

# 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
  - Approaches
    - Via natural language
    - Via formal notation
- Characterisation of legal order: many **implicit** and rare **explicit** teleological structures

# Teleological structures in context

- “Goal” is not among fundamental legal concepts!  
Why?
  - However, in G. Sartor, 2006 “Fundamental legal concepts”
- Teleology
  - Berman & Hafner 1993; Bench-Capon; Prakken; Sartor etc in *AI and Law* journal, V.10 (2002), No.1-2
  - Goals
    - Interests, values
    - Purposes, policies
    - Intentions of a legislator

# Proposed notation

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

The proposed notation is:

$$A \ te \rightarrow \ G$$

“Legal act  $A$  aims at goal  $G$ ”

The speech act:

*TE-statement*(“...”)

*TE-Statement* ( “Legal act  $A$  aims at goal  $G$ ” )

4

# 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*

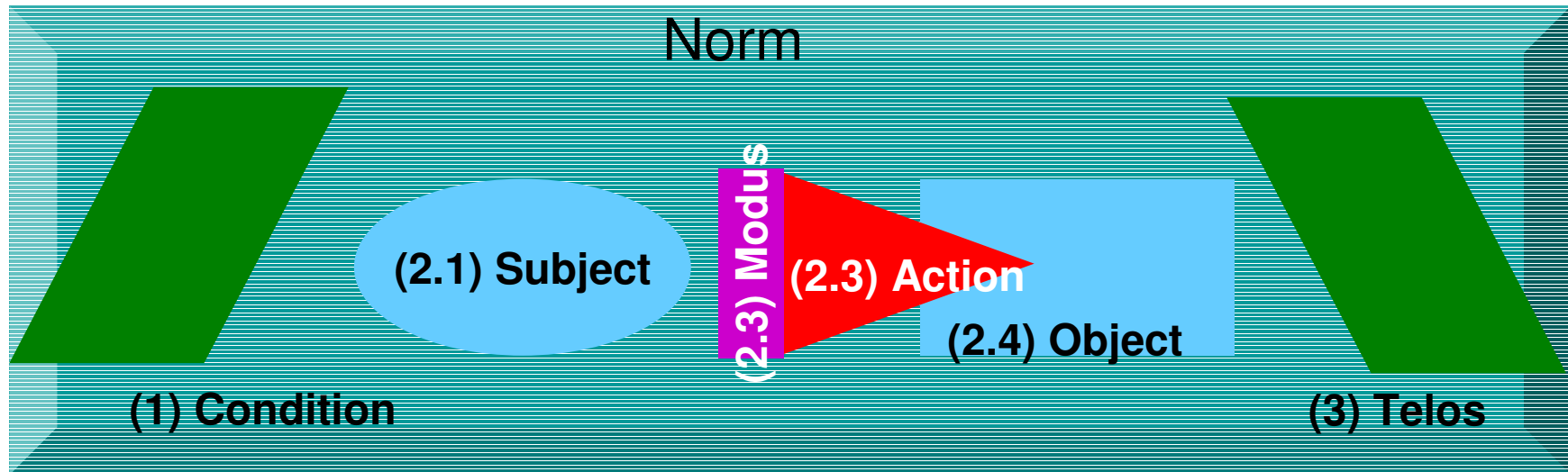
# Theory of relations

- Binary relation:
  - Infix notation  $A \text{ te} \rightarrow G$
  - 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:  $\{(x,y) \mid x \in X, y \in Y\}$
  - In relational algebra, a binary relation is represented as a two-column table, e.g.

<i>Act</i>	<i>Goal</i>
<i>A1</i>	<i>G</i>
<i>A2</i>	<i>G</i>

- Theory of relations in law?

**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;**

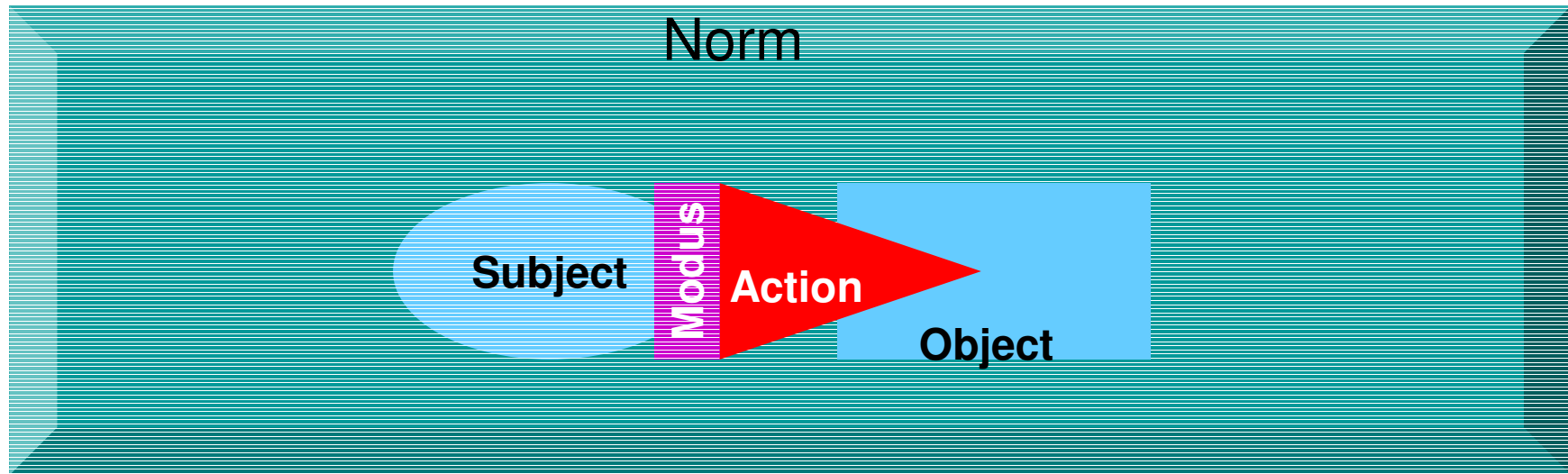
(2.3) Normative **modus** of the action;

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

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

We add the *telos*.





