Dealing with Changes to the Law

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Abstract. The AGILE project aims to improve the adaptivity of ICT infrastructure, business processes, services, data collections, and knowledge sources within administrative organizations facing regularly changing demands and constraints following from developments in the law and changing arrangements with network partners. This paper presents some of the ontological choices we made during the development of a methodology for change management in the AGILE project. We introduce a three-tier approach in which we make a distinction between brute reality, institutional reality and the context of production of the sources of law. In AGILE the use of OWL2 models of sources of law plays a central role.

1 Introduction

One of the objectives of the AGILE project (Advanced Governance of Information Services through Legal Engineering) is to analyze and address the interaction between sources of law, logical representations of these sources, business process models, and legal service models, as change can affect each of these elements separately. Maintaining traceability is important (cf. [1,3]): following those traces back is helpful for diagnosis when undesired or unintended results are produced, but also for justification of the system's behaviour in terms of the original sources of law.

Our approach is to distinguish between three ontological layers [3,4]. The entities in each layer are explicitly linked to corresponding entities in adjacent layers, to be able to trace the impact of changes in sources of law all the way to implementation in an organization, and back from experiences on the work floor to the legislator's intentions.

The interjection of an abstract legal institutional layer between law and implementation enables us to more accurately document the impact of changes, and better reflects the degrees of freedom the organization has in implementation.

2 Three Ontological Layers

We will start with addressing the three posited layers (see Figure 1). The first layer addresses the relevant provenance information about the sources of law. The sources of law include not only legislation and case law, but also policy statements and guidelines of lower level rule makers used in the organization.

On the next layer we find abstract legal institutions, whose presence is produced by the sources of law [9,3]. We take the source of law to be a writing that may be used to back an argument concerning the presence of a certain institutional entity, often a *rule*, created by the legislator in a certain legal institution [5]: The source of law is the

result of a legislative act performed with the intent of creating that institutional entity, and functions as evidence of the legislative act. In this sense the sources of law are the media of legal institutional reality.

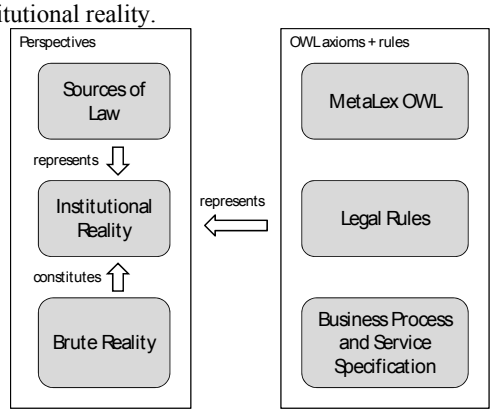

Figure 1 Layers and their Representation

Finally, on the third layer, there is the implementation of the legal institutions in brute reality, in the context of AGILE typically within an organization in the form of business processes, services, documents and forms, and fielded software. The institutional reality as represented in the sources of law only comes to life through the brute reality that constitutes (or *counts as*) it. The raising of a hand counts as a bid in an auction and the issuing of a document invented by some administrative agency tasked with issuing residence permits counts as an official residence permit.

The rules in the sources of law do not only constrain the structure of institutional reality, but also constrain the superposition of institutional reality on brute reality. Any rule mapping brute reality (the raising of the hand) to institutional reality (the bid) may either be backed by the sources of law, making it institutional itself, or simply by knowledge of the domain, making it brute.

Changes can often be isolated to layers, and mappings between layers. If the requirement for a valid passport is for instance dropped from immigration law and replaced by the more general requirement that an immigrant should be identified, the implementing organization may still opt to retain the requirement for a valid passport in a *fast track* service implementation, and delegate the handling of cases where no valid passport can be shown to the fully manual appeal procedure. The business process remains the same, while its legal justification changes.

Each of the described layers of reality needs to be formally represented as largely distinct universe of discourse, as illustrated by Figure 1. Moreover, the entities in each layer should be traceable to corresponding entities on adjacent layers to be able to track the impact of changes as described.

