Chapter 3
Legal Ontologies in ICT and Law

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ABSTRACT

Re-usability is frequently declared as sine qua non feature of modern ontology engineering. Although thoroughly examined in general theory of knowledge management models the re-usability issue is still barely a declaration in the domain of legal ontologies. The similar situation also applies to statute-specific ontologies. Those knowledge modeling entities are well described especially as an opposition to the general application legal ontologies. Yet it is trivial to say that most of the developed legal ontologies so far are those generic ones. And this sole fact should not surprise as the very specialized knowledge models – usually harder to develop – are at the same time narrowed with their utility. Of course in terms of re-usability this simply means that this feature may be largely disabled in this kind of knowledge models. In this chapter we face both challenges, i.e. as an excuse for presentation of the most interesting in our opinion trends and works in the field we will demonstrate the practical approach to modeling copyright law case by re-using statute-specific ontologies.

INTRODUCTION

The legal information and knowledge computer representation is still an open issue. In this chapter we decided to introduce a global view on problems and challenges which have been solved so far contrasting them to those which in our opinion are still awaiting some constructive approaches.

Moreover it is our intention to present matter within the scope of the topic together with the important background information incorporated as well, ergo in the context of legal ontologies we felt obliged to present also selected facts and materials which concerns less specific (broader) range – the ontologies – as necessary[1].

This chapter shows the background works of modern legal ontologies state of art. We thoroughly discuss legal ontology knowledge engineering

methods. We demonstrate how ontologies are useful for modeling the legal knowledge and normative aspects of reality described in various types of documents. We discuss logical formalisms that can be used mutually as a part of ontologies or together with them in order to provide environments for legal reasoning. Finally we are analyzing some real legal logic-based problems and give examples of solutions on the basis of our own research and lessons learned from those experiments. Unlike the other works on this topic we selected a specific strategy of approaching to the presented above issues, taking into account an aspect which is very often declared by the authors of knowledge models but at the same time does not obtain the expected attention. By the aspect we mean the re-usability feature of ontologies. Therefore we examine what is the potential of existing ontologies – both our own and those of external authors – in modeling legal knowledge straight ahead without the very costly burden of new legal ontologies creation.

BACKGROUND

Ontologies are "an explicit specification of a conceptualization" as states one of the most commonly known definition by Gruber (Gruber, 1993). Being based on the OWA assumption the ontological formalisms are well fitted to meet some of the challenges of legal knowledge representation. What is more – the wide spread of web standards introduced into development of ontology life-cycle guarantees that the fulfillment of the vision of automated sharing of knowledge and the reuse of that knowledge between software components and human agents is not far from realization. In terms of legal domain the vision of accessing pieces of codified knowledge from different sources in a standardized manner can be tempting esp. on account of possibilities of making automated inference on a larger scale.

In the field of legal knowledge management and representation the problem of representing legal knowledge in the form of variety of knowledge bases or ontologies has been vastly recognized (Despres, 2004). As a consequence a number of generally elaborated methods of ontology engineering have been tested to produce legal ontologies. Some of those methods were also used to create specific solutions for legal domain embedded tasks of building semantic knowledge repositories.

Legal ontologies have been formed to fulfill numerous aims (Gangemi, 2007) and to provide support for various functions. Those functions coupled with the aims delimit the outline and structure of the ontology. Those mentioned properties define content and expressivity in addition. Thus, methods used to construct the knowledge models are to reflect the needs and intentions of constructors.

The already developed methods of creating ontologies in the legal domain that reflects a specific highly expertise knowledge models form small domains connected to single statutes or other legal documents. In the context of works of (Guarino, 1998) our ontologies should be considered as a mixture of domain and application specific ones. The aim of research is to look closer to the problems of not only creating a common semantic platform as a set of symbols and concepts but to be able to built logical theories around it. The creation of legal ontologies (or rights and norms representing knowledge models) overcomes a number of obstacles. Thus, although the efforts of creation of legal ontologies are intensified for the last decade and there exists a rather large resource of those, containing and dealing with a general legal vocabulary (Breuker et al., 2006) we perceive a lack of oriented models describing more precisely matters of a concrete branch of law, a statute or even only some specific regulations. It is certain that with new opportunities of use arising and with demand from the software systems for facilities enabling easy to re-use

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