### **Example 1: “Open the door”**

(1) Condition: empty

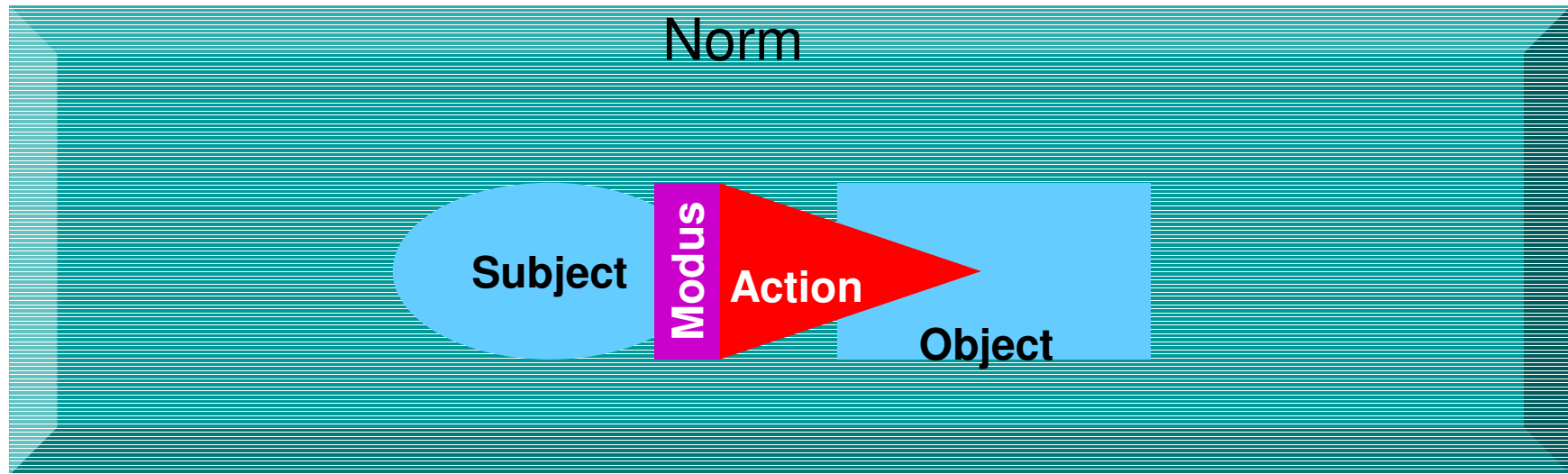
(2.1) Subject: implicit

(2.2) Action: “open”

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

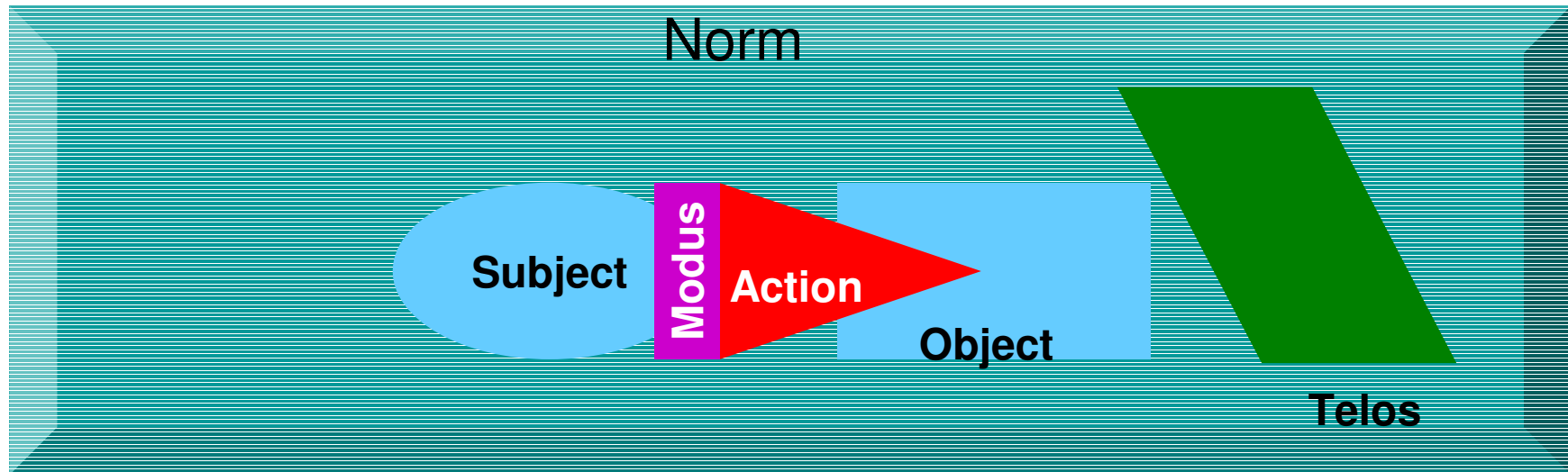
(2.4) Object: “the door”

