# Legal knowledge based systems
## JURIX 93
### Intelligent Tools for Drafting Legislation,
### Computer - Supported Comparison of Law

The Foundation for Legal Knowledge Systems
Editors:
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# NORM FRAMES IN THE REPRESENTATION OF LAWS

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*Summary*

*In this paper we introduce an intermediate frame language for the representation of legal knowledge. The frame language is based on the concept of a norm as a coherent entity in the legal domain. The aim of this article is to show that the norm-frame representation method offers a fertile approach to the representation of legal knowledge. Moreover, this contribution also treats the possibility to use the ideas behind norm frames in the drafting of legislation.*

## 1. Introduction

Law is generally accepted as an instrument for social guidance, and, as such, law plays an important part in the control of everyday life. The function of law entails the communication of general rules, standards of behaviour and principles that subjects of law have to comply with [Hart, 1961]. These general rules, standards of behaviour and principles are often referred to as *norms*.

Communicating norms requires the use of language. The norm authority promulgates or makes known by means of signs to the norm subjects what he wants them to do or forbear. The signs which are used to announce the norm, are what has been termed the *norm formulation*. It is important not to confuse the norm itself with the norm formulation [Von Wright, 1983] since the two are not identical.

A norm comprises more than what can be read from its formulation. Only *part of* a norm can be read from the texts of law. The common sense of the reader as well as other knowledge is called upon to supplement what can be read from the norm formulation; in order to have normative sentences make sense, the reader places them in a wider context.

During the past years the 'isomorphic' approach to modelling legal knowledge has caught on [*e.g.*, Bench-Capon and Coenen, 1992; Prakken, 1993]. In these direct correspondence approaches to the modelling of legal knowledge, normative sentences are not placed in their context; the gap between norm formulation and norm is not bridged. An opportunity to reconstruct the original norm is traded in for reasons of efficiency or simplicity [*e.g.*, Bench-Capon and Coenen, 1991; Routen and Bench-Capon, 1991]. For this reason, we believe that, though these approaches do offer some advantages, they do not do justice to the richness of the legal domain. Consequently, we turn our attention to *indirect* modelling. Indirect modelling makes use of an intermediate language between legal texts and formal representations of these texts. The intermediate (conceptual) language has to comply with several constraints. First, it should allow for the comprehensive representation of norms, *i.e.* we aim for a model of a *complete* norm. Second, a (heuristic) procedure for the 'translation' of norm formulations into the intermediate language must be available to legal professionals. Third, the intermediate language should allow for the formalization of standard legal reasoning methods and procedures, and, finally, the language must facilitate maintenance. In this paper, we concentrate on the first and the second constraint.

Building on the work of legal theorists such as Brouwer, Hart, Kelsen, Ross, Ruiter and Von Wright, we propose the use of *norm frames* as a plausible method for the conceptual representation of legal knowledge. A norm frame is a theoretical model of a 'complete' norm. Such a model cannot only be of help in the representation of *existing* legislation, but also in the drafting of *new* legislation.

Before elaborating on norm frames, we must build the foundation on which the use of norm frames is based. To this end, we give a short introduction to the drafting of legislation, the process that connects norms and their precipitation in the form of language (section 2). In the next section, the idea of a norm frame is introduced (section 3), the usefulness of the idea of a norm frame for drafting legislation is discussed. In section 4 we introduce some rules which guide the translation from statute texts into norm frames and we illustrate the possibility to use norm frames with the help of an example from the Dutch Penal Code. A short example of reasoning with norm frames is presented in section 5. In section 6 we draw some conclusions.

## 2 . From norm to norm formulation: legislative drafting

To understand the relation between a norm and its formulation in, for instance, an article in a statute, it is important to gain some insight in the process that leads to the precipitation of norms in a written form: this is the process of legislative drafting.

The drafting of legislation starts with a set of instructions to the draftsman. These instructions hold the objectives or goals the legislator wishes to accomplish with, for instance, a statute rather than detailed information about statutory provisions [Thornton, 1987]; the instructions contain information about standards of behaviour or *norms* the legislator hopes to communicate and enforce. Legislation forms the reflection of these norms. The normative sentences found in statute laws are the counterparts of the norms they are meant to express.

