Defeasibility and Deontic

OASIS LegalRuleML Technical Committee
Guido Governatori

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Part I

Defeasibility
Why/What Defeasibility

\[ \text{body1} \Rightarrow \text{head} \]
\[ \text{body2} \Rightarrow \neg \text{head} \]
Why/What Defeasibility

\[
\text{body}_1 \Rightarrow \text{head} \\
\text{body}_1, \text{exception\_conditions} \Rightarrow \neg \text{head}
\]
Why/What Defeasibility

body1 ⇒ head
exception_conditions ⇒ ¬head
What is a rule?

A rule is a binary relation $\text{body} \times \text{head}$. What are the relationships between the $\text{body}$ and the $\text{head}$?
What is a rule?

A rule is a binary relation

$$body \times head$$
What is a rule?

A rule is a binary relation

\[ \text{body} \times \text{head} \]

What are the relationships between the \textit{body} and the \textit{head}?
### Strength of a rule

<table>
<thead>
<tr>
<th>Head/body relationship</th>
<th>Notation</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>body always head</td>
<td>$body \rightarrow head$</td>
<td>strict</td>
</tr>
<tr>
<td>body sometimes head</td>
<td>$body \Rightarrow head$</td>
<td>defeasible</td>
</tr>
<tr>
<td>body not complement head</td>
<td>$body \rightsquigarrow head$</td>
<td>defeater</td>
</tr>
<tr>
<td>body no relationship head</td>
<td></td>
<td></td>
</tr>
<tr>
<td>body always complement head</td>
<td>$body \rightarrow \neg head$</td>
<td>strict</td>
</tr>
<tr>
<td>body sometimes complement head</td>
<td>$body \Rightarrow \neg head$</td>
<td>defeasible</td>
</tr>
<tr>
<td>body not head</td>
<td>$body \rightsquigarrow \neg head$</td>
<td>defeater</td>
</tr>
</tbody>
</table>
Option 1, Context block:

```xml
<lrml:Context key="ruleInfo2">
  <lrml:appliesStrength
iri="&defeasible-ontology;#defeasible2"/>
  <lrml:toStatement keyref="#cs1"/>
</lrml:Context>
```
Defeasibility and strength of rules in LegalRuleML

Option 2, directly inside a rule:

```
<ruleml:Rule key=":key1">
    <lrml:hasStrength>
        <lrml:Defeater key="str4"/>
    </lrml:hasStrength>
    ...
</ruleml:Rule>
```
Example

**Complaint**

means an expression of dissatisfaction made to a Supplier in relation to its Telecommunications Products or the complaints handling process itself, where a response or Resolution is explicitly or implicitly expected by the Consumer.

An initial call to a provider to request a service or information or to request support is not necessarily a Complaint. An initial call to report a fault or service difficulty is not a Complaint. However, if a Customer advises that they want this initial call treated as a Complaint, the Supplier will also treat this initial call as a Complaint.

If a Supplier is uncertain, a Supplier must ask a Customer if they wish to make a Complaint and must rely on the Customers response.
Example

\[ r_1 : expressionDisatisfaction \Rightarrow complaint \]
Example

\[ r1 : expression\text{Disatisfaction} \Rightarrow \text{complaint} \]

\[ r2 : initial\text{Call} \Rightarrow \neg \text{complaint} \]
Example

\[ r1 : \text{expressionDisatisfaction} \Rightarrow \text{complaint} \]
\[ r2 : \text{initialCall} \Rightarrow \neg \text{complaint} \]
\[ r3 : \text{initialCall}, \text{adviseCompliant} \Rightarrow \text{complaint} \]
Example

<ruleml:Rule key=":rule1">
  <lrml:hasStrength>
    <lrml:Defeasible key=":str1"/>
  </lrml:hasStrength>
  <ruleml:if>
    <ruleml:Atom>
      <ruleml:Var>X</ruleml:Var>
      <ruleml:Rel>is an expression of dissatisfaction ...</ruleml:Rel>
    </ruleml:Atom>
  </ruleml:if>
  <ruleml:then>
    <ruleml:Atom>
      <ruleml:Var>X</ruleml:Var>
      <ruleml:Rel>is a complaint</ruleml:Rel>
    </ruleml:Atom>
  </ruleml:then>
</Rule>
Part II

Deontic
Prescriptive vs Constitutive Rules

Section 29 of the Australian “National Consumer Credit Protection Act 2009” (Act No. 134 of 2009).

