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ICT for Networking Research and Education Communities around Europe: towards an ontology-based model for a collaborative platform of European law.

Daniela Tiscornia [1] , Piercarlo Rossi [2]

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Abstract

This paper aims at providing an ontology based model for the creation of a collaborative platform to improve knowledge transfer between research outcomes and educational resources related to European law. The objective of the article is to examine the legal background and the methodological issues related to the modelling of knowledge of European law that constitute the backbone on which the technical aspects of the collaborative platform are built. The first part of the article highlights the role of ICT for the Europeanization of law, supporting the foundation of a European common legal discourse. The second describes the ontology based model, considering both theoretical issues and applicative solutions for the collaborative platform.

1. A collaborative platform of European law: a policy perspective

The use of ICT in the educational market has been developed through new ways of integrating pedagogical and technological resources in the learning practice. Extensive literature exists on the methodological underpinnings and the state of art in the adoption of ICT for educational purposes across European countries (Collis 1999; European Commission 2003; Adelsberger et alii 2003) .

Legal education is not exempt from this development, particularly as regards the flexibility of the learning process, the interaction between teachers and students, the organisational structure, and the assessment techniques in terms of educational goals (Laurillard 1993; Maharg 2007; Paliwala 2007).

Different issues are dealt with by the current projects designed by research or implemented in national contexts, in consideration of the institutional structure of legal education in the different jurisdictions and the needs from the even more transnational

legal practices (Leith 1995; Maharg and Muntjewerff 2002).

A rather limited issue is concerned with the distinctive institutional environment deriving from European Union which poses some challenges to the uniform curricula of European law.

Europeanization is profoundly affecting key areas of public law as well as private law. The legal orders of Member States are soon to experience a further convergence of their laws under the pressure of European primary and secondary legislation. The cooperation between the Community and national jurisdictions which originally focused only on the establishment of a single market, in the 21st century is expanding to cover a far broader spectrum of matters. While the EU attempts to harmonise the divergent interests of European nations, the European polity still consists of a variety of state and local institutional arrangements, laws and practices.

There is a need for such a variety to be integrated into a EU-wide communicative environment in order for the European multi-level system of law to be cohesive with a common legal discourse. The process towards this communicative environment is mainly left to significant but unconnected outcomes of several European research projects, European law reviews, and the European curricula of several universities. From a sociological point of view, the increasing number of students studying abroad and the globalised structure of the legal market stimulate this process.

A general awareness is emerging among scholars and practitioners about the relevant role that ICT can play in supporting these efforts. Online repositories and portals are today flourishing in order to make statutory law, case-law and legal literature from EU and national legal orders available [3]. Several studies on electronic legal education increasingly consider the dimension of European Union as a multi-tier structure of knowledge units (Schafer 2002; Muntjewerff 2009). However, it seems that an effective knowledge transfer between the results obtained by European research groups and the educational outputs in national contexts is not sufficiently achieved.

Legal education in Europe has primarily a national character for many reasons. First of all, the Europeanization of law has been a piecemeal project, sectoral and not perfectly consistent when adopted by the means of EU secondary legislation. Therefore, teaching law is still considered a national affair, whilst the major source of new legislation in Member States is at Community level and EU law related litigation continues to grow.

Moreover, the Europeanization of law has taken place without fully exploring the key issues related to the growth of multilingual law and its impact on legal practice in Europe. In particular, an exclusive focus on the multilingual drafting of EU law has concealed the implications of multilingualism with respect to the reality of national legal orders.

Legal theory has devoted little attention to what it means to manage European law in 23 languages, though it presumes both a vertical dimension, represented by the interaction between the European institutions and national legal orders, and a horizontal dimension, represented by the legal orders of each Member State. Effective European legal education requires that the unity and the diversity of European law are preserved. Unity means that the regulatory message should be the same, whatever communication medium is used. Diversity means that the language of the law, tied as it is to the institutional setting in

which the law must operate, should be able to convey that message through a variety of linguistic means across national frontiers, to effectively reach the various communities to whom it is addressed [4].

