Introduction

The Semantic Web: More than a Vision

by Jane Greenberg, Guest Editor

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Our dependence on World Wide Web (Web) technology for information, communication and services grows daily. Consider the slightly frantic behaviors people often exhibit when they are unable to access the Web for an extended period of time. Of course there is the other side – a break from interacting with a computer is viewed as a relief for the eyes. Even so, it is clear that our information society is becoming wedded

to Web technology for daily activities. The proliferation of library and information science publications addressing and researching aspects of the Web – still a relatively new phenomenon – provides even further evidence of our dependence on this technology. In fact it's difficult, if not impossible, to find an information science periodical without one article dealing with Web technology.

While all this is exciting, there are many limitations to the current Web. Visionaries and researchers throughout time have talked about exploiting our mass of information to automatically produce new knowledge, build intelligent systems and eliminate human burdens associated with information seeking and problem solving activities. There have been successes, but they are often limited by domain or infrastructure. The Web offers us a new playing field for addressing these goals through the *Semantic Web*, which is an extension aiming to foster communication between computers and people via semantically encoded information.

This special section includes four articles about the Semantic Web. A great deal of the Semantic Web activity is taking place at the World Wide Web Consortium (W3C). In this review of the field, Eric Miller and Ralph Swick provide an overview of W3C Semantic Web activities. They discuss Semantic Web enabling technologies and important Semantic Web Advance Development (SWAD) initiatives. These include SWAD DAML, SWAD-Europe, SWAD Simile and SWAD Oxygen.

Bijan Parsia focuses on Semantic Web services (remote programs). Parsia outlines the shortcomings of the current Web, explaining why current services are severely limited and how they could be improved. Attention is specifically given to the problems of service discovery. Parsia explains current efforts to solve this problem with Universal Description, Discovery and Integration of Web Services (UDDI) and

demonstrates the significant role of semantics in problem solving. This article draws from work currently being conducted in MIND's Semantic Web Agents Project at the University of Maryland, College Park.

Jane Greenberg, Stuart Sutton and D. Grant Campbell address the fundamental role that metadata plays in building the Semantic Web. We discuss the vision and architecture underlying the Semantic Web and explain how each layer of the Semantic Web's architecture, as envisioned by Tim Berners-Lee, is connected to or directly involves metadata. Topics include metadata vocabularies, enabling technologies and Semantic Web authoring and annotation. We find ourselves, in some respects, as early pioneers exploring the potential roles and forms of metadata related to the Semantic Web's emerging architecture.

Elin Jacob's article concludes this special section with an article on ontologies. Jacob offers a philosophical and practical discussion of ontologies and their roles in building the Semantic Web. Specific attention is given to ontology languages, such as RDFS (Resource Description Framework Schemas) and OWL (Web Ontology Language) and their application to the Semantic Web. Jacob urges us to think outside the box and realize that there are indeed new capabilities that we need to explore.

To pick up on Jacob's remarks, I have heard people say the Semantic Web is "old wine in a new bottle." There is likely some truth here, as is always the case with innovations drawing upon developments and ideas from earlier times, but I agree with Jacob's line of thinking. The technology underlying the Web is unprecedented and affords us new opportunities to turn segments of the growing mass of electronic information into new intelligence for both humans and computers. The Semantic Web is an engaging territory to explore and cultivate.

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