An Ontology for Spatial Regulations

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Abstract. The last decade improving access of legal sources using ICT and especially the Internet has lead to various internet portals for accessing textual sources, standardisation of those sources using W3C standards such as XML for describing the structure of such documents and meta standards such as MetaLex1. In order to improve access to spatial regulations we should establish a successful marriage between geographical information systems based technology and a machine readable regulative framework, allowing connecting regulations as described in legal sources to an object oriented representation of the real world such as a zoning plan. This paper describes the architecture of an application developed for improving access to spatial regulations, integrating different sources such as GIS (Geographical Information Systems) information, maps and textual legal sources. This application called Legal Atlas uses a relatively compact ontology in OWL for combining spatial planning information in GML (Geographical Mark-up Language) with legal sources described in MetaLex XML. We will explain this ontology and the way it is used to support users in accessing spatial regulations, starting either from querying a map based interface of a text based one, i.e. starting from the spatial perspective or from the normative perspective.

1 Introduction

In crowded nations or regions such as the Netherlands spatial regulations are important domains of law. At municipal level this legal domain perhaps has the most influence on both the (local) government as well as the citizens. Spatial regulations determine if building permits may be granted, businesses can expand etc. Spatial regulations can be characterised as normal regulations, but although those regulations contain spatial elements - laws are for example bound to the jurisdiction that relates to location - in spatial regulations spatial elements obviously play a much more prominent role. In the legal practice this has lead to a dominant role for annotated maps as source of law. The last decade improving access of legal sources using ICT and especially the Internet has lead to various

1 http://www.metalex.eu
internet portals for accessing textual sources, standardisation of those sources using W3C standards such as XML for describing the structure of such documents and meta standards such as MetaLex\textsuperscript{2}. In order to improve access to spatial regulations we should establish a successful marriage between geographical information systems based technology and a machine readable regulative framework, allowing connecting regulations as described in legal sources to an object oriented representation of the real world such as a zoning plan. A major part of geospatial data used in the GIS world is collected by governments and actually represents normative statements, positions, and titles relating to space rather than representation of existing ‘real’ geographic features. The Leibniz Center for Law is involved in the DURP project (DURP is the acronym for Digitale Uitwisseling Ruimtelijke Plannen, in English: Digital exchange of spatial plans) that is aimed at developing a digital exchange format for spatial regulations. The DURP project is coordinated by the Dutch Ministry of Housing, Spatial Planning, and the Environment (VROM), and it involves diverse parties such as the Association of Cooperating Municipalities, the provinces and the Union of Water Control Boards. For the Leibniz Center for Law, being one of the founding fathers of the current CEN/MetaLex standard, having designed the MetaLex/NL XML schema \textsuperscript{1} for ‘regular’ legal sources, involvement in the DURP project offered possibilities to apply models of law in combination with models of spatial functionality represented in geographic interfaces (maps). The MetaLex/NL XML interchange format has been extended in order to support exchange of spatial regulations, including the associated geospatial information.

We developed support software that is intended to improve access to spatial regulations. One component of that support software is called Legal Atlas \textsuperscript{3}. This component builds upon past experiences in projects such as the ADDwijzer\textsuperscript{4} project, in which it was showed that potentially valuable services can be delivered to citizens if only the legal sources of the spatial regulations would be available in the right form, and the already mentioned DURP project.

In order to establish the relationships between the regulations and the geographical objects we developed a relatively compact ontology in OWL for combining spatial planning information in GML with legal sources described in MetaLex XML. In this paper we will explain the architecture of the Legal Atlas application and we will especially focus on the role of the ontology in that application.

2 Linking Texts and Maps

In the previously mentioned ADDwijzer application the maps and text were linked by a hard coded mechanism with links in the texts and the map and using hyper links. In that application all relevant regulations were manually connected to regions on the map. A painstaking and tedious process, not only during design time. Such technical solution will make maintenance very labour intensive and therefore expensive both in terms of time and money. Unfortunately many

\textsuperscript{2} \url{http://www.metalex.eu}