The Concept of "Goals" in Legal Informatics

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1. Introduction

In the paper I express a viewpoint to formalisation of teleological structures in law. I view the representation of the related categories — "goal", "objective", "purpose", "aim", "result", "value", etc. — as a challenging problem for research in artificial intelligence (AI) and law.

The concept of "goal" deserves to be placed in a top legal ontology. I think that the formalisation on a large scale is required. Automatic indexing of purposes which appears in the text of a statute, e.g. EC Treaty, can hardly be expected as a breakthrough approach, cf. [Oskamp, Lauritsen 2002].

When speaking informally about what law is, one speaks, first, about norms, then about rights and duties (or permissions and obligations). Though two Hohfeldian squares do not contain the "goal", one understands that it is among the fundamental legal concepts. See, e.g. Dworkin's Law's Empire [Dworkin 1986], Hage's formalisation of comparing alternatives [Hage 2004], Sartor's formalisation of fundamental legal concepts [Sartor 2006]. In the latter paper, the concept of purposes is referred to von Jhering (1924), who distinguished the purpose of a duty as the interest it is intended to serve. The function of an artifact is considered as a teleological concept in philosophy [Dennett 1989]. When speaking about intentionality, Dennett refers to scholastics in the middle ages. The intentional nature of law is considered seriously in AI, see, e.g. [Sartor 2003]. Thus one can see that teleology should be represented in a legal ontology.

I also aim at formalising the teleological method of interpretation of law. Text retrieval systems and experts in domains outside law rely primarily on the grammatical method of interpretation. However, "the historical and teleological dimensions of the law entail that the liberty of interpretation enjoyed by the reader of a statute from a linguistic point of view becomes even wider within a legal context" [Van Hoecke 2002, p. 150].

The research also aims to contribute to legal drafting. A statement of the purposes of a legal act is required in a legislative procedure. This is usually presented in the preamble of the act, where social relations to be regulated are treated as an element of the purpose.
The research can result in three products. First, a ‘theory of goals’. Second, formalised conceptualization, which is identified as an **ontology**. Thus legal theory contributes to computing. Third, a semantic network of goals, which are inherent in European Union law: EC Treaty, EU Treaty and the European Constitution.

This paper is written from the perspective of informatics in law.

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### 2. Motivation

This research is motivated to gain from explicit representation of teleological structures in law. This motivation is viewed from the following perspectives:

- **Using the teleological method** in law, namely, in legal reasoning. This is a legal perspective. It is reasonable to make purposes explicit, because purposive interpretation of law is broadly used by courts.

- **Tracing of purposes**, a computing perspective. Purposes in the law should be validated and verified, in particular, while creating law. Thus *ex ante*, *ex post* analysis and XML-based tools are in the focus. I expect similarity to goal tracing in information systems (IS) development.

- **Visualisation of goals**. This is actual for jurists and non-jurists.

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#### 2.1. Teleology in legal argument

Modelling teleology in legal argument is elaborated, in particular, in a special issue of AI and Law journal in 2002. A series of papers [Bench-Capon, 2002], [Hafner, Berman 2002], etc. recapitulate the ideas of [Berman, Hafner 1993] regarding the role of teleology in legal argument. The authors elaborate theories based on (teleological) values. A distinction between factors and values is made. An exercise of three cases results with a list of values legal certainty, social utility and sanctity of property. A list of elicited factors includes ‘the plaintiff/defendant was pursuing his livelihood’, ‘the plaintiff was on his own land’, ‘the plaintiff was not in possession of the animal’, etc.

I think that modelling teleology in legal argument is important, but one of several levels of teleological structures. I also think that teleological structures should rest, primarily, on legal theory, then on observations. Thus a ‘theory of goals’ has to be developed. Techniques of implicit knowledge elicitation suit better to an analysis stage of IS development than to analysis of a legal domain.