(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”**
- (2.4) Object: “the door”
- (3) Telos: empty



### **Example 3: “You must open the door for fresh air”**

(1) Condition: empty

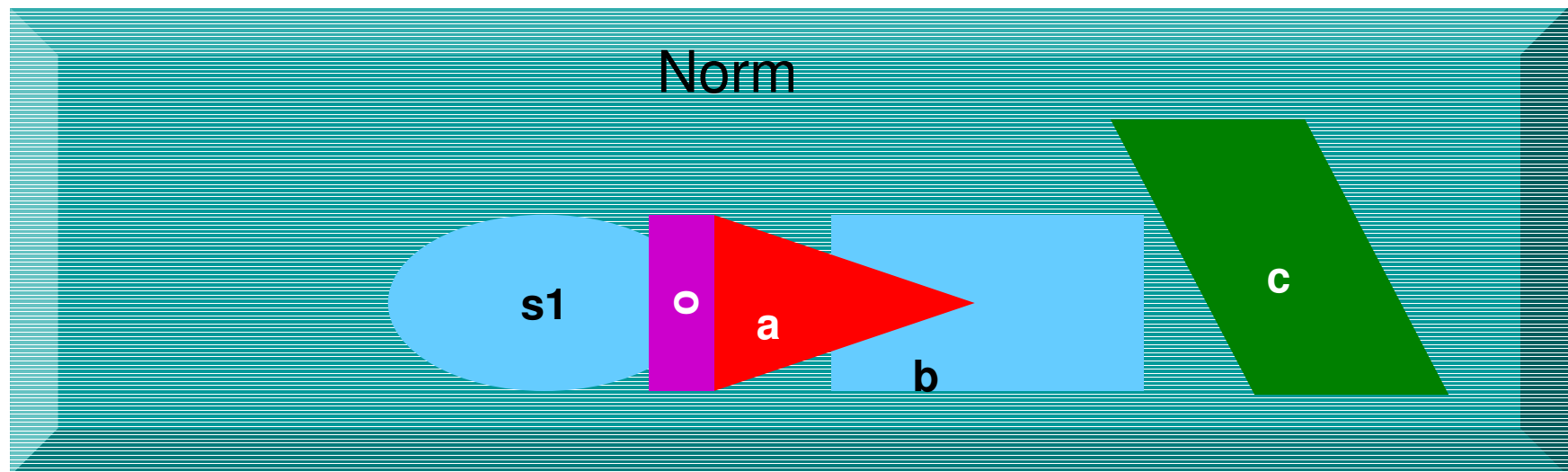
(2.1) Subject: “you”

(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 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:

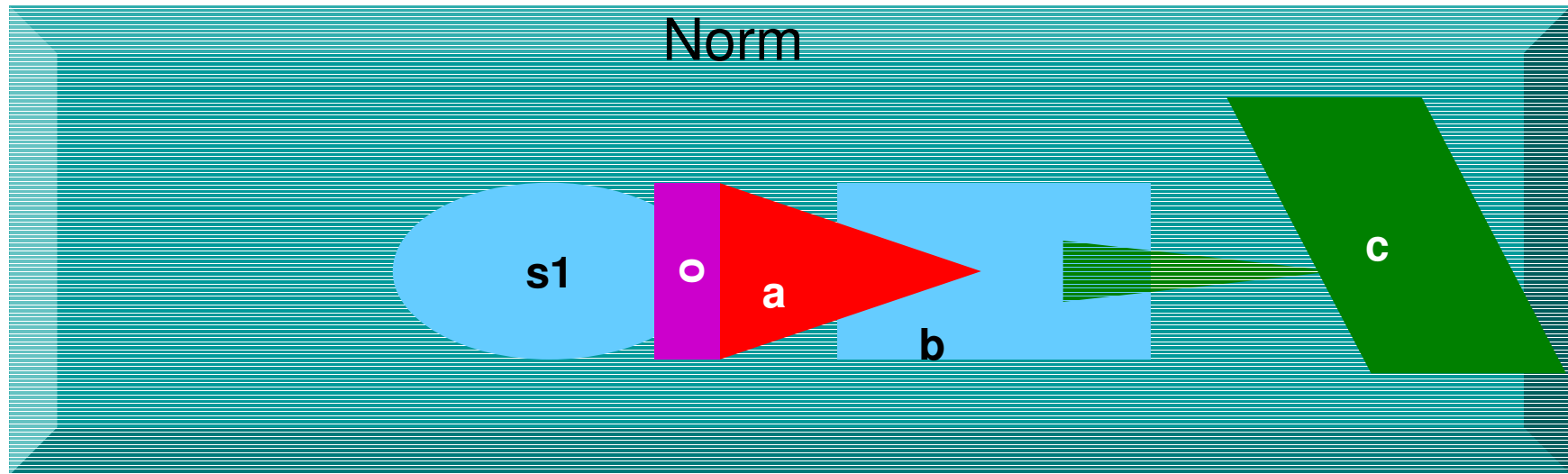
$o_{s1}(a \rightarrow b)$  **te** → **c**

