Legal Patterns for Different Constitutive Rules

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ABSTRACT

The research for solutions for compliance is mainly focused on the representation of regulative rules, the imperatives that the industry is asked to comply to. Yet, a relevant part of the legal knowledge contained in regulation cannot be expressed in terms of deontic statements. Such part is represented as *constitutive rules*, a concept first introduced by philosophers of language such as J.L. Austin and J.R.Searle and further developed in legal philosophy, where constitutive statements are classified in categories according to their legal effects. The present paper presents an approach for the representation of alethic statements as part of a methodology aimed at ensuring effective translation of the regulatory text into a machine-readable language. The approach follows a classification of constitutive statements contained in the work of legal philosophers A.G. Conte and G. Carcaterra. The methodology includes an intermediate language called Mercury, accompanied by an XML persistence model, and introduces a set of patterns (called Legal Concept Patterns) to specifically represent the different constitutive statements. The paper identifies five patterns for the corresponding constitutive statements found in financial regulations: legal definitions, commencement rules, amendments, relative necessities, and party to the law statements.

KEYWORDS

Constitutive rules, CNL, Legal Patterns, Legal Definitions, Meta-rules, SBVR

"*Comprendere un diritto significa sapere che cosa esso è, sapere che cosa è significa possederne la definizione.*"

"*Understanding a right implies knowing what it is, and knowing what it is implies possessing its definition.*"

(Carcaterra, 1985, p. 25).

1 INTRODUCTION

Assessing compliance means checking the correspondence of an activity with a set of norms. Here, norm is intended as the interpretation of a rule contained in a regulation. To assess compliance, we need two pieces of information: one about the activity, and the other about the interpretation of the regulation.

In order to speed up the process of compliance assessment, we thus need a machine-readable interpretation of the law.

Great are the potentials of semantic web technologies to express semantics of legal texts, especially in terms of legal references (e.g. LegalDocML, [OASIS 2015]) and legal scope (e.g. LKIF, [Boer et al. 2008]). Several rule languages exist that manage legal rules, and rest on solid logical foundations (e.g. LegalRuleML, see survey in [Ceci et al. 2016b]). Unfortunately, those layers of technology are difficult for lawyers to grasp, and the related solutions are still out of their reach.

The goal of the research presented in this paper is to represent regulations for GRC tasks in financial industry. This research developed a Regulatory Interpretation Methodology (RIM) to guide a Subject Matter Expert (SME, e.g. the legal expert) and a Semantic Technology Engineer (STE) in a collaborative process of transformation of the regulatory text into machine-readable information (see [Abi-Lahoud et al. 2014]). Regulatory requirements are core information in regulation: it is thus of central importance to capture their main characteristics and to model them in a way that opens up options for semantic enrichment and machine reasoning. Philosophy of language [Austin 1976, Searle 1969] identified two types of rules: regulative rules and constitutive rules.

Previous work describes our approach to regulative rules [Ceci et al. 2016a]. The present paper discusses the representation of constitutive rules, which, despite not being requirements themselves, still play more than a marginal role in compliance assessment: legal definitions are very important, and so are metarules, and there are also statements of fact to take account for.

1.2 Mercury

Understanding regulations is a complex task for both non-trained human agents and machines. Legal experts face a number of challenges in interpreting a regulatory text, including: following and fleshing out references and citations; identifying, delineating, and disambiguating definitions; making sense of complex sentences; clarifying ambiguities resulting from legalese; accounting for exceptions [Abi-Lahoud et al. 2014]. A lot of the research in the field is therefore devoted to bridging the gap between the legal expertise required to interpret the regulatory text and the modelling skills required to build a semantic knowledge base. The goal is to foster compliance in the financial sector by supporting corporate lawyers, risk practitioners and

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compliance professionals in their role of SMEs in making law more readily consumable and comprehensible by the industry, thus deriving greater accuracy and efficiency in the application of regulatory requirements and associated business policies and processes.

The Regulatory Interpretation Methodology allows the SME to represent the semantics of regulatory requirements in a machine-readable format through a SME-friendly process. This is ensured through the use of SBVR[1]. SBVR is a powerful instrument for modelling an area of business activity and for building a business vocabulary (van Haarst 2013, p. 14), but it is not suitable – as is – for the representation of legal rules; some SBVR components are not needed, or overcomplicate the task of rule representation (e.g. the logical formulation of a sentence), and some components are falling short in capturing legal concepts (e.g. constitutive rules).

To overcome this, the authors of the paper have developed an artefact called *Mercury*, composed of Mercury-SE, a Structured English based on SBVR to function as an intermediate language, and Mercury-ML, a persistence model in XML and RDF format, capturing the semantics of Mercury-SE in a machine-readable format. Mercury represents rule statements contained in regulations and describes the concepts used in those rules in a terminological dictionary. The process of translation from the legal text to the Mercury-SE language is manual and tool-assisted: the software, *Ganesha* is specifically designed to make the translation process as intuitive as possible, while at the same time ameliorating the user's time devoted to the most repetitive work.

Mercury exploits technologies from the Semantic Web (SW) stack at the XML and RDF layer as well as non-SW technologies (SBVR and the RIM). It relies on upper SW layers, particularly OWL, for advanced classification and reasoning on rules and vocabulary. The reader is invited to refer to Ceci et al. (2016a) and Al-Khalil et al. (2016) for more details on SBVR and Mercury, which is also useful to understand the information contained in Section 4 as well as in the appendixes.

1.3 Representing Regulative Rules

Regulative norms are the result of *directive acts* [Biagioli and Sartor 1993]. These norms regulate behaviours by introducing deontic modalities (it is obligatory that…, it is prohibited that…, it is permitted that…) for their addressees. Their application is not categorical, but conditional: they specify all their applicability conditions. In order to correctly identify and represent them, it is necessary to identify:

- The addressee;
- The applicability conditions;
- The (deontic) modality;
- The behaviour being regulated.
- The (legal) source.

The argument of representing regulative norms in AI & Law has been widely covered i.e. in [Gordon et al. 2009].

In SBVR, deontic statements are exhaustively represented through operative (or behavioural) rules. Allowed deontic statements include obligation statements, prohibition statements and restricted permission statements. These statements are equivalent, in the sense that the same statement can be expressed in any of the three deontic modalities. Regulative norms are covered by the present research in [Ceci et al. 2016a-b, Al-Khalil et al. 2016].

1.5 Scope

The present paper focuses on the issue of representing alethic statements (legal definitions, meta-rules, statements of facts) in a machine-readable way. The solution it presents employs an intermediate language and follows the classification drawn in legal philosophy for constitutive statements.