Ideally, the product of the drafting process should reflect the intended norms fully and exactly. Unfortunately, this is not always the case. First, for reasons of efficiency, it is not possible to record all information relevant to a legal norm (*e.g.*, common-sense and real-world knowledge). Second, a statutory provision derives part of its meaning from its context. This context is usually not represented in a statute. Third, the meaning of legislation are often veiled by complicated formulations and the necessity to use terms for *classes* instead of *instances*.

In the direct (isomorphic) modelling of legal knowledge this deficiencies are not made up for. By attempting to reconstruct the 'original' norm we can solve some of the problems; more attention is spent on incompleteness, illegibility and unclarity of statute texts, and on the relations between norm elements.

As a first step in the process, we must define which elements make up the original norm, or, in other words, we must name the elements of a complete norm. Not all elements of a complete norm can be reconstructed from, for instance, one article in a statute; norms are often represented in different segments. Not only statutes, but other sources of legal knowledge, such as case law, are important in this respect as well.

Though the focus of attention of this paper is on the *representation* of statute texts in norm frames, we think that the concept of a norm can also play an important role in the drafting process [*cf*. Ruiter, 1987]: in principle it should be possible to read every element of a norm from the text that forms the reflection of the norm. This implies that a norm frame can be an important graduator in the determination of the information value and complexity of a drafted piece of legislation. If the norm formulation of a complex norm leaves much information to be guessed, it probably does not live up to its task. With respect to the complexity of a norm formulation we remark the following: if the translation from norm formulation to norm frame (with the help of the heuristics we introduce in section 4) yields a large number of frames, this could be an indication that the level of complexity of the formulation is to high.

## 3 . The concept of a (complete) norm

A norm is a statement to the effect that something ought to or may or can be done [*cf*. Von Wright, 1963, 1983]. We distinguish between norms of conduct and norms of

competence. Rules that describe how to act are denoted as *norms of conduct*, rules that guide the creation of new valid and binding norms are called *norms of competence*. An instance of a norm of conduct is the norm prohibiting theft. An instance of a norm of competence is the norm empowering the judicature to administer sanctions in case of a criminal offence such as theft (this is a norm of competence conferring the power to decide on an appropriate sanction; in short a 'sanction norm').

To fulfil its function, a norm must convey a certain amount of information. Instances of relevant information in this context are: who ought to do something?, what should he do?, *etc.* A norm that addresses *all* relevant questions is a *complete* norm. From literature we can learn what are the questions that a complete norm should answer, or, stated differently, which elements constitute a complete norm [*e.g.,* Hart, 1961; Von Wright, 1963, 1983; Ross, 1958, 1968; Kelsen, 1979; Brouwer, 1990].

In table 1 we find a presentation of the elements (slots) of a norm structure. The first three slots, the catch word, the promulgation and the norm goal, are reserved for auxiliary elements. The elements contained in these slots do not form an essential part of the norm; they are used to indicate the name of the norm, the source of the norm, and the idea (reason) behind the norm respectively. The conditions of application, the subject, the legal modality and the object constitute the *norm-kernel* [*cf.* Von Wright, 1963, Brouwer, 1990]. These elements determine the nature of the norm.
The conditions of application (the fourth slot) establish the circumstances under which a norm is applicable. The subject of a norm (the fifth slot) is the person or institution to whom the norm is addressed. The legal modality (the sixth slot) determines the function of a norm [*cf.* Kelsen, 1979]; a norm is either an obligation (a command or a prohibition; *ought* and *ought not* respectively), a permission (*may*), or a power-conferring norm (*can*). Power-conferring norms take a special place since they grant the power to create new valid and binding norms or rules through the performance of *actes juridiques* [Ross, 1968]. Finally, the norm object is typified in the seventh slot. The norm object is described in more detail in table 2 (the description of the action).

