

Goal Concept of e-Government

Vytautas ČYRAS

Vilnius University,
Faculty of Mathematics and Informatics,
Vilnius, Lithuania

Vytautas.Cyras@mif.vu.lt

Friedrich LACHMAYER

University of Innsbruck,
Faculty of Law,
Austria

Friedrich.Lachmayer@uibk.ac.at

1. Introduction

Motivation

- Teleological statements are especially found in the legislative workflow
 - governmental drafting; parliamentary decisions; publication of the valid laws
- Characterisation of legal order: many **implicit** and rare **explicit** teleological structures
- Teleological method in law
- “Goal” is not among fundamental legal concepts!?
 - However, in G. Sartor, 2006 “Fundamental legal concepts”
- Formalisation of teleology for AI & Law community
 - Berman & Hafner 1993; *AI and Law* journal, v.10 (2002), no.1-2
 - Goals
 - interests, values; purposes, policies; intentions of a legislator

Teleological reasoning vs. norm-based reasoning

- General legal reasoning, especially by non-experts in law, is driven, primarily, by **purposes**, then by **norms**
- Rational agent = intuitive cognition + reasoning

Roots

- Von Jhering's "Interessensprudenz"
- Westerman (2007)
 - "Governance is governing by goals"
 - Result-prescribing norms
- The European Union law
 - A constitution for Europe
 - Article I-2 The Union's values; Article I-3: objectives

2.

Goals in Software Engineering

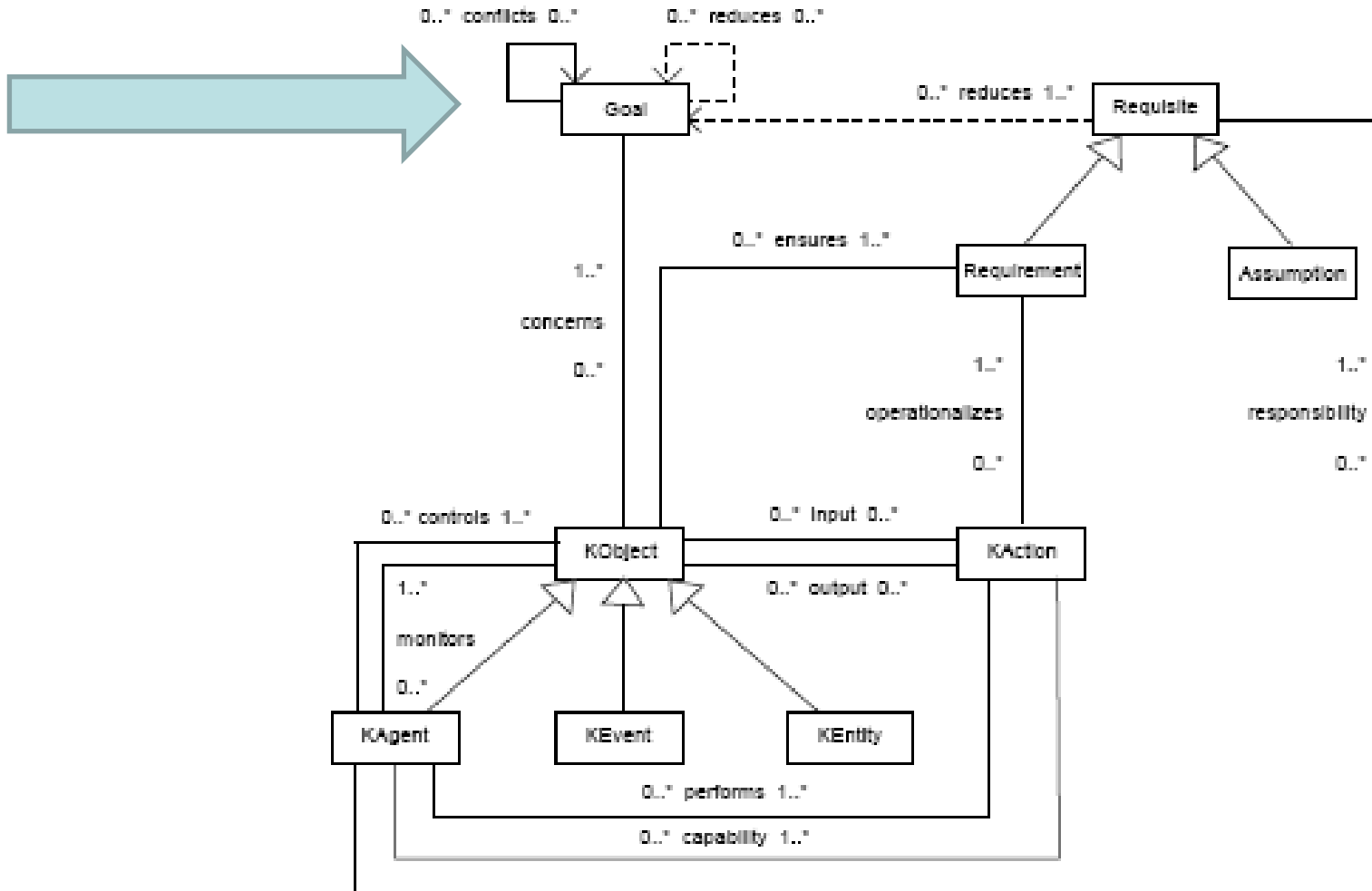
Our approach: to treat
a teleological network in law
similarly to the goal model in RE

Assumption: a statute is a system.

Conclusion: system design methods might
be used in legislative drafting.

- Teleological network in a statute ~
goal model in requirements engineering

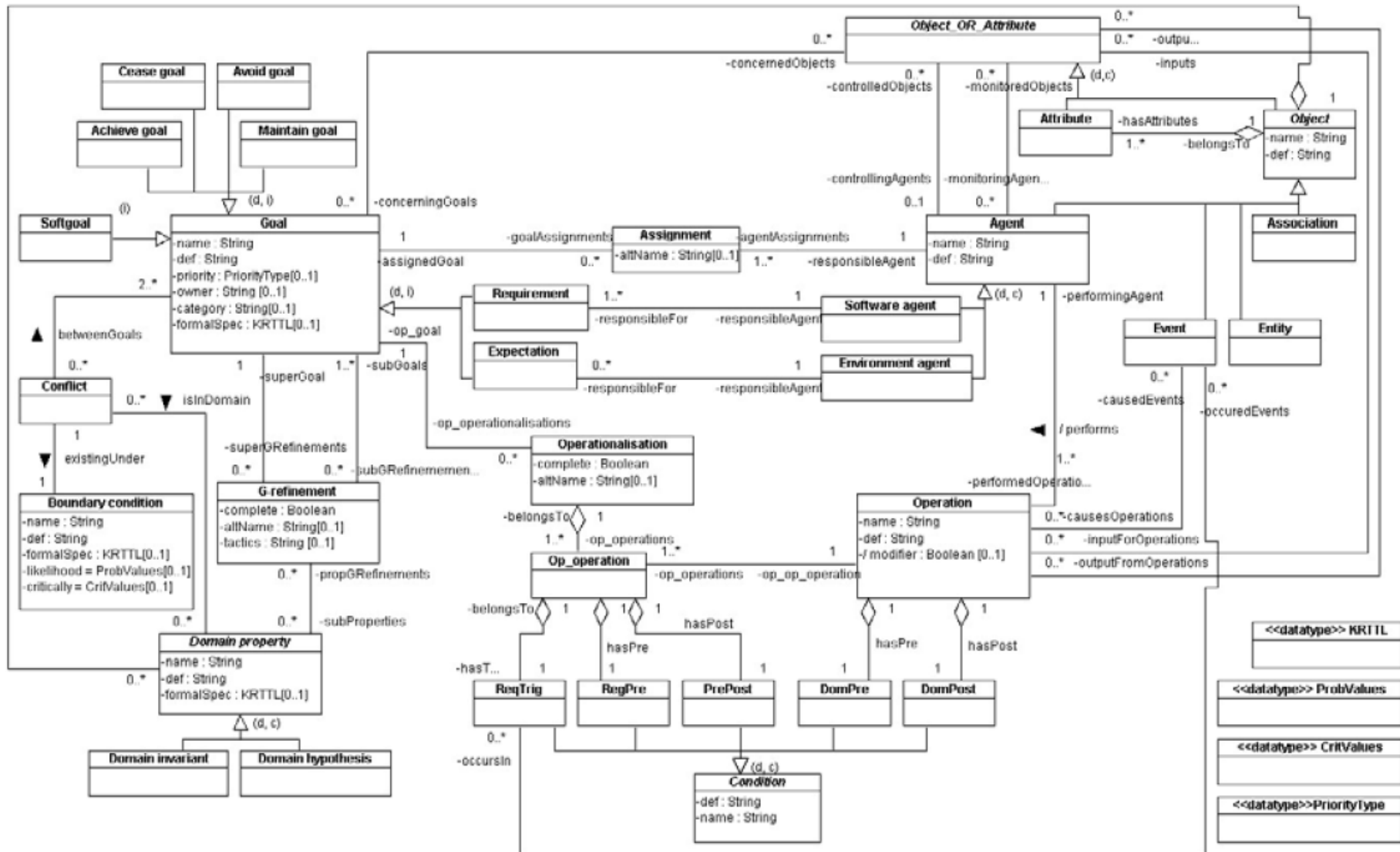
Goals in software engineering



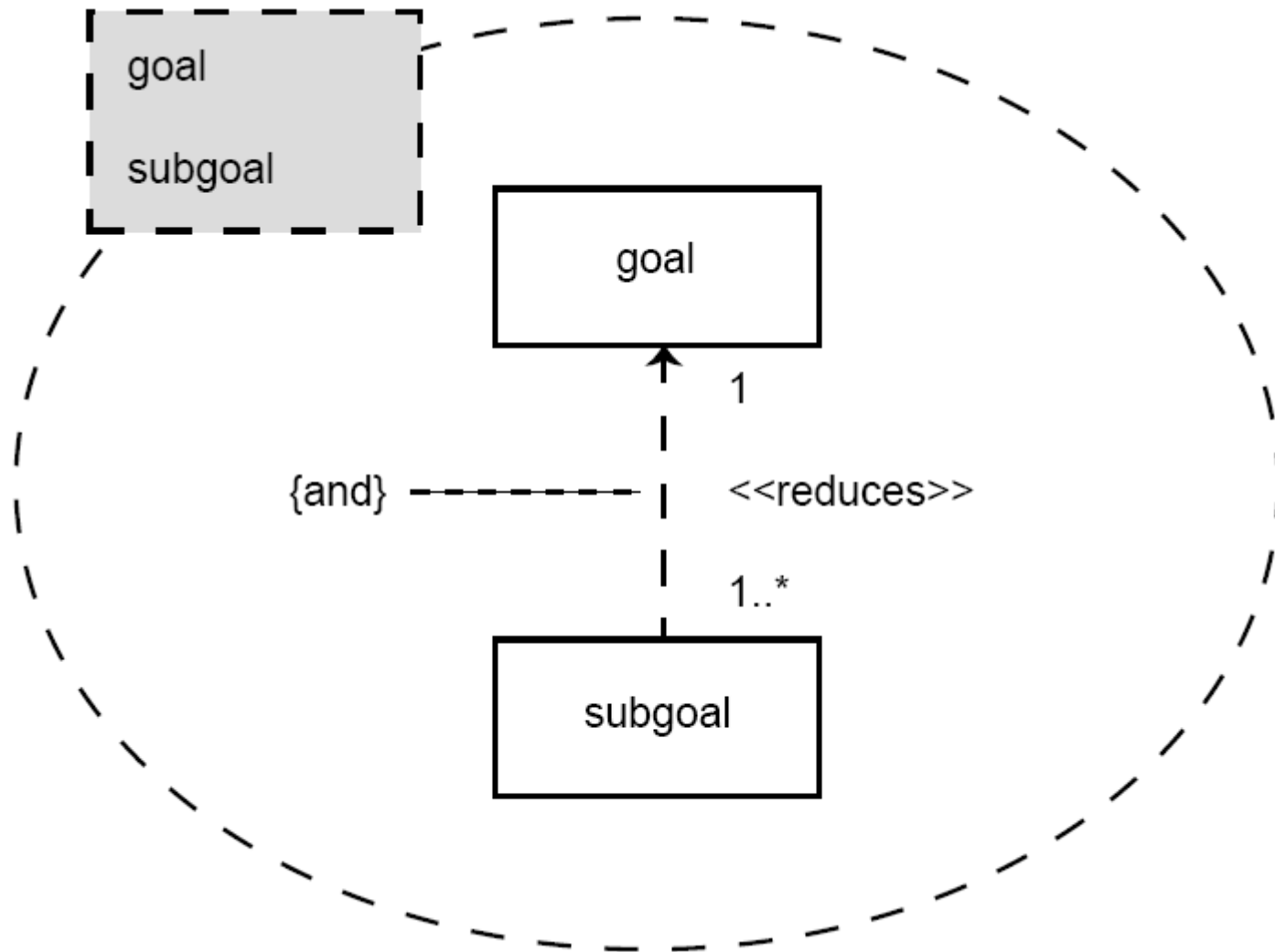
KAOS metamodel [Heaven, Finkelstein 2004]. KAOS – goal-oriented requirements engineering methodology, see van Lamsweerde
 27-29.05.2008, Mautern e-Government, Workshop II

