Chapter 8
The Multi-Layered Legal Information Perspective

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8.1 Introduction

This paper tries to lay the basis for a procedural model that could contribute to improve the interoperability of legal ontologies. At the same time it focuses on critical points of current use of legal ontologies due to the fact that often the practice of law is disregarded.

Generally speaking, ontologies respond to diverse functions. One is related to the structuring of information; another is for reasoning and problem solving. There are ontologies aiming at information retrieval; while others are aimed at semantic integration. Finally, ontologies are useful for knowledge discovery or for the domain understanding (Valente 2005). As to the legal domain, all of these ontologies may play a role, according to the tasks for which they are applied. Legal ontologies are very varied, according to their building methods (such as bottom up v. top down approach), to their levels of formalisation (lightweight v. heavyweight ontologies), to their granularity (by the means of data amount and representation subjects).

This state of affairs is normally justified by the recourse to the diverse functions of ontologies. However, the ascertainment on what the law is inevitably impinges on several ways to build legal ontologies. We do not refer here to the philosophical debate on the nature of law. Normativity is a relevant phenomenon of law and normativity is communicated by linguistic means. Norms, too, exist in a non-linguistic sense: rights are intersubjective facts which emerge from behaviors and they can be rendered explicit by linguistic means. The real question is the operational understanding about the content of normativity. Such content is a social product because our experiences of intersubjectivity are not simply a set of sense-data, but rather the result of our application of socially-influenced conceptual frameworks to the interpretation of that sense-data. Different conceptual frameworks may change our notion of which legal rules should be applied in a single instance and how they could

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be detected. These frameworks are normally underestimated in ontology engineering, subsuming them into the general cognitive or philosophical tenets at the basis of top level ontologies, or reducing them to the specific content at the basis of task level ontologies.

It is precisely because law is inherently multilevel, that we need to maintain several levels in the ontological structure in order to explain the different aspects of law. Although, of course, we can only produce incomplete subsets of the multilevel account of law.

8.2 The Interoperability Issue

Semantic interoperability is one of the main issues about knowledge engineering in order to avoid the construction of numerous contents not properly communicating with each other. Knowledge represented in a specific format should be interoperable with other knowledge bases.

The context of web applications such as e-commerce transactions requires an effective communication among different knowledge bases.

Beyond the syntactic dimension constituted by the varied representation languages, such as RDF, OIL, OWL, XML, XOL, a shared vocabulary and a similar knowledge model are needed.

To achieve the "legal interoperability" one could argue that ontologies should represent all the concepts and instances of any legal domain and, then, create a knowledge model to ensure the correspondences. Large knowledge bases are difficult and expensive to build. Consequently, ontology developers are normally devoted to find a knowledge model that could be applied independently by single domain requirements. This choice implies that effective applications needed by final users are often based on content dependent vocabularies and taxonomies without sufficient matching with knowledge models.

Numerous knowledge models have been proposed according to two approaches. The first is devoted to the identification of a core ontology of law that can clarify the fundamentals of law. Among the most well-known core ontologies, FOLaw (Functionnal Ontology of Law) (Valente 1995), LRI-Core (Breuker and Winckels 2003), CLO (Core Legal Ontology) (Gangemi et al. 2003) may be mentioned.

The second one is devoted to the adaptation of foundational ontologies to the particularities of the legal domain. Top-level ontologies have recently been the subject of much research, as they facilitate the representation of commonsense necessary for human-like understanding and reasoning. This work has been concentrated to the enrichment of commonsense notions with legal biases, extensions and occurrences, such as LLD (McCarty 1989), or NM-L (Shaheed et al. 2005).

All these solutions aim at improving an unitary conceptualization of law, according to the main tenets of ontology developers. A well known definition of "ontology" is "formal and explicit specifications of a shared conceptualization" (Gruber 1995).

However, shared conceptualizations of law are difficult to be detected. One reason is that conceptualizations cannot be inferred only from legal texts. Several legal contents are present in the diverse jurisdictions and different legal systems support the production, interpretation and implementation of such contents. The corpus of laws in effect in each jurisdiction does not give us any clear indication of the legal rules operating in that legal order. Despite the fact that legal norms are ultimately based on formal sources, a meaningful understanding of a legal order requires also the comprehension of other rules influencing the legal process. They are related to the institutional context (such as the functioning of the judiciary, the influence on the legislative process of bureaucratic elites and so forth) and to the socio-cultural context (such as the legal education system, the role of the ideology on legal practice, and so forth).