| | Norm type (norm of conduct or norm of competence) | |
|---|---|---|
| | **Element** | **Typification** |
| 1 | Catch word | Term used as a point of reference for the norm, preferably a legal-technical term. |
| 2 | Promulgation | Source of the norm-kernel and the norm authority |
| 3 | Norm goal | State or effect desired by the norm authority (wish of the norm authority). |
| 4 | Conditions of application | Uncertain circumstances under which the norm is applicable; they do not form an integral part of the description of the act. |
| 5 | Subject | Addressee of the norm. |
| 6 | Legal modality | *Ought*, *ought not*, *may* or *can* |
| 7 | Object | Typification of the act which falls under the scope of the legal modality. Used as a point of reference for the connection with the sub-frame for the description of an action. |

**Table 1:** a norm frame

The method for the description of an action has been borrowed from Rescher [1967; *cf.* Loth, 1988]. The first (7.1) and the seventh slot (7.7), the 'final state', have been added to Rescher's description. Every slot but the first is used to specify a different aspect of an act. The typification of these aspects forms a guide in the process of the completion of the sub-frame for the description of the action. As we will see in the next section, the aspects of action play an important part in the conversion process that leads from norm formulation to norm frame.

| Description of the action | | |
|---|---|---|
| | **Element** | **Typification** |
| 7.1 | Object | Typification of the act, used as a point of reference. (Source of the description of the act.) |
| 7.2 | Agent | An agent can be an individual, a set of individuals, an aggregate or a conglomerate. The agent and the norm subject denote the same (group of) person(s). |
| 7.3 | Act-type | Both 'basic acts' and acts that have been specified elsewhere can be used in this slot. |
| 7.4 | Modality of Action | |
| | b) Modality of means | The material objects used in the act, as well as the sub-acts that contribute to the 'main' act can be specified here (*e.g.*, with a gun, killing a man by strangling him). |
| | a) Modality of manner | In this slot the way in which the material objects have been used or the sub-acts have been performed (*e.g.*, aggressively) is specified. |
| 7.5 | Setting of Action | |
| | a) Temporal aspect | Only absolute time specifications can be used in this slot (*e.g.*, on the 1st of august, on sundays, at night, *etc.*, but not: during a fire, after the king dies, *etc.*). |
| | b) Spatial aspect | This slot is reserved for a description of the location of the act (*e.g.*, in the Netherlands, in Leiden, on a train) |
| | c) Circumstantial aspect | This slot is reserved for circumstances under which the act took place (*e.g.,* during a fire, during a war). |
| 7.6 | Rationale of Action | |
| | a) Causality | A specification of the reason(s) to perform an action (*e.g.*, revenge) is contained in this slot. |
| | b) Finality | Here the goal visualised by the agent (*e.g.,* with a view to unlawfully appropriate an object) is specified. |
| | c) Intentionality | The state of mind of the agent (*e.g.*, insanity) can be described here. |
| 7.7 | Final state | Description of the end state in which the act has resulted (*e.g.*, the death of the victim). |

**Table 2:** The description of an action

The first slot of the sub-frame for the description of the action (slot 7.1) is used to name the act. This slot provides the connection with the norm frame. The second and the third slot are, respectively, the agent and the act-type. As instantiations of slot 7.3 both 'basic acts' (acts that are not specified elsewhere in more detail) and acts that have been specified somewhere else can be used. The rest of the slots add to the description of the action. We refer to their typification in table 2 and to the example in section 4 for more details about (the filling in of) these slots.

A norm frame and the sub-frame for the description of the action always comprise a constant number of slots. Slots irrelevant to the norm under consideration can remain uninstantiated (the slots 'norm subject', 'legal modality' and 'object' must be instantiated). The relation *between* the slots of the norm frame and between the slots of the act sub-frame can be characterised as an *and* relation. Predicates used *within* each separate slot can be connected by *and*, *or*, *xor* or combinations of these operators. Of course, a norm can only have one legal modality. Predicates can be used to refer to other norms, acts or definitions.