Historically, much attention was given to a *norm*, a central concept in law. The norm concept is examined in legal philosophy ([Kelsen, 2001], [Hart 1994]), legal theory (e.g. [Van Hoecke 2002]), and also AI & law (e.g. [Boella et al. 2004]).
Legal theory agrees on the structure of a norm consisting of three elements: hypothesis, disposition (i.e. action), and sanction. The four legal relations duty, right, no-right and privilege are attributed to the norm. Placing fundamental legal concepts in a legal ontology is recently presented in [Rubino et al. 2006]. Ontological structures should also be represented in such a kind of ontology.

2.2. Legal engineering and systems engineering

This research is motivated by the following intent regarding legal drafting. From systems engineering (SE) standpoint, the law can be viewed as a formal system. This can be even backed by the view of legal theory that the law is a system of norms. Such a system can be compared to a production system in AI. But it should be noted that the problem is the complexity of the system.

Considering the view above, a legal engineering task should include the following stages (similarly to analysis-design-implementation stages in a software life-cycle – as requirements engineering methods recommend):

- First, formulate the goals of a system under consideration.
- Second, from the goals derive requirements.
- Third, from the requirements design the system.

Here I rest on the idea to treat a statute as a system [Čaplinskas, Mockevičius 2002]. The following example was given by Čaplinskas in personal communication while discussing the powers of a judge to determine the limits of custodial sentence duration. Two distinct principles are inherent in criminal law: (a) to punish a person, or (b) to punish for a crime. These principles can be treated as distinct goals. They can differentiate two distinct legal systems, e.g. continental law and common law. Top-down development and goal tracing techniques, which are known in systems engineering, might result with two distinct criminal codes. Luckily, the world is not that black and white. In each country the two principles are intertwined distinctively and result with different criminal codes. However, a ‘theory of goals’ could make this intertwinement more explicit.

2.3. What law is and what goal is

I try to discover the essence of law through the category of goal. Can the related categories in legal theory be built on the basis of it? In other words, can the category of goal be placed in an ontology of law?

A key question in legal philosophy ‘what law is’ can be supplemented with ‘why one obeys the law’. Answers are explored in jurisprudence. Lawyers note
that the problem in not in the law, but in the use of legislation. The Aristotelian concepts of finis and telos have to be distinguished. Finis is treated as a state (status) of the world, the final end; telos – a way, a direction or a process.

Dworkin shows in [Dworkin 1986] what problems are faced while answering ‘what law is’. In his analysis of Elmer’s case, I find that the teleological concept of “intentions” is formalised as coherence with legal principles. In the endangered specie’s case, I find the formalisation as a classical comparison of alternatives: one value (endangered specie) vs. another value (a hydro station).

2.4. Teleological structure depends on a legal task

I share the view of [Valente 1995, p. viii] that “another path to develop models of problem solving, complementary to the one based on the ontology, is the development of models of typical legal tasks”. He proposes typology of legal problems comprising some main views on the use and design of legislation (emphasis added): “the perspective of elaborating legislation, the perspective of an agent using the legislation, and the perspective of elementary internal problems implied or indicated by the ontology”. Thus, legal knowledge engineering should rest on legal theory. A feedback loop would contribute in the opposite direction – to jurisprudence.

3. Functions of law as top level teleological structure

The functions of law can be treated as a high level teleological structure. The context is of the nature and the role of law. The question ‘what the aims of law are’ can be supplemented with ‘what the functions of law are’. The functions of law are in the focus of legal theorists, cf. Hart, Krawietz, Raz. I discover in [Van Hoecke 2002, p. 61] that “the (main) aim of the law” is reduced to values, more precisely, to “realise values such as “justice”, “equality”, “individual freedom” and the like”. The values as teleological concepts are also mentioned by other authors.

Legal theory classifies the functions of law to three categories: the judicial function, the legislative function, and the executive function.

