Encoding the Normative Logic of the OECD Threshold Tests

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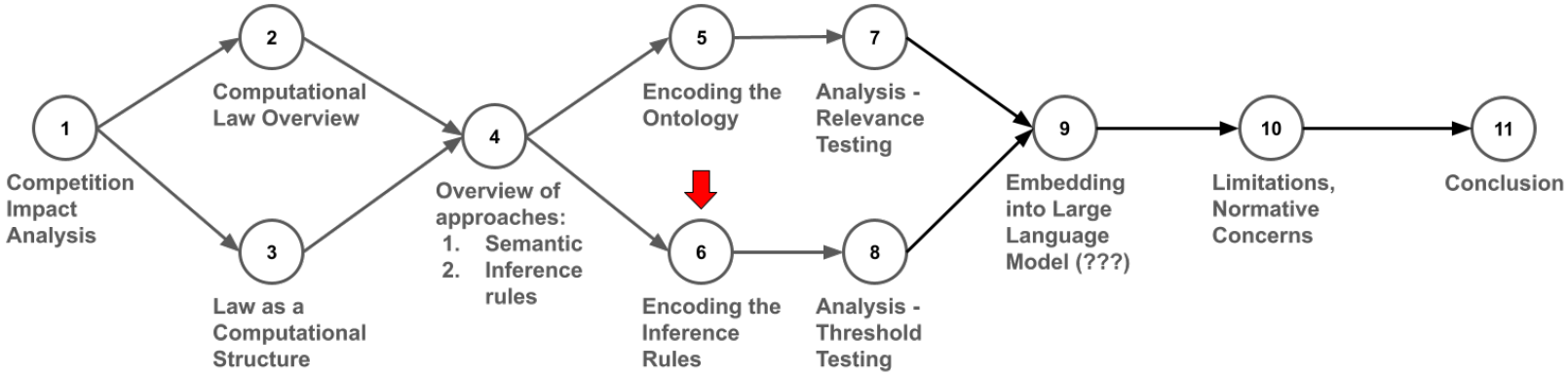
Outline

Background/Problem

- Legal and normative reasoning for digital systems
- Connectionist vs. symbolic approaches
- Goal: KB for Automated Legal Reasoning

Chapter Plan



Computational Law Approaches

Problem	Encoding	Analysis
Relevance Testing: Does the law map with the industry being assessed? (Actors, transactions)	Ontologies (Ontology Web Language)	Reasoning engines to determine relationships: - No mapping? - Identity? - Classification? - Mereological?
Threshold Testing: Given a specific rule within a relevant law - How does this rule relate to the norm of the threshold test?	Inference rules (Prakken, Sartor) - LegalRuleML	Argumentation Frameworks (?) Propositional networks (?)