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 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  $G = \textit{fresh\_air}$

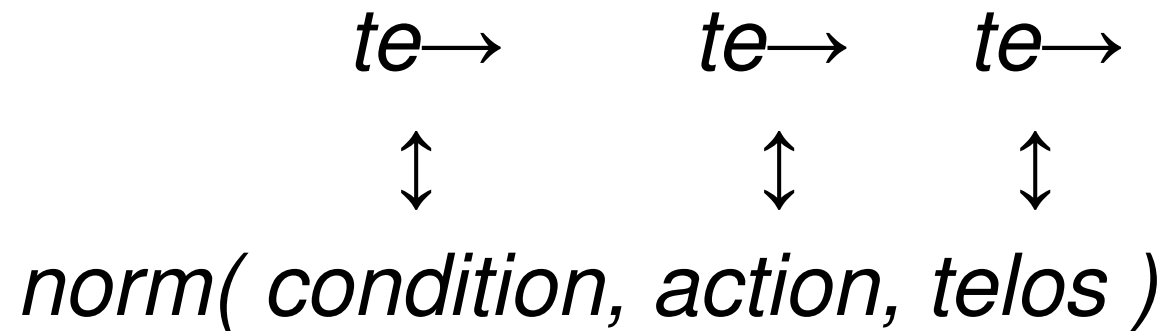
$A = \textit{close\_door}$  and  $G = \textit{security}$

- **Internal teleology**

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

E.g. “Open the door for fresh air”

# Variations of teleology within the content of a norm



# Symbolisation and formalisation

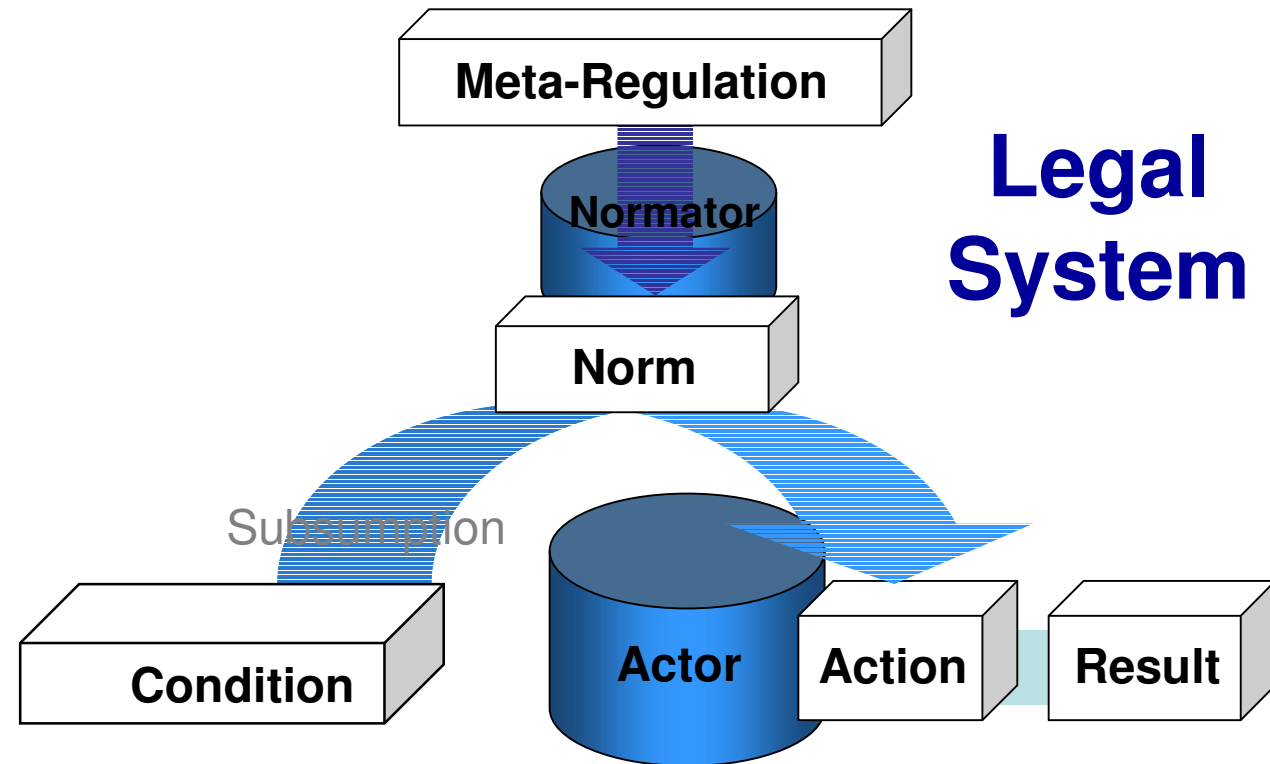
- **Symbolisation** is more or less domain notation like  $te \rightarrow$ .
- **Formalisation** is a correct logical notation.
- The relation between them:

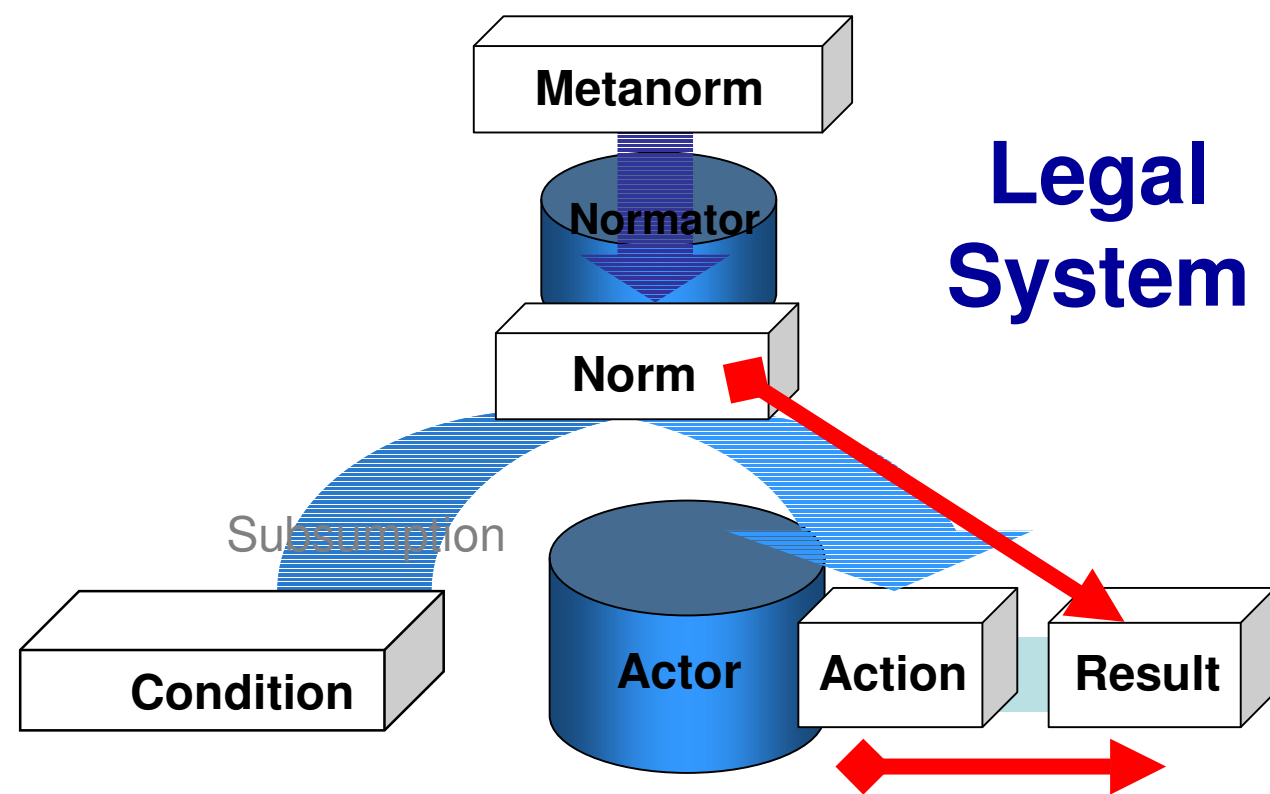
$norm(A te \rightarrow G)$  does not necessarily imply  
 $N te \rightarrow G$

- In other words:

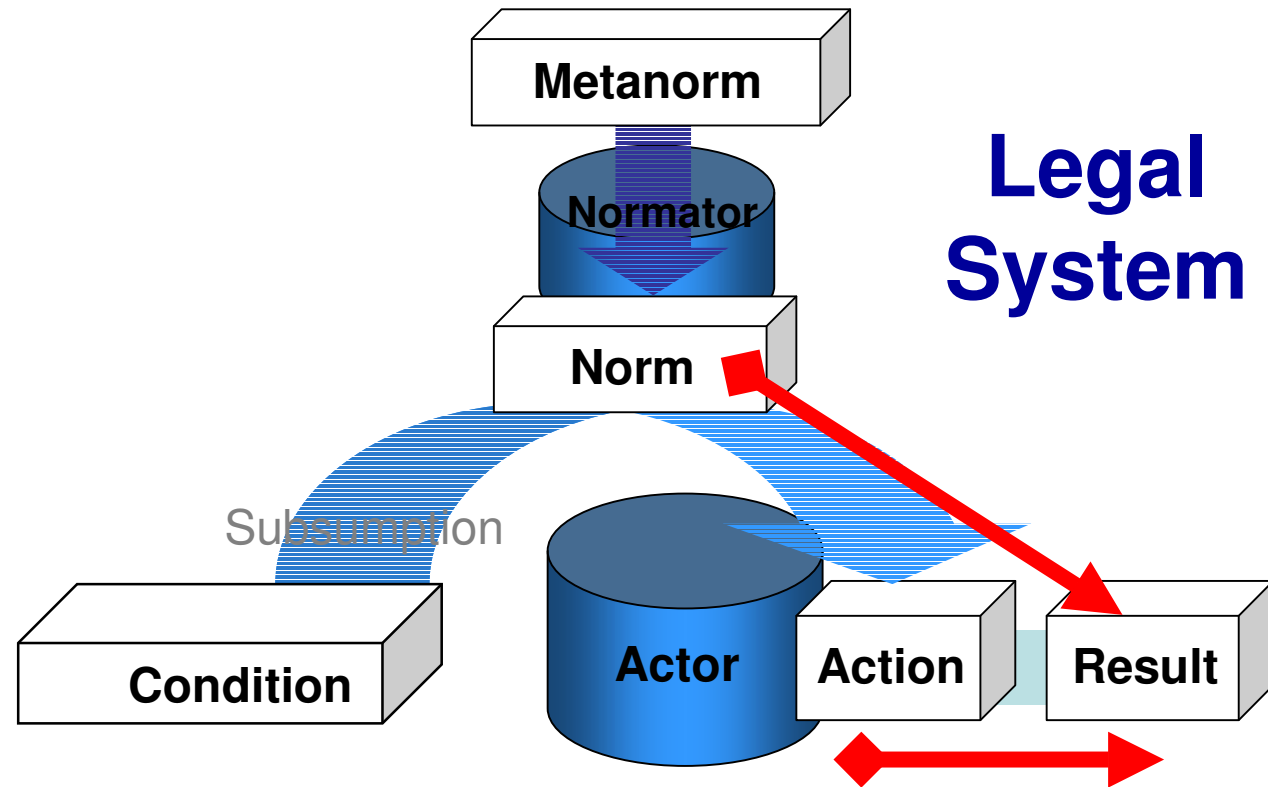
$$norm(A te \rightarrow G) \neq N te \rightarrow G$$