KAOS goal model

[Matulevičius, Heymans 2005]

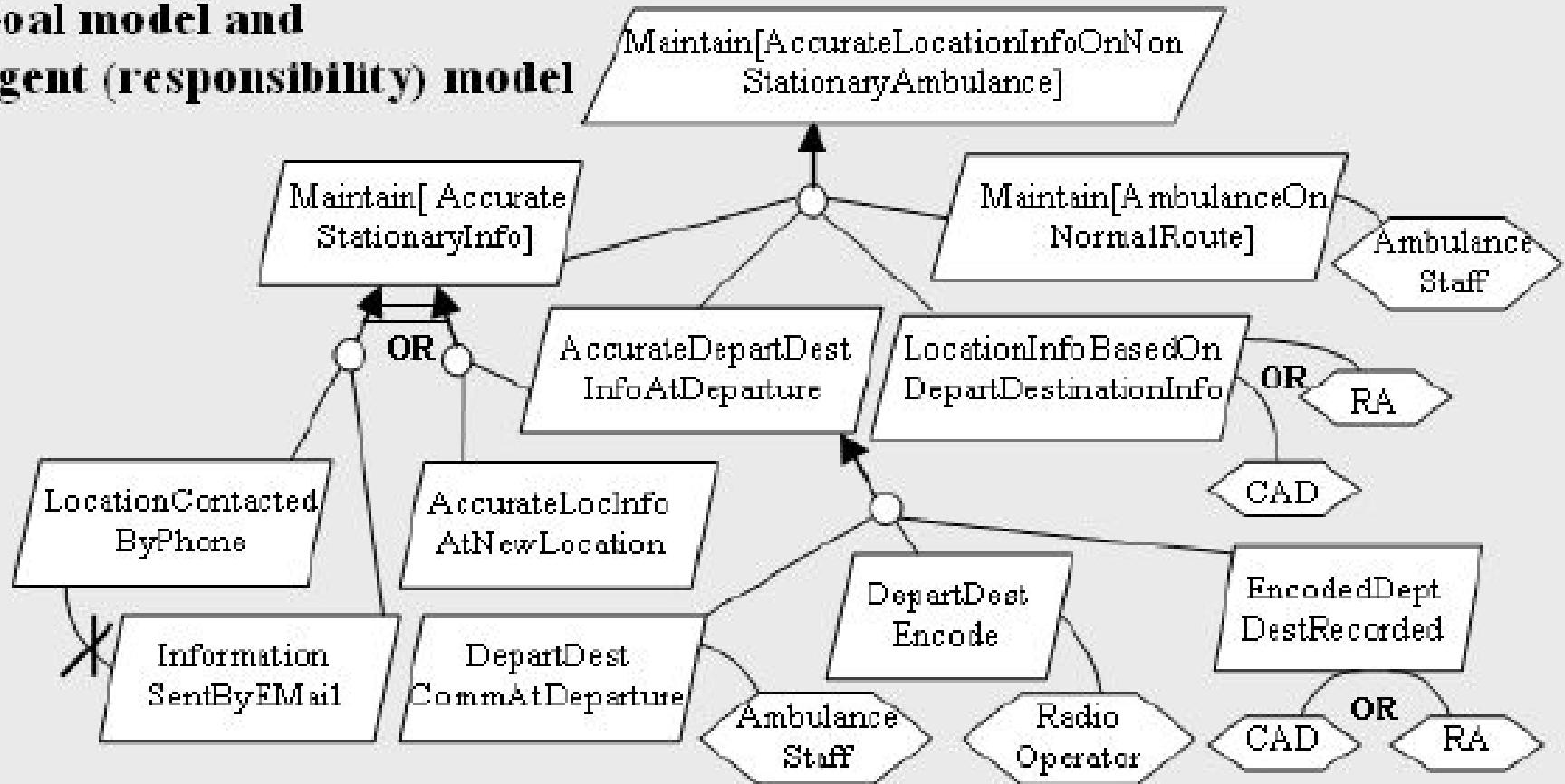


Goal reduction: AND, OR, XOR



Example: KAOS model for the London Ambulance Service system

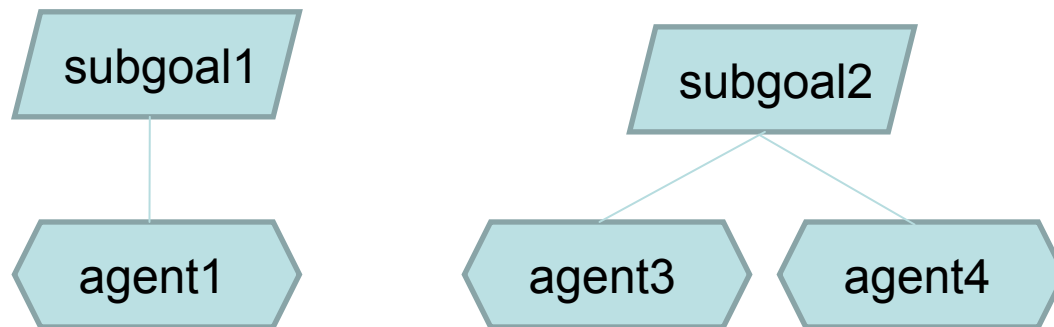
Goal model and Agent (responsibility) model



See [Heaven, Finkelstein 2004], adapted from [Letier 2001]

Goals and agents

- Responsibility link assigns a goal to an agent. A bottom level subgoal is related to an **agent**



- The agent is responsible for goal satisfaction
- **Agent** of a requirement ~ **subject** of a norm
- **Goal and agent** in requirements engineering ~ **telos and subject** in the law

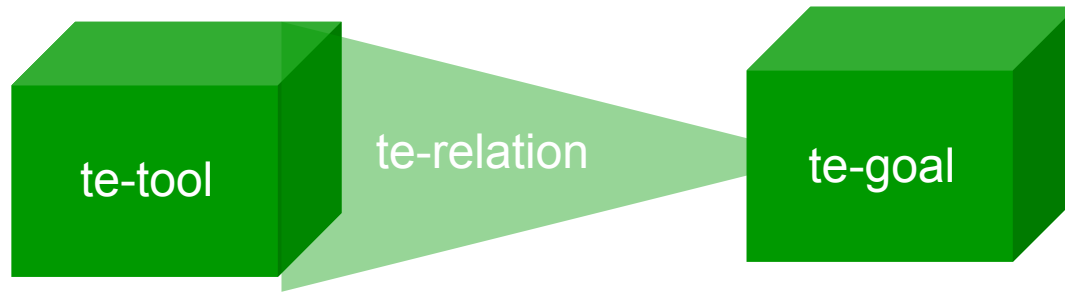
Types of goals

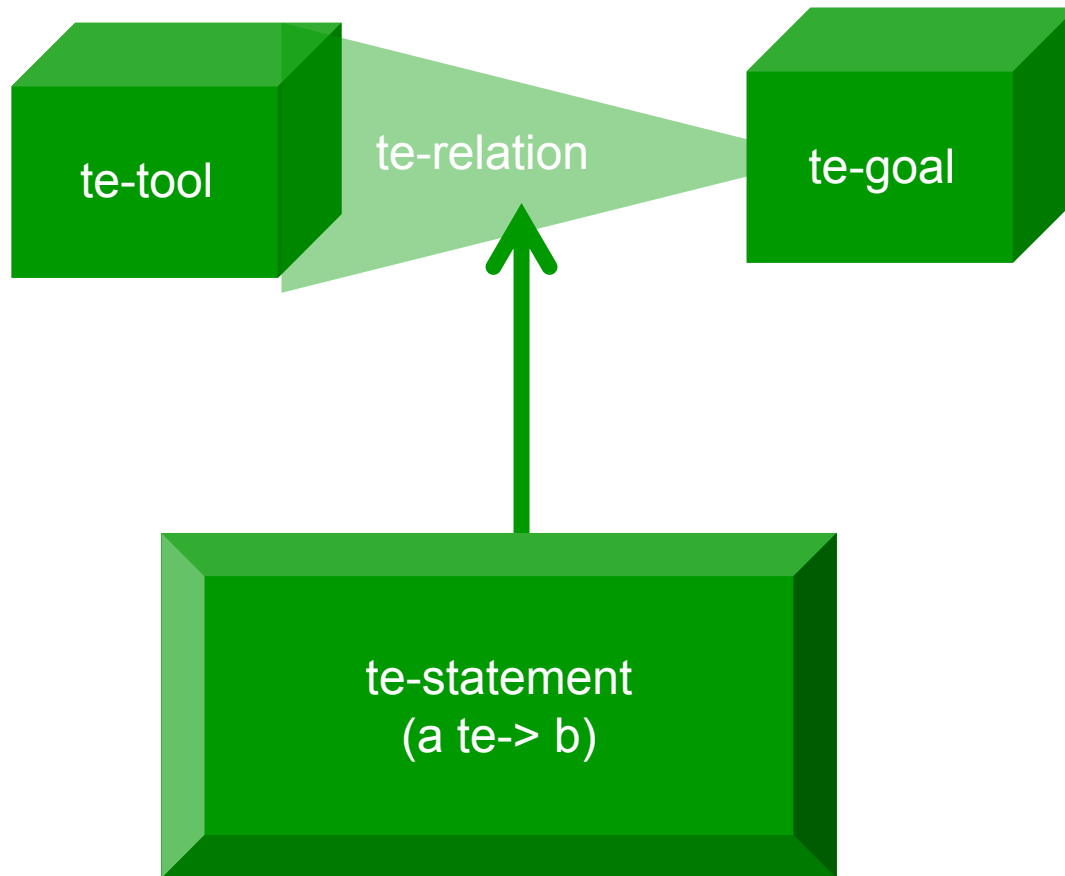
- Different goal types
 - **Achieve** goals require that some property *eventually* holds. In deontic logic, $\diamond G$.
 - **Maintain** goals require that some property *always* holds. $\square G$.
 - **Cease** goals requires that some property *eventually stops* to hold. Negation of achieve.
 - **Avoid** goals require that some property *never* holds. Negation of maintain.
 - **Optimise, Test, Query, Perform, Preserve** [Braubach et al. 2004] about Belief-Desire-Intention agent systems

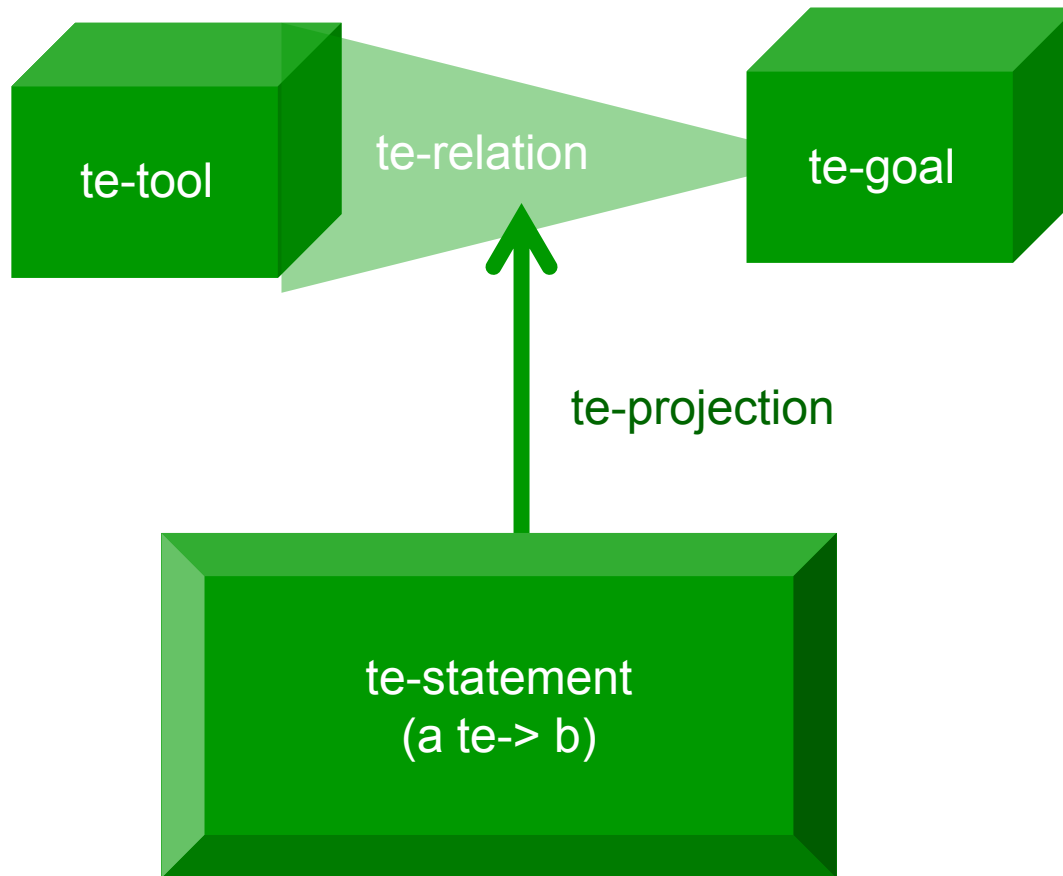
Expected usage

- Annotation of a statute with goals – a commentary
- Goal representation forms
 - Textual annotation
 - A network of goal identifiers