(1) A person must not engage in a credit activity if the person does not hold a licence authorising the person to engage in the credit activity.
Constitutive and Prescriptive Rules

- A constitutive rule defines a term
- A prescriptive rule asserts a deontic effect (e.g., obligation, permission, prohibition)
Prescriptive Rules

body \Rightarrow [D_1] formula_1, [D_2] formula_2, ..., [D_n] formula_n
Prescriptive Rules

\[\text{body} \Rightarrow [D_1] formula_1, [D_2] formula_2, \ldots, [D_n] formula_n\]
Prescriptive Rules in LegalRuleML

<lrml:PrescriptiveStatement key="ps1">
  <ruleml:Rule key=":key1">
    <lrml:hasStrength>
      strength of the rule
    </lrml:hasStrength>
    <ruleml:if>
      set of deontic formulas and formulas
    </ruleml:if>
    <ruleml:then>
      <lrml:SuborderList>
        list of deontic formulas
      </lrml:SuborderList>
    </ruleml:then>
  </ruleml:Rule>
</lrml:PrescriptiveStatement>
Example

Section 29 of the Australian “National Consumer Credit Protection Act 2009” (Act No. 134 of 2009).

(1) A person must not engage in a credit activity if the person does not hold a licence authorising the person to engage in the credit activity.
Civil penalty: 2,000 penalty units.
[...]  
Criminal penalty: 200 penalty units, or 2 years imprisonment, or both.
Penalty and Reparation

A penalty is just a subordr list

\[ [D_1]formula_1, [D_2]formula_2, \ldots, [D_n]formula_n \]
Penalty and Reparation

A penalty is just a subordr list

\[ [D_1] \text{formula}_1, [D_2] \text{formula}_2, \ldots, [D_n] \text{formula}_n \]

A reparation connect a norm (rule) with the penalties compensating the violation of the norm
Penalty and Reparation in LegalRuleML

<lrml:PenaltyStatement key="pen2">
   <lrml:SuborderList>
      list of deontic formulas
   </lrml:SuborderList>
</lrml:PenaltyStatement>
Penalty and Reparation in LegalRuleML

<lrml:PenaltyStatement key="pen2">
  <lrml:SuborderList>
    list of deontic formulas
  </lrml:SuborderList>
</lrml:PenaltyStatement>

<lrml:ReparationStatement key="rep1">
  <lrml:hasTemplate>
    <lrml:Reparation key="assoc1">
      <lrml:appliesPenalty keyref="#pen1"/>
      <lrml:toTarget keyref="#ps1"/>
      </lrml:Reparation>
  </lrml:hasTemplate>
</lrml:ReparationStatement>
Section 29 of the Australian “National Consumer Credit Protection Act 2009” (Act No. 134 of 2009).

(1) A person must not engage in a credit activity if the person does not hold a licence authorising the person to engage in the credit activity.  
Civil penalty: 2,000 penalty units.  
[...]
Criminal penalty: 200 penalty units, or 2 years imprisonment, or both.
Example

\[ ps1: \text{Person}(x) \Rightarrow [\text{FORB}]\text{EngageCreditActivity}(x) \]
\[ ps2: \text{HasLicence}(x) \Rightarrow [\text{PERM}]\text{EngageCreditActivity}(x) \]
\[ ps2 > ps1 \]
\[ pen1: [\text{OBL}]\text{PayCivilUnits}(x, 2000) \]
\[ pen2: [\text{OBL}]\text{PayPenalUnits}(x, 200), \]
\[ [\text{OBL}]\text{Imprisonment}(x, 2y), \]
\[ [\text{OBL}]\text{PayPenaltyUnitsAndImprisonment}(x, 200, 2y) \]
\[ rep1: [\text{Violation}]ps1, pen1 \]
\[ rep2: [\text{Violaltion}]ps1, pen2 \]
Thank You

Questions?