As is well known, a common methodology for legal reasoning in Europe has been solicited by numerous scholars and different ways have been proposed to achieve it. However, the multilingual nature implied by the European multi-level system means that the variety of legal notions and doctrines expressed in a multiplicity of languages need to be previously identified. On the technological side, ICT could ease the linking between the legal concepts identified at European research level and those enshrined by national traditions and transmitted by legal education.

1.1. Education and ICT: a new direction for European law

EU policies on education and training have evolved over time. Only vocational education was mentioned in the EEC Treaty (Art. 128) because it was considered as a way to encourage the mobility of workers in the light of the economic cooperation at the basis of the Treaty. General education was not comprised within the Community competences until the European Court of Justice included higher education within the notion of vocational training (Ertl 2006). The competences were extended by the Maastricht Treaty under Art. 126 (Art. 165 TFEU Treaty on the Functioning of the European Union) which introduced the development of general education [5] and Art. 127 (Art. 166 TFEU Treaty) which reinforced the implementation of vocational education [6].

Two instrumental goals have emerged during the evolution of such a policy stream: to encourage distance education and to develop the European dimension of education.

Since 1987, with the European Parliament resolution on Open Universities, distance education had been promoted [7]. The support for distance learning initiatives in the Member States and accession countries was funded by several European programmes, including Socrates, Tempus and Phare, and by specific action programmes such as Eurotecnet, Comett and Delta. E-learning may be considered as an evolution of distance education when internet and electronic devices substituted other types of distance communications (Curran 2001). The Commission's eLearning Action Plan and the Council Resolution on e-Learning started a phase where e-learning was the central pillar for the achievement of education policies [8]. After the Lisbon Council, e-learning has been even more substituted by the developing of a European dimension of education (Jones 2005) [9]. Despite the fact that they were mentioned in the Treaty of Maastricht and now in the Lisbon Treaty, distance education and the European dimension of education have been considered separately in the policy implementation [10]. Essentially, the European dimension is considered as a matter of increasing the mobility of European students and this goal has been sustained by several European programmes. Conversely, distance education has been introduced in a number of Member States in order to extend access to national education, particularly with reference to lifelong learning for disadvantaged people. European programmes aimed here at complementing national initiatives, such as the acquisition of some skills relevant for the European Union, like, for example, studying Member States' languages.

The setting of a European educational dimension by the means of e-learning would have required direct intervention with harmonization measures, but EU competences are limited to areas in which the Treaty explicitly authorizes such actions (and this is not the case of Art. 149 TFEU Treaty). Moreover, on the basis of the principles of subsidiarity and respect of national and regional diversity, harmonisation is permitted only if and as far as it cannot be sufficiently achieved by the Member States.

By promoting the mobility of European citizens, the EU may indirectly increase the pressure on national education and training to converge in order to effectively allow the movement of students from one national context to another.

The European dimension is considered separately by e-learning also at the intergovernmental level. The Bologna Declaration aimed at establishing the European dimension in university training in all EU countries [11]. The European dimension is considered here as part of cooperation for introducing comparable degrees, quality assurance and unified assessment indicators. In other words, the mobility of students is strengthened by the insertion of similar educational contents into University curricula.

The establishment of a European education system, no longer bound exclusively to national provisions, affects legal education too. This entails comparability in academic degrees, a uniform structure for the legal curriculum, and a common system of transfers for course credits. Given the diversity of legal education in Europe, this will not be an easy transition. Legal training materials expressed in different languages are context dependent, open to diverse interpretations according to the national traditions in which they are produced. The only attempts proposed are to prepare, in vehicular languages, some common materials limited to the legal fields where there is uniformity under the EU law [12]. Anyway, even in these fields, controversial doctrines may arise from diverse interpretative communities. The preparation of such materials is, therefore, a very expensive activity with a limited scope and without consolidated domains.

The establishment of a common legal education requires the development of a common legal reasoning to address commonalities and differences in the legal concepts arising out of the European multi-level system of law.