Because the research is focused on compliance, the constitutive statements are seen as complementary to the regulative ones, and thus represented only to the extent necessary to define and specify the effects of regulative statements.

Legal philosophy identifies different categories of constitutive rules. This paper follows this classification in order to represent their semantics. The research has therefore come up with the concept of legal concept patterns (LCPs), that work as templates to represent constitutive norms with fixed effects. A list of legal concept patterns for four identified types of constitutive rules is provided.

This Paper is structured as follows: Section 2 introduces constitutive rules and relevant doctrine on them. Section 3 presents legal concept patterns, that are used to represent constitutive norms as explained in Section 4.

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[1] The Semantics of Business Vocabulary and Business Rules (SBVR) [OMG 2015] is an Object Management Group (OMG) specification for a business natural language that is grounded in ISO Common Logic. Natural text is structured against elements in the SBVR metamodel, allowing for the definition of noun concepts, verb concepts, and business rules. Noun Concepts are things in the domain of interest, for example – market operator, financial institution, or regulator. Individual Noun Concepts are a particular type of Noun Concept for representing actual entities or individuals, for example – ESMA, Directive 2014/65/EU. Verb Concepts capture the relationships between two or more Noun Concepts. Keywords are linguistic symbols that identify the natural language logical quantifiers, logical operators, and modal operatives, for example – it is obligatory that, each, exactly one. An SBVR semantic repository typically includes a Terminological Dictionary and Rulebook. The Terminological Dictionary contains the vocabulary made up of noun concepts and verb concepts but also contains definitional rules that constrain the meaning of the entries. The Rulebook is a set of regulatory requirements in the form of behavioural rules that capture the regulatory intent of legal texts. The vocabulary entries form the building blocks of the rules and the knowledge base is populated through an iterative process. This leads to an increased horizon of understanding [Abi-Lahoud et al. 2014] of the regulatory domain for both legal experts and software engineers.

2   CONSTITUTIVE RULES

The concept of constitutivity, as distinguished from the regulative effects of norms described in section 1.3, was first introduced by John Rawls, with the following distinction:

"justifying a practice and justifying a particular action falling under it... [by meaning for] practice any form of activity specified by a system of rules which defines offices, roles, moves, penalties, defenses, and so on, and which gives the activity its structure." (1955)

J. L. Austin investigated the phenomenon of the *performative utterances*, defining them as:

"Utterances [...] that [...] do not 'describe' or 'report' or constate anything at all, are not 'true or false,' and the uttering of [which] is, or is a part of, the doing of an action, which again would not normally be described as, or as 'just,' saying something." (1976, pp. 5-6)

The concept of performative utterances was later refined by John R. Searle into that of speech acts and constitutive rules, defined as follows:

"[R]egulative rules regulate antecedently or independently existing forms of behaviour […]. But constitutive norms do not merely regulate, they create or define new forms of behaviour. The rules of football or chess, for example […] create the very possibility of playing such games." (1969, p. 33).

In legal theory, constitutive norms are the result of *declarative acts* [Biagioli and Sartor 1993]. These norms introduce new abstract classifications of existing facts and entities. Those classifications are called institutional facts (e.g. *marriage*, *money*, *private property*) and they emerge from an independent ontology of "brute" physical facts. Differently from regulative rules, constitutive norms have no deontic content: they do not introduce obligations, prohibitions or permissions. Instead, they typically take the following form:

(*a*) counts as (*b*) in context (*c*)

In order to capture these rules, it is thus necessary to identify three elements:

(a) a material (or previously identified) phenomenon (*token*);
(b) an abstract concept that is created by the constitutive rule itself (*type*);
(c) a limited area of application (*context*).

Two additional elements, the (alethic) modality and the legal source, are in common with regulative rules. Constitutive norms are called "determinative rules" in [Gordon et al. 2009]. In LegalRuleML, that class is represented as *ConstitutiveStatement* Node Element. In Normative Multi-Agent systems they are formalized as belief rule of normative agents: from a knowledge representation point of view, they behave as data abstraction in programming languages [Boella and Van der Torre 2004]. An investigation of the logic underlying "count-as" statements is contained in [Grossi et al. 2006]. A survey of the existing attempts to provide a formalization for constitutive norms and count-as

conditionals is contained in [Grossi et al. 2013]. In it, the diversity of formal approaches is evident. Seven strands of reserach are identified in [Grossi et al. 2013, p. 429]:

- contextual aspects of counts-as;
- classificatory aspects of counts-as
- counts-as and actions;
- counts-as and conventions;
- counts-as as grounded on dedicated agents;
- counts-as as related to regulative norms;
- counts-as as related to the definition of legal terms.

This multiplicity of approaches suggests that a unique formalization is not capable of representing all the possible aspects of constitutive norms. Furthermore, the distinction in [Grossi et al. 2005] of counts-as statements in classificatory counts-as, proper classificatory counts-as, ascriptive counts-as and constitutive counts-as, is a proof of the heterogeneity of such statements, not only in their form but also in their effects.

SBVR's restricted language does not explicitly include institutional facts or constitutive norms, although it has a rule category called structural (or definitional) rules that can be used for the purpose. These rules are represented in the language through alethic statements instead of deontic statements.

The rest of this Section will present part of the research conducted in philosophy of law on the subject of constitutive rules with the aim of identifying a taxonomy of constitutive rules.

2.1   On the Constitutivity of Rules

The Italian school of legal philosophy introduced distinctions within constitutive statements [Carcaterra 1974, Conte 1981, 1995, Guastini 1986]. In particular, according to Carcaterra [1974 p. 61], the constitutive statement "produces, at the very moment when it enters into force, the effect that is its scope and content". Carcaterra distinguishes two meanings of constitutivity in legal norms: according to the first meaning, constitutivity is a process downright creator of legal effects (or states of affairs). Rules carrying such constitutivity correspond to Searle's *declarative speech acts* [Searle 1979 pp. 16-20]. In the second meaning, constitutivity is the process of creation of acts and facts with a specific legal meaning. Such meaning of constitutivity differs from that of *declarative speech acts*, rather resembling the creative attitude of Searle's *rules constitutive of speech acts*.

According to this distinction, we can distinguish two types of constitutivity: *thetic-constitutivity* (from θέσις, "affirmation") directly creates its object (a legal effect or state of affairs), while *eidetic-constitutivity* (from εἶδος, shape) rather creates the abstract concept of its object, thus making such legal effect or state of affairs possible in the legal system. An example of *thetic-constitutive* rule (a declarative speech act) would be a marriage celebrated by a public officer (as it creates the legal bond between two individuals) or the divorce sentence of a judge (as it removes it), while examples of an *eidetic-constitutive* rule (a statement constitutive of speech acts) would be the laws that establish such procedures and effects (marriage and divorce).