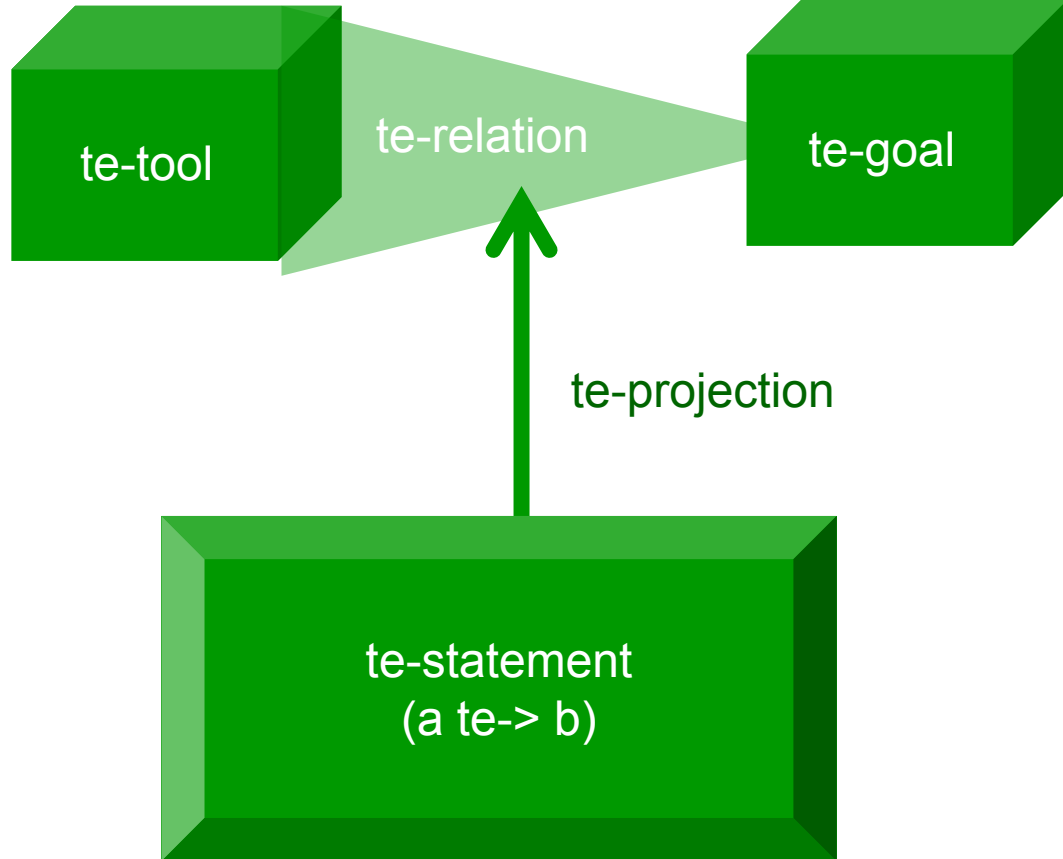
3. Teleological Statements and the Context of Teleology

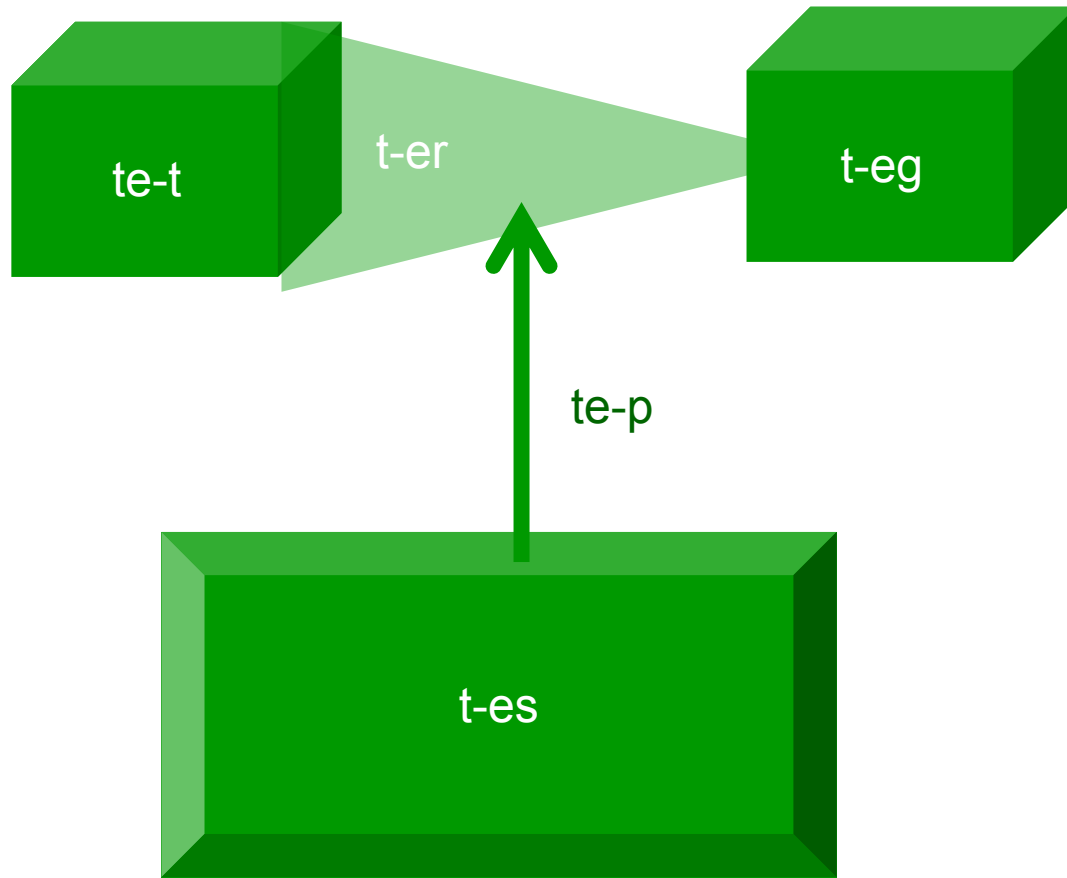




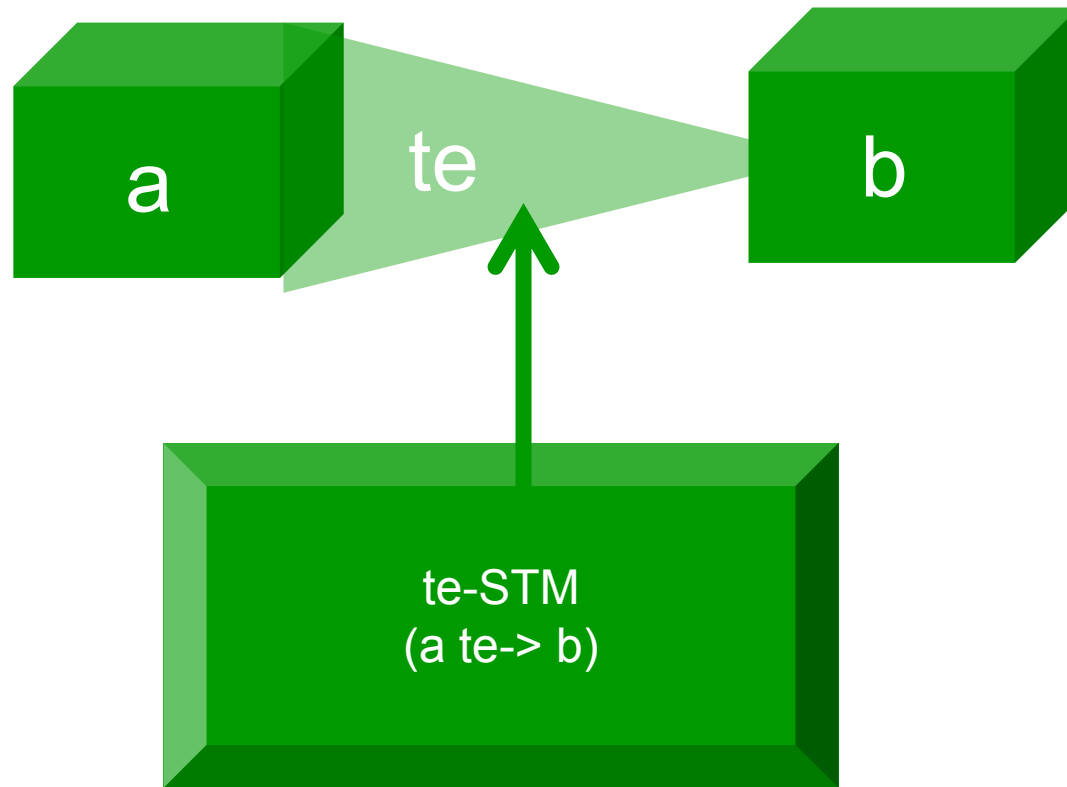


te-context





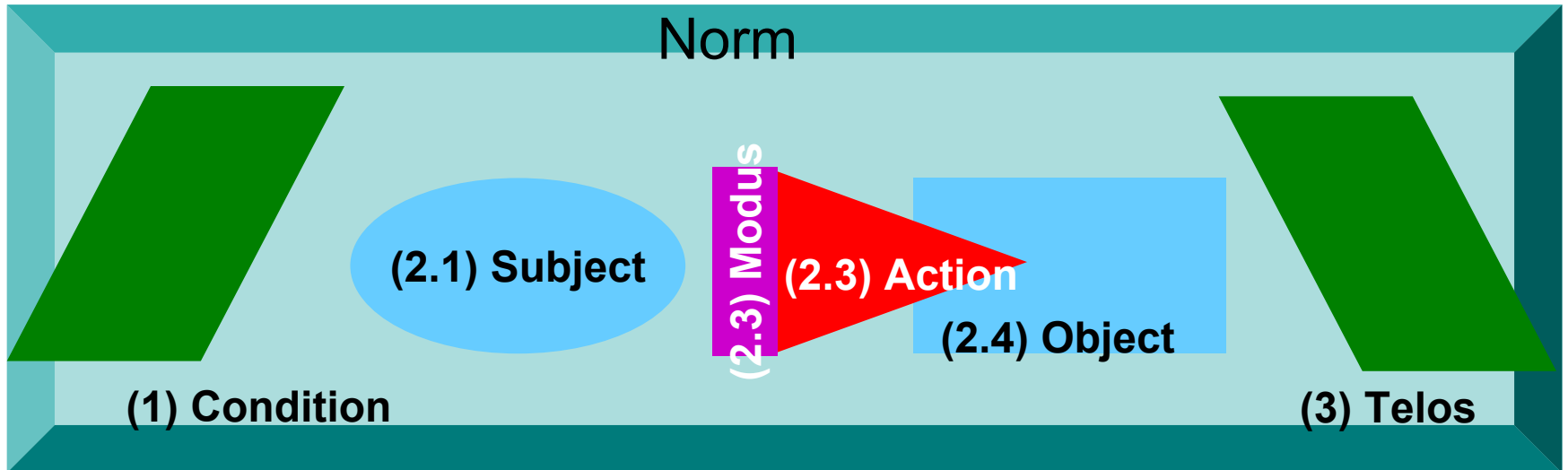
Teleological Statement, Context



Contexts: legal, economical, scientific, political, ideological, etc.

te-c te-context	{ STM (a te-> b) }
te-g te-goal	a te-> b
te-p te-projection	STM (a te-> b)
te-r te-relation	a te-> b
te-s te-statement	STM (a te-> b)
te-t te-tool	a te-> b

4. Explicit teleological element within the norm



Consider the structure of a norm to be composed of the following elements:

(1) **Condition**

(2) **Disposition**

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

(2.2) **Action**;

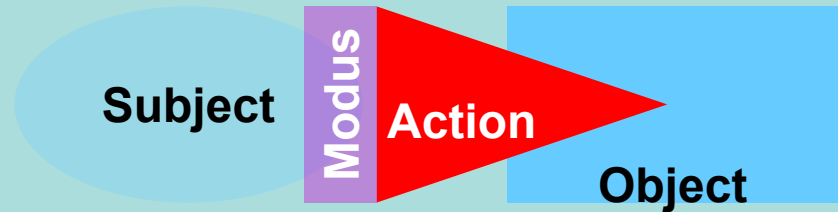
(2.3) Normative **modus** of the action;

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

(3) **Telos** – the explicit teleological element of the norm.

