Most people first became aware of the term Semantic Web through an article by Tim Berners-Lee published in Scientific American in 2001. In that article, Berners-Lee talks about a future in which the Semantic Web would “usher in significant new functionality as machines become much better able to process and ‘understand’ the data that they merely display at present.”

Since that time, much work has gone into developing standards for Semantic Web applications, including XML, the Resource Description Framework (RDF), and the Web Ontology Language (OWL). But, as Berners-Lee himself acknowledged in a followup article in IEEE Intelligent Systems, “This simple idea remains largely unrealized.”

Nevertheless, some Semantic Web concepts and technologies have gained considerable traction. Ontologies, for example, have become indispensable tools in the biological sciences and genomic research. And many Semantic Web concepts have influenced the development of today’s leading-edge technology in unacknowledged ways. XML-based Web services and the service-oriented architecture (SOA) found in many enterprise architectures borrow many of their ideas from the Semantic Web, including intelligent search and discovery of new services.

This special issue of IT Professional provides an overview of the progress that has been made in translating Semantic Web concepts into real-world applications. “Semantic Web Technologies: Ready for Adoption?” by Valentina Janev and Sanja Vraneš, provides an analysis of the state of the art in Semantic Web standards and tools, with an emphasis on the work being undertaken in the EU. “Equal Format Databases and Semantic-Relational Encoding,” by Dean Keith, describes a semantic approach to relational database design. And finally, my tutorial, “Just What Is an Ontology, Anyway?” provides
an overview of ontology concepts and applications. It’s our belief that you’ll walk away with a new understanding of a fundamental concept behind many of today’s systems.

References

Thomas C. Jepsen is an IT consultant in Chapel Hill, North Carolina. He also serves as the programming languages editor for IT Professional and chair of IEEE-USA’s Medical Technology Policy Committee. Jepsen’s current research interests include healthcare IT standards and development of service-oriented architecture (SOA) applications. He’s the author of Distributed Storage Networks: Architecture, Protocols and Management (John Wiley & Sons, 2003), editor of Java in Telecommunications: Solutions for Next Generation Networks (John Wiley & Sons, 2001), and contributing author of Systems Engineering Approach to Medical Automation (Artech House, 2008). Contact him at tjepsen@ieee.org.