A discussed topic in the knowledge engineering literature is that ontology axioms only indirectly account for a conceptualization. A large part of the intended meaning of the ontological concepts will remain implicit between ontology developers (Guarino 1998). In the same way, to encode the rules pertaining of the legal domain, the conceptualization of all legal rules should be explicit. Unfortunately, part of these rules are not rendered explicit, because institutional and socio-cultural contexts are always the preconditions of the legal process and jurists are not completely aware of them, even if these work as conceptual frameworks. Comparative law as well as, more recently, ethnographic research (Benjamins et al. 2004) are enriching legal knowledge engineering with instruments for legal rules explicitation. However, the results from comparative law and legal anthropology demonstrate that within and without any legal system there are self-differentiating legal patterns and historical traditions. The unitary compulsion of national authoritative law drove to cover over difference, but today many scholars insist upon the pluralism of any legal experience.

Another reason is constituted by the nature of legal language that can be misleading whether ontology developers stress its representational feature. Legal language has many usages indeed. It can be used to represent something (such as legal doctrine), to manipulate someone (such as the rhetorical communication in judicial claims), to do things in the social world (such as "commands" in legislative or judicial texts). There are not tight boundaries between these usages: persuasive opinions of legal scholars may influence the legal provisions in the enactment of a statute, as well as the performative nature of judicial opinions in common law systems may be shifted by the recourse of distinguishing in further decisions. Legal scholars and practitioners surf the translation from a language of factuality to that of normativity, from cases to doctrine and to policy. In contemporary legal debate, the question of how law should be conceptualized for theoretical versus pragmatic purposes remains, by and large, unresolved. This consideration implies that law is always fragmented in several conceptual frameworks with different features and objectives. And these conceptual frameworks may change according to time and events in the practice of law.

Therefore, any effort to improve the legal interoperability may begin by integrating the current solutions by a different perspective.

8.3 The Multilayered Legal Information Perspective: A Tentative Procedural Model

Legal knowledge can only be established through a knowledge-producing process. This process is determined by the intertwined effects of diverse pre-existing conceptual frameworks, institutional practices, prior normative commands, decisions of the legal actors, influences from other social and economic forces that are interested and determined by the legal process itself. Moreover, all elements may change in relation to different legal systems or different domains (like labour protection or financial services regulation) where the legal process is involved.

In consideration of this complex picture, ontology developers may prefer to analyse those elements that are quantitatively or qualitatively prevalent in the legal process. However, any explanatory priority for some elements may hinder the interoperability if other elements, underestimated in the knowledge model, are prevalent in different legal systems or domains.

Nevertheless, legal knowledge cannot be considered as a monolithic entity. A modularization of legal knowledge is more useful to manage large concepts with efficient reasoning. The introduction of modules with local semantics may help to analyze diverse legal systems or domains, providing a basis for the development of methods for localizing inference.

In the model we propose, lightweight ontologies are normally built, reviewed, and maintained by several types of knowledge experts, according to the expertise of different legal systems or domain experts. This constitutes the first layer (L1) that represents information about legal content as interpreted at a certain time by a certain community of experts. In our current project Legal Taxonomy Syllabus (Rossi and Vogel 2004; Ajani et al. 2007, 2010) we have lightweight ontologies of European different legal vocabulary and concepts (EU and five national jurisdictions) related to specific domains, such as consumer law. L1 allows multiple representations of the same domains, according to several extensional ontologies obtained by the legal literature.

The second layer (L2) is constituted by service ontologies, enabling the definition of roles and behaviours for agents in charge of executing tasks related to the specific domains considered by L1.

The third layer (L3) is devoted to link L1–L2, allowing to convert service concepts into/from domain concept ones, through a refinement in terms of ontological relations. The four layer (L4) is constituted by the state of art in core concepts ontology, but it is constantly enriched by the results of intensional semantics derived from the outcomes of the procedural model (L1–L3) applied to numerous legal systems and domains. The L4 is based on a set of orthogonal concepts that provide a basis for defining the legal process in a more complex way, independently from single applications.