If adopted with a European dimension strategy, e-learning may be particularly functional in supplementing the process towards a common legal education. Many law faculties are moving their education and training into the web environment. However, these initiatives are based in the national contexts. There is an inadequate exchange of information among national experiences. E-learning with a European dimension indeed implies that national legal materials are integrated in a pan-European shared environment. What is prohibited to EU intervention is allowed to initiatives flourishing in faculties of law and other research and training centres all over Europe [13].

This e-learning development should involve the cooperation of people with very different backgrounds (academics, practitioners, students, ICT experts), languages and nationalities. Thus, this specific set of circumstances requires a very good communication system in order to ensure a meaningful and efficient workflow. An interesting solution is to adopt an ontology-based approach for building a computational framework where a synthesis of the results of several research and education communities can be

implemented, ensuring that coherent links can be established between linguistic sources (contexts) and local concepts. Accordingly, a shared conceptual reference model can be clearly represented and discussed. Through a collaborative platform the content will be dynamically populated by multilingual concepts extracted from legal sources, by the reference documentation and by scholarly contributions. Within the formal architecture the reference ontology will act as a backbone, on which multiple perspectives of the same core elements can be mapped and enriched in a consistent way by local properties extracted from EU and national sources. Within this collaborative platform academics, practitioners and students can help each other to identify and discuss legal concepts by debating issues, reviewing actions among different communities, giving peer feedback on work undertaken in the communities, and so on. The final goal could be the implementation of e-learning materials consistent both with the needs of the European legal market and national specificities [14].

1.2. Networking Research Communities: some issues

Several scholarly initiatives have been promoted across Europe to highlight principles, definitions and model rules on European private law and public law. Accordingly, different projects have been elaborated on the basis of a comparison between the national laws of Member States and Community law. The results achieved are significant, in particular in the field of private law with the publication of an Academic Common Frame of Reference [15]. Though these results cannot be considered the last word on the subject, they will surely represent a benchmark for future investigations in this field [16]. In particular, they offer some insights into the difficulties experimented by research groups at European level that could be partially overcome by a collaborative platform.

In the different research projects, a proven difficulty is to properly describe the current state of national doctrines related to European law. Doctrinal debates developed in national contexts are normally articulated in national languages and refer to specific circumstances underlying normative, political and economic preferences. The research teams working at European level and the national legal literature translated into English or into other vehicular languages represent a minority of the national scholars and of the works published in the Member States. Clearly, the costs for effectively enabling these human and material resources are too high, while a collaborative platform which employs multilingual support can render this enabling process more affordable.

Moreover, it is well known that translating legal terms causes more difficulty than translating information from other disciplines. In contrast with what happens in sciences such as biology or physics, in law there is not necessarily the same correspondence between terms and concepts from different legal orders. Lawyers trained in different countries express principles and rules in different ways and legal languages depend on the legal systems and cultures to which they belong. This is best exemplified by an observation shared by the participants in European harmonisation projects: quite often, above and beyond the difficulty in agreeing on the principle or rule to be enacted, at the European level one also meets the difficulty of assigning to that principle or rule an appropriate linguistic form in the languages of Europe.

It is necessary to develop a communication instrument for matching the several concepts

expressed in the national languages in order to avoid constant problems with the interpretation and application of European multilingual law. This instrument may emerge from the enrichment of the English language with a particular use of specific terms representing the legal concepts of other traditions [17]. Another solution may be to study the meaning of legal terms in the European languages with a comparative law view in order to increase the knowledge of the different concepts without adopting a single vehicular language (Šarčević 1997 ; Sacco 1999 ; Gambaro 2007 ; Olsen et alii 2009). A third solution may be the development of a trans-linguistic approach to identify the taxonomy of concepts independently by their language documentation, such as in the studies of scientific terminology (Sandrini 1996).

A collaborative platform may enhance this search for effective communication by connecting the major number of research communities into a web environment where these alternative solutions can be framed through an ontology-based model. These communities relying on mutual learning and cooperation, as well as on competitive approaches, need to elaborate which law is best adapted to meet the challenges of a single market, and to respond to the needs of European citizens.