Together, the norm frame and the act sub-frame(s) constitute a conceptual model of a 'complete' norm. Such a model cannot only be used in the representation of existing legislation, but also in the evaluation of legislation under development. If the filling in of a norm frame on the basis of a norm formulation leads to problems with, for instance, the instantiation of the slots which constitute the norm kernel, the (cross) relations between slots or the interpretation of operators, the norm formulation is inadequate. In addition to this 'checklist' function, the idea behind a norm frame can also be used to determine if norm formulations can be combined. If it proves to be possible to translate, for instance, two articles into one norm frame, it is likely that the two articles can be merged, leading to a more efficient formulation of the norm.

## 4. An example from the Dutch Penal Code

In this section we will illustrate the possibility to use norm frames with the help of two articles from the Dutch Penal Code (Sr.); 310 Sr. (theft) and 311 Sr. (aggravated theft). First, we describe the constraints and heuristics governing the conversion process. Second, we convert the articles of our example to norm frames.

*Constraints and heuristics*
The use of norm frames is based on the idea that text elements should be arranged as coherent entities. We refer to this entities as 'norms'. Consequently, the point of departure in the conversion process is the recreation of these entities. This may lead to a representation where elements from different provisions are merged into one norm frame, or where elements from one article are distributed over several norm frames.

In order for the method to work, several constraints must be observed. Before introducing the heuristics for conversion, we formulate three constraints the modelling process has to meet:
- The meaning and scope of connectives (*e.g.*, 'either', 'or', 'and', 'as well as', or combinations, such as 'a *or* (b *and* c)', '(a *xor* b) *or* c') must remain intact [Gamut, 1982]. The operators we use are *and*, *or* and *xor*.
- It must remain possible to link the classifications used in a statute to the case at hand (*e.g.*, it must be possible to label an act as 'theft as referred to in art. 311, paragraph 1, 1– Sr.').
- The original method of referring to other parts of the statute must be preserved as much as possible. In practice, only references to norms, acts and definitions (an interpretative statement) are used.

The reconstruction of a norm starts with a statutory provision that contains the norm-kernel (*viz.* the conditions of application, the subject, the legal modality and a description of the norm object). Not every element of the norm kernel needs to be explicitly present (*e.g.*, a norm often does not have any conditions of application, in criminal law the legal modality is often not explicitly formulated, *etc.*).
The instantiation of the slots of the norm frame and the act frame is determined by the typification of the different slots of the norm frame and the act frame we have provided in the previous section. If an element appears to be irrelevant, the slot remains uninstantiated.

In theory, it would be possible to break down every norm to a level where no connectives are used within the slots of the norm frame and the act frame. Because this approach would yield a lot of redundant information, a strategy is used that combines information when possible. In combination with the demand imposed by the first constraint, this implies the first heuristic:

1) If, by adding a new provision to an existing norm frame (containing, for instance, a norm kernel) or act frame, changes to *more than one* slot are made (if an empty slot

is instantiated, or if a value in a slot must be removed, this also counts as a change), a new norm frame or act frame should be created. Of course, this heuristic only applies to slots concerning the *content* of a norm (not to the catch word or promulgation).

The intention of this heuristic is the fact that, if changes in more than one slot are permitted, new situations, not intended or foreseen by the legislator, come into existence due to the cross relations between the elements in the different slots. If additions are limited to one slot, the use of operators, such as *and, or*, and *xor* does not result in any problems. The range of application of the first heuristic is limited by the following, complementary, heuristic:

1a)   If a provision comprises more than one legal modality, a separate norm frame should be created.

The result of application of the first heuristic is that provisions are merged when possible. However, this does not take into consideration the importance of references in legislation. References are used to avoid repetition or redundancy. We distinguish between two main types of references, explicit and implicit references (we will not elaborate on the sub-types). Explicit references point to entities within the structure of a statute (*i.e.* to chapters, sections, articles, paragraphs, subs and sentences). An example is article 311, paragraph 2 in which reference is made to paragraph 1, subs 3, 4 and 5. Implicit references are usually based on unification of terms. An example of an implicit reference is the catch word 'theft' as used in article 311, paragraph 1, subs 1 to 5. This term refers to theft as indicated in article 310.
The frame-representation method allows for references to norm frames, act frames, and definitions (interpretative statements). However, it must be noted that preservation of the original method of referencing is not a point of departure. In the domain of criminal law there is one exception to this statement. An important issue in a criminal trial is the classification of the act that has been committed as a criminal offence (*e.g.*, theft). The second heuristic, based on the second constraint, is introduced to facilitate classification:

2)   Acts (criminal offences) that are classified under different names must be represented autonomously.