Conte [Conte 1981 p. 82-3] classifies those rules as conditions for their regulated entity: then, an *eidetic*-constitutive rule is a *necessary* condition and a *thetic*-constitutive rule is a *sufficient* condition. These two types of constitutive rules are different and this duality cannot be reduced or simplified, as argued in [Roversi 2012a].

2.2 Relative Necessities as Constitutive Statements

According to [Sartor 2006], "in many cases, when a legal text uses the words must, ought, may, or can, it does not express obligations or permissions in the sense discussed above, but it conveys a completely different notion, which is parasitical on the idea of a normative conditional."

Consider those cases in which, for example, the law says that a petition or contract must or must not be done in a certain way, or that it can or cannot contain certain terms. In these cases, the law establishes what we may call a relative necessity: it establishes that certain requirements have (or don't have) to be satisfied for a certain legal result to be obtained in a certain way. Often, the specification of this result is left to further normative propositions.

For instance, suppose that in a legal text, after stating that "whoever appropriates the property of others is going to be punished as a thief", it is stated that "the appropriator must have the intention of getting permanent possession of the stolen object". Clearly, there is no legal obligation to have such intention. The "must" signals a necessity, relative to the normative antecedent which determines subjection to punishment for theft. It indicates that the elements explicitly contained in the antecedent of the rule on theft are not really sufficient to produce the effect indicated in that rule: a further element, namely, the intention to appropriate, is also required to instantiate the precondition of the rule.

We may use the term *anankastic* – from the Greek word Ἀνάγκη, necessity – to characterise the (*anankastic*) propositions expressing this kind of necessity. As we may have normative propositions expressing *anankastic* connections, we may also have propositions denying (excluding) such connections. However, the basic and constant meaning of the *anankastic* must consist in what Sartor calls relative necessity, that corresponds to the combination of the following propositions (1) and (2):

(1) if A then B
(2) C must be realized for B to be determined according to (1)

Being considered equivalent to the following proposition (3):

(3) if A and C then B.

According to Conte [Conte 1985 p. 362], *anankastic*-constitutive rules *create* a (necessary) condition for their regulated entity, rather than being themselves a condition.

2.3 A Taxonomy of Constitutive Statements

The considerations of the previous paragraphs allow us to identify three types of constitutive rules, namely:

a. rules that directly constitute new entities and are sufficient conditions for the new entity to exist (*thetic-constitutive* rules);
b. rules that merely create the possibility of new entities and are necessary conditions for the new entity to exist (*eidetic-constitutive* rules);
c. rules that, without constituting new entities, introduce necessary conditions for them to exist (*anankastic-constitutive* rules).

Azzoni, scholar of Conte, completed this taxonomy adding *noetic-constitutive rules* (directly constituting new entities with necessary and sufficient conditions, e.g. the *Grundnorm* of a legal system), *metathetic-constitutive rules* (introducing a sufficient condition, e.g. the rule of the House of Lords Act 1999 that grants the right to membership to 90 hereditary peers) and *nomic-constitutive rules* (introducing a necessary and sufficient condition, e.g. the rule in Article 12 of the Constitution of Ireland saying that "The President is elected by direct vote of the people") [Azzoni 1986 p. 161]. Introducing *noetic* and *nomic* constitutive rules, however, exalts some critical points in the whole taxonomy [Roversi 2012b pp. 1289 ss.], which is outside of the scope of the present paper. Following is a table showing the six types of constitutive statements as identified in [Azzoni 1986]:

	Declarative speech act	Constitutive of speech act
Necessary	*Eidetic*	*Anankastic*
Sufficient	*Thetic*	*Metathetic*
Nec+Suf	*Noetic*	*Nomic*

This taxonomy suggests that, when dealing with constitutive rules, we need to ask two questions:

a. Is the posed condition necessary, sufficient, or both?
b. Does it create its effect directly or indirectly?

Answering these questions helps in defining the effects of constitutive rules[2]. Specifically, answering the first question helps to determine the logical formulation. In our research, the second question helps in distinguishing rules that have an effect on the legal source and the resulting Mercury rulebook from rules that have only effect within the single Mercury rules or the vocabulary.

In a more recent work [Biagioli 2009], conceived for rationalization of legislative drafting for automatization purposes, what we define so far as "constitutive statements" are classified

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[2] It is however necessary to be careful in the classification of constitutive rules because it can change depending on the perpective taken [Roversi 2012a, Hindriks 2005]: there are views where all rules are constitutive, or none of them are.

alternatively as constitutive rules or metarules. Constitutive rules and metarules expressed in legal texts are identified in [Biagioli 2009] in the following table:

Classes	Rules	Arguments
Constitutive Rules		
Definition	Term	definiendum, definiens
	Procedure	addressee, counterpart, action, object
Creation	Institution	addressee
	Organization	addressee
Attribution	Power	addressee, counterpart, activity, object
	Liability	addressee, counterpart, activity, object
	Status	addressee, object
Metarules		
Application	Inclusion	partition
	Exclusion	partition
Modification	Repeal	partition, position, out, in
	Insertion	partition, position, out, in
	Substitution	partition, position, out, in

2.4 Constitutive Rules for Compliance

In financial regulations, the work presented in this paper has so far identified five types of constitutive norms. We now list those types, indicating the way in which they specify the generic form "(*a*) counts as (*b*) in context (*c*)", introduced at the beginning of this Section:

i.   *Legal definitions*: these rules, often contained in the first article of regulations, specify the meaning (*a*) of specific terms (*b*) that are found throughout the regulative text or in a subpart of it (*c*). When terms specifically appear in *legal definitions*, the interpretation of their meaning cannot be arbitrary: every time they occur in the text, they must be understood as meaning the exact combination of words (or sentences) that appear in the definition (*a*). In this sense, legal definitions are creators of intermediate legal concepts, one of the ways to represent constitutivity [Ross 1957]. Legal definitions are thus *eidetic constitutive rules* in the distinction made by [Carcaterra 1979]: they are in fact called "stipulative definition" in [Guastini 1986]. They are thus *constitutive of speech act*, not *speech act* themselves: to have the latter we need also the rules that tell us what is the legal valence of that concept ([Roversi 2012b p. 1278]). When exhaustive (intensional definitions), legal definitions are actually *nomic* constitutive rules, as they do not only define what

something *is* (the definiens), but also what something *isn't* (the negation of the definiens). This is true only for intensional definitions, while extensional definitions are, strictly speaking, not *eidetic* rules [Roversi 2012b p.1278]. For our representation we treat all legal definitions as *declarative speech acts*, and therefore intensional definitions are *noetic* constitutive rules while extensional definitions are *thetic* constitutive rules.