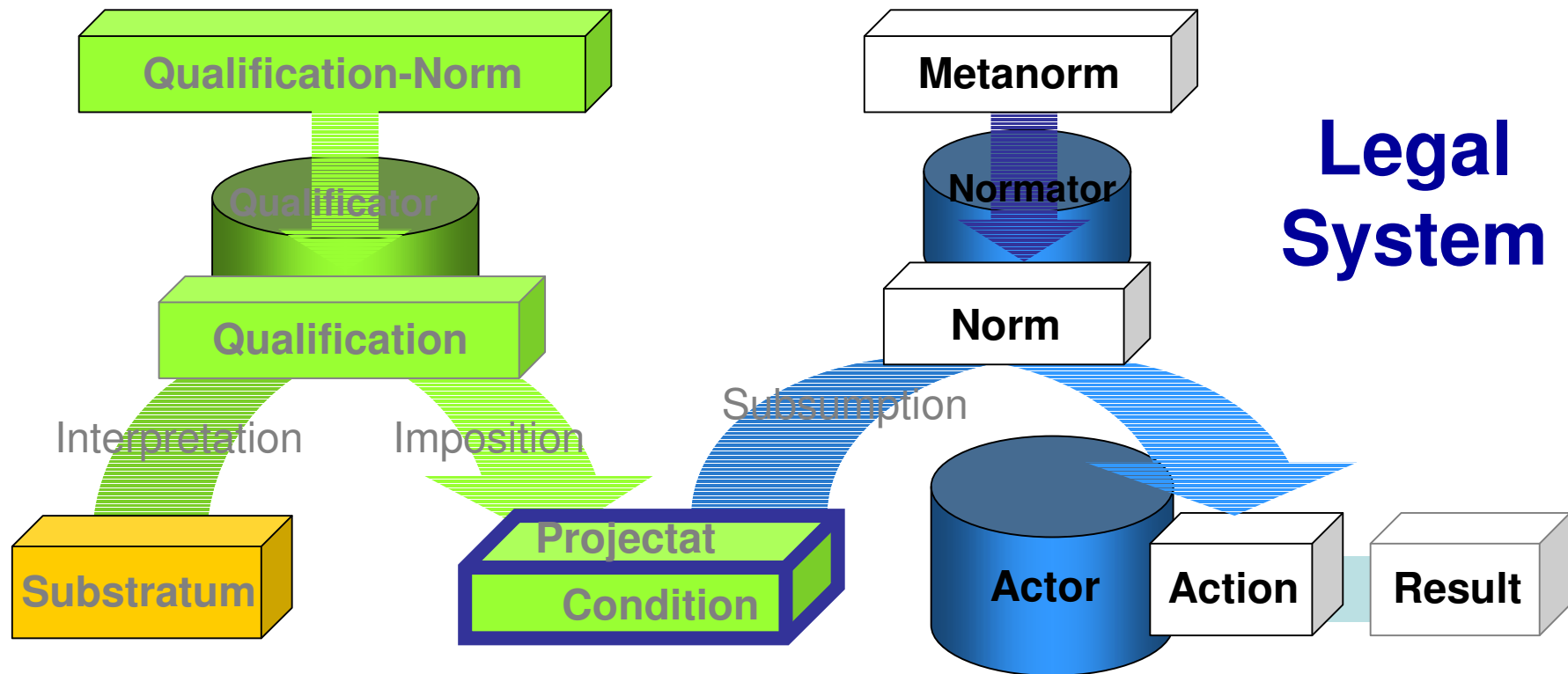
explicit / implicit **Teleological Relations**

