Completing LOM - How Additional Axioms Increase the Usability of Learning Objects Metadata

Present: New applications (e.g. LMSs, Edutella) need a comprehensive description of e-Learning resources with metadata to access these resources.

Drawbacks:
- Lack of sophisticated metadata tools
- Tedious and annoying method
- Error-prone
- Time-consuming
- Semantics of metadata elements not clearly defined (example: lom:hasPart)

Our Approach: Support the authoring of metadata using inference rules.

Advantages:
- Only selected metadata elements need to be entered
- No implicit metadata to be entered
- Less error during entering
- Rules can also be used for searching purposes
- Rules as Integrity Constraints

RDF-File (excerpt)
```
<rdf:Description about="http://www.ifn.ing.tu-bs.de/tv/painter/sue/html/sigueb2/5digmod/5_1prinzipien/5_1prinzipien.html">
    <dc:subject rdf:resource="http://www.ifn.ing.tu-bs.de/tv/painter/sue/html/sigueb2/5digmod/5_1prinzipien/5_1psk5.html"/>
    <dc:subject rdf:resource="http://www.ifn.ing.tu-bs.de/tv/painter/sue/html/sigueb2/5digmod/5_1prinzipien/5_1psk6.html"/>
    <dcterms:requires rdf:resource="http://www.ifn.ing.tu-bs.de/tv/painter/eels/eels.rdf#722.3"/> <!-- 722.3 = Data Communication (Equipment and Techniques) -->
    <dcterms:isPartOf rdf:resource="#Kapitel_10_1_4PSK"/>
    <dc:language>de</dc:language> <dc:creator>
        <vCard:FN>Mark Painter</vCard:FN>
        <email>m.painter@tu-bs.de</email>
        <url>http://www.learninglab.de</url>
        <institution>Technical University Braunschweig</institution>
        <country>Germany</country>
        <department>Institute for Communications Technology</department>
    </dc:creator>
</rdf:Description>
```

Inference Rule (Graph)
```
inverse(A1, A2) <-
FORALL R1, R2, A1
    R2[A2 -> R1] AND
    R1[A -> R2] AND
    inverse(A1, A2).
```

Inference Rule (TRIPLE)
```
FORALL R1, R2, A1
    R1[A1 -> R2] AND
    inverse(A1, A2).
```