We add the *telos*.

Norm



Example 1: “Open the door”

(1) Condition: empty

(2.1) Subject: implicit

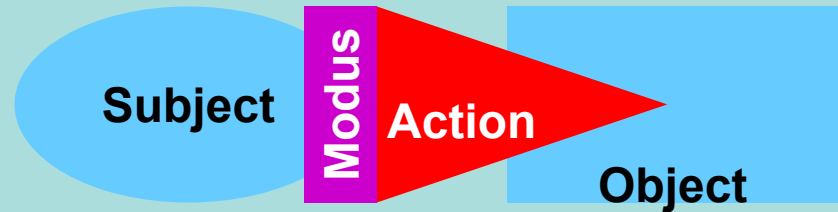
(2.2) Action: “open”

(2.3) Modus: implicit in the verb “open”

(2.4) Object: “the door”

(3) Telos: empty

Norm



Example 2: “You must open the door”

(1) Condition: empty

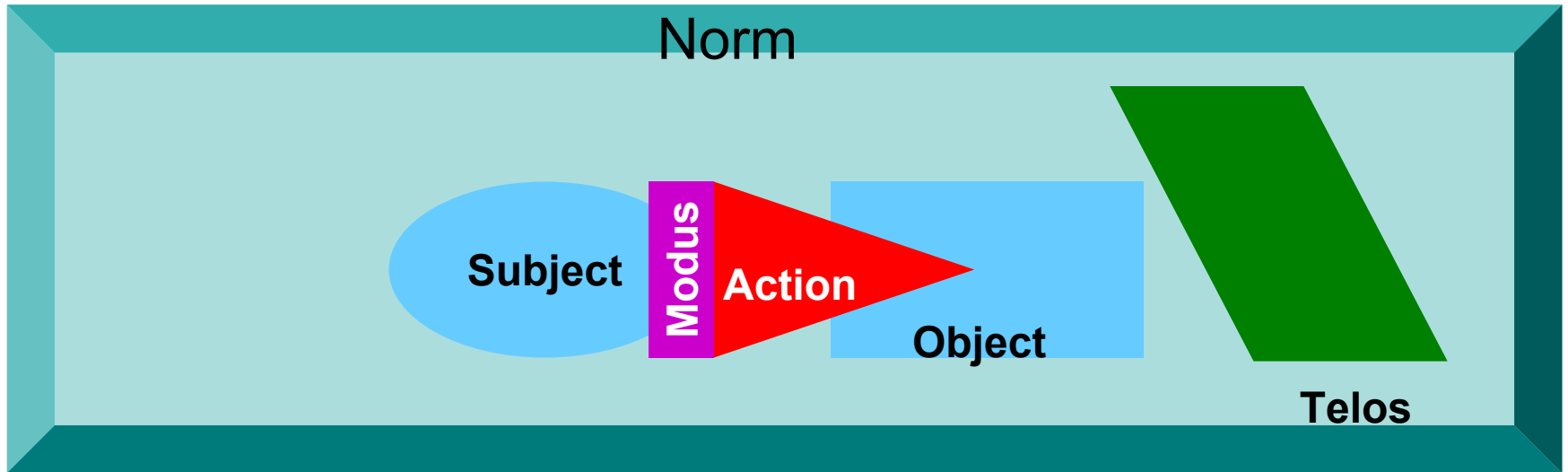
(2.1) Subject: “you”

(2.2) Action: “open”

(2.3) **Modus: “must”**

(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”

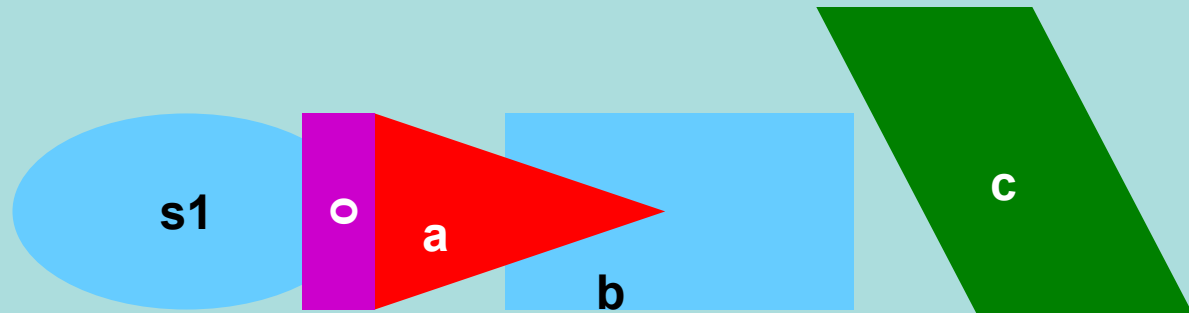
(2.2) Action: “open”

(2.3) Normative modus of the action: “must”

(2.4) Object the action: “the door”

(3) **Telos: “for fresh air”**

Norm



Example 4: “Subject 1 must open the door for fresh air”

Formal notation (in the form of relation):

disposition **te** → telos

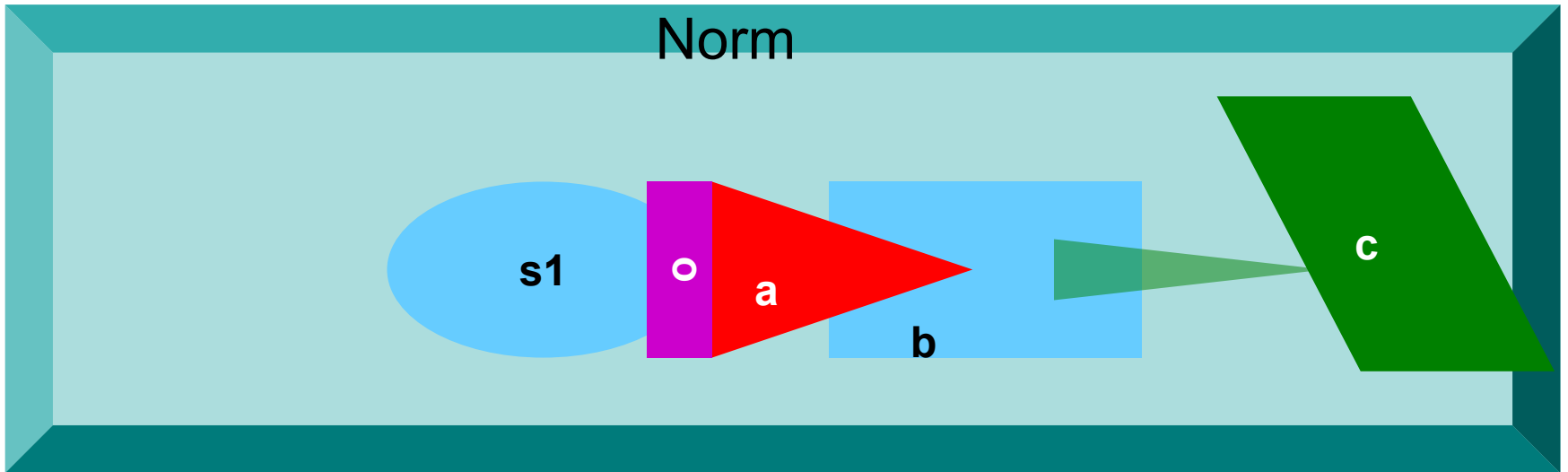
Notation within the elements of a norm:

$o_{s1}(a \rightarrow b)$ **te** → **c**

Notation in algorithmical language:

norm(condition=empty,

disposition(subject=s1, action=a, modus=o, object=b),
telos=c)



Example 4: “Subject 1 must open the door for fresh air”

Visualization:

The teleological relation is depicted by a sharp green transparent triangle.

External and internal teleology of the norm

- **External teleology**

$$\textit{norm}(A) \textit{ te} \rightarrow G$$

E.g. $A = \textit{open_door}$ and $G = \textit{fresh_air}$

$A = \textit{close_door}$ and $G = \textit{security}$

- **Internal teleology**

$$\textit{norm}(A \textit{ te} \rightarrow G)$$

E.g. “Open the door for fresh air”

Symbolisation and formalisation

- **Symbolisation** is more or less domain notation like $te \rightarrow$.
- **Formalisation** is a correct logical notation.
- The relation between them:

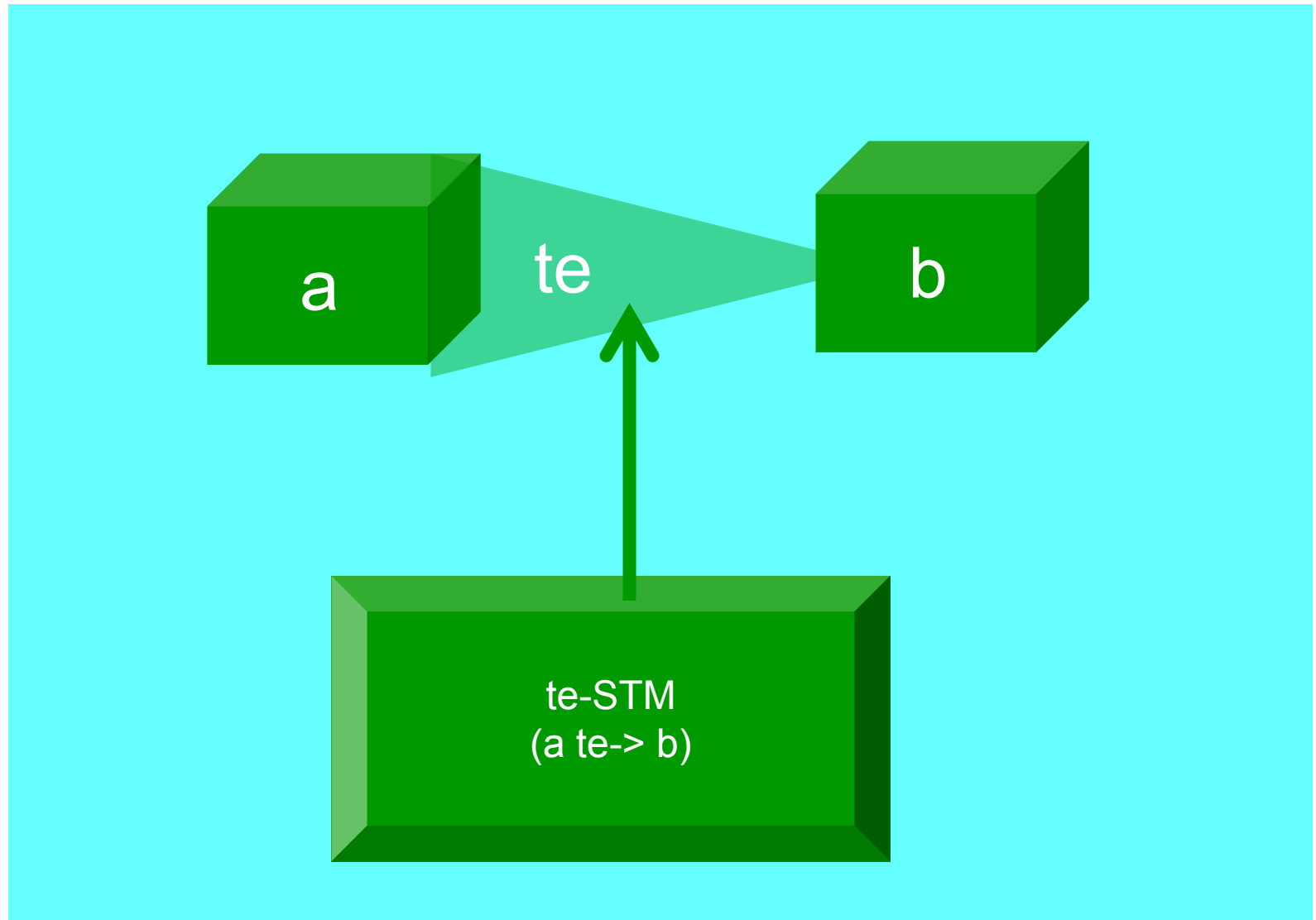
$norm(A te \rightarrow G)$ does not necessarily imply
 $N te \rightarrow G$