Model for the KB

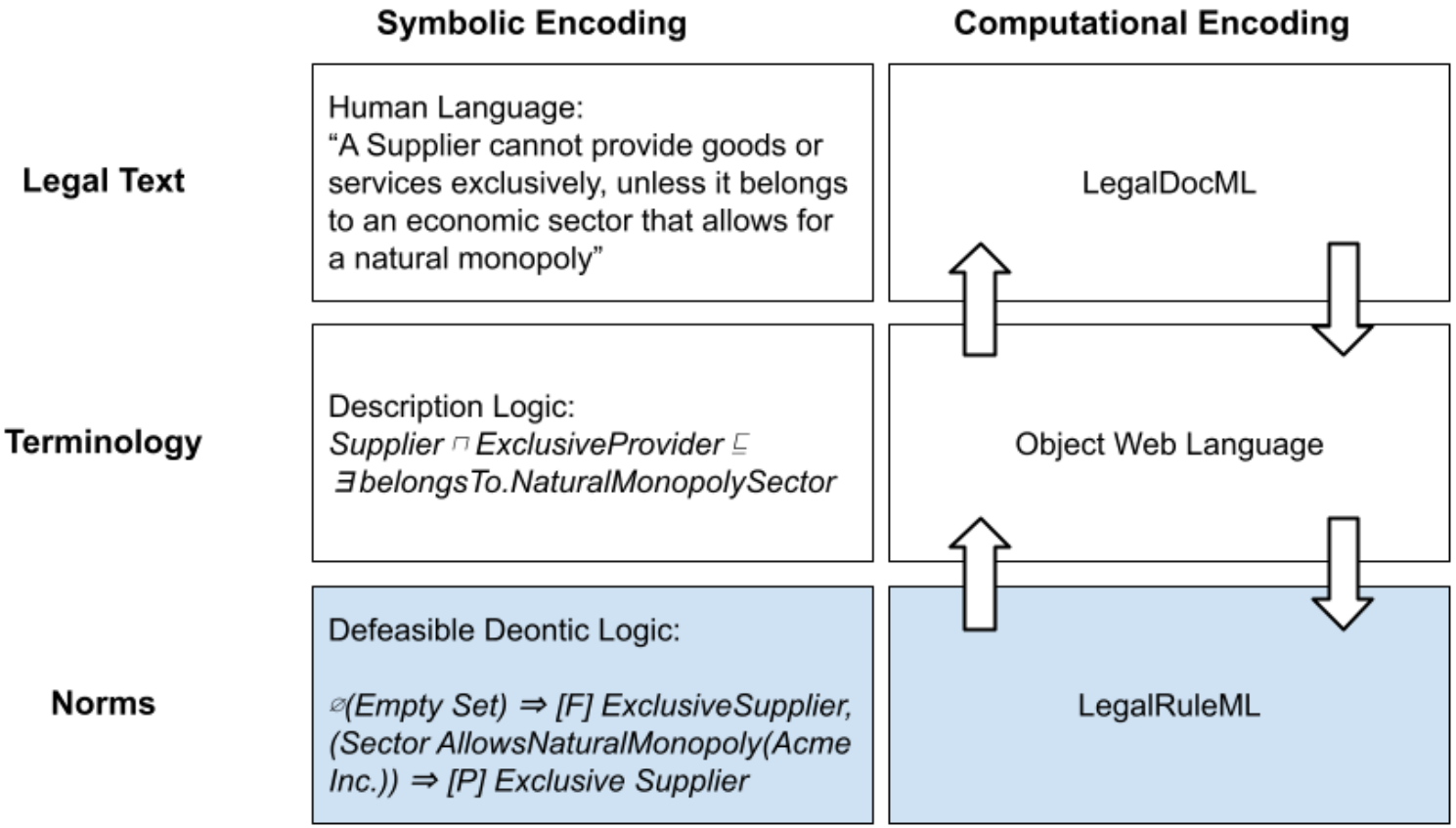


Figure: Layered Encodings (Robaldo, 2020)

