

Ontology and the Semantic Web

Robert M. Colomb, IOS Press, Oxford, 2007, £71.00 (hardcover)

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The emergence of ontologies within information science was (arguably) first noted by Vickery in 1997 (Vickery, 1997). Since then, the library and information science (LIS) community has experienced a tremendous growth in ontology related research and development work, primarily in response to Tim Berners-Lee's vision of the Semantic Web (Berners-Lee et al., 2001).

The LIS synergy with the Semantic Web is clear. Not only has LIS established a role within the developing Semantic Web framework itself (e.g. Greenberg and Méndez, 2007), but many are keen to see greater deployment of Semantic Web tools within digital library applications thus facilitating improved user resource discovery across distributed heterogeneous collections and improved data interoperability (Macgregor, 2008a; Prasad and Madalli, 2007). The recent announcement by Yahoo! to make better use of structured data on the web is yet another indication that the LIS community has to continue its commitment to metadata and knowledge organisation; assuming a key role in bringing the Semantic Web to fruition (Macgregor, 2008b). Now is therefore an appropriate juncture at which to identify those monographs that can assist the unacquainted LISer in comprehending ontology and the Semantic Web.

Ontology and the Semantic Web is an attempt to bring together developments in philosophy, artificial intelligence, information systems and the Semantic Web in order to formalise a "collection of functional requirements for ontology development". Author Robert M. Colomb takes the reader through nine chapters laying the theoretical groundwork of ontology, before exploring in detail a variety of ontology representation languages. During his theoretical exposition, Colomb does a sterling job at deconstructing complex ontological concepts (brute and institutional facts, subclasses and sub-properties, complex objects, formal upper ontologies, etc.), but also those concepts that might be unfamiliar to the reader, such as data interoperability and semantic heterogeneity. Each of these chapters is expertly annotated with examples and illustrated with Unified Modelling Language graphical notation.

Once the functional requirements are established, the remainder of the book turns its attention to ontology representation, focusing on the Resource Description Framework Schema, the W3C Web Ontology Language (OWL), Common Logic (CL) and Topic Maps. Colomb notes the expressiveness of each, their respective deficiencies and how they relate to each other. RDF(S) and OWL are the most germane to the Semantic Web project, both being key specifications of the W3C Semantic Web Activity initiative [1] and the specifications with which most will be interested. The chapter on OWL is particularly well explained, with well annotated Metadata-Object Facility metamodels and RDF/OWL snippets provided to explain the creation of an airline ontology. OWL also provides much of the context for Colomb's chapter on predicate logic, which segues into the use of CL to aid the discussion.

Now an honorary reader in the School of Information Technology and Electrical Engineering at the University of Queensland, Colomb wears on his sleeve his time as a lecturer providing a measure of

depth and detail in 260 pages which is frankly astounding. A total of 260 pages chock full of theory, examples, case studies and then more examples. Besides the collection of running examples used throughout, readers' understanding is underpinned by an extended example of a hypothetical ontology for the Olympic Games. This is initially presented as a set of end-of-chapter exercises which are then solved in a lengthy appendix.

It was stated earlier in this review that the author does a “sterling job at deconstructing complex ontological concepts”. This is indeed true, but only up to a point. And this is by no means a slight on the author. Ontologies and ontology representation can be a complex area and there is a limit to which such topics can be reduced for widespread consumption. *Ontology and the Semantic Web* is therefore not a book for someone seeking mild edification on what the Semantic Web is and how it works; rather, it is for the reader serious about understanding ontology and implementing ontologies within real life contexts.

If a minor criticism could be levelled it would be that the bibliography comprises only 31 references, many of which are too stale or inadequate to support further understanding on the reader's part. A more serious criticism might be that the book tends to neglect the use of ontology in information retrieval and within intelligent resource discovery tools, emphasising instead its use in business information systems and e-commerce – and whilst most of the principles remain the same, *Ontology and the Semantic Web* could have been an altogether more holistic offering. This book nevertheless remains essential for those wishing to wrestle ontology. Just do not expect to leave the ring without sustaining some intellectual injury.

Note

[1] W3C Semantic Web Activity, available at: www.w3.org/2001/sw/ (accessed 27 March 2008).

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