- In other words:

$$norm(A te \rightarrow G) \neq N te \rightarrow G$$

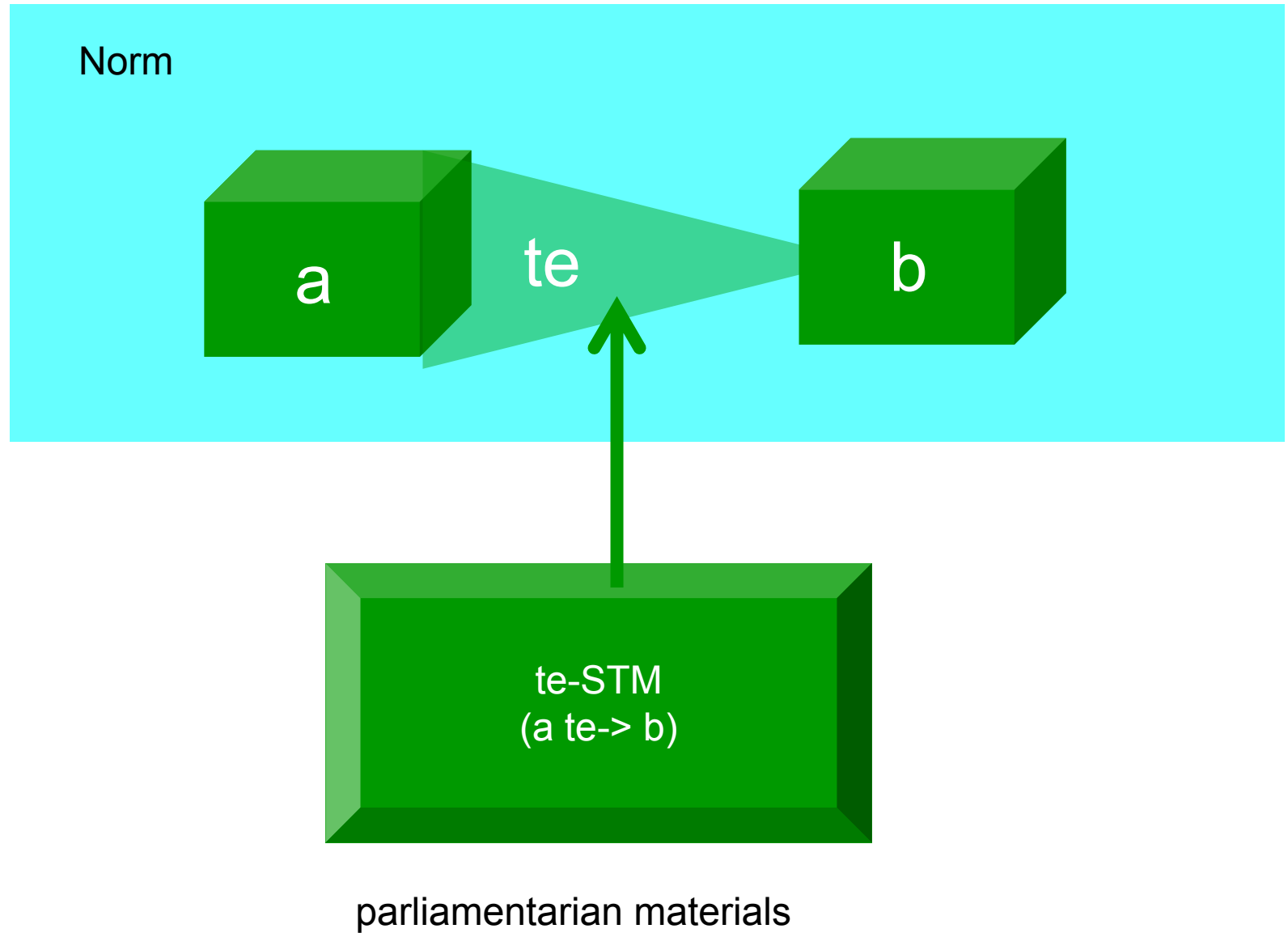
5. Explicit teleological Statements within and outside the Law