Forms of Logic

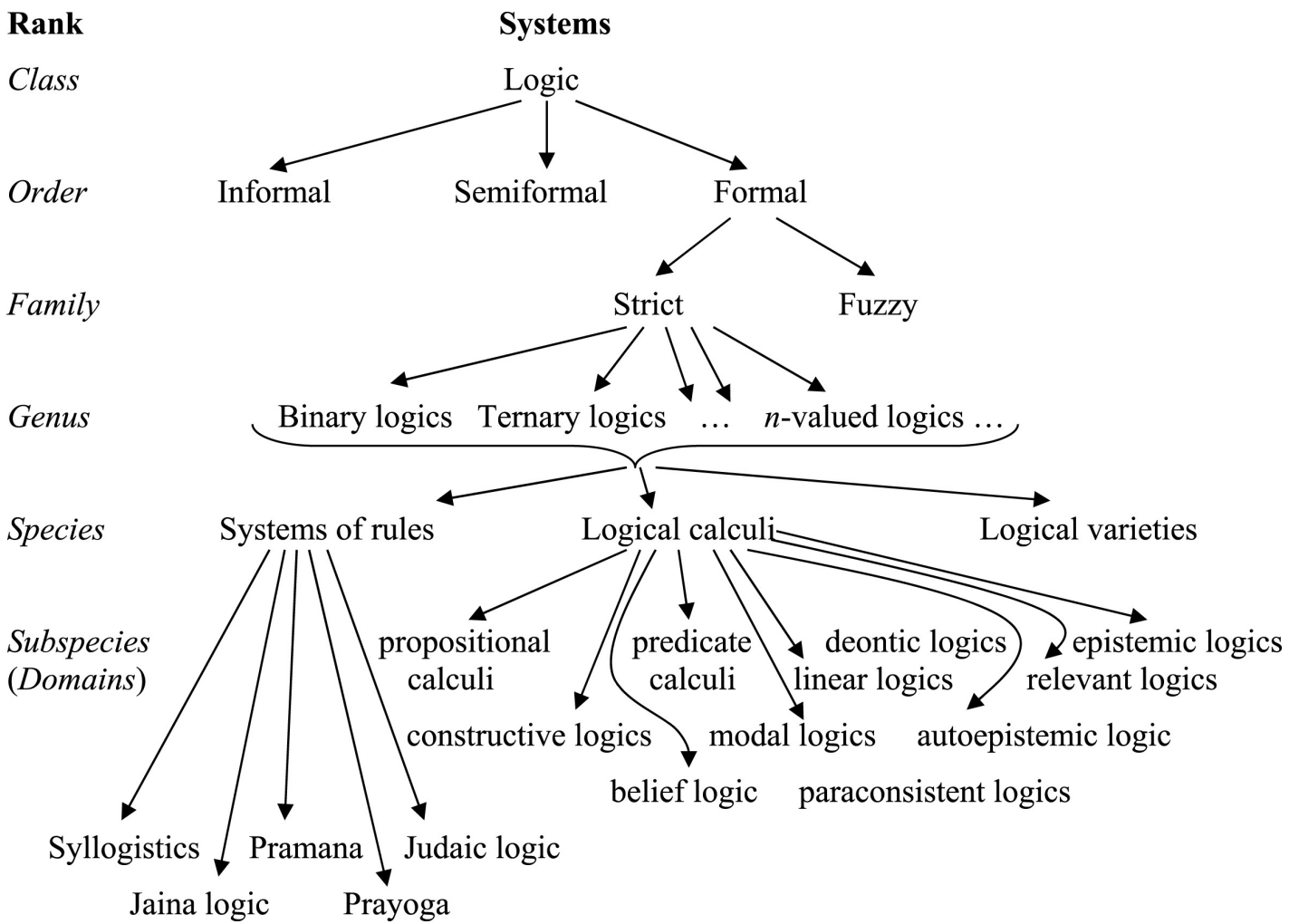


Figure: Evolution of Logics (Burgin, 2022)

Features of DDL

Defeasible Deontic Logic	Strength of Relation: Strict, Defeasible, Defeater
Deontic Logic	Modes: [OBL], [PER], [FORB]
Propositional Logic	Axioms, Operators - $\wedge$, $\vee$, $\neg$, $\rightarrow$

Prescriptive Rule in DDL

$$\text{If } X \Rightarrow [D_1]formula_1, \ldots, formula_n[D_n]$$

Where:

- X - Set of factual or deontic statements
- $[D_i]$ - Deontic value (OBL, PER, FORB)
- $\Rightarrow$ - Denotes implication is defeasible

Encoding A1 of the OECD Guidelines

Rule 1

$$\text{ps1}{:}\mathit{Person}(x) \Rightarrow [\mathit{FORB}]\mathit{ExclSuppl}$$

Rule 2

$$\text{ps2}{:}\mathit{SectAllowsNatMono}(x) \Rightarrow [\mathit{PERM}]\mathit{ExclSuppl}$$

Defeasibility

$$ps2 > ps1$$

Important Issue

Logic, Computation and Truth

- Logic has little to do with Truth
- We determine which premises are True
- We determine how to interpret/act on evaluations
- Logic is a commitment to process

Next Steps

- Encode normative component of the OECD guidelines
- Linking with the ontology
- Test analysis

End

Thank you!

emersonbanez.github.io/dissertation_public