1.3. Networking Research and Education Communities: some issues

Any further convergence of the law of Member States can only succeed if there is a number of European-minded jurists who are prepared to work in a multi-system environment [18]. Here, faculties of law have an important role to play. As it is well known, there are many significant differences in the structure not only of legal education (Merryman 1975, Gordley 2001) but also of the legal communities in each jurisdiction (Schafer 2001; Rieder and Hamann 2009).

Moreover, most courses remain rooted in doctrinally orthodox legal concepts that are national-specific. A collaborative platform may allow the fruition of many learning materials on the law of different jurisdictions without time limits. Furthermore, the specific education contents in several languages may be ontologically indexed to the principles already accepted by the majority of research communities because they derive from common European roots (e.g., good faith, undue enrichment) or because they have been created by EU law (e.g., mutual recognition, weak party under a contract). Even those principles that reveal significant differences between European private law jurisdictions may be ontologically indexed to the specific education contents (i.e., how to transfer property and to create limited real rights, the role of the *causa* in contracts in each jurisdiction, and so forth).

The classification scheme that integrates these contents enables us to consider what legal principles are still missing or what are contradictory when considering the different national learning materials comparatively. Thus, such a platform can encourage a continuous spill-over from research to education communities and, vice versa, a feedback related to research findings. The major hypothesis is that learning materials incorporate legal knowledge that can follow the legal perspective and the knowledge engineering perspective.

Even more important, the classification scheme enables the user to assemble, store and

re-use materials for teaching law. The ways of learning the law may also be changed, for example, by providing students with an environment in which they can manage legal information and legal knowledge for their personal professional use. Additionally, former students may continue to be advantaged by the web environment in developing their vocational attitudes. As already described in 1973 by the Commission green paper 'For a Community Policy in Education', the division of general and vocational education is a major obstacle to the acquisition of skills and competences, because 'there is no longer any good vocational training that does not comprise a sound general training at all levels, and there is no longer any good general training which is not linked with concrete practice, and, in principle, with real work' [19]. Thus, a collaborative platform may complement an integrated model of legal education, aiming at developing people who are prepared for practice not only in legal analysis but also in practical skills.

2. A collaborative platform for European law: the ontology-based model

The Artificial Intelligence and the Law Community dedicate a great deal of attention to ontology-based approaches to knowledge representation, with the aim of overcoming the so-called 'knowledge bottleneck' that in the past has prevented the effective development of knowledge-based systems. Compared to other fields, for example natural sciences, the possibility of building, in a semi-automatic way, reliable knowledge bases was, in fact, very limited in the legal domain because of the complexity of the system of sources, because of the continual evolution of the concepts and because of the subjectivity of interpretation.

Legal ontologies have the advantage of being flexible, extensible and (limited to lexical ontologies) easy enough to be built through automatic procedures. They are considered effective tools in many computational applications for improving information retrieval in legal information systems, for guaranteeing the terminological consistency in multilingual legal drafting environments, for ensuring data interoperability in the organisation of service providing processes, for representing legal rules in systems that perform reasoning on them.

The attempt to build conceptual models able to express the universal and fundamental principles of the law was also made last century by legal theory, but proved ineffective as well as somewhat unrealistic. This experience explains why lawyers are a little sceptical regarding legal ontologies. In effect, the modern concept of ontology originating in the world of ICT has little to do with the philosophical concept of ontology: a long way from wanting to search for the fundamental principles of the law or, as in analytic philosophy, the universal structure of the legal discourse, computational ontologies are a means of communication, necessary artefacts for describing some aspects of social reality in a form that does not pretend to be univocal but built on explicit cognitive presuppositions (ontological commitment) and, therefore, recognisable and shareable.

The cognitive principles which inspire the ontologies take a description model (or the conceptualisation) of the phenomena of the structured world of shareable elements (classes of concepts and properties/relations linked to those classes) so that they enable a user/provider community to share their knowledge and, therefore, communicate.