Teleological Structure within the Law

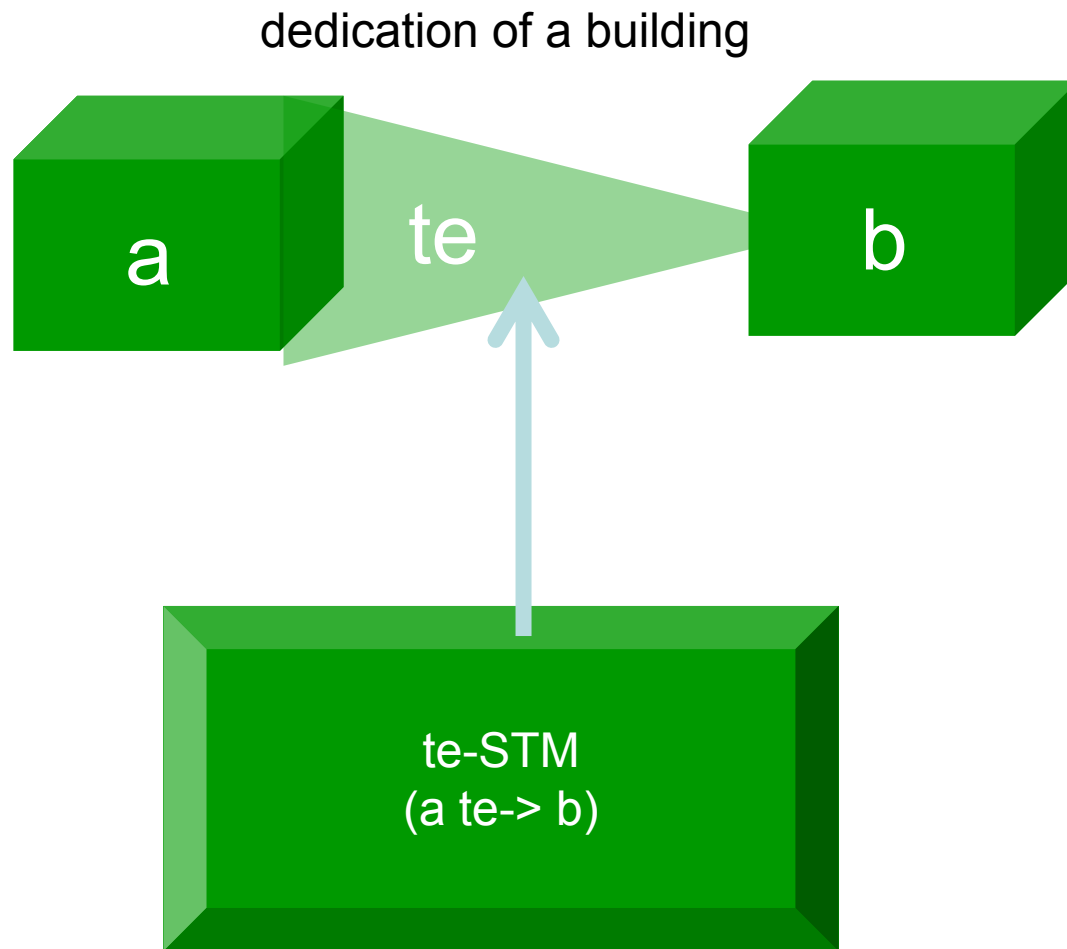


preamble of a regulation

Teleological Structure concerning the Norm

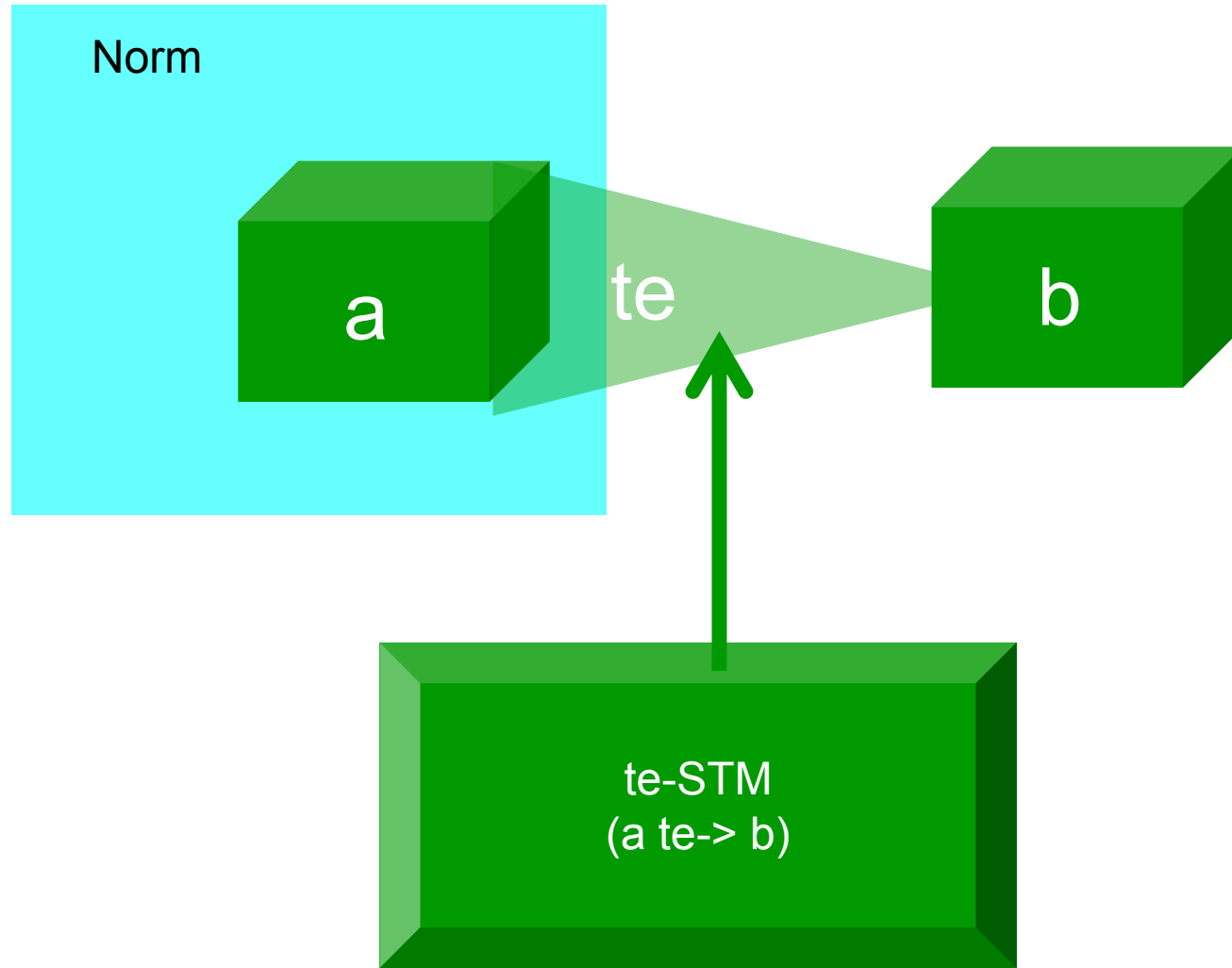


Normative Teleological Statement



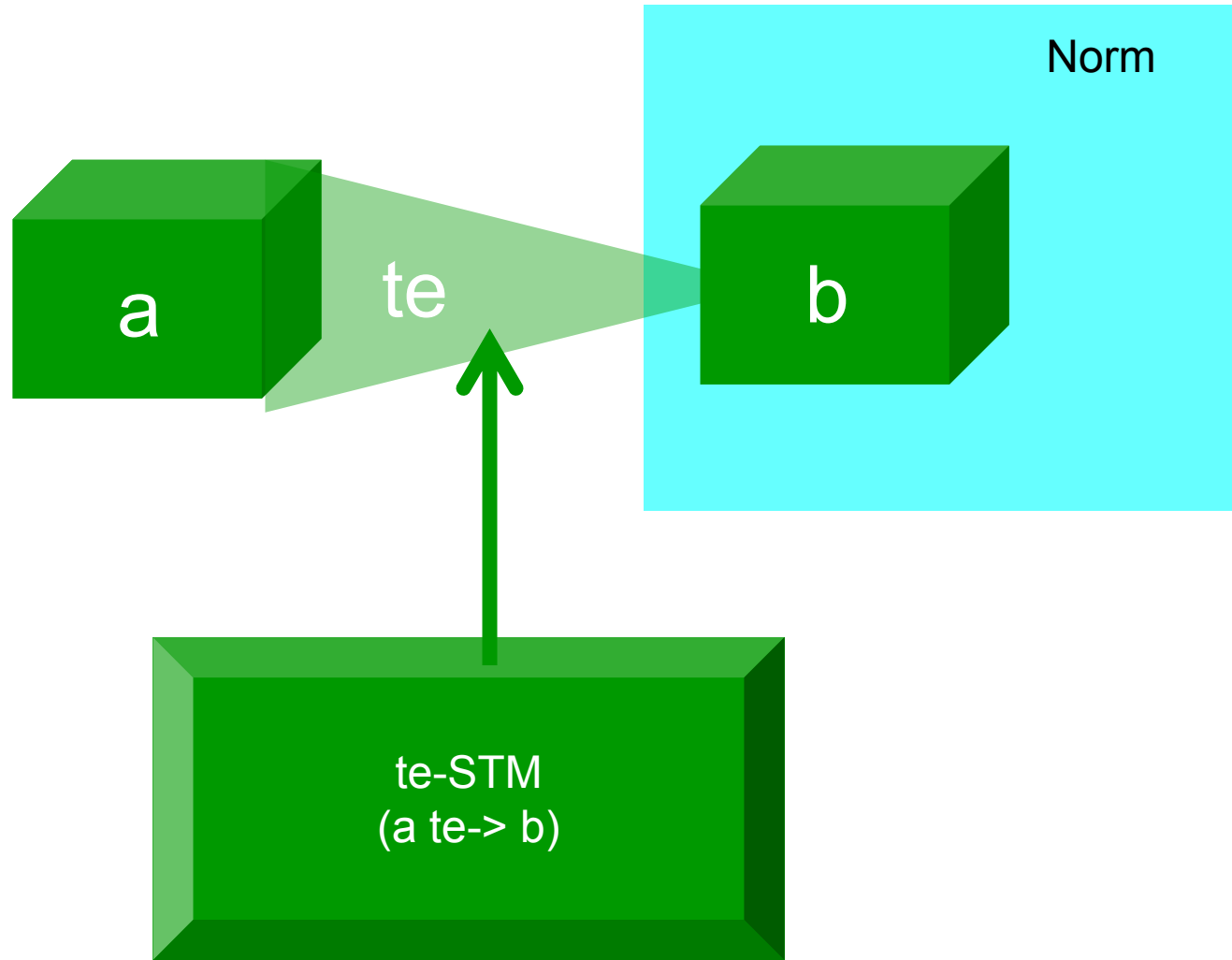
administrative decision

Teleological Statement, Norm as Tool



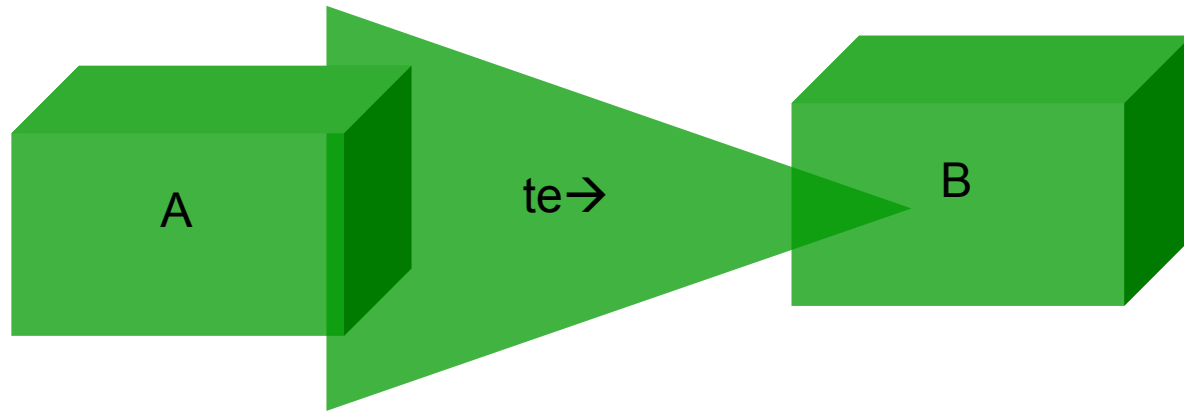
juridical commentaries upon an article of a law

Teleological Statement, Norm as Goal



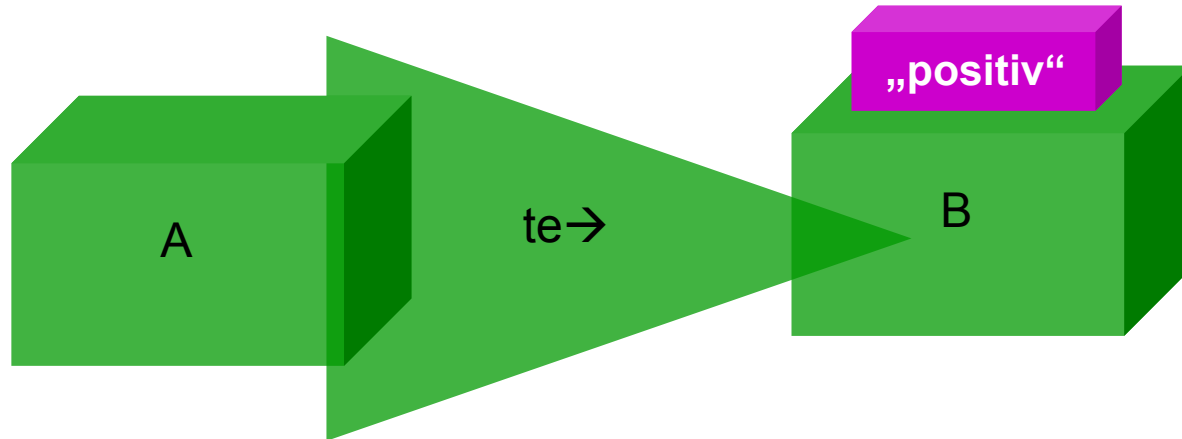
political commentaries upon a legislative initiative

6. Multiple Subjects and Statement Types



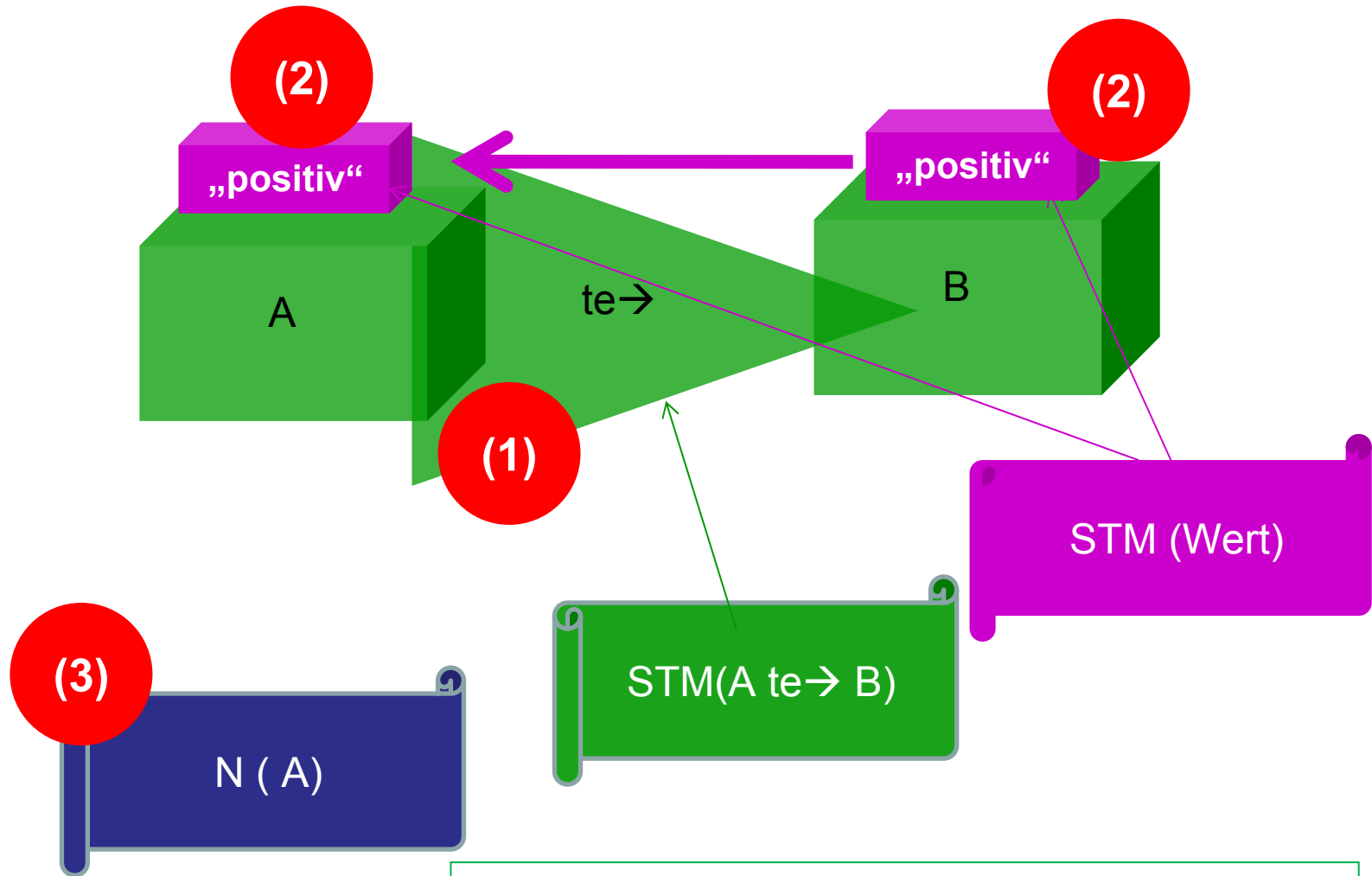
Goals have relational structure

- Goals have immanent structure of values
- A serves to achieve B
- B is a value



- Next comes evaluation
- This evaluation may be done by somebody else, not necessary who sets the relation

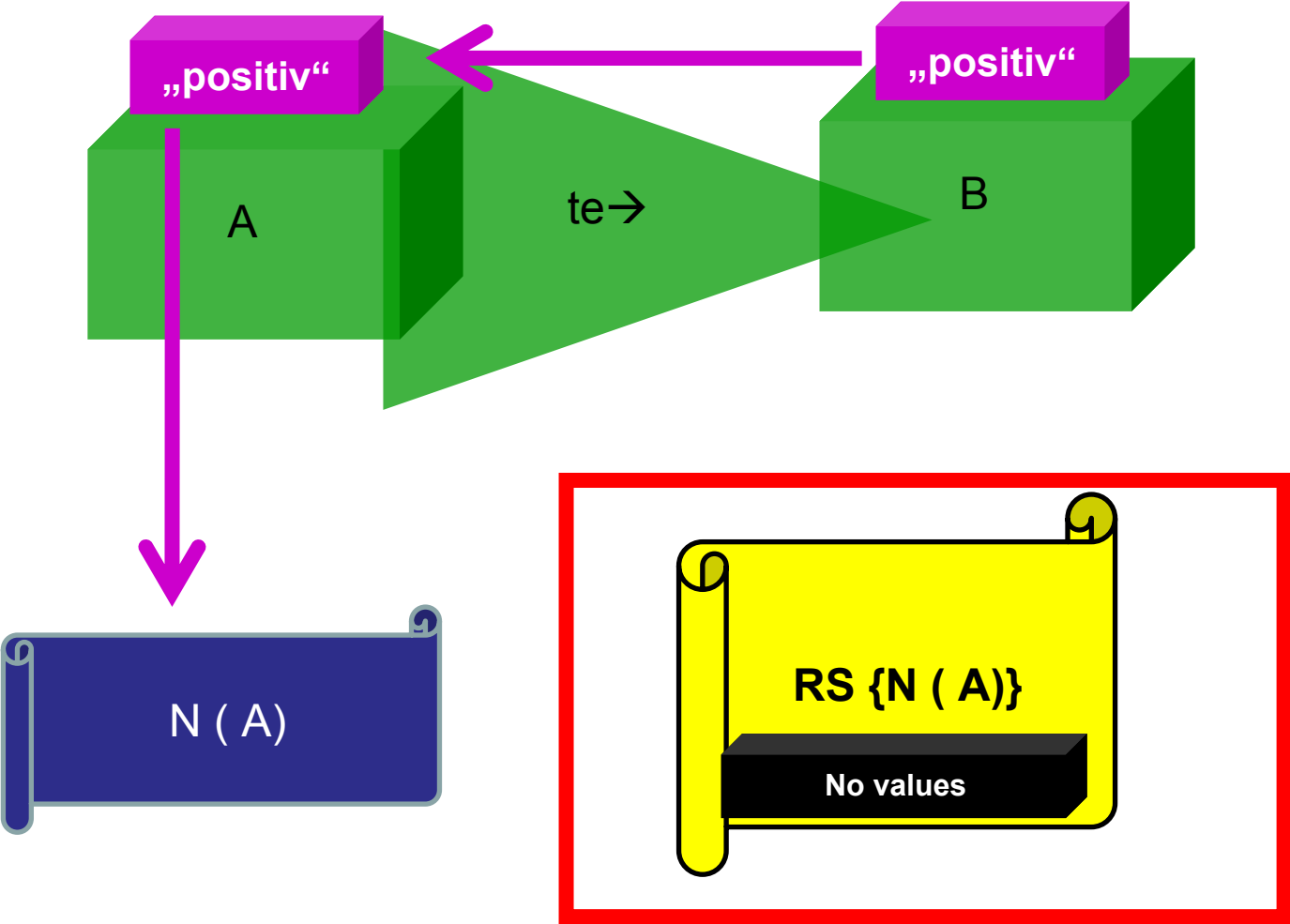
The norm is not the same as the relation

