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LAW FUNCTIONS: MODELING PRINCIPLES IN LEGAL REASONING

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Summary

*Within the ESPRIT project KADS-II, a library of interpretation models is currently being developed. To accomplish this task, we have to define a series of ontologies associated to general domains. In this paper, we propose the use of a functional analysis of the law through the use of what we called **law functions**, and its use as a middle-out approach for the development of the library of interpretation models for the law domain.*

1. Introduction

The work presented in this paper has two contexts. On one side, we are working on the development of a library of *interpretation models* within the KADS-II project. On the other, we are working on a new approach to legal analysis and legal KBS development, namely the *functional approach*. In this paper, we will focus on the first of these contexts.

One of the goals of the ESPRIT project KADS-II [Wielinga et al. 91a] is to develop a library of *interpretation models* for domain dependent tasks. Interpretation models are abstract configurations of basic reasoning steps that are typical for a particular task, such as diagnosis, planning, monitoring, assessment, etc. Within this context, we are currently working on a sublibrary for the Law domain. I.e., we have to analyze typical tasks in the legal practice, and propose to each of them a task structure and a set of ontologies.

With respect to the ontologies, the problem touches the question of the common sense role in the legal domain. The law is not only a technical domain, but rather a kind of social device, that takes active (even if indirectly) part in our daily life.

The common sense problem in the Law domain has two faces. The first one has a linguistic character. Every term used in legal texts has different possible interpretations, i.e., it is not certain whether or not a certain fact or entity in the real world matches the term written in the legal text. Not only the basic understanding of the meaning of the names, but also whether a certain concept can be considered part of a given class or type can be a serious problem.

The second one involves the idea of the legal system as a kind of 'social device', i.e., a system that interacts with its environment (the society) in order to accomplish a number of *functions* and obtain a number of { goals}. One of the consequences of this idea is that these functions will reflect in the structure of the legal system and, more specifically, in the legal sources: regulations, statutes, case precedents. Each legal source will have a certain role in the structure. It is easy to expect that there is a finite number of these roles, that we will call the *law functions*.

In this paper we propose a basic set of law functions and its application as a basis for the development of the KADS-II library of interpretation models in the law domain.

The paper is organized as follows: the next section introduces the problem, that is, the development of the library and its issues. We then present the proposed basic set of law functions. Follows to this the description of how the law functions can give us a guidance on the ontologies of the library. We work a simple example and finally present our conclusions.

2. The Problem

2.1. The KADS Library of Interpretation Models

One of the features of the KADS methodology for constructing knowledge based systems (KBS) [Wielinga et al. 91b] is that it has a library of interpretation models. An interpretation model is an abstract configuration of basic reasoning steps which are typical for a particular task, such as diagnosis, planning, monitoring, assessment, etc. The assumption in KADS-1 was that this abstract configuration can be conceived, independent of the domain [Breuker et al. 87]. For instance, diagnosis in medical domains would *in abstracto* require the same reasoning components as in the troubleshooting (diagnosis) of devices. Experience shows that this is only partially true. If one refines these interpretation models further (by e.g. further detailing these reasoning components) the way these components are decomposed or elaborated becomes more and more dependent on the nature of the predominant domain structures. In other words, the less abstract the problem solving method, the more it `interacts' with these domain structures [Chandrasekaran 87].

In this article we will call these domain structures *ontologies*. An ontology is not only a specification of these domain structures, but also of the related inference engines. An example of a typical ontology is that of electronic devices consisting of configurations of components whose functions change attributes of signals. The inference engine provides a `calculus' that derives outputs from inputs and vice versa. Similarly, reasoning about time implies a way to represent events, and a calculus that derives all possible and legal inferences about a configuration of events [Allen 84]. In the CYC project [Genesereth et al. 1990], which aims at representing most of our day to day concepts and common sense reasoning, nine of these typical ontologies have been identified, but the expectancy is that this number will grow more or less exponentially with the specialized character of domains. For instance, each branch of science holds a specific `ontology'. Note that the term ontology does not have here the notion of an underlying inherent pattern; the pattern may be an artifact, i.e. a theory imposed upon phenomena. The term ontology is used here as in AI, i.e. as a schema to interpret what happens in a domain.