In the Internet world which is the biggest container of non structured knowledge, these resources constitute the most important components of the Semantic Web (Berners-Lee 1998) project integrated with tools, languages, data structures and models. The approach of the Semantic Web plans to associate a virtual structure (a metadata set) with every type of data expressed in standard, i.e., *open,* languages and formats (Berners-Lee 2009), that describe the contents by making reference to shared vocabularies (ontologies). The objective is to construct a level of language independent virtual knowledge, linked to available information in such a way that it overcomes language barriers and semantic confusion. The implementation of the Semantic Web will require the collaboration of official information producers of *open data*, the collaborative production of knowledge and the involvement of users who will become users rather than generators of knowledge *(Linked data* [20]). For the Semantic Web to consolidate, it is also necessary for it to have a clear and shared theoretical framework of reference. Formal architectures are needed where the relationship between knowledge and signs, between contents and communication channels *(in primis* the language), between the concept and its multiple linguistic manifestations are explained.

2.1. Ontology-based models of legal concepts

In every legal document, there are two levels of knowledge: on the one hand, the typical nature of legal sources, the criteria of belonging and validity, the typical textual structures, the prescriptive force attributed to the system's meta-rules, and, on the other, the contents which are the fruit of the lawyers' interpretation and of the conceptual link between words (the expressions in the texts) and the objects (the regulated reality). The two distinct systems, linguistic and normative, have their own rules and their own internal knowledge which coexist and contribute to the formation of legal concepts. There is a clear-cut separation between the two levels of legal discourse: the conceptual level models knowledge re-elaborated from legal theory and organised by means of meta-linguistic concepts; and the contextualised level identifies semantic structures and typical terminological uses in the texts for the purpose of building on those conceptual elements organised according to the relations of lexical meaning in the texts. Added to this, there is the pragmatic perspective of 'law in action' which is modelled and transformed through its impact with social phenomena and the influence of cultural, sociological, political and historical factors. It would seem, therefore, that the principles of the Semantic Web, namely, the creation of a shared vocabulary for the semantic annotation of data, cannot easily be achieved for the law, unless a framework able to take into account and link all the components is constructed.

2.2. Legal core-ontologies

Legal core ontologies are normally built on the knowledge elicited from legal experts and include the formalisation of basic concepts with which legal theory commonly agrees, as, for instance, duty, right, power, liability, commitment, sanction, etc. *Core ontologie*s are formal specifications of the general basic concepts of a specific domain; in their specialisations in *domain ontologies*, the choice about the levels of generalisation is left to the developers; it mainly depends on the kind of applications and the results one expects

to achieve, as they are expected to support classification, reasoning and the decision making process. Both core and domain ontologies include clear assumptions about the normative knowledge, the ideal view of law about reality, and the world knowledge composed by entities, belonging either to physical or social reality, over which norms act by imposing constraints. Their goal is to represent intentional descriptions of legal concepts as classes for guiding the interpretation of the world and explaining common sense reasoning.

A variety of core legal ontologies is already available in the literature [21]. Some of them take a more epistemological approach by representing the categories of legal knowledge (van Kralingen 1993); some others represent just a fragment of the basic conceptual blocks of the law (Valente 2005); some others put an emphasis on building an actual ontological representation of the law distinguished from its epistemological component as LRI-Core (Breuker et alii 2004 , Hoekstra et alii 2007); and yet some others try to ground a core legal conceptualisation on a sound philosophical scheme, like in the case of CLO (Gangemi et alii 2006), an extension of the DOLCE foundational ontology (Masolo et alii 2004), which draws inspiration from cognitive science studies and from traditional philosophical categories, such as *endurants* and *perdurants*.

