Transparent Complexity by Goals

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Abstract. Making the teleological structure of e-government explicit can contribute to reduce its complexity. E-government can be viewed from distinct standpoints – from authorities and citizens, but also from conception and construction. This view of administrative and legal informatics requires paradigmatic changes in the effective development of e-government. We have an impression that a currently dominant normative thinking is not enough to solve specific problems of e-government. Here a new concept of legal teleology is required. We propose to supplement norms and even structural parts of a whole legal system with teleological relations. This will form a separate structural layer of legal knowledge representation. Such a layer can contribute to metadata of legal documents. This is important in the search of legal documents and information retrieval. Proposed notation A te B contains three elements: a basic element A, a target element B and a teleological relation te.

Keywords: Teleological structures in law, goal concept, legal engineering, legal drafting, e-government.

1 Introduction

Making teleological structure of e-government transparent contributes to understand it. Thus its complexity is reduced. Here theoretical concepts have to be concerned too.

Legal order as a societal instrument is characterised by mostly implicit and rarely explicit teleological structures. Teleology concerns not only a single norm but also a whole legal system. An early attempt to analyse legal teleological structures was "Interessensprudenz" done by von Jhering [9, 10]. But nowadays the recent challenges of e-government (Traunmüller [23], Wimmer [27]) require a new concept of legal teleology. The concept of governance entails teleology, too. This lays in Westerman's idea "governance is governing by goals" [26].

Therefore the "goal" deserves to be placed in a top legal ontology. This is especially in the branches of law where legal materials are in the process of development. On the one hand, the goal concept can be treated as a generalisation of "objective", "purpose", "aim", "result", "value", "end", etc. These high-level words are widely used in the legal domain. For example, the purpose of the law is considered in Hart's example of the vehicle in the park [8]. On the other hand, the goal generalises
low-level measurable results such as targets, benchmarks, best practices, etc. The second argument is a teleological method. It is among major legal methods [15].

We see several reasons to consider goal concepts. First, teleology is innate in normative legal systems. Therefore the representation of teleological structures should be an inherent task of legal knowledge management. Second, legal reasoning, especially by non-experts in law, is driven primarily by goals then by norms. Third, teleological structures are mostly implicit and rarely explicit. Therefore their representation is a true challenge in knowledge management. Fourth, teleological statements are extensively used in legal drafting. Listing the purposes of a statute in its preamble is not enough.

Kelsen in his "Reine Rechtslehre" [13] focuses on the model of an action within a norm. The norm is treated as a rule of social behaviour. We think that action-oriented models have to be supplemented with teleological relations.

Sartor [20] treats the goal as a fundamental legal concept: "More articulate normative notions and, in particular, the idea of a right, cannot be built on the basis of obligations and permissions alone. Such notions embed a teleological perspective, namely, a focus on purposes or interests (final or intermediate values, ends, objectives) which a normative proposition is meant to serve …". Sartor [20, p. 108] proposes a notation $A \models G$ "to mean that the adoption of a proposition $A$ advances the goal (or the set of goals) $G". Artosi et al. [2] while proposing elements for a formalisation of the theory of norms treat a propositional assertion and an action as constituent elements of a norm. We think that goals have to be assigned to other elements of the legal system too.

Since legal teleology was introduced to the AI&Law community by Berman and Hafner [3] in 1993, the formalisation has been much discussed a decade later (see Artificial Intelligence and Law, vol. 10(1-3) September 2002).

There are more theoretical beginnings in this direction. Teleological relations enter a broad field of relations. For example, Kaufmann [11] examines ontology of relations (Relationenontologie). There exist many subterms of different relations: Radbruch [19], Tammelo [22], Kaufmann-Hassemer-Neumann [12], etc. The comparison, symbolisation and translation into a logical notation are for future.

Normative teleological structures can be compared with institutional teleological structures. A viewpoint "not rules, but roles" leads to analysis of, first, von Jhering's Interessensprudence [9, 10], then MacCormick and Weinberger [18], etc.

Summers [21, p. 42-47] while speaking about a form and function says that "the overall form of a functional legal unit as a whole must be designed to serve purposes". He distinguishes the following types of purposes of a functional legal unit: (1) founding purposes, (2) internal operational purposes, (3) public policies, (4) political values; general values of the rule of law.