In the KADS-II project [1] a new library of interpretation models is being developed. The library will consist of typical components of reasoning *tasks*, and also of domain ontologies. Most importantly, it will contain knowledge about how reasoning components are related to domain ontologies. Domains are rather `fields', like electronics, mechanics, hydraulics, medicine, (psycho) social activities etc. One of these fields is legal reasoning. In this paper we will provide an approach to the identification of these ontologies and what consequences these have for designing artificial legal reasoning systems.

The most typical task in legal domains is assessment, i.e. the identification whether something in the world 'is the case'. Most legal and para-legal decision making is of this nature. Other less prominent tasks are planning (where one tries to find optimal paths between legal constraints) and design (where regulations are constructed). The reason why some types of tasks such as diagnosis, which are typical for other domains -- e.g. medicine --, do not occur may be a rather pragmatic one than an ontological one. There is little use for detecting a malfunction in a regulation. In most civilized countries the legal system provides mechanisms through which an automatic repair is done in situations where it is the intention rather than the wording that counts. This is not to say that in legal planning deficiencies in regulations may be profitably exploited, but this does not necessarily involve real diagnostic reasoning. Therefore, we assume that the fact that at this high level only a few types of tasks occur, is due to practice rather than to ontological principles in legal reasoning.

2.2. *Common Sense and Legal Reasoning*

Legal domains differ from other domains of expertise considered so far because they contain a high degree of common sense reasoning. Common sense reasoning plays two important roles.

The first role is in identifying *category membership*, i.e. the identification of an instance (object, action, state) as a legal concept (term). The legal terms may be vague and not well defined leading to the 'open texture' problem in legal reasoning. In this article we will not be concerned with this problem. Open texture problems are functional to adequate regulations and should not be resolved by automatic legal reasoning systems. They form the human interface between case and regulation and should be implemented as such in legal reasoning systems, i.e. as a task for the user [Breuker & de Greef 92].

The second role is more interesting and intertwined with legal reasoning. Common sense is not only used to identify instances, but also to come to a *coherent* interpretation of regulations [2]. Common sense knowledge is used to make 'bridging' inferences [Clark & Havilland 77] that allow one to understand that a legal statement (rule) is an exception to or a further refinement of a previous statement, as argued in [Breuker 90, Breuker & denHaan91]. In fact, our view was even more radical, in that the coherence was to be found in some model of a social system in the world, and not in the regulations that apply to it. In this paper we will take this thesis somewhat further by showing that the incoherence of regulations is reflected by the fact that in each regulations multiple *functions* can be distinguished, and that each function in fact refers to a different ontology in legal reasoning. We will use the notion of 'law function' as an intermediary concept to develop ontologies of legal reasoning.

3. The Law Functions

3.1. *Functional Legal Analysis and the Law Functions*

It is possible to see the legal system, at a certain extent, as a kind of "social device": a system which environment and medium of interaction is the society. Although this assumption may be weakened and have restricted validity if we remember that the legal system itself is part of the society, it opens the space for a different focus

on the Law, based on a simple analogy between legal reasoning and qualitative reasoning.

We can analyze and interpret the Law through a *functional* point of view. We assume that the Law as a whole (and therefore each of its components) exists to accomplish a certain *function*, in order to obtain certain social goals. This assumption leads us to two basic issues. On the one hand we want to focus on the interaction between the legal system and the society. On the other hand, the functional point of view applies to the *internal* mechanisms that makes the legal system work. This is more or less the same generalization of the concept of 'system' as proposed, for instance, by Ludwig von Bertalanffy in his *General System Theory* [vonBertalanffy 73].

If the legal system has inherent functions (internal and external) to be performed, then it is reasonable to expect that these intentions reflect on the legal instruments of interaction. The main instruments of interaction the Law has are what we call the *legal sources* -- regulations, statutes, case precedents. Thus, each legal source has its own function or functions. These functions can be regarded as roles, or hidden intentions of the legal sources. We call these the *law functions*.

As a first step in the direction of a functional approach to the legal domain, we propose here a basic set of law functions. We intend to use this set in two directions. First, it can be used to *analyze* legal sources, both as a way to acquire the knowledge it embeds and to evaluate its clarity. Second, it has consequences in the modeling of legal domain and consequently on the development of legal knowledge based systems. [3]

3.2. A Basic Set of Law Functions

The basic set of law functions we propose is the following:

Definitional When the legislator wants to define some concepts about how he (i.e, the law) sees the world; it is usually stated as i) a textual *definition* of a *concept* or *class* of concepts, or ii) the assignment of a *concept* or *class* as pertaining to (another) *class*, or iii) the statement of an *equivalence* between *concepts* or *classes*.