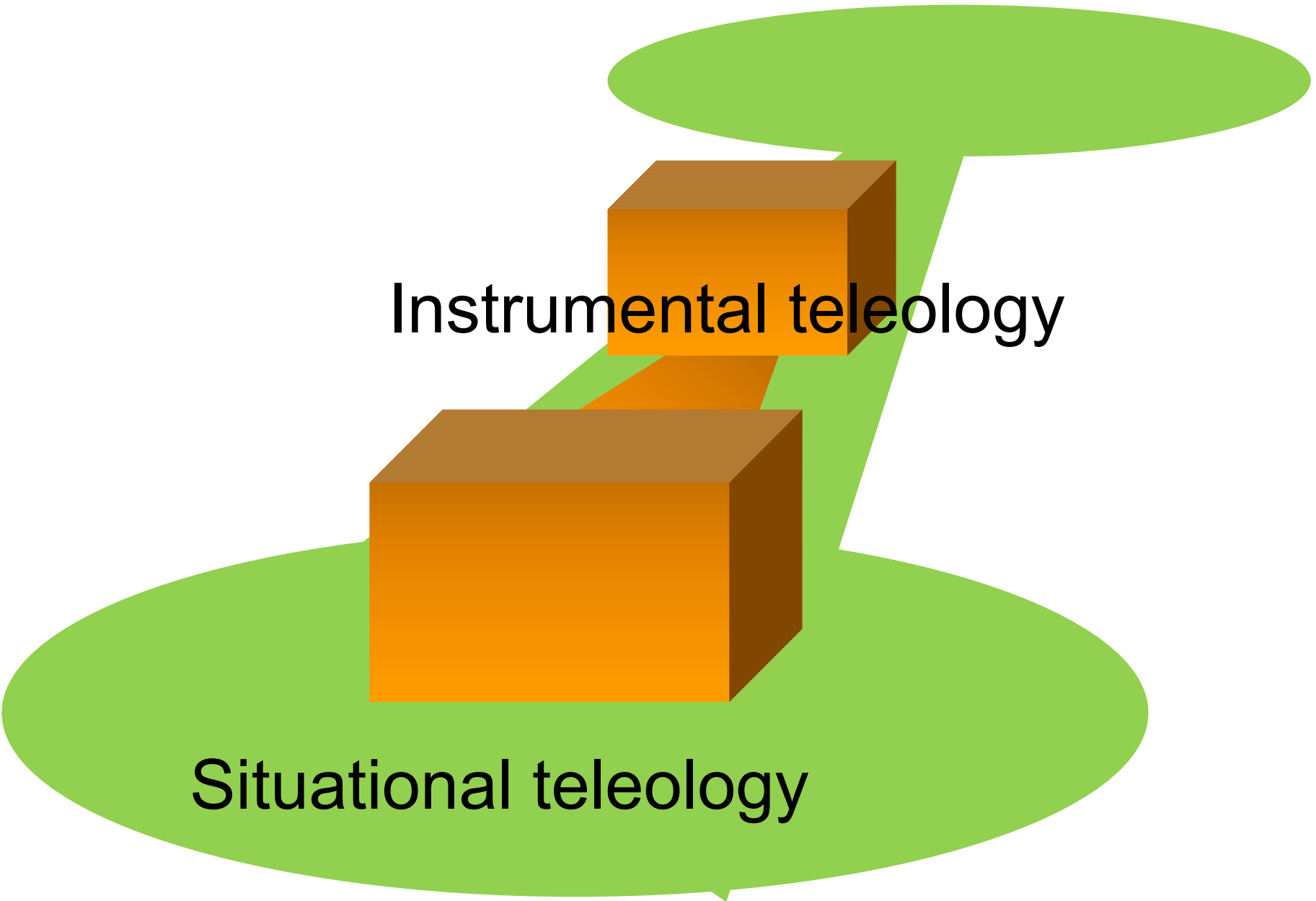


Three subjects:

- (1) sets the relation $A \text{ te} \rightarrow B$
- (2) evaluates: both the action A and the goal B
- (3) sets the norm $N(A)$

Norms are free of values according to Kelsen's "Pure Theory of Law"



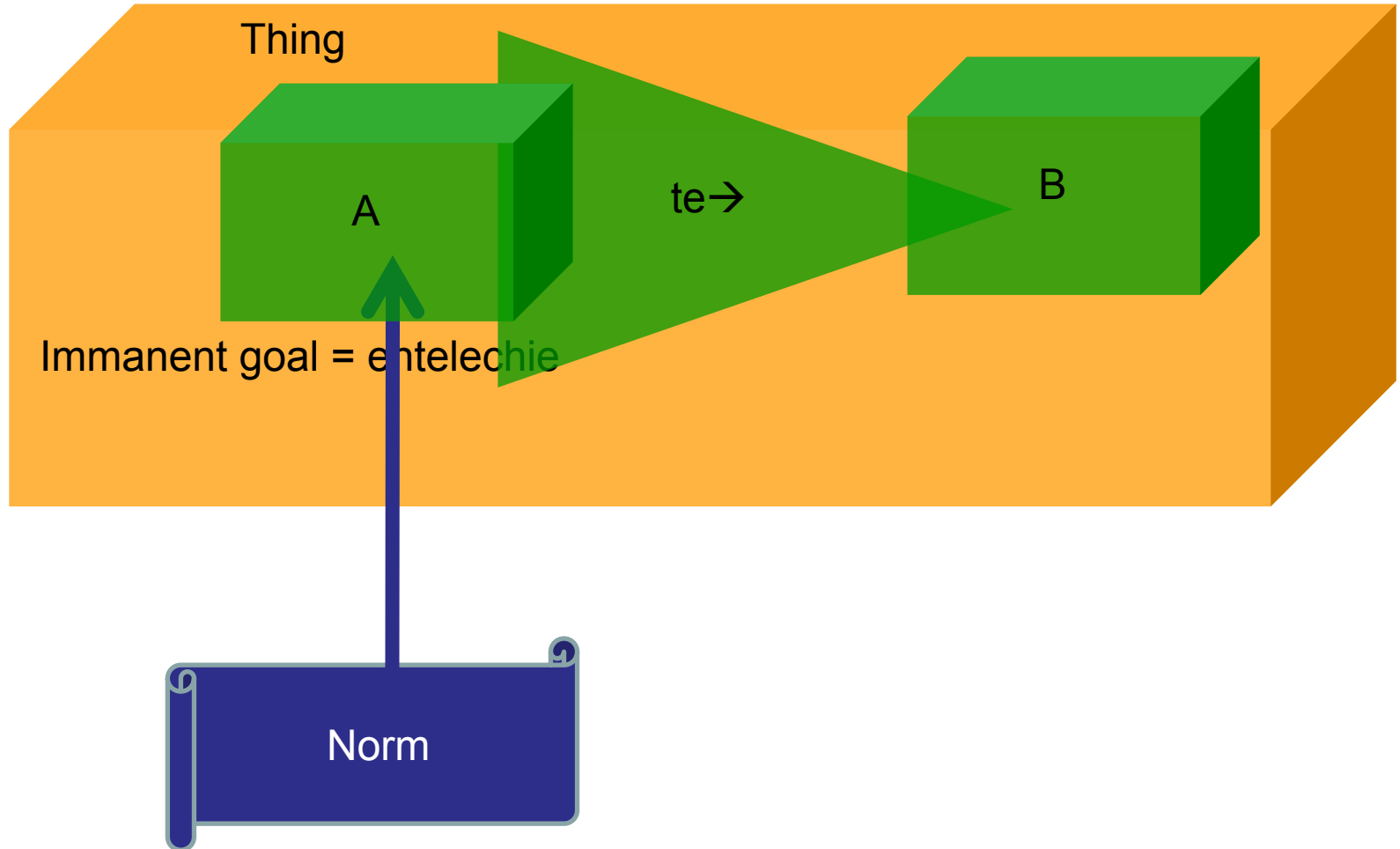


Instrumental teleology

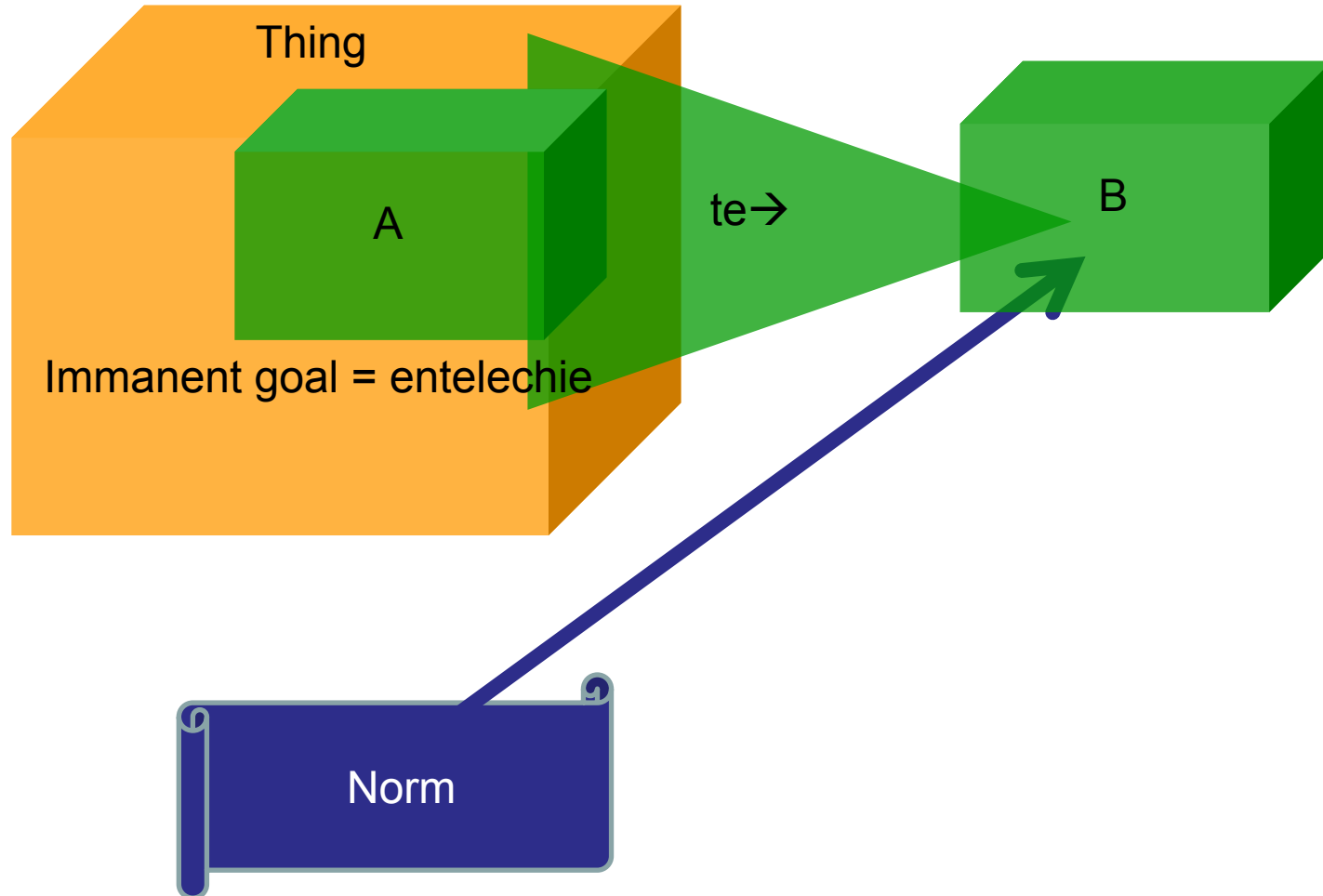
Situational teleology

7. Aristotelian „Entelechie“

Goal: entelechie (= Aristotelian term)



Goal: entelechie (= Aristotelian term)



8.