These works show possible methods to tackle a problem. Thus, teleological structures in law can be approached on a methodological basis.

Our exploration of teleology was also inspired by other reasons. First, the following three concepts are not well distinguished in legislation and even in legal theory, namely, (1) the nature of law, (2) the functions of law as well as of an authority and (3) the purposes of an authority. For example, an official speaks about the computerisation of a country as an aim of e-government. However, here the computerisation is a means – not the goal. Being the means it can contribute (positively or negatively) to certain values, e.g., educated society, democracy, the right to information, etc.
The second reason is that a teleological method is widely used in the European Union law. Purposive interpretation is by far the most used method by the European Court of Justice [24].

2 Requirements and Goals of e-Government

Teleological statements are especially found in the legislative workflow: governmental drafting, parliamentarian decisions, publication of the valid laws, etc. In high-level political and legal acts the concept of e-government is expressed in terms of goals (see, e.g., European Information Society programs eEurope 2005, i2010, etc.). In particular, "It is widely accepted that the goal [of e-government] consists in increasing the performance of the governance" [5]. Thus the concept of e-government is related with the concept of governance, see, e.g., [7]. Grönlund [7] identifies three goals as typically explicitly mentioned:

1. more efficient government
2. better services to citizens
3. improved democratic processes

Goal orientation in e-government is inherited from the European Union law which is very goal-centred. The objectives of the EU are set in Article B (now 2) of the Maastricht Treaty on European Union. Article I-2 of a constitution for Europe lists the values of the Union.

Political goals, legal goals and information system goals shall be distinguished. They are represented in the acts of different levels and in different terminology. For example, a very high-level political aim "common market" can be decomposed to the AND-tree of four sub-goals of a type "right": "free movement of goods", "free movement of persons", "free movement of services", "free movement of capital".

The detailed analysis of e-government goals is done at lower level issues. Requirements can be extracted from e-government issues [23]. General requirements for e-government are examined, e.g., in [5]. Requirements engineering methodologies distinguish between functional requirements, non-functional requirements and goals. Examples of business requirements for digital government (DG) as they are categorised by Costake [5] in the form of a goal tree:

- General
  - a. Transparency and accountability of the Governance ...
  - b. Easy access to the public information ...
  - c. Easy access to DG services; etc.
- Citizens-oriented
  - a. User friendly access to public information and services ...
  - b. International recognition of personal e-documents ...; etc.
- Business-oriented
  - a. Provision of complete online public e-services ...
  - b. E-procurement for public acquisitions; etc.
- Oriented on users in state institutions
  - a. Possibility to simulate and assess the effects of drafts decisions or regulations ...
  - b. Decision support services; etc.
3 Why Should the Formalisation of the Goal Concept Be Taken Seriously?

In the classical theory of norms of Kelsen, the norms are not associated with values [14]. Kelsen devotes the Chapter 2 to a norm and means-goal-relationship. This comprises the teleological necessity between a norm and a goal. However in the contemporary context of e-government and governance, the goal emerges as a primary concept.

Who shall bother about goals: politicians, lawyers, governmental agencies or software engineers? "The prevailing attitude of most legal scholars or students of legal theory is to regard policy-making – with or without politics – and governing – with or without government – as activities that should be kept separate from law. Lawyers deal with the product, not with the process that precedes it. They usually deal with rules and regulations, but not with the art of rule-making" [26], cf. [28].

Another reason for the lawyers to be not interested in the goals can also be mentioned. The practicing lawyer is "continuously engaged in demarcating valid from invalid law". Such a position can be viewed as hardly sustainable: "If we want to understand the products – the rules and principles ..., we should also understand the process that has helped to form those products" [26]. Westerman further characterises governance as new style and introduces the concept of result-prescribing norms (RP-norms) [26]. In the EU law, this can be observed in framework-directives. Here one should notice that Article 249 (ex 189) EC Treaty sets: "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 nature of directives is to formulate aims and goal-prescriptions. Examples of the aims are "reliable care", "good labour conditions", etc.