Normative When the legislator wants to classify a set of situations, most of the times as legal or illegal; it is basically stated as the classification of a certain *generic situation description* as illegal.

Reactive When the legislator wants the law to react towards some agent because of some action or situation it was responsible for. It is basically stated as an assignment of a *reaction* to a certain *agent* that has been responsible for a certain (specific) *situation description*. Commonly, the reactions take the form of a *punishment* or a *reward*.

Creative When the legislator indirectly creates some concrete entity that did not exist before. Most of the cases, this entity is an administrative one, like a school, a government section, a department, a company, etc. It is usually stated in imperative terms, designating an *agent* as part (or not) of the reality from a certain point of the time on.

Prescriptive When the legislator wants to modify the world by prescribing proper and improper actions that some agent in the world can take within a certain

situation; it is basically stated as an advice to a certain *agent* within a certain *generic situation description*. This advice usually involves a prescribed *action* this agent is advised to take. The prescriptive function has a very close correspondence with the normative function, as we will discuss in details later.

We can summarize the proposed basic set for Law Functions as in table 1.

Definitional	The <i>definition</i> of <i>concepts</i> or <i>classes</i> , memberships of <i>concepts</i> to <i>classes</i> , or equivalences between <i>concepts</i> or <i>classes</i> .	What definitions the legislator used or stated with respect to concepts or classes?
Normative	A classification of a certain <i>generic situation description</i> as legal or illegal.	Which situations in the world the legislator wanted to classify as legal or illegal?
Reactive	A <i>reaction</i> to a certain <i>agent</i> that has been responsible for a <i>situation</i> .	Which punishments or rewards the legislator indicates for which agents in which situations?
Creative	The indirect creation (or destruction) of an <i>agent</i> in the real world.	Which agent the legislator wanted to create or destroy in the real world.
Prescriptive	An advice to a certain <i>agent</i> within a certain <i>generic situation description</i> take certain <i>actions</i> .	Which advices the legislator wanted to give to the agents involved?

Table 1: *Basic set of Law Functions*. We can characterize them by their basic features and by a question one must have in mind to extract the desired function from a given legal source.

The first three functions (definitional, normative and reactive) correspond to the three basic steps in the working mechanism of the legal system. First, to distinguish a certain set of agents, actions and situations in the world through a set of legal definitions. Second, to classify certain situations as legal or illegal ones. [4] Third, possibly react towards the classified situations in order to stimulate or repress certain behaviors of the agents.

The definitional and creative function have in common an attempt to define a certain concept conceived as viewed by the law. The difference is that the creative function attempts to make a legal entity that did not exist before (or delete one that already existed), while the definitional function gives a name to classify something that already exists.

The normative and prescriptive functions have also a strong resemblance. In fact, every norm has an implicit prescription or advice. The difference is that the normative point of view is the point of view of the legal system itself, whereas the prescriptive function shows how the person to whom the law is addressed sees it. In short, every norm (addressed to the legal system) is also a prescription (to the agents that have to observe it): one is advised not to do what is legally prohibited, and to do what is (legally) obligatory. Therefore, the normative and prescriptive function are two different perspectives on the same basic content.

The creative function has a somewhat different status if compared to the other ones. In this case, the law not only wants to classify or to react over certain agents that

already exist in the real world, but attempts to create a new agent. The legal system has as *intention* to create the real world entity, and does it having as an immediate *goal* to create the legal entity. The simpler example is the creation of a department within the government or a company. Note that the department by itself is an abstract entity, but it has a physical body (i.e., its workers, facilities, etc.) that indeed makes part of the real world.

The definitional function, in its turn, can be more than a simple text definition of terms. For instance, the British Nationality Act studied by Sergot and his group [Sergot et al. 86] can be regarded as a whole statute (quite complex indeed) concerning almost only definitional aspects.

