A Landscape of Legal Teleology: Formalization through Visualization

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1.
The goal concept in software engineering
KAOS metamodel; see Heaven & Finkelstein (2004). KAOS – a goal-oriented requirements engineering methodology; see van Lamsweerde.
KAOS goal model; see Matulevičius & Heymans (2005)
Goal reduction: AND, OR, XOR
Example: KAOS model for the London Ambulance Service system

See Heaven & Finkelstein (2004), adapted from Letier (2001)
Goals and agents

• Responsibility link relates a bottom level subgoal to an agent

• Agent is responsible for goal satisfaction

• Agent in a requirement ~ the subject of a norm

Agent and goal in RE ~ Subject and telos in the law
Types of goals

• **Achieve** goals require that some property *eventually* holds. In deontic logic, $\Diamond G$.
• **Maintain** goals require that some property *always* holds. $\square G$.
• **Cease** goals require that some property *eventually stops* to hold. Negation of achieve.
• **Avoid** goals require that some property *never* holds. Negation of maintain.
• **Optimise, Test, Query, Perform, Preserve**, see Braubach et al. (2004) about Belief-Desire-Intention agent systems
2. Teleological interpretation in law
An example

- “Dogs are forbidden”
- Is a bear permitted to enter the building?
- Hart’s example “Vehicles are forbidden in the park”
- Bench-Capon’s analysis (2002)
Teleological reasoning in law

Premise 1: Obtaining of the situation G is prescribed
Premise 2: If one had not do H, then G would not be obtained

Conclusion: One should do H


The objective-teleological construction of statutes:

Premise 1: According to an interpretation, supported by various juristic substantive and authority reasons, the provision, L, is a means to fulfill the goal, G
Premise 2: If one had not interpreted L as containing the rule R, then G would not be obtained

Conclusion: One should interpret L as containing the rule R
Limitations of logic

See Peczenik (2008):

“The purpose of the statute (*ratio legis*) as regards *hard* cases differs from the will of the persons that participated in the process of legislation. Neither the *ratio* nor the proposed construction of statutes *follow logically* (emphasis added) from the description of the will alone.”
3. Motivation
Our “naïve” approach

• To treat a teleological network in the legal domain similarly to the goal model in Requirements Engineering (RE)

Teleological network of a statute ~ Goal model in RE

• Assumption: a statute is a system (Čaplinskas & Mockevičius 2002).

• Conclusion: systems design methods might be used in legislative drafting.
Motivation

• Formalisation of teleology for AI & Law community
  – Goals: interests, values; purposes, policies; intentions of a legislator
• “Goal” is not among fundamental legal concepts!?
  – However, in G. Sartor, 2006 “Fundamental legal concepts”
• Teleological statements in the legislative workflow
  – governmental drafting; parliamentarian decisions; publication of the valid laws
• Teleological method in law
• Characterisation of legal order: many *implicit* and rare *explicit* teleological structures
Teleological reasoning vs. norm-based reasoning

• General legal reasoning, especially by non-experts in law, is driven, primarily, by purposes, then by norms
  – “The people think in roles, not rules”
Roots

- Von Jhering’s “Interessensprudenz”
- The European Union law
  - A constitution for Europe
    - Article I-2 The Union’s values;
    - Article I-3: objectives
- Westerman (2007) about e-Government
  - “Governance is governing by goals”
  - Result-prescribing norms
Goals of e-Government, see Costake (2007)

“Increasing the performance of the governance”

• General
  a. Transparency and accountability of the Governance
  b. Easy access to the public information
  c. Easy access to DG services

• Citizens-oriented
  a. User friendly access to public information and services
  b. International recognition of e-documents

• Business-oriented
  a. Provision of complete online public e-services
  b. E-procurement for public acquisitions

• Oriented on users in state institutions
  a. Possibility to simulate and access the effects of drafts decisions or regulations
  b. Decision support services
4. Explicit teleological element within a norm
The structure of a norm. The elements:

(1) **Condition**

(2) **Disposition**

(2.1) **Subject**. This is an addressee – an actor;

(2.2) **Action**;

(2.3) Normative **modus** (obligatory, permitted, forbidden);

(2.4) **Object** of the action.