The Westerman's statement "The conventional rule as a device that indicates a concrete manner to achieve ends is replaced by direct prescriptions of those ends. Rule-making is supplanted by end-setting" [26] suggests us the following formalisation. A classically formed action-centred rule

\[ \text{do action } A \text{ to achieve the goal } G \] (1)

is replaced with the rule which has an open action X:

\[ \text{do whatever } X \text{ to achieve the goal } G \]. (2)

Norm-addressees are paradigmatically changed from individual ones to networks of numerous institutions [26]. A next issue is benchmarking of low-level goals. This can be compared with an "open texture" problem. Suppose a high-level goal "reliable care" be decomposed to contain a sub-goal "short waiting list". Then "the question immediately arises what should be counted as sufficiently "short"" [26]. Thus specifications of goals lead to "performance-indicators that enable the various supervisory bodies to monitor the degree in which the desired aims and policies are realised" [26]. The requirement "at every more specific and concrete level, there is less scope for alternatives routes by means of which the results can be obtained" accords with general top-down decomposition principles of systems design.
There are reasons to prefer goals to rules when disadvantages of rules emerge. The difficulties are discerned in [26]:

1. the choice of rules
2. the enforcement of rules
3. the reception of rules
4. the effectiveness of rules

The above listed difficulties also accord with the preference of declarative knowledge when disadvantages of procedural representation are observed. The nature of requirements engineering (RE) is to tell what to attain not how to attain.

Rules are useful when goals (interests, values) are conflicting. Consensus on shared goals (what is vital in the concept of governance) leads to explicit representation of the goals. The tenet that people should reach consensus leads to the emphasis on learning [26]. A shared goal (general interest) should be learned. Here e-government can serve as a collective process of guided learning.

"Tyrannical goals" are identified in demarcating a "facilitative rule (allowing people to pursue their own goals) and a manipulative rule (serving the interest of the legislator only)" [26]. Such tyrannical goals are avoid-goals that are distinguished in RE. Explicit representation of goals might serve when "within governance, there is no systematic place for such a forum in which conflicting interests can be brought together" [26]. Identification of the means as heavy or lighter in order to achieve certain goals can contribute to the principle of proportionality. Here the following formalisation can be extracted:

1. A mean M1 serves to achieve the goal G
2. A mean M2 serves to achieve the goal G
3. M1 is heavier than M2

4 Comparing Goals in the Legal Domain and Requirements Specification

We advocate the following approach: a teleological network in the legal domain shall be treated similarly to the goal model in requirements engineering (RE). We hypothesise on the assumption that a legal act is a system. Consequently, system design methods might be used in legislative drafting [6].

We make a comparison of two systems: a legal act and a software system. A norm corresponds to a requirement. Structural elements of the norm and of the requirement are compared correspondingly. The subject of the norm corresponds to the agent of the requirement. The telos of the norm corresponds to the goal of the requirement. A whole teleological network in a legal domain corresponds to the goal model in RE.

One of the benefits of goal analysis in information systems RE is to identify conflicting goals [25]. Conflicts shall be identified as early as possible in order to improve the design of a system (of a socio-economic system too). In the legal domain conflicting goals are also a reality. They are identified in legislation, observed in law enforcement, claimed in judicial procedures, etc. An example is procedures of a bureaucratic agency versus efficiency of management. This can be observed, e.g., in public procurement when bureaucratic tendering outweighs price reduction. The
nature of a conflict in the legal domain is expressed in different terminology than in goal-oriented requirements engineering. Here different sorts of models (goals, agents, objects, actions) are used [16]. A goal is a prescriptive assertion that captures an objective which the system-to-be should meet [25]. The identification of conflicting goals is one of the purposes of a graphical notation. AND/OR tree can serve this purpose. We think that notations which are used in goal-oriented RE methodologies can be applied in legislation too. A first step is to identify the goals.

Different types of goals are distinguished in software engineering. For example, KAOS goal-oriented requirements engineering methodology [16] distinguishes:

- **achieve** goals. They require that some property eventually holds. $\Diamond G$
- **maintain** goals – some property always holds. $\Box G$ in deontic logic
- **cease** goals – some property eventually stops to hold. Opposed to **achieve**
- **avoid** goals require that some property never holds. Opposed to **maintain**

Additionally, **optimise**, **test**, **query**, **perform** and **preserve** goals are distinguished in multi-agent systems, see, e.g., [4] about Belief-Desire-Intention agent systems.

