**XML and the Semantic Web: What is the future?**

This forum will look at the complex issues associated with the future of XML. Many issues that arise in XML have also been explored in other research areas, such as databases, knowledge representation, or knowledge discovery. Compounding this is the wide variety of ways that XML is currently being used today. The future direction of XML is unclear, and with this form we hope to provide a well thought out set of issues for future researchers to address.

The eXtensible Markup Language (XML) is a rapidly maturing technology that has powerful applications in industry, military, government, and scientific application. The anticipated benefits of XML include easier integration of legacy systems, improved application communications, superior knowledge representation, and platform independence. XML is very widely used and accepted, and holds great promise for future benefit.

XML was developed as a subset of the Standard Generalized Markup Language (SGML) and was recommended by World Wide Web Consortium (W3C) as a standard in February of 1998. However, XML has currently splintered into many different forms and concepts, with no clearly defined future path. One of the most interesting future concepts for XML is to expand it into what Web creator Tim Berners-Lee calls “The Semantic Web”. The Semantic Web is intended to extend the current Internet by giving well-defined meaning to information to allow better cooperation among computers and people.

This is the goal of XML also, but XML’s capabilities are bounded by syntax-based interoperability and the Semantic Web wishes to extend this abstraction to a higher-level by using semantic-based interoperability. The Semantic Web is based on the Resource Description Framework (RDF) and the DARPA Agent Markup Language (DAML). These two technologies are tightly connected, with RDF being foundational to DAML. RDF is a mechanism for using XML to describe an Internet resource as a directed graph. DAML extends RDF’s capability with a richer set of concepts that describe more complex relationships than described by RDF alone.

This Semantic Web concept extends the idea of XML by providing not only the structure to a Web document, but by providing a way of describing the machine understandable meaning of a document. If this concept can be realized, the power of the Internet and computing in general will be enormously increased. However, many significant hurdles exist to achieving this goal, ranging from semantic representation, to natural language processing, to communication among software agents.

This forum included 15 minute presentations from the panelists, followed by a 45 minute forum discussion. The forum members are:

Dr. Peter Chen

Dr. Chen is the M. J. Foster Distinguished Chair Professor of Computer Science at Louisiana State University and is best known as the originator of the Entity-Relationship Model (ER Model). His original paper on the ER model is one of the most cited papers in the computer software field. Dr. Chen is also the Editor-in-Chief of *Data & Knowledge Engineering*, the Associate Editor for the *Journal of Intelligent Robotic Systems* and other journals. In the past, he was the Associate Editor for *IEEE Computer, Information Sciences* and other journals. Dr. Chen is currently an invited expert of several XML working groups.
Mr. George Bryan

Mr. Bryan is the Director of the Centre for Advanced Systems Engineering at the University of Western Sydney. He has held a number of senior information technology positions in the public sector. He is a pioneer in the use of XML for industrial applications, including implementing one of the first XML data transmission systems in Australia.

Dr. Mladen Vouk

Dr. Vouk is the Associate Vice Provost for Information Technology and a Professor of Computer Science at North Carolina State University with board contributions in scientific data analysis, software engineering, and telecommunications. He is an associate editor of IEEE Transactions on Reliability, member of the Editorial Board for the Journal of Computing and Information Technology, and a member of the Editorial Board for the Journal of Parallel and Distributed Computing Practices. His current research is in developing scientific workflows systems using XML derivatives and services.

The forum leaders are:

Dr. Thomas E. Potok

Dr. Potok is the leader of the Applied Software Engineering Research Group at the Oak Ridge National Laboratory. He is the principal investigator on a number of intelligent software agent and XML projects. These projects include the Virtual Information Process Agent Research (VIPAR) project funded by the Office of Naval Research (ONR) for the US Pacific Command using intelligent agents and novel knowledge discovery techniques to organize open source information.

Mr. Mark Elmore

Mark Elmore is a research staff member in the Applied Software Engineering Research Group at the Oak Ridge National Laboratory. His recent activities involve a number of intelligent software agent projects, producing operational solutions utilizing XML-based technologies including RDF, DAML, and the foundations of Semantic Web concepts.