ii. *Commencement rules*: these rules indicate a (directly or indirectly identified) time paramenter (*a*) as the starting point for the validity (*b*) of the regulation (or part of it) (*c*). Commencement rules are *eidetic* constitutive rules in the distinction made by [Carcaterra 1979], they are really descriptive, as they do not constitute alone the legal effect: to constitute it, in fact, we also need the rules that describe the legal valence of the concept of *validity*. For reasons of simplicity in our representation, however, in our work we treat commencement rules as *thetic* constitutive rules.

iii. *"Party-to-the-law" statements*: these rules extend the subjective or objective dimension (*b*) of the norm (*c*), by identifying new addressees (*a*) to it. Imposing a sufficient condition, and its effects being mediated (by the other conditions of the target rule) makes it a *metathetic* constitutive rule.

iv. *Relative necessities*: Rules restricting the subjective or objective dimension (*b*) of the norm (*c*), by identifying a limitation (*a*) to it. These rules, as explained in 2.2, pose new limit on the subjective or objective aspect of another rule. They are similar to legal definitions except they do not create a new intermediate concept. Because they impose a necessary condition and their effect is mediated (by the other conditions in the target rule) they are *anankastic* constitutive rules.

v.   *Amendments*: these rules modify the legal source (*c*), either by adding, removing, or modifying (*a*) the textual content (*b*). Some theorists don't classify these as constitutive rules but rather as metarules [Biagioli 2009]. According to Carcaterra (1974), repeal laws are definitely *thetic*, because their effect (the disappearance of the norm from the legal system) is immediate

With help from the classification of Carcaterra et al. explained in the previous section, we can group together these constitutive statements depending on their category, and model their content and effects consequently. We see two groups here, one composed by *commencement* and *amendment*, who are speech acts, immediately laying their effects either on a legal source or on single rule statements, and the second composed by *legal definition*, *relative necessity* and *party to the law*, which are rules constitutive of speech acts, and in fact they lay their effects mainly in the vocabulary section, and in single rule statements. While *legal definitions* pose necessary and sufficient conditions, and explicitly introduce an intermediate legal concept (autonomous vocabulary entry), *relative necessities* and *party-to-the-law statements* introduce necessary and sufficient conditions respectively, and do not explicitly create intermediate legal concepts. Their representation can happen within the rulebook

(by limiting or extending one or more factors of one or more conditions) or within the vocabulary (creating an intermediate concept or "convenience form" that applies within the context).

In order to support the lawyer's work on regulations, it is necessary to capture – and represent in the formal model – the semantics of those five types of constitutive rules. This activity complements the work on regulative rules in producing a complete representation of the semantics of a regulation.

3 LEGAL CONCEPT PATTERNS

The specific needs of the research presented in this paper suggested a rather ad-hoc approach in representing constitutive rules: the focus on compliance, and thus on regulative norms, means that the constitutive norms are rather ancillary norms, used to specify and extend the semantics of the regulation. For the same reason, the abstract model does not involve the representation of Hohfeldian powers and thus it is not possible to represent rules attributing powers.

The use of SBVR as a basis for the intermediate language, and the creation of the Regulatory Interpretation Methodology, gave the possibility of an ad-hoc solution where the templates for constitutive rules are specified in the methodology documentation in the style of a user manual, and their semantics can be specified within the vocabulary part, through general entries that constitute a template (thing₁ *counts as* thing₂ *in* context). The literature supports this approach for representing constitutive rules since it highlights the risks and limitations of a omni-comprehensive, generic approach to their representation (see previous Section).

The transformation of regulatory language into SBVR is aimed at providing the knowledge engineers with an unambiguous, understandable text while at the same time maintaining the implicit legal knowledge that is expressed by the original legal fragment. This, however, is not always possible: some legal concepts exist, that can be expressed only by a specific combination of words. Also, sometimes a certain combination of words has a specific legal meaning, corresponding to a precise legal figure. In order to store the semantics of these legal figures in the knowledge base we need specific models which, in turn, take into account the limitations coming from the targeted formal language backing the knowledge base. In all these cases, the risk exists that aspects of the legal figure are lost in the passage from the SME to the STE.

For example, saying that "law applies to something" doesn't entail that the law performs some particular action: instead, as a *party to the law* statement, it entails that for the entity or activity "something" new obligations apply. This, in turn, means that the entity or activity "something" must comply to the obligations of the "law". In the computable model, the rule should therefore be represented as "it is necessary that something *counts as* addressee *in* law", but can an STE independently achieve such representation when he reads the original "law applies to something"?

A second example is the sentence "in the present law, a handshake has the value of an agreement" which corresponds to the constitutive statement "handshake counts as agreement in Law X". Being an extensional *legal definition*, that statement introduces a sufficient condition ("it is necessary that handshake *counts as* agreement *in* Law X") but not also a necessary condition ("it is impossible that [something that is] not [a] handshake counts as agreement in Law X"), which would be the case in presence of an intensional definition such as "A meeting of minds with the understanding and acceptance of reciprocal legal rights and duties as to particular actions or obligations counts as agreement in Italian Law". Should the STE know legal definitions, their status of thetic-constitutive rules, and the distinction between extensional and intensional definitions, in order to correctly translate the structured English into the formal model?

Or should instead the SME be the one in charge of this identification, and deliver to the STE not only the sentence in structured English, but also an indication in the Terminological Dictionary that the sentence follows a specific template with specific semantics?

To represent sentences and forms with specific legal meaning, we thus introduce Legal Concept Patterns. In literature they are known as "technical relations" [Francesconi 2014, Biagioli 2009] and "logical relations" (e.g. Hohfeldian relations). In the present research, Legal Concept Patterns are defined at the Mercury meta-layer as SBVR General Concepts.