In KAOS [16], the bottom-level goals in a goal tree are assigned to agents. The agents are responsible for these bottom-level goals. Time logic is used to represent the semantics of goals.

The variety of goal-related concepts in requirements engineering demonstrates the expected variety of concepts in the legal domain.

5 Structure of Teleological Notation

The teleological structure we propose contains three elements: the basic element $A$, the target-element $B$ and the teleological relation $te \rightarrow$. The proposed notation is

$$A \te \rightarrow B$$

Within the legal taxonomy there are different semantic kinds of legal teleology, depending on the different teleological order like time horizon, e.g., $A \te_{\text{short term}} \rightarrow B$, or $A \te_{\text{long term}} \rightarrow B$.

Pragmatically, the teleological structure is embedded within a speech act. Besides, it is necessary to represent the speech act by a separate notation, e.g., $\text{te-statement}(\ldots)$. Also the speech act can be qualified in different ways, e.g., legal, political, scientific: $\text{te-statement}_{\text{legal}}(A \te \rightarrow B)$, $\text{te-statement}_{\text{political}}(A \te \rightarrow B)$, or $\text{te-statement}_{\text{scientific}}(A \te \rightarrow B)$. Consequently, the notation can lead to a “theory of relations” in law.

The Aristotelian philosophical concepts of *entelechie*, telos and finis [1] can be treated as the roots of the teleology of current normative systems. Aristotelian *entelechie* denotes the immanent goal telos of a thing. We represent the telos $B$ of a thing $A$ as $A \te \rightarrow B$. The natural law has been developed around the concept of *entelechie*. A norm allows behaviour which aims at a positive telos and forbids behaviour which aims at a negative telos.

We advocate the relational nature of goals. In such a context three subjects can be identified:
1. The first subject establishes a goal relation $A \rightarrow B$.
2. The second subject evaluates the goal $B$. For example, $B$ is positive or negative.
3. The third subject establishes a norm $N(A)$ concerning the goal relation.

According to Kelsen [13], a speech act (Rechtssatz) about the norm must contain no evaluation of the goal. This is the essence of his Pure Theory of Law.

We distinguish between the following kinds of goals:

- **instrumental goals.** A goal is treated as a "product"
- **situational goals.** A goal is treated as a "social landscape"

Here we consider different kinds of the telos $B$ in $A \rightarrow B$. In *instrumental teleology*, $A$ is an instrument – a (technological) means – in order to reach the goal $B$ which is treated as a "product". In *situational teleology*, the goal $B$ is treated as a certain situation and the action $A$ leads from one situation to another. Here the goal $B$ is not a product, but a "landscape". The following metaphors can be provided. The instrumental teleology is compared to the teleology of "hands". The situational teleology is compared to the teleology of "feet". The hands produce products; the feet take us to another landscape. An instrumental goal sets a certain step. A situational goal sets not a step but another "campsite", a migration goal, or the social scene which may be even not declared.

Next we distinguish between two projections of goals:

- **officially binding goals.** A subject matter to be represented explicitly in a legal act.
- **subjective goals.** May be expressed by an external evaluator

The two kinds would be visualised differently.

The two concepts – a goal and a means – have to be distinguished. Usually a means to achieve a certain high-level goal can be treated as a goal, a lower-level one. Such coercion can go recurrently. This can be observed in governance and public administration law. For example, the means "computerisation of a country", which is set by a high-level governmental agency, is treated by lower-level agencies as a goal. The lower-level agencies decompose the goal to sub-goals, set lower-level means and pass them to next lower-level agencies.

### 6 Teleological Phrases in Legislation

Legislation is a kind of societal practice and, therefore, can be approached from teleological point of view. However, two forms of teleology have to be distinguished: explicit and implicit. Firstly, explicit teleological formulations are in the focus. They can be provided in the texts of legislative materials, both in the texts of laws and in accompanying texts. Implicit teleological formulations are next. However, implicit teleology forms a contextual dimension which frames the legislation. Within this analytical framework one can try to cut teleological phrases and then formalise them as newly-discovered structures.