(3) **Telos** – the explicit teleological element of the norm. We add the *telos*. 
Example 1: “Open the door”
(1) Condition: empty
(2.1) Subject: implicit
(2.2) Action: “open”
(2.3) Modus: implicit in the verb “open”
(2.4) Object: “the door”
(3) Telos: empty
Example 2: “You must open the door”
(1) Condition: empty
(2.1) Subject: “you”
(2.2) Action: “open”
(2.3) **Modus:** “must” – *obligatio*
(2.4) Object: “the door”
(3) Telos: empty
Example 3: “You must open the door for fresh air”

(1) Condition: empty
(2.1) Subject: “you”
(2.2) Action: “open”
(2.3) Normative modus of the action: “must”
(2.4) Object the action: “the door”
(3) Telos: “for fresh air”
Example 4: “Subject S1 must open the door for fresh air”

Notation in the form of relation:

\[ \text{disposition } \text{te} \rightarrow \text{telos} \]

Notation within norm elements:

\[ \text{Obligatio } (S1,A,B) \text{ te} \rightarrow G \]

Notation in algorithmical language:

\[ \text{norm( condition=empty, disposition( subject=S1, action=A, modus=O, object=B ), telos=G )} \]
External and internal teleology

• **External teleology**

  \[ \text{norm}(A) \rightarrow G \]

  E.g. \( A = \text{open\_the\_door} \) and \( G = \text{fresh\_air} \)
  \( A = \text{close\_the\_door} \) and \( G = \text{security} \)

• **Internal teleology**

  \[ \text{norm}(A \rightarrow G) \]

  E.g. “Open the door for fresh air”
Example of A $te \rightarrow G$

Straße: eine für den Fußgänger- oder Fahrzeugverkehr bestimmte Landfläche samt den in ihrem Zuge befindlichen und diesem Verkehr dienenden baulichen Anlagen. (see Straßenverkehrsordnung 1960 (StVO), §2, para.1)

$Straße = Landfläche te\rightarrow (Fußgängerverkehr \lor Fahrzeugverkehr) \land (Anlagen te\rightarrow Verkehr)$

in English:

$street = land\_area te\rightarrow (pedestrian\_traffic \lor vehicle\_traffic) \land (facilities te\rightarrow traffic)$
5. Path metaphor.
Initial situation – path – goal
Intuitive understanding of a path in the landscape

\[ y = f(x_1, x_2) \]

\[ L = \langle g_0 = \text{initial\_situation}, g_1, g_2, \ldots, g_M = \text{goal\_situation} \rangle \]
The Entities of Sinnlandscape (Sinnlandschaft)
A formalisation in mathematics

“A destination can be reached by a cheap and slow train, means\(_1\), or by an expensive but fast train, means\(_2\),”

\[
w(\text{means}) = \alpha_1 \cdot \text{price} + \alpha_2 \cdot \text{time}
\]

\[
L = \langle m_1, m_2, \ldots, m_M \rangle
\]

\[
w(L) = \sum_{i=1}^{M} w(m_i)
\]

\[
\text{path}_1 = \langle \text{up, up} \rangle \quad \text{is preferred to} \quad \text{path}_2 = \langle \text{up, down, up, up} \rangle \quad \text{because}
\]

\[
w(\text{path}_1) = 2 < w(\text{path}_2) = 4.
\]
The landscape metaphor in means-ends analysis

“The end justifies the means” (Der Zweck heiligt das Mittel).

Kant’s imperative: “Who is willing the end, must be willing the means” (Wer den Zweck will, muss das Mittel wollen).

3 means $m_{wrong}$, $m_{weak}$ and $m_{right}$
6.
Rudolf von Jhering
(1818-1892)
Bentham’s conception of the purpose of law

Jeremy Bentham (1748-1832), an English jurist, philosopher, utilitarian:

“Legislation must be shaped with reference to the greatest good for the greatest number.”

My notation:

*legislation* $\rightarrow$ *the_greatest_good_for_the_greatest_number*
Jhering’s book
“Law as a Means to an End”

1. Law is a means.
2. This means teleologically serves a certain end.

Jhering’s Law of Purpose: no volition, or, which is the same thing, no action, without purpose.
Sufficient condition scheme from Walton (1998) incremented from 3 to 5 elements:

Argument scheme AS1

- currCircumstances: In the current circumstances R
- action: We should perform action A
- newCircumstances: To bring about new circumstances S
- goal: Which will realise goal G
- value: And promote value V
8. Summary
Expected usage

• In e-Government:
  – Assigning goals to software requirements

• In law:
  – Annotating a statute with goals, i.e. serving as a commentary
  – Goal representation forms
    • Textual annotation
    • A network of goal identifiers
Conclusions

1. Formal analysis of goals is employed in systems engineering. Therefore, we aim at the usage in law.

2. Visualization precedes formalisation.

3. Teleology can be associated with different elements of a norm.

4. From the viewpoint of legal knowledge representation the normative layer of a legal system can be supplemented with a teleological layer.

5. A continuous landscape metaphor supplements the discrete 2-elements notation action te→ goal.
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