Legal Concept Patterns are created in the form of a verb concept with generic verb concept roles (e. g. the Legal Definition pattern "definiens counts as definiendum in context"). When the SME meets a rule that follows a legal concept pattern (e.g. "handshake *counts as* agreement *in* Law X"), a verb concept entry is created and the attribute "general form" is added, recalling the pattern of the legal definition. The roles played by the verb concept roles in the pattern definition are important, as they determine the classification of the instances found in the single rules: e.g. the Legal Definition pattern "definiens counts as definiendum in context" tells the STE where to locate the information related to "definiens", "definiendum" and "context" in the rule "handshake *counts as* agreement *in* Law X" (handshake is
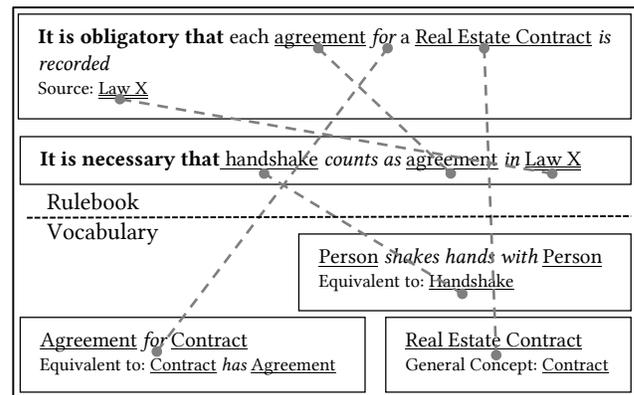
Figure 1. Example of an implicit ontology built using SBVR. In the example, an occurrence of the verb concept "Person shakes hands with person" is implicitly inferred as being subject to duty of recording when it is referred to a Real Estate Contract.

the definiens, <u>agreement</u> is the definiendum, and <u>Law X</u> is the context). It is also possible to extend the basic patterns into more complex forms by further specifying its verb concept roles, even introducing verb concepts as roles (e.g. adding the vocabulary entry "<u>person1</u> *shakes hands with* <u>person2</u>" with the attribute "general concept: <u>handshake</u>" results in the more complex pattern "<u>person1</u> *shakes hands with* <u>person2</u> *counts as* <u>agreement</u> *in* <u>Law X</u>").

Generally, Legal Concept Patterns enhance the interaction between SME and STE during the iterative process of translation by allowing both users to refer to concepts that are defined both in their legal valence (for the SME) and in their formal model (for the STE). When a STE finds "<u>handshake</u> *counts as* <u>agreement</u>" and doesn't know how to model it in the knowledge base, the STE can ask the SME to point at a Legal Concept Pattern to specify the intended legal meaning. The SME would refer e.g. to the *legal definition* pattern that indicates "<u>definiens</u> *counts as* <u>definiendum</u> *in* <u>context</u>", and this would at the same time specify the role of the terms handshake and agreement in the formal model, for the STE, and remind the SME that in Mercury the context of legal definitions must be explicitly stated. Legal Concept Patterns thus assist SMEs in conveying legal content in a way that is understandable by the STE, without abandoning the legal language constructs that express a specific meaning. The resulting translation is then readable by both STEs (who understand the logical model) and SMEs (who understand the legal model).

In Mercury, Legal Concept Patterns can be used for three purposes:

    a.   When **defined in the protocol**, to help representing the most important legal figures. A number of LCPs are introduced in Mercury documentation; those can be used to express common legal concepts. Their use however is not compulsory: the SME can decide to ignore them for their first iterations, relying on them only to disambiguate resulting vocabulary and rules when required by the STE (see point *c*).

    b.   When **defined by SMEs within their SBVR transformation**, to represent recurring (also non-legal) patterns easily (see business definitions and convenience forms in Section 4.2.1).

    c.   When **used within SME-STE iterations**, to disambiguate concepts and keep track of the incremental process. Because legal concept patterns are documented both in their legal model (for the SME to understand) and in their formal model (for the STE to understand), they are the common ground that allows the feedback between the two and the iterative refinement of the knowledge base.

There is another advantage in using Legal Concepts Patterns: by combining the attributes "general concept", "synonymous (form)", and verb concept roles, the SMEs effectively build taxonomies and ontologies covering portions of the knowledge base (see Figure 1). Those ontologies are built independently, but can also be linked together (e.g. through a common term or pattern). In this way, the burden of enriching the ontology is
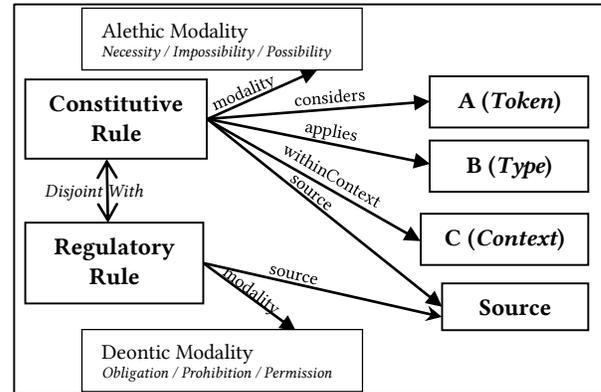

Figure 2: Ontology of a constitutive rule.

partially lifted from the computer scientist and now partially rests on the shoulders of SMEs, which can successfully express modules of legal ontology, leaving to the computer scientist only the task of merging them.

4   LEGAL CONCEPT PATTERNS FOR CONSTITUTIVE RULES

Mercury models constitutive rules according to the doctrine explained in Section 2, not explicitly (as this would be too abstract for an SME to use) but rather modelling single types of constitutive rules as Legal Concept Patterns. In this way, the SME easily understands what template to use for representing a specific type of constitutive rule, without having to worry about the type of constitutive rules being represented (*eidetic*, *thetic anankastic*, or *metathetic*).

Following is the list of Legal Concept Patterns currently available for constitutive rules. For each of them, we show the syntax that these patterns normally use in legal language, followed by the equivalent syntax that we use in our research to capture those statement in a uniform way:

Constitutive Rule	It is necessary that <u>thing$_1$</u> *counts as* <u>thing$_2$</u> *in* <u>context</u>
Legal Definition	<u>definiendum</u> *means* <u>definiens</u> = It is necessary that <u>definiens</u> *counts as* <u>definiendum</u> *in* <u>context</u> It is impossible that not <u>definiendum</u> *counts as* <u>definiens</u> *in* <u>context</u>
Party to the Law	<u>law</u> *applies to* <u>Thing</u> Synonymous Form: It is obligatory that <u>thing</u> *complies with* <u>law</u> = It is necessary that <u>thing</u> *counts as* <u>addressee</u> in <u>context</u>

Relative Necessity	Thing *must be* qualified
	=
	It is impossible that not qualified *counts as* Thing *in* context
Commencement	law *comes into force on* date
	=
	It is necessary that date *counts as* start date *in* rule *or* source
Amendment	Old text *is* repealed *in* context
	New text *is* added *in* context
	old text *is replaced by* new text *in* context
	=
	It is necessary that new text *counts as* old text *in* context

4.1 General Properties of a Constitutive Rule

In the rest of this section we are going to first present the attributes that are common to constitutive rules, and then introduce the five legal concept patterns that specify those attributes for the five types of constitutive rules identified in the table above, with an indication of the meaning of the variables and on the effect that these constitutive rules have on the regulative rules contained within the Context.