From a societal perspective [Van Hoecke 2002, p. 62] distinguishes two main functions: (a) structuring political power, (b) creating and keeping social cohesion. Achieving social cohesion implies the function of consolidation of the social system and of the legal system. The latter statement can be represented as state transition. I mark the final state with a teleological attribute ‘social cohesion’. This
transition is achieved by the function ‘consolidation’, which is represented as an edge in a kind of a semantic network.

However, the notes on overestimating the aims of law can also be found, see e.g. of [Van Hoecke 2002, p. 61]: “in traditional jurisprudence attention often has been paid too exclusively to the aims of law. This is narrowing the analysis to deliberate lawmaking . . .”. Continuing this quotation, I again discover the dimension, which has been already identified earlier – aims are formalised as values (emphasis added):

When taking such a position, moreover, jurists tend to mingle a descriptive analysis with normative points of view. This is especially the case when it is posited that the (main) aim of the law is to realise values such as “justice”, “equality”, “individual freedom” and the like, thus offering an idealistic picture of law.

A teleological notion of “function” is considered by Dennett: “what makes something a spark plug is that it can be plugged into a particular situation and deliver a spark when called upon”. Here I find a challenge to apply the functionalism and intentionality to law. The phenomenon of law is qualitatively on a higher level of complexity than such artifacts as mechanical machines.

3.1. Different meanings of the term law

One can find the following different meanings of the term “law”:

- A social phenomenon.
- A legal or judicial system; structure and contents, e.g. continental law and common law.
- A (logical) system of rules. A statute is treated as a (logical) system of norms.
- A body of rules made by legislature; statute law.
- Science or knowledge of law; jurisprudence.
- The principles originating and formerly applied only in courts of common law; equity.

Goals may be assigned to a structural part of the law, too. One may speak about goals of a norm, goals of a contract, aims of the norm-sender – the will of the legislator, etc. [Van Hoecke 2002]. Therefore ontological structures are subject to different formalisations depending on a level above.

4. The teleological method in law

The teleological method is next in our focus. The reason is that “the teleological or purposive method takes the objective of the statute as interpretation context. In
certain cases the interpretation of a statute in the light of the purpose of the statute, or that of the entire legal system, is necessity” [Van Hoecke 2002, p. 140].

The statement “purposive interpretation is by far the most used method by the European Court of Justice” [Van Hoecke 2002, p. 140] is also backed by other authors. One of the most striking characteristics of the legal order established by the Treaty is the competence vested in the Community institutions to enact legislation for the purpose of carrying out the objectives of the Treaty [Arnulf et al. 2000, p. 83]. A ground for looking at the aim of the statute is the clearly absurd or unjust result of applying the statute in its plain \textit{prima facie} meaning. Another ground concerns historical developments which have arisen since the enactment of the statute. Sometimes also here the immediate cause for a teleological construction is the absurd result of a literal interpretation [Van Hoecke 2002, p. 147].

\section*{4.1. Motivation to formalise purposes of an EU directive}

A challenging example for goals elicitation is in European Union law, namely, interpreting the supremacy of Community law and direct applicability of EC Treaty provisions.

Purposes of an EU directive have to be transposed into the national legal systems. Article 249 (ex 189) EC Treaty sets that “a directive shall be binding, as to the result to be achieved, ... but shall leave to the national authorities the choice of form and methods”. Thus, the legislation adopted to implement a directive need not use the same words as the directive itself. Here a natural question is raised: are the purposes explicit enough in the text of the directive? How one can verify that the purposes are implemented correctly in the national legislation?

\section*{4.2. Aim ≠ obligation!!}

In [Barnard 2004] one can find analyses and examples of ECJ decisions which are based on teleological interpretation. For example, the list of benefits of free trade on p. 2 of Barnard’s book can be represented as a causal sequence of goals: ‘free trade’ → ‘specialisation’ → ‘comparative advantage’ → ‘economics of scale’ → ‘consumer welfare’ & ‘efficient use of world-wide resources’.