The third heuristic derogates from the second heuristic. It is based on the status of references as auxiliary constructions:

3)   If a provision does not introduce new information, no new norm frame is created (this heuristic will be explained further on in this section with the help of an example).

The application of the above-mentioned heuristics will be illustrated with the help of an example from the Dutch Penal Code.

*The Dutch Penal Code*
The articles 310 and 311 of the Dutch Penal Code read:
**art. 310 Sr.** The person who takes any good which belongs completely or partly to another person, with the objective of unlawful appropriation of the good, shall be sentenced, as guilty of theft, to a prison sentence not exceeding four years or a fine of the fourth category.
**art. 311 Sr.**
*1.*   A prison sentence not exceeding six years or a fine of the fifth category shall be awarded for:
    1–.   theft of cattle out of the meadow;
    2–.   theft on the occasion of fire, explosion, flood, shipwreck, running aground, railroad accident, riot, mutiny or war time;
    3–.   theft at night, in a residence or on an enclosed property on which a residence is built, by someone present at that place without knowledge or against the will of the appropriate person;

4–. theft by two or more persons in conspiracy;

5–. theft on the occasion of which the culprit has gained access to the scene of the crime or has brought the good to be appropriated within his reach, by means of burglary, housebreaking, false keys, a false order or a false suit of clothes.

*2.* When the theft described under 3– is accompanied by one of the circumstances described under 4– or

5–, a prison sentence not exceeding nine years or a fine of the fifth category shall be awarded.

We start the translation process with art. 310. With the help of heuristic 1a, we can split art. 310 Sr. into two norm frames; in one norm frame the act of 'theft' is prohibited (a norm of conduct of the *ought-not* modality), in another norm a sanction is attached to violation of this prohibition (a norm of competence of the *ought* modality). For the omitted slots a default value applies (the default values are: 'norm subject' - *everyone*; 'spatial aspect' - *anywhere on Dutch territory;* 'agent' - *anybody*; 'temporal aspect' - *anytime*; the other slots are by default empty).

| *Norm of conduct, theft, art(310)* | |
|---|---|
| *Catch word* | *Theft* |
| Promulgation | *art(310)* |
| Norm goal | Protection of property |
| *Legal modality* | *Ought not* |
| *Object* | *Theft, act(art(310))* |

| *Act description, theft, act(art(310))* | |
|---|---|
| *Object* | *Theft, act(art(310))* |
| *Act-type* | *Take away a good* |
| *Circumstantial aspect* | *The good completely or partly belongs to another person* |
| *Finality* | *With the objective to appropriate the good unlawfully* |
| *Final state* | *The good is appropriated unlawfully* |

The other norm that can be read from art. 310 Sr. addresses the judge. This norm delimits the competence of the judge; the maximum sentence for theft is four years imprisonment or a fine of the fourth category. The norm actually establishing the competence of the judge (a norm of competence of the *can* modality; a power-conferring norm) is found in the Code of Criminal Procedure. Here, we will not elaborate on that norm.

| *Norm of competence, maximum sentence theft, art(310)* | |
|---|---|
| *Catch word* | *Maximum sentence theft* |
| *Promulgation* | *art(310)* |
| *Norm goal* | *compensation* |
| *Conditions of application* | *Proven(act(art(310)))* |
| *Subject* | *Judge* |
| *Legal modality* | *Ought to* |
| *Object* | *sentence(art(310))* |

| Act description, sentence(art(310)) | |
|---|---|
| Object | *sentence(art(310))* |
| Agent | *Judge* |
| Act-type | *Award a sentence* |

| Final state | The awarded sentence is a prison sentence with a maximum of four years OR |
|---|---|
| | The awarded sentence is a fine of the fourth category |