All Constitutive Rules share five main attributes:

a. Modality
b. Source
c. Token
d. Type
e. Context

Every Constitutive Statement has exactly one *constitutive modality* of three possible values (possibility, impossibility, necessity). This property indicates the modality in which the original rule entry in the rulebook has been modelled by the SME: a necessity statement can in fact be transformed into an equivalent impossibility statement (and vice versa), but it still makes sense, for authoring purposes, to specify which modality was originally employed. The modality also identifies necessary and/or sufficient conditions: sufficient (*eidetic*) conditions are in fact represented as necessities, while necessary (*thetic*) conditions are represented as impossibilities of the opposite. For example, the necessary condition of a legal definition is "it is necessary that definiens counts as definiendum in context", while its necessary condition is "it is impossible that not definiendum counts as definiens in context".

Source is a general element of Mercury, and LegalDocML [OASIS 2015] is used for its markup.

Token and *type* change depending on the LCP, and it is not possible to define their semantics (and the semantics of "counts as") at a generic level [Grossi et al. 2006]. The classification proposed by the legal theory and presented in Section 2 is useful

in this phase to lead the design choices. While the dichotomy thetic/ipothetic has not been given too much importance (the distinction itself being criticized also in the theory, [Roversi 2012b p.1291]), the distinction of the type of condition being posed (necessary or sufficient) played a major role in distinguishing and modelling those rules.

Finally, every constitutive statement has a *context*. In legal theory, the context of a constitutive rule is used to identify the limits within which the constitutive effects of the rule take place. The concept of context is used in Mercury in a slightly different way: it represents the domains where the rule is relevant. This difference becomes evident when dealing with commencement rules (see below): while in the legal theory the context of a commencement rule is the entire legal system (jurisdiction), in Mercury it is used to indicate which legal fragments have their coming into force date affected by the commencement rule. Context can be specified in terms of themes, activities, rulebooks, or sources. For legal rules, the context must include a legal source. The context determines which regulative rules are affected by the constitutive rule.

4.2 The LCP for Legal Definitions

Legal definitions are eidetic constitutive rule, because they create the *possibility* of a *speech act*. In legal theory, they are called *constitutive definitions* and reduced to a thetic-constitutive rule and an agreed definition. Semantic Web frameworks treat them as *technical relations* [Francesconi 2014]. In our model we treat extensional definitions as sufficient conditions and intensional definitions as necessary and sufficient conditions. In this latter case we need two rules to represent this condition: the first stating the necessity of it and the second stating the impossibility of the opposite (see Section 4.1).

Mercury allows to capture legal definitions by using the rule related to a vocabulary entry (the *definiendum*). Token/Type are thus *definiens* and *definiendum*, respectively. Context is the context of the definition (e.g. the act that contains it). For regulative rules whose source is within such context, the *definiens* and *definiendum* are equivalent: the *definiens* can be replaced with the *definiendum*, and vice versa.

Examples:

a. (*defining a noun concept*) It is necessary that trade *has value* more than 10k USD *counts as* Relevant Trade *in* Code of International Trade
b. (*defining a verb concept*) It is necessary that person *helps* person that *commit* crime *counts as* person *participates in* crime *in* Italian Criminal Code

4.2.1 Legal Definitions vs. business definitions and convenience forms

When modelling the representation of concept definitions, it is important to distinguish *legal definitions* (explicitly introduced by legal texts) from *business definitions*, created within the company or industry, and *convenience forms*, created by the SMEs to simplify the structure of legal sentences. While the concepts of legal definition and business definition are easy to grasp, that of convenience form needs an explaination.
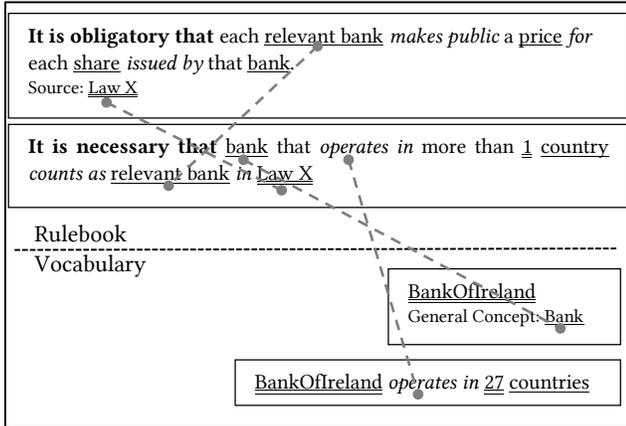
Figure 3: Example of the relationship between an operative rule and the legal definition of a noun concept. Please note that the verb concept "<u>Bank of Ireland</u> *operates in* <u>27</u> <u>countries</u>" does not result from an interpretation of the regulatory text but rather from internal company data.

In regulatory texts, it is common that parts of text are repeated several times. For example, locutions such as "Market operators and investment firms operating a trading venue" and "bonds, structured finance products, emission allowances and derivatives traded on a trading venue" are found several times in the MiFIR[3] regulatory text. To make the work less repetitive, and to increase readability of the interpreted rules in the Mercury-SE language, the SME can use convenience forms for these locutions (e.g. "trading operator" for the first, and "traded instrument" for the second) in the rulebook, and define them in the terminological dictionary. As a result, during the process of interpretation the SME divides the regulatory statement into one requirement (regulatory rule, a deontic statement in the rulebook) and one or more definitions (constitutive rule, a structural statement in the terminological dictionary). This process is also very valuable towards automatizing some phases of the translation: once defined, those forms can in fact be automatically detected by NLP tools, thus easing the process of writing Mercury rulebooks.

Please note that, from a legal philosophical point of view, legal definitions are themselves convenience forms [Ross 1957, Roversi 2012a p. 112], only with an added authoritative value derived from the legal system they are part of.

In Mercury the distinction between legal definitions on one side, and business definitions and convenience forms on the other, is explicitly stated in the rulebook, as every rule is either a legal rule (legal definition) or a business rule (a business definition or a convenience form). Further distinction between these two is to be found in the context: while business rules are valid within a certain class of actions (e.g. pertaining to a specific business activity or industry, or to a specific company), convenience forms

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[3] Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012.

are valid within a certain rulebook (because they are subjective, ad-hoc solutions for the simplification of the job at hand).

4.3 The LCP for Commencement Rules

Commencement rules are thetic-constitutive rules, as they directly modify the validity of the norms contained in the legal source indicated as context. Token is a date, while Type is either a start or an end date of validity. Context is the legal source whose efficacy times are affected. Regulative rules within the context have their applicability restricted by the start and/or end date.