We make no claim that this separation is completely new. Similar observations, for instance, were recently made by Sergot, in a workshop on the third AI & Law conference called 'On the Use of Logic in the Representation of Regulations'. In fact, he has attempted to mention all these functions in a survey of the area [Sergot 87]. We will quote his words and point out the functions of law he implicitly refers to with comments within brackets:

"If one looks at a piece of legislation, it is immediately clear that there are many purposes for which the legislation is passed. A statute, for example, may define a legal concept in more or less precise terms [*definitional*], but it will also include many different types of provisions, describing for example how the statute affects other related legislation [*creative*], or specifying the penalties that will be incurred if its provision are transgressed [*reactive*], or setting out general requirements for the procedures to be used in its administration [*creative*]. Even an apparently simple statement like 'Claimants must submit applications before 1 January' can be read in many different ways. The statement tells a claimant how much time he has to prepare his application [*prescriptive*]. It helps the administration to determine whether an application should be rejected [*normative*]. It could even be used by a lawyer in arguments about the intended meaning of 'valid claim' or 'submitted' where these are used in this or related legislation [*definitional*]." [Sergot 87; pag.17]

4. From Law Functions to Ontologies

4.1. Common Sense Ontologies?

As stated in section 2.2, legal reasoning contains a large proportion of common sense reasoning. In an attempt to cope with that problem, it may be tempting to start from common sense ontologies as those developed in the CYC project. Indeed, most of the coherence between the statements in a regulation can be derived from these ontologies. It seems likely that these ontologies are even more abstract and simplified than in full common sense reasoning. For instance, [Breuker & denHaan 91] show that traffic regulations imply a view on traffic behavior that has hardly any dynamics, and spatial reasoning; temporal reasoning is almost absent. This is not to say that temporal reasoning does not play a role in legal reasoning, but it appears to be less elaborate than in e.g. more time critical domains [Kowalski & Sergot 86]. Similarly, research in the role of contracts and regulations in international trade suggests that the legal view on trade makes simplified abstractions about the

intentions and actions of the participating agents. [5] These simplifications and abstractions are the consequence of the fact that the world to be regulated has to be conceived in the most general, abstract terms. However, the ontologies of these 'Abstract Legal Models' do not characterize the legal reasoning. They are rather a supportive understream to connect legal issues. *We refer to [Breuker & den Haan 91] for a more detailed description of the relation between models of the world and legal reasoning.* There is an important invariance in legal reasoning competence across domains like violence, labour relations, spill of waste products, business transactions and ending shared households. Each of these domains may be connected to different legal disciplines, but their differences are smaller than for instance between reasoning about time and about social action. In other words, although common sense reasoning is the major component, legal reasoning is not modeled after common sense categories. Legal reasoning has its specific functionalities and ontologies.

4.2. What's in Applying Regulations?

In previous papers [Breuker 90, Breuker & denHaan 91] we have argued that most part of the legal reasoning in a strict sense -- i.e. devoid from common sense reasoning -- consists of applying legal rules and meta-rules to interpretations of cases. At least this describes the process of *assessing a case*, but it does not provide meaning to what happens in terms of legal issues. It misses out the point that some of these consequences are punishments, others are advices for courses of action, etc. In other words, we have overlooked the *functions* of these consequences. These functions, as lined out in section 3, can be thought of as typing strict legal knowledge. From this typing we may be able to derive an ontology of legal reasoning. In other words, we propose to use the functional categories of the law as intermediary steps to derive legal reasoning ontologies.

In the next section we will show that the use of these functional categories indeed leads to an unambiguous typing of regulations, i.e. a regulation can be analyzed according to its functions and each statement can be typed. However, this is only a first step. The next step is to identify the ontology involved, i.e. to abstract what a particular function means in terms of the inferences one can draw from this type of knowledge. In other words, our approach in identifying ontologies is first to obtain a functional classification, then to connect types of knowledge to each of these functions, then to develop ontologies and then to show that an inference engine that fits this ontology provides a unique function in (legal) reasoning automata. Of course, in this paper we will not be able to show this full development, but only the first three steps: functions, typing and ontology.

4.3. Functions, Typing, Ontologies

As stated in 4.1, in this section we will show the first three steps in our strategy: the set of functions, the knowledge typing based on these functions and the generation of the ontologies. Since the functions were already discussed in section 3, we will analyze the typing and the ontology identification steps.