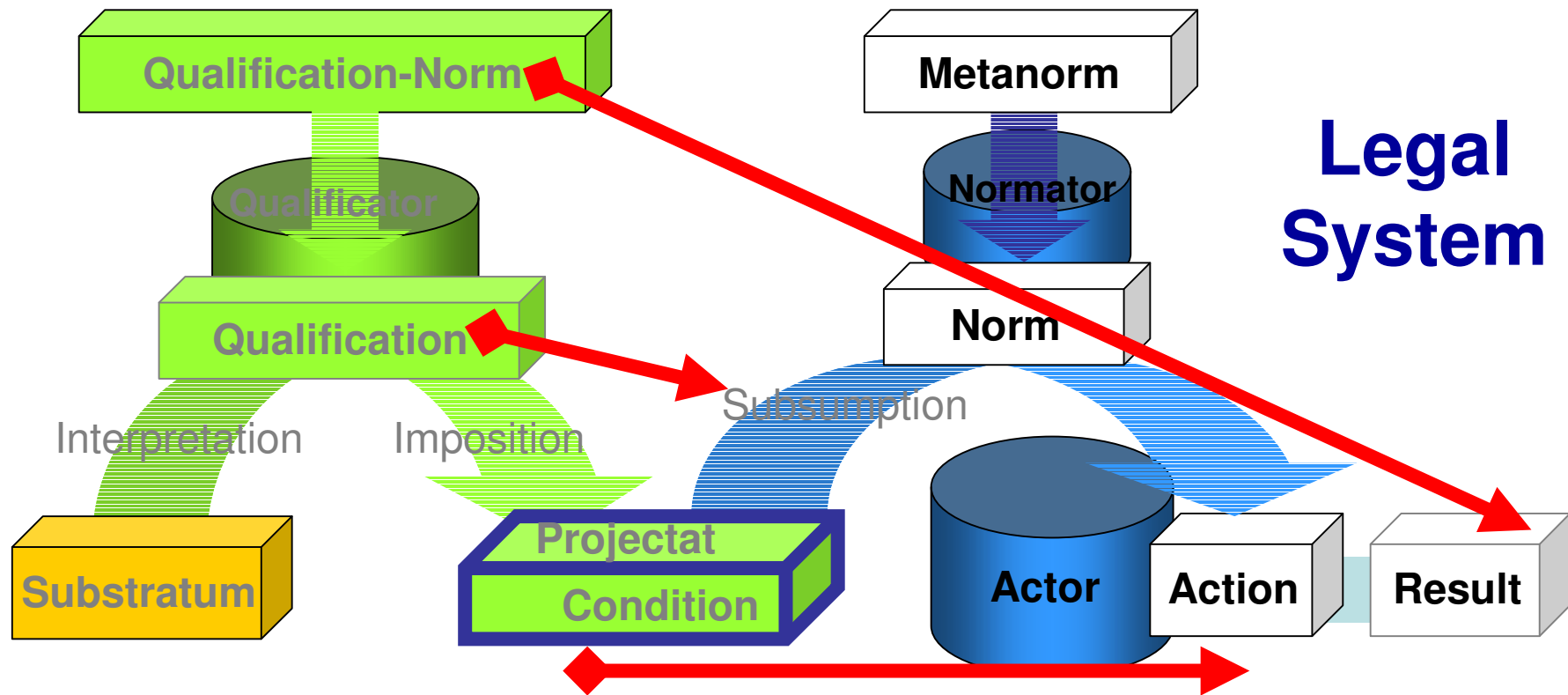


**TE-STATEMENT**

political  
legal  
dogmatical

**(A te short term  
medium t. long term → B)**



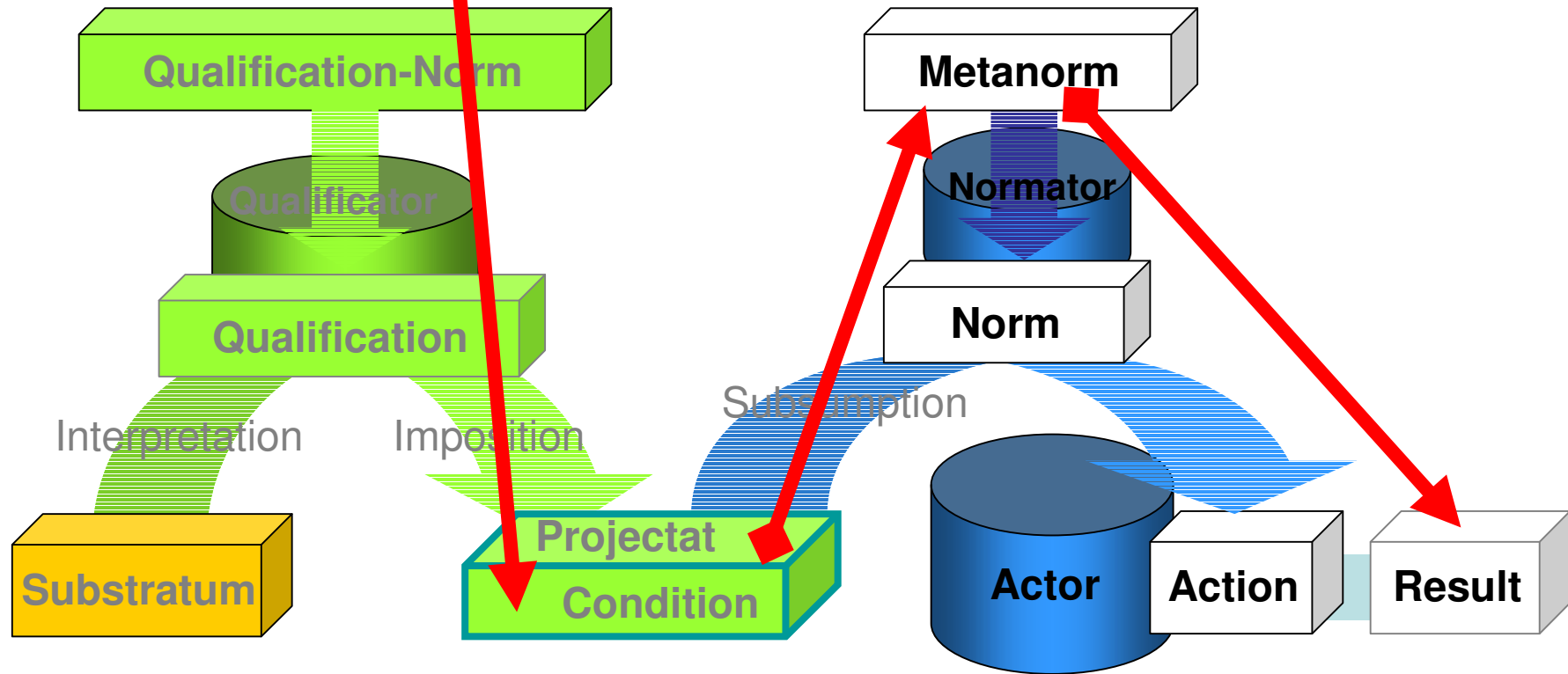
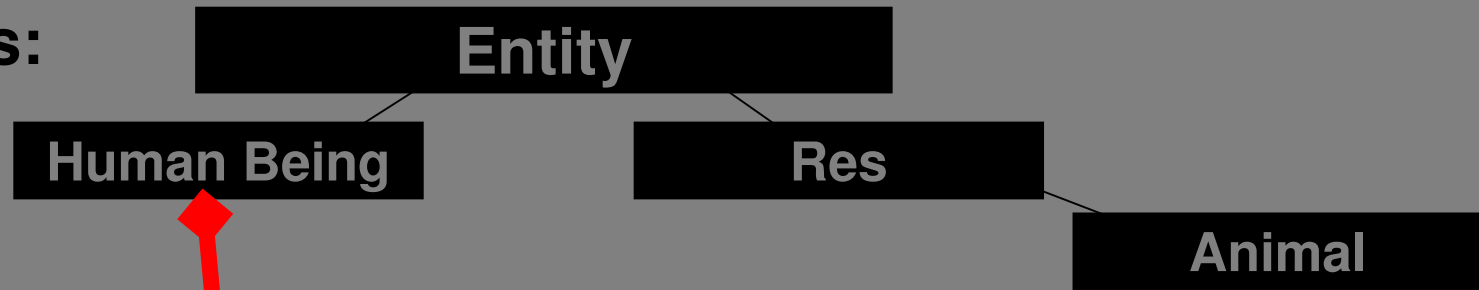