We continue with art. 311. Heuristic 1a again leads to a split between a norm of conduct and a norm of competence (a sanction norm, similar to the one accompanying art. 310). First, we consider the norm of conduct prohibiting aggravated theft. Based on heuristic 1, art. 311 par. 1 can be added to the norm frame of art. 310. This would result in a longer list of acts in the norm-object slot (the act described in the subs 1 to 5 are represented separately based on heuristic 1). However, since the norm of conduct contained in art. 311 par. 1 is referred to in the separate sanction norm contained in the article, application of the second heuristic leads to a split between art. 310 and art. 311 par. 1 (it must be possible to classify acts as falling under the scope of art. 311 par. 1) . Second, we look at the sanction norm. Application of the first heuristic leads to a separate representation of this norm (the conditions of application and the object are different from the sanction norm of art. 310). The following representation is the result of application of the heuristics (only the act of paragraph 1 sub 3 is shown):

| *Norm of conduct* **aggravated theft**, art(311),par(1) | |
|---|---|
| Catch word | *Aggravated theft* |
| Promulgation | *art(311),par(1)* |
| Legal modality | *Ought not* |
| Object | *Act(art(311),par(1),sub(1) OR* |
| | *Act(art(311),par(1),sub(2) OR* |
| | *Act(art(311),par(1),sub(3) OR* |
| | *Act(art(311),par(1),sub(4) OR* |
| | *Act(art(311),par(1),sub(5)* |

| *Act description, Aggravated theft, act(art(311),par(1),sub(3))* | |
|---|---|
| *Object* | *Aggravated theft* |
| | *art(311),par(1),sub(3)* |
| *Act-type* | *Theft* |
| *Temporal aspect* | *at night* |
| *Spatial aspect* | *In a residence OR on an enclosed property on which a residence is built* |
| *Circumstantial aspect* | *Present at that place without knowledge of the appropriate person OR present at that place against the will of the appropriate person* |

We move on to art. 311 par. 2. Application of heuristic 1a leads to yet another split between a norm of conduct and a norm of competence (a sanction norm). The norm of conduct prohibits the act of art. 311 par.1 sub 3 in combination with the acts of art. 311 par. 1 sub 4 and 5. However, since these acts are already prohibited separately (and can already be classified separately or in combination), a prohibition of their combination does not add new information: heuristic 3 prevents the creation of a new norm of conduct. The sanction norm is represented separately. Heuristic 1 prevents it from being added to an already existing sanction norm. The following representation results (the act frame is not shown):

| *Norm of competence*, Compound aggravated theft, art(311),par(2) | |
|---|---|
| *Catch word* | *Compound aggravated theft* |
| *Promulgation* | *art(311),par(2)* |
| *Norm goal* | *compensation* |
| *Conditions of application* | *Proven(act(art(311),par(1),sub(3))) AND (Proven(act(art(311),par(1),sub(4))) OR Proven(act(art(311),par(1),sub(5))))* |
| *Subject* | *Judge* |
| *Legal modality* | *Ought to* |
| *Object* | *sentence(art(311),par(2))* |

*Interpretative statements*

Besides norms, we acknowledge the importance of what we propose to call *interpretative statements* [*cf*. Aarnio, 1987]. These statements do not impose obligations or permissions, nor do they confer powers. They deal with the *meaning* of a certain concept. We distinguish between *definitions* and *contributory properties*. Definitions are used to lay down the meaning of a concept. Contributory properties are weight factors assigned to properties that play a role in the determination of the meaning of a concept [*cf*. De Wildt, 1993].

The meaning of a concept can be defined in terms of its intension and its extension. The intension of a concept is formed by the conditions under which something is classified under the concept. The extension consists of every possible instantiation of the concept. The concept 'good' can serve as an example in our domain:

| Interpretative statement, *Good* | |
|---|---|
| *Catch word* | *Good* |
| *Promulgation* | *NJ 1921, 564* |
| *Intension* | 1. *having a certain autonomous existence, even if its presence can only be established in connection with a physical object,* <br> 2. *can be created by men and can be put at the disposal of the one who created it,* <br> 3. *representing a certain value for the creator, because the creation involves effort and cost, etc.* |
| *Extension* | *for instance: electricity, computer program, cattle, money* |

This interpretative statement or definition is the precipitation of a supreme-court case (NJ, 1921, 564). This case lead to a change in both the intension and extension of the concept 'good'.