Legislative practice often uses teleological phrases. Teleological statements extracted from such phrases can be represented by the proposed notation $Act \rightarrow Goal$. Multiple teleology is feasible too. The goal may be formed of a set of sub-goals,
e.g., Act \( te \rightarrow \{ g_1, g_2, \ldots, g_m \} \). Here the column can be interpreted as a certain operation, e.g., And, Or, Xor. Decomposition of goals leads to graph-like structures that are already used in goal-oriented requirement engineering [25], where goals are associated with actions and agents. Actions in legal norms are expected to have such a similarity too.

7 Norm and Goals

The substitution of a norm \( N \) for \( A \) in (3) leads to \( N \rightarrow B \). Our focus is on the immanent teleology of the norm (which is treated as an obligation). Here the norm is a teleological instrument to realise a certain action. The norm being a technical instrument leads to social techniques of normativity. Our starting axiom is that every norm has such a "teleological shadow". We will try to build this semi-automatically.

Making the immanent teleology of a norm observable requires a paradigmatical change in legal theory. For a long time efforts are being made to translate the textually formulated norm into a formal language. The purpose of these efforts in theory was to develop the logic of norms. The advantage of this logic is the formalisation and, consequently, the operationalisation of norms. Deontic logic helps to express a prohibition with demand and a right with the permission. Deontic logic is presumed in legal expert systems, because different variations of normative consequences can be put on sound logical basis.

Our starting point is within the conception of deontic logic. We propose to include the teleological surrounding of norms into theoretical analysis. Consequently, a kind of teleological net occurs. Teleological relations point to a variety of types and suit to better networking than isolated norms which indicate actions. The norms may also constitute internal structures, e.g. grouping according to a common condition. But the teleological structures are unevenly better suited to networking than separate norms. Hence, our aim is, first, to extract teleology from the norms and, second, to connect the norms with teleological nets.

Legal teleology is also important in another respect, namely, public awareness of law. We hold that public consciousness takes better teleological dependencies than separate norms. Citizens find themselves in certain roles and even more or less unaffected by legal rules. On the other side, the citizens, who usually think teleologically in practical situations of life, are separated from the legal teleology. For a citizen teleology of law is more important than textuality of law.

Another aspect of application is found in the development of databases and search strategies. We hope that emphasis on a teleological component will bring creative impulse for the development of legal databases in the future.

Finally, it is the systematisation of law which involves teleological structures. Up to now there are at least three methodological instruments to build legal systems. First are legal norms which can be arranged into a hierarchy. Second are legal terms which describe a dimension of a legal system in modally indifferent legal taxonomies. Third are the patterns of thinking of legal institutions, especially performance and service in return, which can contribute to internal building of the system of law. Further we consider the forth instrument in legal systematic – teleological structures.
8 External and Internal Teleology of the Norm

We can distinguish external teleology and internal teleology of the norm. The external teleology $G$ is defined to satisfy $\text{norm}(A \rightarrow G)$. For example, $A = \text{open\_door}$ and $G = \text{fresh\_air}$, or $A = \text{close\_door}$ and $G = \text{security}$.

The internal teleology $G$ is defined to appear within the statement (text) of a norm. Formally, it satisfies $\text{norm}(A \rightarrow G)$. For example, "Open the door for fresh air".

This internal teleology is of a special interest when an action is open (denoted $X$) and only the goal $G$ is given. Formally, it is denoted $\text{norm}(X \rightarrow G)$.

If the content of the norm is considered a classical dual structure of the norm is obtained: $\text{condition}$ and $\text{action}$. We add the third element – $\text{finality}$. Thus we assume that a norm consists of three elements – condition, action and finality:

$$\text{norm}(\text{if condition } A \text{ then should be behaviour or action } B \rightarrow G).$$

Here we note that Luhmann [17] differs between conditional programming ($\text{conditional Programmierung}$) and finality programming ($\text{Finalprogrammierung}$).