After analysis of numerous Court’s decisions and quotations, which include the terms ‘purpose’, ‘function’, etc., I find the following conclusion important. After examining external economic relations of the EU, [Barnard 2004, p. 227] concludes that “trade liberalization has always been an \textit{aim} rather than an obligation”.

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The above quotation illustrates a conceptual difference between the notions of “aim” and “obligation”. I also find that this statement draws a border between AI and law. AI task is to model aims; a legal task focuses on the content of obligations.

5. Possible approaches to solutions

In this section a sketch of some approaches to solutions is given. In order to propose a formalisation, I expect AI and requirements engineering (RE) to contribute to the insight and propose instruments.

5.1. Teleological relation: legal act$^{\text{TE}} \rightarrow$ goal

In personal communication F. Lachmayer proposed to introduce a concept of teleological relation$^{\text{TE}} \rightarrow$ between a legal act $a$ and a goal $g$. An infix notation is $a^{\text{TE}} \rightarrow g$; consequently a prefix notation: $^{\text{TE}} \rightarrow (a, g)$. To illustrate the notation, consider the three statements:
- “A goal $g$ is achieved by a legal act $a_1$”
- “A goal $g$ is achieved by a legal act $a_2$”
- “A legal act $a_1$ implies less quantitative restrictions (QR) than $a_2$”

A very simplified meaning of these statements can be represented:
$a_1^{\text{TE}} \rightarrow g, a_2^{\text{TE}} \rightarrow g, a_1^{\text{QR}} < a_2$

Thus the formalisation leads to a “theory of relations” in law. Here it should be noted that, for instance, in discrete mathematics a relation is the set of ordered pairs and represented as a table.

5.2. Goals in artificial intelligence and requirements engineering

Why RE? It provides us with goal-oriented RE methodologies. A guided tour is presented in [van Lamsweerde 2001]. He lists the reasons why goals are so important in RE process and formulates the problem of verification/validation. Goal driven approaches are examined by other authors, see, e.g. [Rolland, Prakash 2000] where conceptual modelling (CM) is treated as the first phase of the two-phase organisation of the information system (IS) life cycle. I treat CM to be in the intersection of RE and AI. CM glues RE and KR. However I find that the universe of discourse in law – the whole society – is more complicated than that in IS design.
Why AI? The term “goal-oriented revolution” is used in [Bolchini, Mylopoulos 2003]. They note that a goal-directed philosophy to systems design was borrowed from AI where goals have been studied since ’50s. I expect that nowadays research in AI-like ontologies [Lehmann, Breuker, Brouwer 2003], [Rubino, Rotolo, Sartor 2006], etc. glues AI and IS better; in legal IS development, too.

5.3. Goal set as a vector of values

A concept of goals plays a central role in Hage’s research on qualitative comparative reasoning [Hage 2004]. He considers an example of choosing between a Mercedes, a Volvo and a Porche. This example is also analysed by other authors.

A natural way to formalise goals is to represent them as coordinates of n-dimensional space. Here two preferences are compared as two vectors. A bad news is that there is no total ordering relation \( \leq \) in n-dimensional space. In case the weights are assigned to goals, then a natural ordering on real numbers is obtained (by summing up the weighted goals). However the concept of legal goals is not so simple, cf. Dworkin’s analysis of hard cases [Dworkin 1986].

6. Acknowledgements

I benefit greatly from collaboration with Friedrich Lachmayer. He positioned the research, advised to use the term teleological structures, shifted from informatics to law, and identified a direction to formalise as a “theory of relations”. Thus this paper resulted.

7. Conclusions

Different nature of goals is inherent to human agents and artificial agents. This differentiates between human intelligence and artificial intelligence. However formalising teleological structures in law makes sense and constitutes a real challenge in the legal domain.

I agree with [Van Hoecke 2002, p. 119] that “when analysing the structure of legal systems we have to take into account this intertwinement of form and substance”. I back his conclusion that “the structure of legal systems cannot be studied in isolation from its content”. In order to discover ontological structures, studies of the structure of law are not enough; studies of the content are required.
8. References


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