On formal notation of the teleological structure of law

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Motivation; context

- **Teleological statements are especially found in the legislative workflow**
  - governmental drafting; parliamentarian decisions; publication of the valid laws

- **Law and Artificial Intelligence (AI) – different methodological paradigms**
  - T. Bench-Capon, W. Bibel, J. Breuker, T. Gordon, C. Hafner & H. Berman, J. Hage, G. Sartor, B. Verheij etc
  - Approaches:
    - Via natural language
    - Via formal notation

- **Characterization of legal order: many implicit and rare explicit teleological structures**
Teleological structures in context

- “Goal” is not among them!? Why?
  - However, in G. Sartor, 2006 “Fundamental legal concepts”

- Teleology
  - Berman & Hafner 1993; Bench-Capon; Prakken; Sartor etc
  - Goals
    - Interests, values
    - Purposes, policies
    - Intentions of a legislator
The proposed notation

1. The basic element \( A \)
2. The target-element \( G \)
3. The teleological relation \( te \rightarrow \)

The proposed notation is:

\[
A \ te \rightarrow \ G
\]

“A legal act \( A \) aims at a goal \( G \)”

The speech act:

\[
TE\text{-statement}(\ldots)
\]

\[
TE\text{-Statement} \ ( \ “A \ legal \ act \ A \ aims \ at \ a \ goal \ G” \ )
\]
Different semantics of teleology

Different taxonomies:

- **TE-statement-legal(…)**
- **TE-statement-political(…)**
- **TE-statement-scientific(…)**

Different time horizon:

- **A te-short-term → G**
- **A te-medium-term → G**
- **A te-long-term → G**
Illustration

(1) “A goal $G$ is achieved by a legal act $A_1$”

(2) “A goal $G$ is achieved by a legal act $A_2$”

(3) “A legal act $A_1$ implies less quantitative restrictions (QR) than $A_2$”

(1) $A_1 \rightarrow G$

(2) $A_2 \rightarrow G$

(3) $A_1 \text{ QR} \lesssim A_2$
Theory of relations

- Binary relation:
  - Infix notation: \( A \rightarrow G \)
  - Prefix notation: \( TE(A,G) \)

- Theory of relations in mathematics and computer science is well developed:
  - A binary relation \( R(x,y) \) is defined as Cartesian product, i.e. a set of pairs: \( \{(x,y) | x \in X, y \in Y\} \)
  - In relational algebra, a binary relation is represented as a two-column table, e.g.

<table>
<thead>
<tr>
<th>Act</th>
<th>Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>G</td>
</tr>
<tr>
<td>A2</td>
<td>G</td>
</tr>
</tbody>
</table>

- Theory of relations in law?
Legal System

Meta-Regulation

Normator

Norm

Subsumption

Condition

Actor

Action

Result
Legal System

explicit / implicit Teleological Relations
TE-STATEMENT

(A \textit{te} short term medium t. long term \rightarrow B)

Legal System

IVR 2007, Krakow

Normator

Metanorm

Norm

Actor

Action

Result

Condition

Subsumption

political legal dogmatical

TE-STATEMENT

(A \textit{te} short term medium t. long term \rightarrow B)
Legal System

TE-STATEMENT

(A te short term medium t. long term → B)
Human Image → Human Rights