8.4 A Scenario

In this section, we illustrate the model by analysing a scenario from regulatory compliance. We are inspired for this example by the ongoing work in the project

ICT4LAW.[1] The domain of the example is the Markets in Financial Instruments Directive (MiFID) 2004/39/EC, a European Union law that provides harmonised regulation for investment services across the Member States of the European Economic Area.

Large enterprises like banks and financial intermediaries are being subject to principles and regulations issued by national and supranational institutions (e.g. European Union). These oblige them to manage the risks of not being compliant to regulations, whose number increase continuously and which are of an ever-growing complexity. Enterprises are requested to set up specific functions to monitoring compliance, like, for example, the compliance management office. The non-compliance risk is the operative risk of being subject to penal or administrative sanctions, to relevant monetary losses, or to reputation damages for violating laws or self regulations. Risk is the possibility of being damaged due to circumstances which can be foreseen or not and are related to the probability of a damage event and risks are proportional to the seriousness of the damage.

Once a year the appointed offices have the task of identifying and evaluating the major risks of conformity and to plan the proper management actions.

Regulatory compliance requires the following steps. The compliance manager has:

1. To identify the legal provisions in order to evaluate the relevant regulation, in particular each time there is a new regulation, and to evaluate its impact. To evaluate the relevance for the business domains. To establish their normative interpretation and identify the prescriptions.
2. To identify the different domains of business: in particular, to identify roles which are responsible for risks and processes and activities of different domains.
3. To map prescriptions onto processes in order to detect the risks in the business processes; to define and apply methodologies to evaluate the risks.
4. To monitor the performance of rules and procedures to deal with risks.
5. To report to top offices according to the compliance program and to all offices involved in the compliance management.

The first three steps obviously seem to require the use of ontologies for facilitating the mapping between regulations and processes: building an ontology for the regulations, an ontology for the internal organization processes and business rules of the enterprise that have to show to be compliant, and to make the two ontologies interoperable.

However, this intuitive strategy is not viable in this naive formulation.

First of all, as many other regulations, MIFID is a multilevel regulation: the norms in the European Directives are then implemented by the national legislator (e.g., in Italy, TUF 98/58, Reg. Consob 16190 Intermediari, Reg. Consob 16191 Mercati).

From the ontological point of view this leads to the necessity of a double level ontology to represent both the concepts from the European point of view and the concepts from the national point of view. The European and national concepts may or may not be associated with the same terms. For example, a term in the Italian version of the directive may be translated in the implementation with a different Italian term, still maintaining the same meaning at the two levels, maybe because the same concept was already present in the system named with a different term. Vice-versa, a term from the directive which is directly imported in the national implementation without any change can assume a different meaning. Finally, the term can be translated in the national implementation with a different term with a different meaning. As a small example consider Art. 28 of Italian language version of Directive 2006/73/EC implementing Directive 2004/39/EC in comparison with Art. 35 of Reg. Consob 16190 where "supporto durevole" is implemented as "supporto duraturo".

These shifts in terminology could be motivated by different situations: an Italian term in the directive could have already a different meaning in the national system, so another one has been used in the implementation to identify the concept introduced at the European level. Otherwise, the term is introduced in the national system with the same meaning as in the European directive, then due to a different legal interpretation, the concept in practice may assume a diverse meaning.

This implementation process gives place to further problems in case of enterprises working at the transnational level, since not only the MIFID can be implemented in different ways in different countries, but also the socio-cultural contexts in which legal rules of MIFID are transferred will have an influence on the ontology of the law implementing the directive. Thus, such enterprises will get a plurality of ontologies which possibly diverge.

From the point of view of the representation by means of ontologies of such legal knowledge, the above discussion raises several issues. First of all, legal ontologies must be multilevel, to take into account the differences between the European level and the national implementations.[2] Second, the ontologies must be multisystem, to take into account the ontological differences between the different national systems. Third, approaches that aim at annotating legal texts with formalizations of rules in languages like LKIF-rule, RuleML, RIF, SWRL, etc. concerning definitions or prescriptions must beware to consider such rules as the ones which compose the legal system, since the legal culture interpreting them must be considered too. Otherwise they will fall in the still recurring positivistic illusion.