2.3. Lexical Ontologies

Terms are extracted from legal documents and organized in semantic lexicons. In fact, functionalities of Natural Language Processing (NLP) tools are rapidly evolving from the traditional processing of the formal aspects of language (part of speech tagging, syntactic parsing) towards automated analysis of meaning, by implementing tools for 'ontology learning': the term denotes a suite of methodologies and procedures for extracting the semantic structure from linguistic objects (Gomez and Machado 2003). The parsing process works in layers of increasing complexity [22] and generates taxonomic chains and term clusters that are organized in a network by means of lexical relations. A *de facto* standard for building lexical ontologies is WordNet (www.wordnet.princeton.edu, Fellbaum 1998), a lexical database under constant development at Princeton University (www.globalwordnet.org, Felbaum and Vossen 2008); the wordnet model has been adopted in EurWordNet (EWN) (Vossen et alii 1997), a multilingual lexical database which maps together lexicons of ordinary languages belonging to eight European languages.

Mapping legal terminologies extracted from different languages (and legal systems) implies coping with the issues of legal translation: in legal language, every term collection belonging to a language system, and any vocabulary originated by a law system, is an autonomous lexicon: the most 'neutral solution' seems to be the monolingual mapping of each terminology through equivalence relationships to a pivot language, which acts as the interlingua. In the project LOIS (Peters et alii 2007), a multilingual database of legal terminology built on the WordNet model, monolingual wordnets are autonomously created and then mapped to the others by means of the Inter-Lingual-Index (ILI), a set of equivalence relations of each concept (synset) with an English synset. Cross-lingual linking indicates complete equivalence, near-equivalence, or equivalence-as-a-hyponym or hyperonym. Unlike the wordnets, the ILI is a flat list and, unlike an ontology, is not structured by means of relations. Language-specific synsets from different languages

linked to the same ILI-record by means of a synonym relation are considered conceptually equivalent. The LOIS database has been built in a semi-automatic way, by means of NLP techniques for morfo-syntactic parsing and conceptual clustering, to extract syntagmatic and paradigmatic relations between terms; from the output, sets of candidates for synonyms, taxonomies and non-hierarchical relations were further manually refined.

An alternative approach, adopted in the Syllabus (Rossi and Vogel 2004) project conciliates the textual aspects with legal authority because the cross-lingual mapping of the concepts is produced manually by the experts and is justified by the links to the contexts (national legislation, case law, comments from legal authority). The terminology extracted from Community sources constitutes the ontological reference skeleton for the comparison of national concepts; therefore, it is assumed that the Community terminology is aligned (each linguistic version expresses the same concept) and that the semantic and terminological variations between the two normative levels and the conceptual distance between the national legal systems are recorded.

2.4. The middle-out model

What we have outlined in the previous sections demonstrates how crucial it is to fill the gap between the two layers for capturing the semantics of law. This is indeed a current challenge emerging in the AI and law community and in legal ontology engineering, which are addressing several research efforts towards the design of coherent methodologies for connecting language-independent models with knowledge acquired from texts, so that, beyond philosophical accuracy abstract, conceptual models support concrete applications.

This problem is well known to lawyers who work in the areas of translation and comparative law, when the time in which the lawyer has to conceptualise constitutes the bridge between the analysis of the sources and the comparison of the models or the translation of the terms. There are, therefore, practical experiences and methodologies that can be transferred from the theoretical analysis sector to that of practical application and vice versa; there are technological solutions that can assist in both consolidating analytical procedures and the systematisation of the models. The main point is to conciliate an epistemologically interpretation directed towards a formal conceptualisation that should be epistemologically neutral.

If, in theory, the subject is not without its critics (Roche 2007), on a purely methodological level satisfactory solutions can be found (Agnoloni et alii 2009). The scope of computational projects is to reach a good level of abstraction from case studies in order to design general purpose architectures, in the same way as the comparative law method must make reference to solid and shareable criteria on which to justify the results. The integration of the two models has already proved to be profitable (Ajani et alii 2007) being a combination of two components: a) a suitable technological support, that is, a communication platform that enables a collaborative formation of concepts and b) a multilevel framework that contains:

- A lexical layer , composed of:
    - a lexicon (a net of synsets or clusters of terms) extracted by means of NLP tools from a set of parallel corpora of EU legislation and case law. The EU

lexicon acts, like in Syllabus, as the *reference ontology*, where a consistent parallel alignment is assumed;
    - monolingual terminologies, acquired from national sources where meaning misalignment and divergences with EU terms are expressed by proper relations; it acts as a keyword repository for documents indexing and for driving the cross lingual retrieval of national contexts;
    - the contexts (national and Community sources, case law, articles from legal authority, comments, web pages, etc.) accessible in a distributed way: each point of access is able to display the contexts relating to the national legal systems.
- A conceptual layer:
    - the conceptual layer is a flat list of the English synsets that assume here the role of *concepts*, linked by *has-lexicalization* relation to monolingual synsets in a lexical layer; it is a 'virtual level', that acts as pivot, like in Wordnet ILI, in order to align synsets of different languages. They do not carry any kind of semantic information, which is provided by the ontological layer.

The ontological layer formally describes the intentional meaning of concepts, whose core elements are expressed by a minimal set of attributes (unary predicates) and properties (relations among concepts). The role of the ontological layer is to assign a uniform characterization to entities lexicalised in national corpora, and consequently, to 'explain' and point out differences expressed by local contexts. The ontological layers are created by the collaborative works of legal experts through the platform, that support the dynamic integration of the ontology, pointing out the conceptual (and normative) distinctions in national systems and the diachronic meaning evolution of legal terminology.

These layers are used not only to organise the learning objects in terms of multilingual conceptual retrieval, but also to configure personalized e-learning content and interactions between participants. Consequently, a two level structure of the collaborative platform has been set up: the user ontology level and the common ontology level.

At the user level, the contents are stored according to language contexts, roles and actions of the learning process, mainly exploiting standards such as SCORM as well as semantically enriched information based on lexical ontologies. This enriched information is obtained by the insertion of users or inferred by the means of semi-automated comparison with the lexicon.

At the common ontology level, the attention is focused on the re-use of the educational contents by the means of semantic annotation based on the matching between the knowledge obtained at the user level and the knowledge previously acquired in the lexical layer and in the conceptual layer [23].

3. Conclusions

The process of Europeanised legal education is a fascinating goal that poses serious questions to law faculties about how this can be better organised than has been done thus far.

If the legal orders of Member States are soon to experience a further convergence of their

laws under the pressure of EU law, then law courses will need to entail not only the same multilingual EU secondary legislation and ECJ decisions, but also common legal reasoning. The purpose of a collaborative common platform will provide access to common building blocks for researching and teaching as well as an open space for discussion in order to foster the establishment of common legal reasoning. Clearly, the proposal is only one step toward this objective. Legal reasoning is highly complex, based on jurisdictional legal structures, the structure and influence of the profession, traditional educational methods, and much more. Nevertheless, how the law is expressed in these various countries is a matter of identity, but that identity is ultimately established by tacit conventions rather than by explicit discussions.

Only in exceptional cases does a French jurist, a German jurist, or an English jurist have sufficient knowledge of other legal systems and of their inherent assumptions, to be able to precisely identify the key factors accounting for divergences and variations among those systems. This lack of awareness can extend to unawareness of divergences in the symbolic function associated with the expression of the law. This lack of consciousness hinders the ability to address precisely what is to be done, and threatens the development of trust, both as to the effectiveness of cross-border communication and to agreement over the development of the law.

In this respect, the proposal goes beyond the normative dimension of the law, to consider the environment, even if a simulated environment, in which the different interpretative and decision making communities may agree to cooperate [24].

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[1] Director of Research, Institute of Legal Information Theory and Techniques (ITTIG), National Research Council (CNR), Italy.

[2] Assistant Professor of Comparative Law, University of Piemonte Orientale, Italy.

[3] See, for instance, Eur-Lex, the legal database of the EU (http://eur-lex.europa.eu) or the recent European e-Justice portal that will provide practical information on judicial system and procedures for European citizens in their language ((https://e-justice.europa.eu/) .

[4] The enlargement of the EU has increased such diversity and the ultimate challenge is to develop European law whilst preserving the richness of this experience, as represented by the multiple linguistic and institutional features of life under European law.

