
Preface

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Biographical notes: Bruce Bargmeyer is a Staff Computer Scientist at the Lawrence Berkeley National Laboratory, and Group Leader of the Metadata, Semantics and Ecoinformatics Group. He holds an MPA degree from Harvard University. He is Chair of a standards development committee ISO/IEC JTC 1/SC 32 – Data Management and Interchange.¹ He leads research, development and demonstration projects in the areas of metadata registries, semantics and ecoinformatics. This includes the eXtended Metadata Registry (XMDR) project (<http://xmdr.org>), which is designing, testing and demonstrating capabilities for the next generation of metadata registries. The XMDR project has contributed to and benefited from the concepts and approaches described in the papers of this special edition of *IJMSO*.

This issue of the *IJMSO* draws together papers relating to themes and topics of the annual Open Forum on Metadata Registries.² The Open Forum draws together standards committee participants, software developers and practitioners in the field of metadata. The Open Forum is organised by participants of ISO/IEC JTC 1/SC 32/WG 2-Metadate. In the ISO/IEC standards arena, multidisciplinary efforts are underway to help specify fundamental techniques and technologies that advance the capabilities of computers to register and manage semantics. WG 2 participants are collaborating with ISO TC 37 - Terminology and other language and content resources and collaborating with other standards development organisations, including OMG, W3C and OASIS. The collaboration activities help to align standards and build on each other's advances.

The papers selected here describe advancements in information theory, new directions for metadata, semantics and ontology standards, and improvements in practice. Standards that form a common thread through the papers include ISO/IEC 11179-Metadata Registries (MDR), particularly Part 3 Edition 3 currently under development,³ ISO 1087 - Terminology work – Vocabulary, and ISO/IEC 24707 – Common Logic.⁴ These provide foundations for new advances by content providers and application developers to advance the specification, curation and use of semantics. Emerging techniques and technologies are making possible great advances not only in capturing, managing and curating semantic specifications, but also in enabling increasingly useful semantics-based computing. Although new in the context of information technology, many of the advances reach far back in philosophy, linguistics and other disciplines for theory and fundamentals.

The intent of this special issue is to describe recent advances in research, development and practice toward management of metadata, semantics and ontologies. This is for use in advancing traditional computing disciplines, such as data administration and data management as well as to open new possibilities for semantic based computing.

The first two papers describe experiences using metadata for discovery of data assets and for enabling data sharing. Johns and Howard describe discovery metadata catalogues and processes for managing metadata lifecycles for semantic, logical and physical discovery metadata. Jonsdottir et al. describe development of a metadata registry based on the cancer Data Standards Repository, extending the approach to support development of Common Data Elements for Nordic countries. Both papers describe the use of vocabularies in conjunction with other metadata.

In the third paper, Madsen and Thomsen delve into the construction of formal ontologies, discussing basic concepts that underlie both terminology work and data modelling. They argue that the principles of rigorous terminology work are useful for building consistent ontologies. Parmelee et al., in the fourth paper, outline the United States Air Force Net-Centric Metadata Framework, which builds on and extends DoD foundations including the DoD Discovery Metadata Standard and the DoD metadata registry. The work involves development of small Community of Interest vocabularies, expressed as ontologies, which taken together, represent the Air Force enterprise vocabulary. This leverages ontologies to facilitate enterprise semantic consistency and improve enterprise search capabilities as part of a net-centric service-oriented environment.

ISO TC 37 is developing a revised version of its metadata registry following the principles of the ISO/IEC 11179 family of standards, while recognising divergent traditions in this area. Kemp-Snijders et al. describe the Data Category Registry, a resource for language related metadata that can be used in a variety of applications and environments. Typical data categories include 'term', 'part of speech' and 'definition', to name a few examples. It is expected that the registry will facilitate the development and dissemination of data categories and contribute to higher levels of interoperability and interactivity with ontological resources.

Finally, at the deep end of the pool, the concluding paper by Delugach presents a standards-based approach to specifying and reasoning about metadata constraints based on existing metadata registry standards, existing terminologies and Common Logic. The paper introduces the basic theory and principles of Common Logic, and applies it to several examples, where a user might want to reason about metadata

constraints. It is expected that metadata constraints will be developed by makers of metadata and included in metadata registries. This paper shows a first step toward the use of Common Logic's capabilities. Common Logic, ISO/IEC 24707, is a relatively new standard that is freely available.

Notes

- 1 International Organization for Standardization/International Electrotechnical Commission (ISO/IEC) Joint Technical Committee 1 (JTC 1) /Subcommittee 32 – Data Management and Interchange (SC 32).
- 2 See <http://metadataopenforum.org/>
- 3 The latest draft of ISO/IEC 11179 Part 3, Edition 3, can be found at: <http://metadata-stds.org/11179/index.html#A3>
- 4 ISO/IEC 24707:2007 and the ISO/IEC 11179 family of standards are available free at: <http://standards.iso.org/ittf/PubliclyAvailableStandards/index.html>