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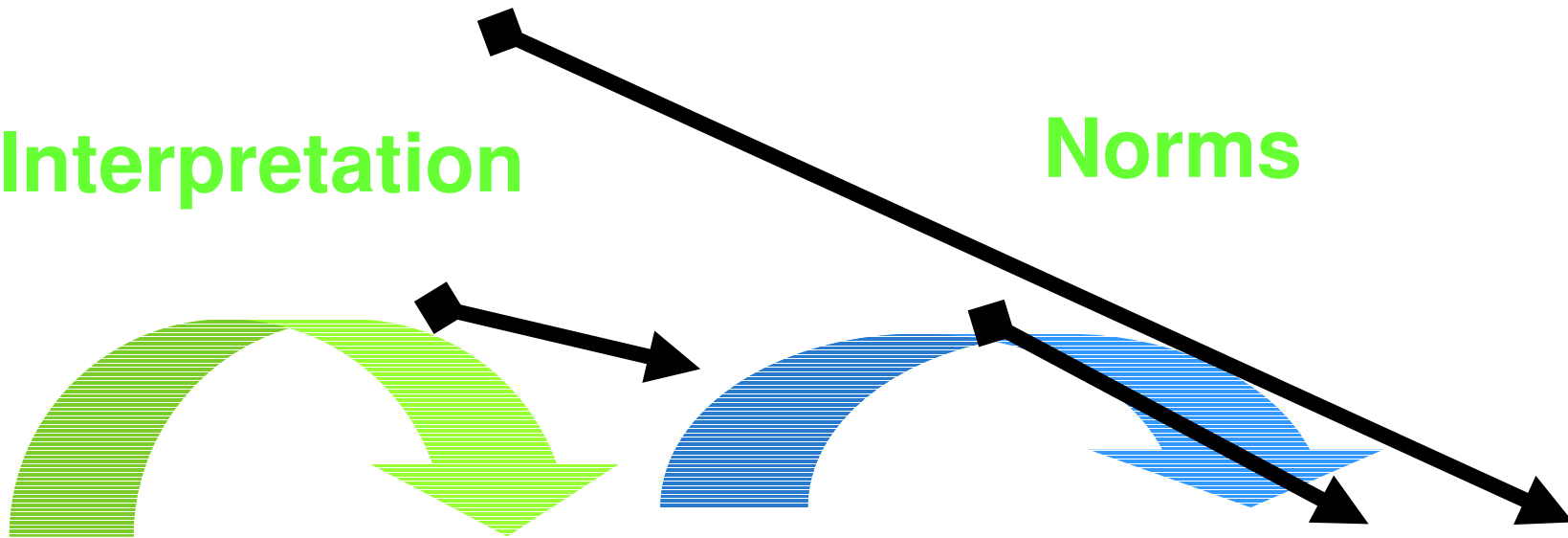
# Taxonomies:



# Human Image → Human Rights

**Interpretation**

**Norms**



**Teleology**