[5] 'The Community shall contribute to the development of quality education by encouraging cooperation between Member States and, if necessary, by supporting and supplementing their action' (Art. 126(1) Maastricht Treaty).

[6] 'The Community shall implement a vocational training policy which shall support and supplement the action of the Member States' (Art. 127(1) Maastricht Treaty).

[7] European Parliament Resolution of 10 July 1987 on Open Universities in the European Community Session Doc A2-0069/87 OJ 0133.

[8] Especially with the launch of the eLearning Initiative (2004-2006), http://ec.europa.eu/education/archive/elearning/index_en.html.

[9] The objectives that emerged from the Lisbon Council introduced a new approach based on 'the development of local learning centres, the promotion of new basic skills, in

particular in the information technologies, and increased transparency of qualifications' (http://www.europarl.europa.eu/summits/lis1_en.htm).

[10] Art. 126(2), now Art. 165 (2) TFEU Treaty.

[11] In 1999, several European countries met in Bologna to discuss the future of higher education in Europe. The Bologna Declaration at the end of the summit stated the objectives for a European Higher Education Area by 2010. See http://www.ehea.info/ [accessed 30/09/10].

[12] As at the European Law Faculties Association (ELFA) conference held in Barcelona 2007 with the subject of 'Strengthening the European Dimension of Legal Education' where a similar proposal was made. See http://elfa-afde.eu/ [accessed 30/09/10].

[13] E-learning as a way to exchange legal information is at the basis of the ELFA project eLegal (electronic learning about law) that is designed to promote both the development and the dissemination of European e-learning expertise in the legal fields (http://elfa-afde.eu/Documents/ELEGAL.pdf).

[14] A first prototype of the collaborative platform has been built by the University of Piemonte Orientale and ITTIG - CNR within the project ICT4Law coordinated by Prof. Gianmaria Ajani, University of Torino, and funded in the research line of converging technologies (ICT, Cognitive sciences and Law) by the Piedmont Region, Italy. The partners involved in the project have previously worked in several research networks devoted to harmonisation of European law, such as Uniform Terminology of European Law (V Framework Programme), CoPecl (VI Framework Programme), and Information Technology applied to Law, such as, among others, FAL (Free Access to Law Movement), DALOS - Drafting Legislation with Ontology-based Support Project, Caselex.

[15] Principles, Definitions and Model Rules of European Private Law Draft Common Frame of Reference (DCFR). Outline Edition, München, Sellier, 2009.

[16] The Academic Common Frame of Reference marks a milestone in the research into European private law, and yet both show shortcomings, despite the praise that they have earned in other respects. These deficiencies are documented by the literature that is assessing them. See, e.g., Whittaker (2009), Zimmermann (2009).

[17] For further information see Dannemann, Ferreri, and Graziadei (2010).

[18] And by means of multi-system legal texts. See, on this point, Larouche (2000).

[19] As quoted in Janne (1973). For further information see Brine (1995).

[20] Berners-Lee, Design Issues for Linked Data, www.w3.org/Designissues/LinkedData.html [accessed 30/09/10].

[21] A complete survey of legal ontologies is in Casellas (2008) and in Casanovas et alii (2010).

[22] '[o]ntology development is primarily concerned with the definition of concepts and relations between them, but connected to this also knowledge about the symbols that are used to refer to them. In our case this implies the acquisition of linguistic knowledge about the terms that are used to refer to a specific concept in the text and possible synonyms of

these terms. An ontology further consists of a taxonomy backbone and other, non-hierarchical relations. Finally, in order to derive also facts that are not explicitly encoded by the ontology but could be derived from it, also rules should be defined (ad if possible acquired) that allow for such derivations.' See Buitelaar and alii 2006, 10.

[23] Several matching methods are currently experimented in the first prototype test that comprises learning modules on European private law in five languages (English, French, German, Italian, Spanish) and an interactive environment for discussion among scholars. The overall approach is however different from wiki models of collaboration as shown in Hoorn and van Hoorn (2007); Giménez Costa and González Bondia (2007).

[24] On the virtual environments for legal education purposes see McKellar and Maharg (2005).