Teleological Networks and Legal Knowledge Representation

n1

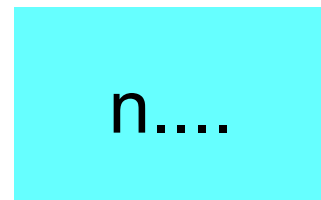
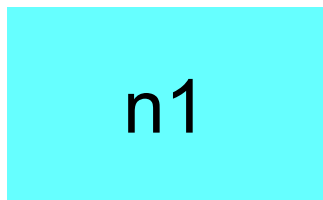
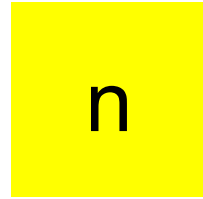
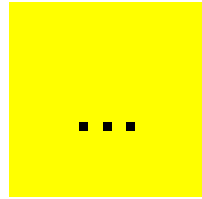
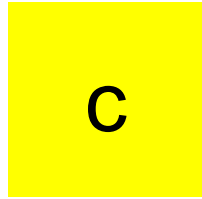
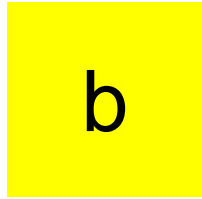
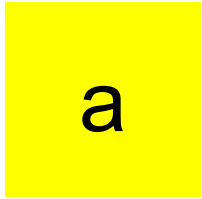
n2

n3

n....

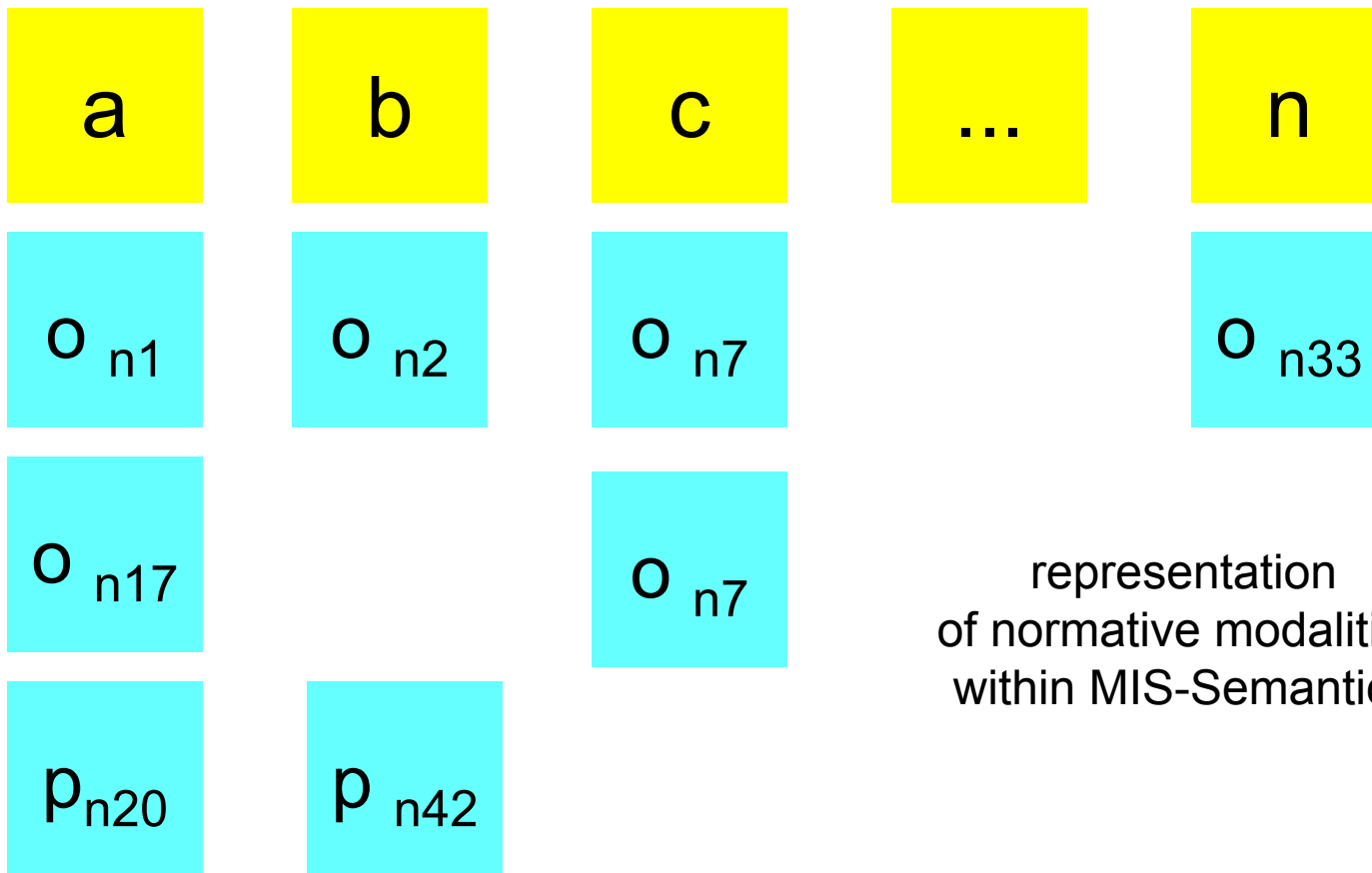
Norms

MIS Modal Indifferent Substratum

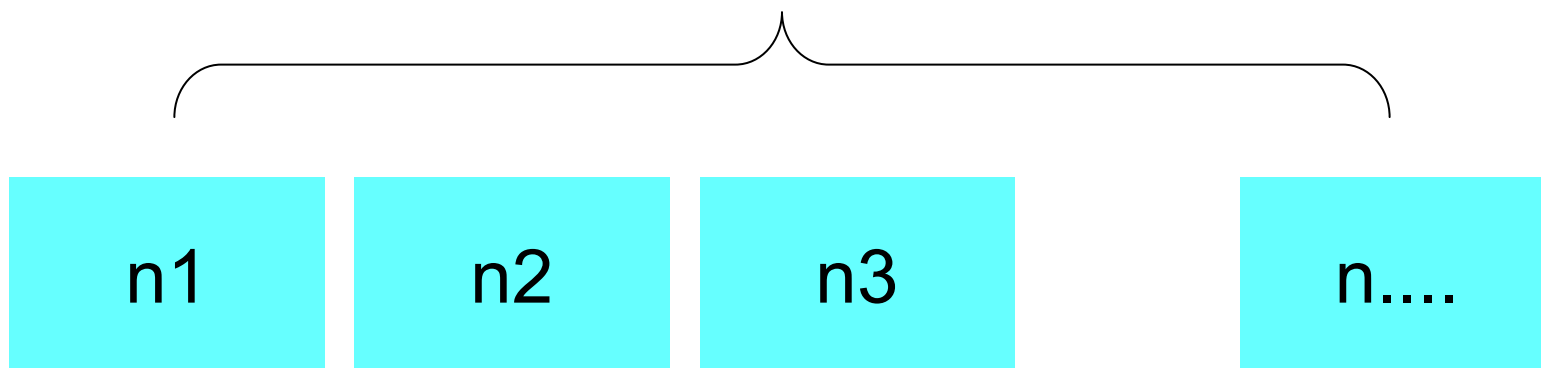


Norms

MIS Modal Indifferent Substratum

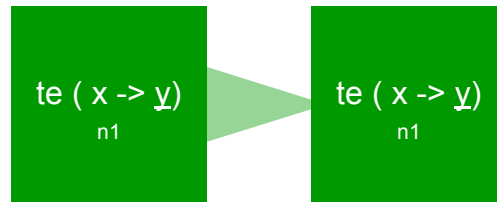
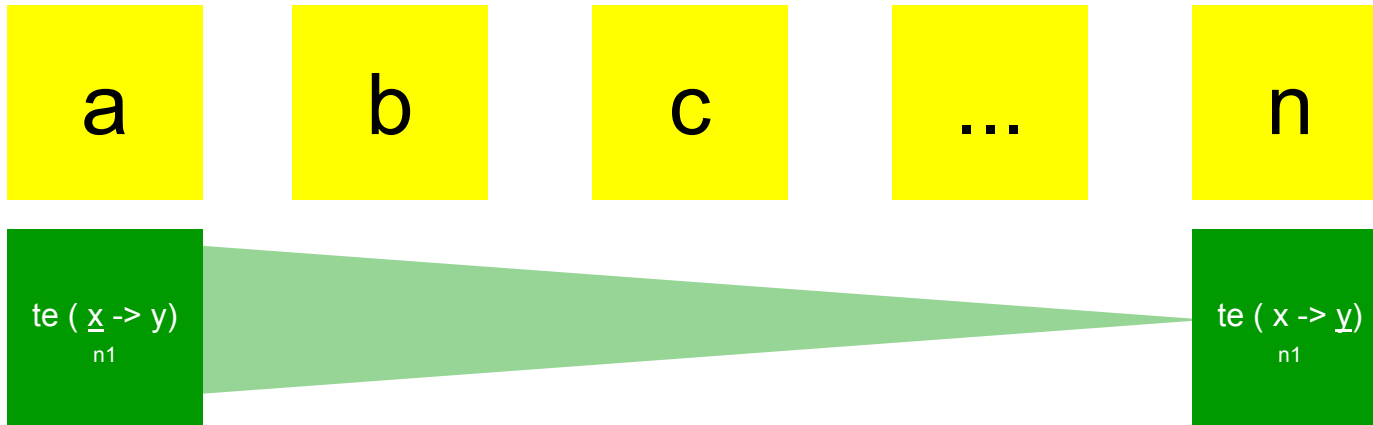


representation of normative modalities within MIS-Semantics

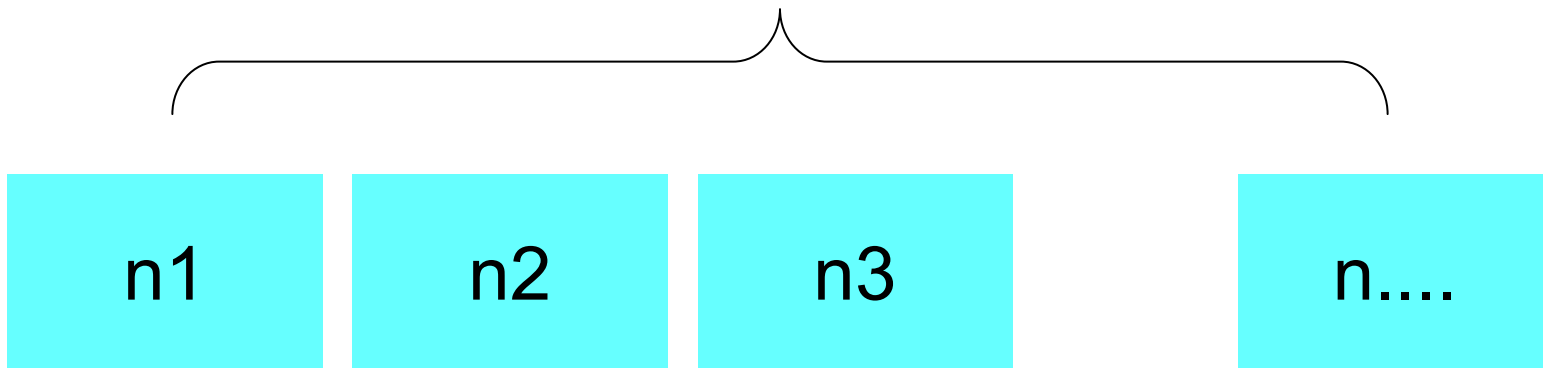


Norms

MIS Modal Indifferent Substratum



representation
of te-structures
within MIS-Semantics



Norms

9. Summary

1. Formal analysis of goals is utilized in **systems engineering**. We aim to use goals (teleology) in the legal domain
2. Teleology can be associated with different **elements of a norm**
3. Textual statements concerning legal goals are mostly rational. Therefore **explicit instruments** (like formalisation and symbolisation) are adequate

4. From the viewpoint of legal knowledge representation the **normative layer** of a legal system can be supplemented with a **teleological layer**
5. Teleology appears both **inside** and **outside** of a legal system

*Thank you
for your
attention*