Dublin Core and CIDOC CRM Harmonization

Lais Carrasco  
Unesp, Brazil  
laiscarrasco@hotmail.com

Silvana A. Borsetti Gregorio Vidotti  
Unesp, Brazil  
vidotti@marilia.unesp.br

Keywords: Dublin Core Metadata Element Set (DCMES); CIDOC CRM; ontologies, metadata, information integration, semantics mappings.

1. Introduction

In order to integrate information from heterogeneous sources, ontologies as semantic technologies are a recommend solution. “An ontology is a description (like a formal specification of a program) of the concepts and relationships that can formally exist for an agent or a community of agents”. (Gruber, 2001) CIDOC Conceptual Reference Model (CIDOC CRM) is a very prominent ontology used for such purposes.

The CIDOC CRM is intended to promote a shared understanding of cultural heritage information by providing a common and extensible semantic framework that any cultural heritage information can be mapped to. […] In this way, it can provide the "semantic glue" needed to mediate between different sources of cultural heritage information, such as that published by museums, libraries and archives. (CIDOC CRM)

As semantics mapping can be a solution for information integration and Dublin Core is the most prominent metadata used to describe web resources, we propose a harmonization between Dublin Core and CIDOC CRM ontology. According to Nilsson (2010, p. 107) harmonized standards is “a set of metadata standards that can be semantically embedded into another standard”. Here, CIDOC CRM is used as the mediated schema to integrate metadata sources in the Cultural Heritage domain. It’s important to mention that other works are making efforts in this direction, for example, the Mapping of the Dublin Core Metadata Element Set to the CIDOC CRM headed by Doerr (2000).

2. Mapping Dublin Core into CIDOC CRM ontology

Beneath we present a semantic mapping from the Dublin Core Metadata Element Set (DCMES) into CIDOC Conceptual Reference Model entities in order to provide information integration.

### TABLE 1: DCMES and CIDOC CRM Harmonization.

<table>
<thead>
<tr>
<th>Dublin Core</th>
<th>CIDOC CRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributor</td>
<td>E39 Actor</td>
</tr>
<tr>
<td>Coverage</td>
<td>E50 Date</td>
</tr>
<tr>
<td>Creator</td>
<td>E39 Actor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dublin Core</th>
<th>CIDOC CRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>E55 Type</td>
</tr>
<tr>
<td>Publisher</td>
<td>E12 Production</td>
</tr>
<tr>
<td>Identifier</td>
<td>E42 Object Identifier</td>
</tr>
</tbody>
</table>
3. Final considerations

According to the literature, there are many XML metadata mapping to the CIDOC CRM ontology efforts, since this ontology is considered one of the most appropriate models in integration architecture. On the other hand, Dublin Core is the most used metadata in semantic web applications. In this way, metadata can be mapped into an ontology to provide interoperability of its data and to achieve information integration. When the different kind of metadata are mapped into an ontology the system can interoperate and the information access is higher as well as their information retrieval.

The major difficulty found in this research was that the Dublin Core Element Set has just 15 attributes, on the other hand, CIDOC CRM has 93 entities, making it difficult to express all CRM relationships, so in this work, we chose only those entities that have their concepts more similar to the DCMES.

As DCMES is the most prominent metadata used to describe web resources, a DCMES and CIDOC CRM cross-walking model will be developed in a future work in order to handle cultural heritage data representation into the web.

References

CIDOC CRM. http://www.cidoc-crm.org/.