AGILE knowledge representation is based on OWL2 axioms, augmented with MetaLex and a (defeasible) rule formalism more expressive than OWL2. To implement traceability from knowledge representation to sources of law, we build on the results of our participation in MetaLex XML (cf. for instance [5,3]). In the MetaLex CEN/ISSS initiative, IT industry, publishers, government agencies, and academics work together to create an open XML interchange standard for sources of law.

The legal rules represented by the source of law appeal to two separate realities – institutional reality and brute reality. *Institutional rules* map out a logical space of

possible models of the institution: they form the institution's ontology, and can be interpreted as terminological axioms [3,9]. They are not to be considered defeasible as a matter of convention.

Institutional events are *constituted by* events in brute reality. The main function of the *constitutive rule* is to define the interface through which the state of the institution can be changed through necessary and indicative conditions.

Applicability [3,8] plays a central role as soon as the logical proposition and the legal rule are separated, a necessary consequence of taking the *production of presence* ontological position towards the sources of law. If a logical proposition states that a certain legal rule *means* that a certain proposition indicates or entails another proposition, we must add to this conclusion that the legal rule has been applied. Applicability rules can be used as a guide for clustering sources of law into coherent domains of application, and are generally used for that purpose by the law. The *choice rule* makes the application of one legal rule conditional on the application of another legal rule, if the combined application of two legal rules is judged to be problematic [3].

The institutional interpretation however tells us little about the functions of law for its users. Law makes social interaction predictable by giving people reasons to do certain things and to refrain from doing certain things. To explain these functions, we have to appeal to planning and plan recognition. To explain the normalizing effect of other rules one must ascribe intentions and preferences to agents: People sometimes intentionally try to bring about or avoid certain legal facts. Since cognitive resources for planning are limited, and people share a lot of their knowledge, intentions are both predictable and recognizable on the basis of observing behaviour.

The principal aim of Hohfeld's work [7,10] was to clarify *jural relationships* between parties. Hohfeld's relationships distinguish between the (legal) competence (or power, ability) and incompetence to play a certain agent role, and therefore to cause a certain change of position, and between the obligation to cause a certain change of position or the absence of such an obligation, and most importantly, between the one who acts and the one who predicts the actions of another [2,3,6,7,9,10]. In essence we are dealing with the ability of one agent to infer:

1. that another agent has the ability or inability to change his (in this case legal) position in relevant ways, and
2. that the other agent has a preference for changing or not changing it.

Business process specifications i.a. represent an intention to use one's (legal) abilities in a predictable manner. Services publicly advertise this intention, so that it creates an ability of prospective clients (to change their legal position). These clients use this ability by requesting a service. Of central importance is the adoption of agent roles: the client becomes a client by requesting a service and – thereby – adopting a well-defined role, while the employee of the administrative organization adopts an agent role in an associated business process. Agent simulation [2] as a tool for impact analysis and exploration of design options assumes the development of prototypical agents representing both the organization itself and its relevant environment.

3 Conclusion

The distinction we make between layers helps us to more precisely address the impact of changes of the law in various organizational specifications and knowledge sources.

It is also required if we aim at supporting legislative drafters and policy makers who need to predict the outcomes of their intended changes not only with respect to the legal consequences for the categories of cases determined by the sources of law, but also with respect to business processes, to (human) resource consumption, in administrative organizations.

Central to our approach are ontologies expressed in OWL2. Limitations in OWL2, in particular with respect to isomorphism between source and representation, defeasibility of legal rules, and the role of provenance information in determining applicability, force us to use an additional rule language.

A challenge is to account for the relation between jural relationships usually left implicit in the sources of law on the one hand, and agents, goals, and services on the other hand. This relation is to be found in the representation of abilities and preferences.

Together with our non-academic partners, the Dutch tax and customs and immigration and naturalization administration, BeInformed, and O&I Management Partners, we hope to create a systematic approach to improving adaptability, quality and cost-effectiveness in government administration.

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1 See http://www.jacquard.nl/?m=426