Some approaches to legal ontologies are compliant to these requirements, like the Legal Taxonomy Syllabus, where the European vs national levels and the multisystemic issues are considered. This is realized by means of separated ontologies, a common one for the European level, whose concepts have linguistic realizations

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[2]We disregard the possibility of conceptual ambiguity among the different translations of a Directive in the different languages. Alas, such assumption is not always true, and there can be conceptual differences already in the different linguistic versions of the same directive.

in the different languages of the EU, and distinct ones for the national systems, whose concepts have linguistic realizations in the respective national languages. The European and national levels are related via an implementation link between concepts to indicate how the national system has implemented a concept present in a directive and with which terminology. The translation between the terms of the different languages in the meaning they have at the European level is realized via the common ontology, while the translation at the national level is possible only if explicit links are added between the corresponding concepts in the separated ontologies at the national level.

Moreover, in the Syllabus rather than attaching the definition of concepts as rules inside single legal texts, concepts are defined independently on the basis of the knowledge extraction from different sources like statutory laws, case law and legal literature. These sources are related to the concept to support the interpretation leading to its meaning, which can differ from the literal one proposed by single legal texts. At the same time, the norms supporting a concept constitute the context in which the term denoting the concept assumes such a meaning. It is well known, in fact, that terms, like, e.g., "withdrawal" in Directive 97/7/EC and Directive 90/314/EEC change their meaning depending on the norm defining them. This approach does not prevent, however, to represent the meaning of a term as given by the literal interpretation of a norm, since this situation can be represented by specifying the norm as the only context of the concept. The feasibility of such a flexible approach rests in the fact that the Syllabus provides a temporal stratification of concepts (Ajani et al. 2010), where the same concept can evolve over time depending on the modifications of the norm defining it, or on the interpretation provided by case law or doctrinal reconstructions, which can be added as subsequent sources of the meaning after the initial norm defining the concept.

Coming back to the regulatory compliance scenario, there is a further problem concerning ontologies. The conventional wisdom suggests that it is possible to have a legal ontology with a full description of the regulated process in the bank or insurance companies. It cannot be found in the MIFID provisions. The legislator is not able to foresee all processes to be regulated, so it cannot commit to a specific ontology when designing a law. By recourse to legal interpretation we can partially overcome the incompleteness of statutory law. The abovementioned double level ontology of Syllabus corresponds to L1 of the procedural model. It permits to elaborate extensional ontologies related to the described domain.

Alternatively, someone may consider the feasibility of building an ontology of the processes implied by MIFID regulation within the interested companies. Therefore, this ontology could be enriched by the concepts from MIFID, mainly sanctions for non compliance. This vision however is not correct. It is already difficult to assume that it is possible to construct a coherent ontology of the organizational structure and processes of companies, given the temporal stratification of legacy information. Much more critical is the assumption that processes may couple the schemes provided by the MIFID regulation.

Conversely, the definition of the roles and behaviours for agents in charge of executing tasks related to the scope of MIFID (L2), without considering the need

of matching this ontology with the ontology of L1, gives the possibility to work in L3 with a contrastive comparison. This comparison may allow to discover the misalignments between internal company organisation as shown in L2 and the legal statements about company organisation provided by L1. In this way, the ontology of legal potentialities may emerge in the particular company choices, the black letter rule of the law and the legal interpretation about it.

The verification of these potentialities can be done by the orthogonal concepts of L4 that may offer solutions adopted in similar cases by the means of broader conceptual frameworks.

Thus, the ontology that can be constructed adopting the proposed model can be a partial one and a specialised one. Our experience with the ICT4LAW project is that rather than employing a unified knowledge model starting from one single perspective, it is better to work on the several single layers without assuming their reducibility to another layer or not.

This method follows a bottom–up approach, but it allows to make new knowledge emerge from the interplay between several dimensions, such as regulation vs business processes, and it facilitates the mapping between the specialised knowledge bases and the various conceptual frameworks.

The prospective objective of the proposed model could be to reconstruct conflict situations in accordance with basic principles of understanding that are the product of a sufficient consensus among explicit conceptualizations instead of a search for objectivity from a single theory of legal normativity.

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