## 5. Reasoning with norm frames

We conclude this paper with a short illustration of the possibility to conduct reasoning processes with norm frames. We start with a general remark. If we look at the two frames that form the description of a complete norm, we can distinguish four levels: norm, act, slot and predicate. The norm frame represents the highest level of abstraction. The predicates in the different slots represent the most concrete level. By taking into consideration one or more levels, reasoning processes can be conducted at various levels of abstraction.

In this section we limit our exposition to two basic tasks a judge has to perform in the process of adjudication: classification and sentencing. In order to fulfil this task two

consecutive questions have to be answered: 1) Do the facts described in the charge yield an offence? (the classification process), and, 2) What sentence or measure has to be awarded for the offence? (the sentencing process).

The first question is answered by matching the description of the offence in the charge (the supposedly violated norm) to the frames used in the representation of the statute texts. Only if the offence a suspect is charged with, forms a possible instantiation of a norm frame, is the norm applicable. For example, stealing money from a residence at night is first classified as theft. In this process the interpretative statement 'good' is checked. Next, every act frame with an act-type slot instantiated with 'theft' is checked to see if the offence can be classified as an aggravated form of theft (we will not go into the search strategy here - see, for instance, [Van Kralingen and Visser, 1991]). This is a recursive process that makes use of the relations between norms and interpretative statements (coherence) by means of implicit and explicit references. The result is a classification of the offence as the act'(art(311),par(1),sub(3))' connected to the norm of conduct 'aggravated theft'. The conclusion is that the norm of conduct prohibiting aggravated theft is breached.

In the sentencing process norms of competence are used to determine the sentence or measure to be awarded for violation of a norm of conduct. The only norms of competence we have described in this paper are concerned with maximum sentences; no other norms of competence (*e.g.*, procedural norms) have been described. The sanction norm corresponding with the norm that has been breached is 'Norm of competence, maximum sentence aggravated theft, (art(311), par(2))'. This norm has as its condition of application 'Proven(act(art(311),par(1),sub(3)))'. This condition is fulfilled, and consequently we can conclude this norm is applicable. The final result is that a maximum prison sentence of six years or a fine of the fifth category can be awarded.

## 6. Conclusions

In this paper we have presented an intermediate language for the conceptual representation of legal knowledge. We have based this frame language on the legal-theoretical basis laid down by authors such as Brouwer, Hart, Kelsen, Ross and Von Wright. We believe that the representation of, for instance, statute texts in norm frames is an approach to the representation of legal knowledge that does more justice to the richness of the legal domain than an isomorphic or *1 on 1* representation of legal knowledge. Instead of accepting the capriciousness of norm formulations, a serious attempt is made to reconstruct the original norms. The guidelines offered by the stable structures of norm frames and act frames are useful in determining relevant aspects of legal norms. Though the original references within statutes are not maintained as a rule, in practice application of the heuristics for conversion leads to a representation in which all relevant references can be made. We see this as a confirmation of the feasibility of the 'norm frame' and the 'act frame' as autonomous coherent entities within the legal domain.

In our research we have concentrated on the representation of (a small part of) the Dutch Penal Code. However, seen from a different point of view, it is not difficult to imagine the possibility to use norm frames in the drafting of legislation. The frame structures can be used to determine if a new piece of legislation provides us with sufficient information. If a norm formulation contains considerably less information then the corresponding norm frame, the formulation should be reconsidered.

The heuristics for conversion can be of help in the evaluation of the structure of a new piece of legislation. If it is possible to combine several articles in one norm frame, it is probably possible to merge the articles. From another point of view, if application of the heuristics to a single article yields a large number of norm frames, this would be an indication that, for reasons of clarity or legibility, a distribution of this article over several new articles would be desirable. Perhaps, this would be an interesting subject for future research.

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