Examples:

a. (*start date*) MIFID II Comes into force on January 10th, 2014

   It is necessary that <u>January 10th, 2014</u> *counts as* <u>efficacy start</u> *in* <u>MIFID II</u>

b. (*end date*) MIFID I Stops being into force on January 10th 2014

   It is necessary that <u>January 10th, 2014</u> *counts as* <u>efficacy end</u> *in* <u>MIFID I</u>

c. (*start and end date*) Article 13 is in force from January 1st, 2014 to December 31st, 2014

   It is necessary that <u>January 1st, 2014</u> *counts as* <u>efficacy start</u> *in* <u>Article 13</u>
   It is necessary that <u>December 31st, 2014</u> *counts as* <u>efficacy end</u> *in* <u>Article 13</u>

d. (*end and start date*) Article 13 is suspended from June 1st 2014 to June 15th 2014

   It is necessary that <u>June 1st, 2014</u> *counts as* <u>efficacy end</u> *in* <u>Article 13</u>
   It is necessary that <u>June 14th, 2014</u> *counts as* <u>efficacy start</u> *in* <u>Article 13</u>
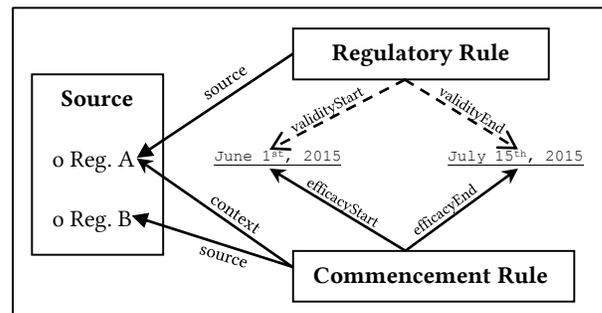
Figure 4: Ontological model of the relationship between a regulatory rule and a commencement rule. The dashed properties of the regulatory rule are inferred.

4.4 The LCP for Party to the Law Statements

Party-to-the-law statements are metathetic-consitutive rules, as they create the possibility of "new speech acts" by specifying a new category of addressees for an existing speech act. Token is one (or more) person(s), Type is "the addressee of a norm" or "the co-responsible of the breach" or other similar legal liability figures. Context is the norm or legal text. Regulative rules within the context have now potentially new addressees.

Examples:

a. (*context as a legal source*) It is necessary that <u>Person</u> that *participates in* <u>crime</u> *counts as* <u>subject to the law</u> *in* <u>Article 13</u>

b. (*context as an interpreted norm*) It is necessary that <u>Person</u> that *participates in* <u>crime</u> *counts as* <u>subject to the law</u> *in* <u>Obligation_L_143</u>

4.5 The LCP for Relative Necessities

Relative necessities are the converse of the Party to the law statements, as they identify necessary conditions for the regulative rule. On this aspect, they are anankastic-constitutive rules.

Token is the new requirement. Type is the target condition contained in the context. Context is the target regulatory statement(s) or legal source. Regulatory statements within the context have their condition extended with the new requirements.

Because they are necessary conditions, they are better expressed as impossibility statements, stating the impossibility of negating the condition.

Example:

a. It is prohibited that <u>person</u> *steals* <u>object</u>

b. It is impossible that <u>person</u> not *has* <u>intention</u> *to keep* <u>object</u> *counts as* <u>person</u> *in* <u>Rule1</u>

4.6 The LCP for Amendment

Amendments are thetic-constitutive rules, as they immediately create new states of affair (insert/remove/modify regulation from legal system). Token is the new text, Type is the old text, Context is the target location as a structural element (e.g. article, clause). Regulative rules within the context are replaced/repealed.

Examples:

a. (*substitution*) It is necessary that <u>"10"</u> *counts as* <u>"15"</u> *in* <u>Article 13 charposition 134-135</u>.

b. (*new text*) It is necessary that "*, as specified in Article 13bis*" *counts as* <u>new text</u> *in* Article 13 charposition 145.

c. (*repeal*) It is necessary that <u>repeal</u> counts as "with the exception of relevant transactions" in Article 13 charposition 180-227.

4.7 Possibility Statements

Mercury uses SBVR possibility statements for representing exceptions [Ceci et al. 2016b]. They can also be used for representing *eidetic-* (or, in some cases, *metathetic-*) constitutive rules or rules that attribute Hohfeldian powers ("ESMA will publish technical standards on what constitutes a prevalent market condition"): because these rules introduce *events* that may or may not happen, the purpose is not to trigger automatic conclusions out of those statements, but only to record the eventuality of them to happen and the legal relevance attributed by the law to such administrative acts. Because the scope of Mercury is regulatory compliance, this information is only marginally relevant and thus needs to be recorded but not semantically enriched. From a theoretical point of view, such statements are constitutive to the extent to which they attribute a new power (as noted previously, Hohfeldian powers are not represented in Mercury). In all other cases, e.g. when they foresee the publishing of some documentation, these statements have no constitutive power as they are statements *de jure condendo* and not *de jure condens* [Carcaterra 1985 p.19, Roversi 2012b p.1273].

5 CONCLUSIONS

The paper presented some results from applied research for compliance on the representation of alethic statements in an intermediate language that is both human and machine readable. The solution applies notions from philosophy of language and philosophy of law to AI & Law, identifying different types of constitutive statements.

The paper claims that, in order to capture the different legal effects of these statements (i.e. the conditions posed by these rules), we need to represent them through distinct models, with different semantics but a similar syntax, emanation of a general "constitutive rule" pattern.

Legal Concept Patterns are thus conceived to fill the gap between the SME and STE in the process of translating the regulatory text into machine-readable information, a process that is collaborative and iterative. This process (and thus the LCP solution) is part of the Regulatory Interpretation Methodology, that guides the translation process.

Applications of Mercury and the RIM include: building a knowledge base and exploring it; modelling the effects of alethic statements in the document metadata (for metarules) or Mercury rulebook/vocabulary (for constitutive rules); mapping the knowledge to FIRO (Financial Industry Regulatory Ontology, [Al-Khalil et al. 2016]) for reasoning and queries; or mapping to a (defeasible) rule language.

In FIRO, reasoning capabilities rely on axiomatization of rules through conditions and factors. The model for regulative rules is explained in [Al-Khalil et al. 2016], while the model for constitutive rules is currently under construction.

The next step for the research is to find a logical formulation for the types of constitutive statement, similarly to what is done in [Ceci et al. 2016b] for regulative rules. This will allow the definition of the logical expressivity necessary to represent them in a rule language. Outside of constitutive rules, but towards the same goal of logical formalization, the attention will focus on the formalization of keywords (especially logical operators and quantifiers). The research is also investigating the application of NLP techniques to partially automatize the translation process,

especially of the most repetitive tasks, thus making the process easier.

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REFERENCES

[1] Abi-Lahoud, E., O'Brien, L. and Butler, T. (2014) 'On the Road to Regulatory Ontologies: Interpreting Regulations with SBVR' In: In, AI Approaches to the Complexity of Legal Systems, Lecture Notes in Artificial Intelligence. Berlin, Heidelberg: Springer-Verlag.