The knowledge types of the legal sources will correspond to the basic set of law functions in a one-to-one basis. To each legal statement in the legal source will correspond a single law function. [6] This typing is to be done in the analysis of the relevant legislation for a specific application. The guidelines are the definitions of the basic law sources. Particularly useful are the questions mentioned on table 1. They are the filters through which the knowledge engineer (or, in general, the legal

analyst) will interpret and classify the legal sources.

From the typing to the ontologies is a crucial step. As we stated in section 2.1, an ontology consists of both a specification of domain structures and related inference engine. We will list, to each basic law function, what are the domain structures that it is linked to and what type of inference steps (that comprise the inference engine) we may expect.

4.3.1. *Definitional*

Domain structures The basic domain structures associated with the definitional function are the hierarchies of concepts in the domain. Also, a hierarchy of relations and predicates that link and qualify the concepts in the domain under the point of view of the Law. These are mostly static structures that correspond to the first role for common sense in legal reasoning as stated in section 2.2.

Inference steps The basic inference step associated with this function is a *conceptualize* (or *abstract*). This means that elements in the domain have to be assigned to concepts, and later on to classes of concepts. Also, in the conceptualization there is the abstraction of the relations and predicates of the concepts. In other words, it corresponds to a mapping or interpretation of the domain as stated in real world terms into a more restricted set of concepts, relations and predicates.

4.3.2. *Normative*

Domain structures Rules that classify legal situation descriptions (conceptualized using the definitional function) into normative legal abstract concepts. These are the rules that establish that certain configurations of things are discrepant (or not) compared to the norm -- in other words, if they are 'correct' with respect to the Law.

Inference steps The basic inference step related to this function is clearly a *classification* one. Also, it is implied in this function a selection step that can also be regarded as a classification -- namely, to specify an agent or agents that are responsible for the legal situation being addressed.

4.3.3. *Reactive*

Domain structures Rules that depart from a classification of a legal situation (plus the assignment of the responsible agents) to definitions of reactions (punishments or rewards) on these agents.

Inference steps This function implies both a *specify* and a *control* inference steps. The reactive component means first to specify which reaction is to be done, and then realize this reaction through a control step. It has to be noticed that the control step is not a simple one, but a whole task in itself. Therefore, it should be further decomposed into smaller inference steps. This decomposition seems to be domain dependent, but this issue has yet to be further investigated.

4.3.4. *Creative*

The creative function has a somewhat different character if compared to the other

ones. It is in fact a meta-function, because it changes (indirectly) the domain, instead of using it as an input. It therefore does not correspond to structures in the domain, but to domain entities themselves. Also, it does not have any correspondence with inference steps, since it does not imply any legal reasoning inference alone. It should be noticed that in any creative legislation there is also present a strong definitional component, that will be taken care separately. There is, to any legal creation follows a definition and most of the times a classification, but they are not the same.

4.3.5. Prescriptive

Domain structures The prescriptive component comprises an indirect use of the normative function into a 'soft' control task. Therefore it refers to the same basic structures of the normative component, i.e., the rules that classify situations in 'legal correctness' terms.

Inference steps For the same reason explained above, the prescriptive function will comprise both the same classification step of the normative component plus a control step simplified into a *specify* inference step. The term specify, here, means the counterpart of abstract, i.e., the mapping of abstract concepts of the legal domain into real world domain concepts.

4.3.6. Summary

We can see the sum of the abstract, classify and specify inference steps related to, respectively, the definitional, normative and reactive components as composing an *analytical* task. This analytical task is followed by a *modification* task represented by the control inference step of the reactive component or the compose step of the prescriptive function. As a whole, the working mechanism of the legal system seems to resemble a basic *monitoring plus control* inference structure, but this issues still have to be analyzed in detail.

The correspondence between the functions and their related domain structures and inference steps is summarized in table 2.

Law Function	Domain Structures	Inference Steps
Definitional	Hierarchies and typologies of domain concepts	Conceptualize (abstract)
Normative	Rules that classify legal situations	classify
Reactive	Rules that define reactions over normative classifications	Specify and control
Creative	Domain objects	--
Prescriptive	The same rules as the normative function	Classify and specify

Table 2: *Summary of the law function ontologies.* To each law function there are associated ontologies, in the form of a group of domain structures and inference steps.