9 Case-Based Reasoning Versus Statute-Based Reasoning

In legal theory there are several mainstreams which bring about specific results. These mainstreams are not opposites but emphasize different positions of the same system. This is true for CBR and SBR: $\text{case-based reasoning} \neq \text{statute-based reasoning}$. However, there is no contradiction in this formula, but different aspects of reasoning are revealed. CBR and SBR deal with different dimensions of legal reasoning.

The argumentative acts of parties are covered by facts and norms which are relevant to assess the facts. "Attack v. defence" involves not only facts, but also rules, e.g., $\text{Attack} \ "r1, r2, r3, fact1, fact2" \ v. \ defendant \ "no r1, but r7"$.

Legal arguments are based not solely on the decisions of cases, but also on the legislation of general rules. We can even say that a trend rises to automate the production of individual legal norms so that the argumentation steps back. If the process is ruled by forms the parties fill in the forms and no additional argumentation takes place. Therefore it is possible that in future the legal argumentation in routine cases will step back because of massive computer applications.

Respectively, in the future legislative workflow and argumentation in frame of legislation will gain more interest. This is true for both the professional argumentation of disputing parties and also the argumentation of citizens in e-participation. The arguments will be confronted in synopsis. Therefore it is interesting to evaluate the arguments and to represent them in the system of content.
We believe that a two-state status of an argument is not enough to accept it. This corresponds to practical needs where different forms of asserting, disputing, supporting, etc. in explicit modes of argumentation are considered. There are different statuses of qualifications of elements within a case, not only two, e.g., Case "r1 attacked-defended, r2 con, fact1 attacked-defended, fact2 con". Facts can be confirmed by testimonies, proved (official version of a decision), etc.

From the point of view of the teleological method different forms of argumentation are interesting in both the decisions of individual cases and in the legislative workflow of production of general norms. Not only norms but also the arguments concerning the norms may be the subject of goal analysis. In legislation the goal-based argumentation is more frequent than in decisions of individual cases.

10 Legal Speech Act Versus Legal Content Versus Container of Legal Documentation

We think that three layers are important in teleological analysis. First is a concept of "speech act" in general and "legal act" specifically. The law is a legal act, so is a decision. While writing about legal acts, Kelsen [13] says that "Is" is transformed through the interpretation to "Ought". Legal hierarchy consists of such legal acts. They have their external teleology and also goals for which they have been created.

The second concept is "legal content", i.e. the content of legal texts. The language structure of a text does not depend on what legal act it appears in. If a draft is created by a ministry and presented for examination the draft has a particular text. Let us assume that the text is presented unchanged to the government and the government formally passes it as a governmental bill. And finally the parliament passes the unchanged text as a statute. Then the text is the same but three different legal acts are presented. The concept of legal content refers to this text. From the teleological point of view, the same formulation of the text is handled and different teleological structures may be derived from it.

The third concept is "container of legal documentation". The later consists neither of statutes nor paragraphs, but of a variety of other documents. These documents consist mostly of a text as the content of the container and thereupon metadata. The teleological structures come up to the legal documentation from different places; similarly they come up to the metadata of the container.

Legal taxonomies and legal ontologies emerged in connection with legal informatics. They serve to produce the containers of legal documentation better and contribute to more efficient search. Here ex ante and ex post views are distinguished. This is also true for the definition of teleological elements.

The presented concept of the analysis of teleological structures in law emerged from the field of legal informatics and not from the dogmatics of interpretation of legal acts and their content. We defend a methodological approach which rests on the following statement. Formal analysis of teleological structures in law is feasible on condition that we find structures in the text which lead – as a bridge – to formalisation. Such intermediate structures require creating a notation. In fact, the aim of the paper is to draw reader's attention to an intermediate method that underlies a strictly formal treatment.
11 Conclusions

We aim to contribute to theoretical foundations. Without the progress in theory there is no progress in practice. The proposed notation $A \rightarrow B$ leads to a theory of relations in law. Different types of the teleological relation $\rightarrow$ can be distinguished. The teleology concerns the whole legal architecture. Apart from norms, concepts and institutions the teleology offers independent base for system development in law. The intermediate notation for teleological structures in law can be viewed as a contribution to formal methods of knowledge representation in legal informatics.

The practical expectations are to supplement legislative drafting with teleological statements. Thus the transparency of e-government can be increased.

References