[2] Al Khalil, F., Ceci, M., Yapa, K. and O'Brien, L. (2016) July. SBVR to OWL 2 Mapping in the Domain of Legal Rules. In International Symposium on Rules and Rule Markup Languages for the Semantic Web (pp. 258-266). Springer International Publishing.

[3] Austin J. L. (1976), How to do Things with Words. 2nd Edition, Oxford, Oxford University Press (1° ed. 1962).

[4] Azzoni G. (1986), Condizioni costitutive. Rivista internazionale di filosofia del diritto, 63, pp. 160-91.

[5] Biagioli, C. (2009). Modelli Funzionali delle Leggi: Verso Testi Legislativi Autoesplicativi. European Press Academic Publishing (2009).

[6] Biagioli C., Sartor G. (1993). "egole e atti linguistici nel discorso normativo. Studi per un modello informatico-giuridico. In: Nuovi modelli formali del diritto. Il ragionamento giuridico nell'informatica e nell'intelligenza artificiale. CLUESP

[7] Boella, Guido, and Leendert WN van der Torre (2004). "Regulative and Constitutive Norms in Normative Multiagent Systems." KR 4: 255-265.

[8] Boer, A., Winkels, R., & Vitali, F. (2008). Metalex xml and the legal knowledge interchange format. In Computable models of the law (pp. 21-41). Springer Berlin Heidelberg.

[9] Carcaterra G. (1974), Le norme costitutive, Milan.

[10] Carcaterra G. (1979), La forza costitutiva delle norme, Rome.

[11] Carcaterra G. (1985), Le regole del Circolo Pickwick. Nuova civiltà delle macchine, 3, pp. 16-23.

[12] Ceci, M., Al Khalil, F. and O'Brien, L., (2016a) Making Sense of Regulations with SBVR. RuleML 2016 Challenge, Doctoral Consortium and Industry Track hosted by the 10th International Web Rule Symposium (RuleML 2016).

[13] Ceci, M., Al Khalil, F., O'Brien, L., and Butler T. (2016b) Requirements for an Intermediate Language Bridging Legal Text and Rules. MIREL 2016 workshop, held within JURIX 2016, Nice, France, December 13th, 2016.

[14] Conte A. G. (1981), Konstitutive Regeln und Deontik, in E. S. Morscher (ed.), Ethik. Akten des Fünften internationalen Wittgenstein-Symposiums (Kirchberg am Wechsel, 1980), 82-6, Wien, Hölder-Pichler-Tempsky.

[15] Conte A. G. (1985), Materiali per una tipologia delle regole. Materiali per una storia della cultura giuridica, 15, pp. 345-68.

[16] Conte A. G. (1995), Regola costitutiva in Wittgenstein, in A. G. Conte, Filosofia del linguaggio normativo. I, 237-54, Torino (1° ed. 1981).

[17] Francesconi, E. (2014). A Description Logics Framework for Advanced Accessing and Reasoning over Normative provisions, Artif. Intell. Law 22:291-311, Springer.

[18] Gordon T.F., Governatori G., Rotolo A. (2009). Rules and Norms: Requirements for Rule Interchange Languages in the Legal Domain, in: A. Paschke, G. Governatori, J. Hall, eds., Rule Interchange and Applications, Berlin, Springer, 2009, pp. 282-296

[19] Grossi, D., Meyer, J. J. C., & Dignum, F. (2005). Modal logic investigations in the semantics of counts-as. In Proceedings of the Tenth international Conference on Artificial Intelligence and law (ICAIL '05), pages 1-9. ACM, June.

[20] Grossi, D., Meyer, J. J. C., & Dignum, F. (2006). Classificatory aspects of counts-as: An analysis in modal logic. Journal of Logic and Computation, 16(5), 613-643.

[21] Grossi, D., Jones, A.J.I. (2013). Constitutive Norms and Counts-As Conditionals, in: Gabbay, D., Horty, J., Parent, X., van der Meyden, R., van der Torre, L. (eds.): Handbook of Deontic Logic and Normative Systems, College Publications, Milton Keynes, 2013.

[22] Guastini R. (1986), Six Concepts of "Constitutive Rule", In T. Eckhoff, L. M. Friedman, e J. Uusitalo (a cura di), Vernunft und Erfahrung im Rechtsdenken der Gegenwart (Reason and Experience in Contemporary Legal Thought: Proceedings of the 11th World Congress of IVR, Helsinki 1983), 261-9, Rechtstheorie Beiheft 10.

[23] Hindriks F. A. (2005), Rules & Institutions, Alblasserdam, Haveka BV.

[24] Hohfeld, W.N. (1913). Some fundamental legal conceptions as applied in judicial reasoning. Yale Law Journal, 16-59.

[25] OASIS, Akoma Ntoso Version 1.0 Part 1: XML Vocabulary, Committee Specification Draft 01 / Public Review Draft 01, Standards Track Work Product, 14 January 2015

[26] Object Management Group, Semantics of Business Vocabulary and Rules, May 2015, http://www.omb.org/spec/SBVR/1.3/

[27] Palmirani, M., Ceci, M., Radicioni, D., & Mazzei, A. (2011). FrameNet model of the suspension of norms. In Proceedings of the 13th International Conference on Artificial Intelligence and Law (pp. 189-193). ACM.

[28] Rawls, J. (1955). Two concepts of rules. The Philosophical Review, 64, 3–32. doi:10.2307/2182230.

[29] Ross, Alf. "Tû-Tû." Harvard Law Review 70, no. 5 (1957): 812-25. doi:10.2307/1337744.

[30] Roversi, C. (2012a) Costituire: Uno Studio di Ontologia Giuridica, Giappichelli, Turin.

[31] Roversi, C., (2012b). Sulla Duplicità del Costitutivo, in: RIFD, Quaderni della Rivista Internazionale di Filosofia del Diritto, 8:1251-1295, Giuffrè, Milan.

[32] Sartor, G. (2006). "Fundamental Legal Concepts: A Formal and Teleological Characterisation". In: Artificial Intelligence and Law 21 (2006), pp. 101–42.

[33] Searle, J. R. (1969). Speech acts: An essay in the philosophy of language. Cambridge: Cambridge University Press.

[34] Searle J. R. (1979), A Taxonomy of Illocutionary Acts, in J. R. Searle, Expression and Meaning. Studies in the Theory of Speech Acts, 1-29, Cambridge, Cambridge University Press (1° ed. 1975).

[35] Van Haarst, R. (2013): SBVR Made Easy. ConceptualHeaven.