5. An Example: the Imperial College Library Regulations

A common toy set of regulations currently being used to test some ideas in AI applications in the law domain is the Imperial College Library (ICL) Regulations [Sergot 82; Herrestad 91]. In this section, we will use the ICL Regulations to draw a partial example of the strategy proposed in section 4.1. We will briefly analyze this set of regulations using the law functions, and show which functions are present in each section.

The Imperial College Library regulations (as stated in [Herrestad 91]) are the following:

- a) A separate form must be completed by the borrower for each volume borrowed.
- b) Books should be returned by the date due.
- c) Borrowers must not exceed their allowance of books on loan at any one time.
- d) **NO BOOK WILL BE ISSUED TO BORROWERS WHO HAVE BOOKS OVERDUE FOR RETURN TO THE LIBRARY.**

Book allowances

Undergraduates	6
Postgraduates	10
Academic staff	20

The first three statements are normative ones. They imply that a situation is only legal if the respective statements were hold. They also imply incorrect or illegal situations, namely the ones in which there is a conflict with the statements.

The fourth statement, however, is a reactive one. It states a reaction (in fact a punishment) as "a borrower that has books overdue for return to the library will be punished by not being allowed to borrow more books". It is very interesting to notice that it is not a coincidence this is the only rule to be written in capitals. The designer of the regulations wanted clearly to gather a special attention from the borrower to this statement. Although it is not clear at a first analysis, this statement is the complement of the second one -- i.e., the reaction against violations of the norm expressed in the second.

Finally, the fifth statement (about book allowances), is a definitional one. Again, some elements of the structure of the text reflect functional issues: this is the only statement which does not have a number. Also, it is a complement to a norm, namely the third one.

With respect to the prescriptive function, some comments are needed. We observed earlier that to each norm in principle correspond a prescription, since every prohibition involves an indirect advice. Therefore, the first three statements in the ICL regulations are both normative and prescriptive. In fact, the regulation as a whole has a strong prescriptive character. It seems that they were meant to be shown to the borrowers as a form of guidance of their behavior -- and so prescribing their behavior in the situations they may be involved in their relationship with the ICL. This is rather typical in this (informal) type of regulation.

The present text of the ICL regulations has no content of the creative function. In fact, it does not attempt to (directly) create anything but the regulation itself.

The table 3 gives us a summary of the typing of the pieces of the ICL regulations into the law functions.

ICL Section	Law Function Present
section 1	normative, prescriptive
section 2	normative, prescriptive
section 3	normative, prescriptive
section 4	reactive
allowences	definitional

Table 3: *Summary of the typing step over the ICL Regulations.* To each section of the ICL Regulations, we state which law functions it contains.

6. Conclusions

The main idea of the functional approach to the legal domain and the law functions is a cartesian divide-and-conquer strategy. In particular, the division of the possible intentions of the law as filtered through the perspective of a set of basic functions can help in managing the complexity of law analysis and keep under control part of the open texture of the law texts. As so, the Law Functions can be a valuable instrument for the analysis of regulations and legislation in general.

It can improve the tractability of knowledge-based systems developed under its perspective as providing a means to either use only the necessary perspectives, or producing separate knowledge bases or inference engines (probably more specialized and more efficient) to deal with each of these (different) roles of law.

The analysis presented here has consequences not only for classification or sorting purposes. It is intended to, when further developed, end up in a group of task components that can be used in the library as basic blocks to build complete legal KBSs. Therefore, further consequences on legal reasoning issues will be addressed in the future.

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8. Notes

1. See Acknowledgements for more details
2. With the term 'interpretation' we do not suggest that it is an arbitrary or highly variable one. In this case we mean that 'everybody' makes the same inferences and assumptions to understand a regulation.
3. A discussion of the assumptions of the functional approach and a more complete exploration of the use of law functions in legal analysis will be subjects of forthcoming articles.
4. This may not be exactly true, as it may not be correct to use precisely these labels in situations such as a contract that would be rather proper or valid than illegal. However, the basic principle of classifying a situation description (in this case the contract) still hold, and the normative function is still present.
5. This is one of the results of a study on the role of international contracts of sales of goods in about 10 different branches of industries and commerce in the Netherlands. These studies have been performed at our department by 14 law students as part of their 'doctoraal' thesis in the framework of the ALDUS project. ALDUS is an exploratory study that is part of the ESPRIT program of the European Commission.
6. The exception, as already mentioned, is the pair normative and prescriptive.

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