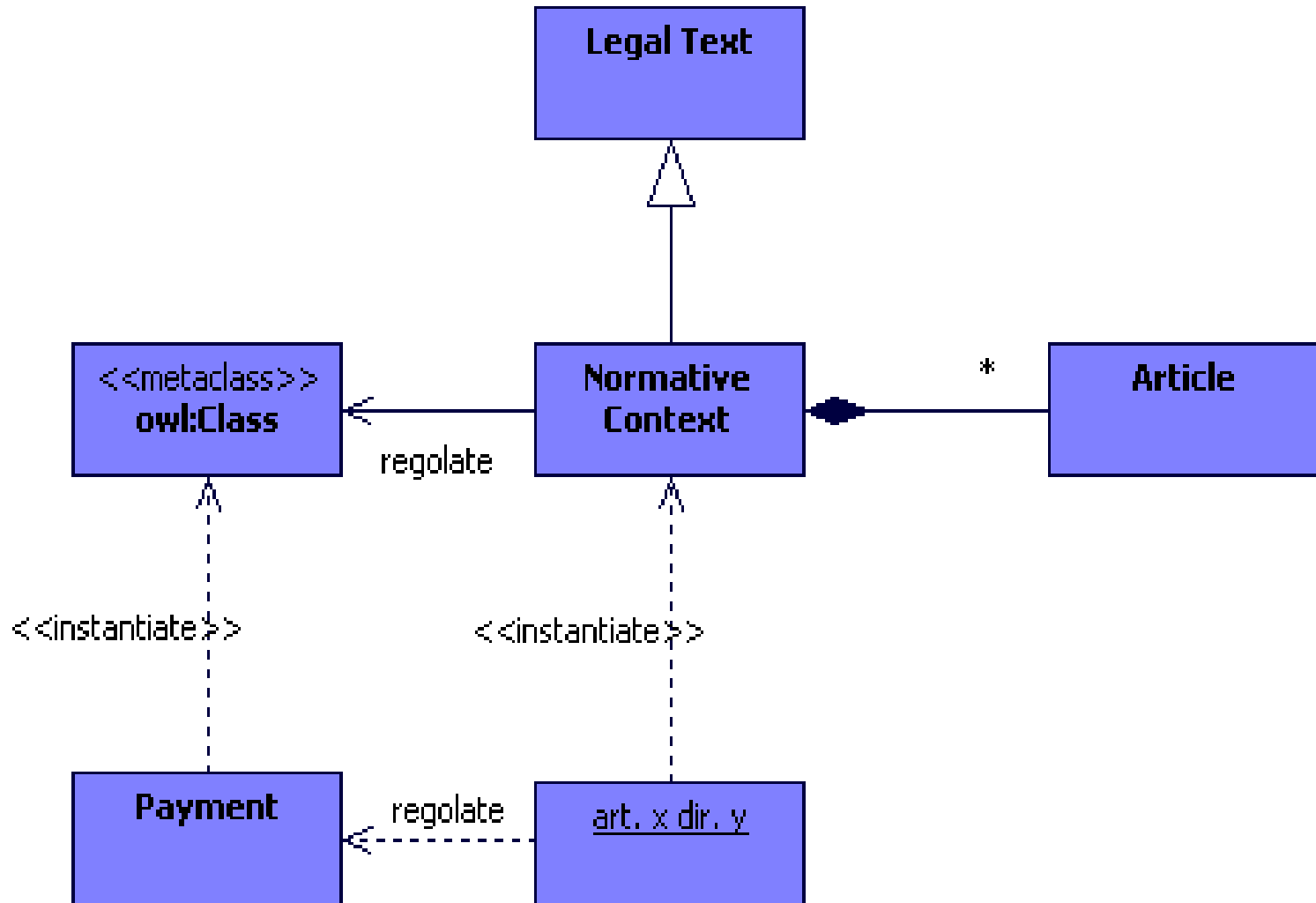
# Physical world and social (economic and legal) objects



# normative qualification of Legal situation:obligation to pay



# normative contexts and ontological classes



# 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.