Chapter 13

Modelling Design of OIS Ontology

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ABSTRACT

This chapter presents the development of OIS ontology and the main elements that formalised in OWL-DL. The OIS ontology followed Methontology as a general framework of methodology. The main result will be introduced, namely, the modelling design of OIS ontology which follows the description of the activities involved in designing the OIS ontology model. The OIS ontology model identifies the terms and definitions in the IS domain. Also, designing the ontocop system and how it can be a useful platform for supporting and assessing the OIS ontology. It starts by introducing OIS designing methodology. At the end of this chapter we will discuss how this tool will help to develop the OIS ontology to be modelled in a comprehensive and consistent manner.

BUILDING CONCEPTUAL MODEL

1.1.1 Specifications

Ontology specification comprises of several activities. It needs to specify the goal of building and designing the ontology, and the scope of the domain that will be captured in the ontology, as well as whether it will be one domain or more than one domain. Identifying the scope indicates the level of detail that is required. This stage aims to put together the resources that cover the ontology’s objects, purposes, scope and granularity. This activity includes:

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1.1.1.1 Identifying the Purpose and the Scope

In software design methodology, the designer needs to establish the domain scope to be captured and described in the proposed ontology, even whether the domain is a single domain or a combination of domains. Prescribing the ontology is important in identifying the domain boundaries to be investigated. In the specification phase we answer questions about the main purpose for building the ontology: why is the ontology of information science (OIS) being built? What are its planned uses? Who are the end users? It is necessary to identify the boundaries of the domain that the ontology will cover.

The process in this stage is to start by identifying the domain ontology that the ontology will be used for and where it will be implemented, by identifying the main features to gain an understanding how the ontology is related to other domains. As shown in Table 1. In Figure 1 we illustrate the domain scope of the proposed ontology of IS.

1.1.1.2 Knowledge Acquisition

Building a conceptual model requires gaining knowledge that describes the domain. Knowledge needs to be elicited, analysed and interpreted, and transferred into a machine representation.

The purpose of knowledge acquisition is to capture the domain concepts of information science (IS) to be organized into a hierarchical structure-based ontology competence. Furthermore, identifying the main concepts and the necessary information to be described, and discerning the core relationships between these concepts.

Table 1. The scope of IS domain

<table>
<thead>
<tr>
<th>Domain Ontology</th>
<th>Information Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>2009-2012</td>
</tr>
<tr>
<td>Built by</td>
<td>Research student at Informatics department in School of Computing and Engineering – University of Huddersfield.</td>
</tr>
<tr>
<td>Purposes</td>
<td>Providing consensual knowledge modeling of IS domain. It is to be accessible and usable by scholars and ultimately users of IS domain. The OIS ontology will be used when the information about the domain is required in technique, process, analysis. Also, it could be applied in other applications for shared knowledge as an index tool for supporting semantic web mark-up of IS knowledge.</td>
</tr>
<tr>
<td>Scope</td>
<td>The scope reflects the domain knowledge in semantic model. The OIS ontology is domain specific. It covers each of these branches; library science, computer science, archival science, etc.</td>
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<tr>
<td>Level of formality</td>
<td>Formal ontology</td>
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