Editor's introduction

The broad range of scientific and technical information and data (STI) that is now available online plays a critical role in the new paradigm of research and development we call *e-Science*. Modern information and communications technology allows access to virtually all forms of information and data at the desktop. Working scientists increasingly rely on web-based and intranet resources to be their virtual library, although this development complements and is not likely to replace the bricks and mortar libraries that continue to play a foundational role in support of scholarship generally, and collaborative scientific research in particular.

In this new world of e-Science, we must ask what does this mean to the creators, providers and users of scientific and technical information and data. ICSTI, the International Council for Scientific and Technical Information, with support from the French Ministry of Research, INIST-CNRS and INSERM, organized an international Workshop in February 2006 to address three aspects of information and data in e-Science:

- What does an e-scientist do and what role does access to information and data via networks play?
- What are the challenges to the STI community – industry, non-profit and government – in supporting e-Science?
- How will modern information and communications technology help meet these challenges?

The program agenda was organized in three parts: Setting the Goal, Challenges, and the Promise of Technology towards achieving a seamless integration of creation and access tools that enable scientific discovery and use.

The first speaker, **Jeff Pache**, provided a broad overview of what INSPEC and other publishers are currently doing with e-journals and what the future of e-publishing holds. He was followed by **Merry Bullock** of the American Psychological Association and International Union of Psychological Science, who addressed the technical, analytical and disciplinary changes that are necessary to promote the goals of e-social science. **Les Grivell** spoke of the special characteristics of research data in the molecular biological sciences, the work of EMBO in producing E-BioSci as a web platform that connects literature with data, and the need for seamless access and interconnectivity of information as a prerequisite for a successful systems biological approach. **Steve Bryant** of the National Center for Biotechnology Information at the US National Library of Medicine looked at the challenges of creating a "one stop shop" for biomedical information, and use of the PubChem and Entrez search engines and the MeSH vocabulary as tools for the seamless integration of molecular data, structures, and published articles. **Tony McSean** of Elsevier addressed the challenges of preserving large scale journal collections, as exemplified by "national" and "official" archives such as the Elsevier relationship with the Royal Dutch Library; as well as trusted third party archives for authors, libraries and readers. **Kurt Molholm**, formerly of the US Defense Technical Information Center focused on the challenges of agreeing upon appropriate data standards, be they proprietary/*de facto* (widely accepted and used but lack formal approval), or open/*de jure* (developed and adopted by an authorized standards body). Open standards are necessary to create systems interoperability, which remains a significant unmet challenge today for all elements of the information continuum that spans origination, access, use, and preservation. **David Brown** of the British

Library, underscored the importance of research leading to a better understanding of user behavior, perhaps made more difficult by the anonymity of web searching but also facilitated by the measurable digital trail left behind by users. The promise of technology is being pursued at the Canada Institute for Scientific and Technical Information, whose work was described by **Bernard Dumouchel** on new opportunities for mining digital libraries as a means to create knowledge. He demonstrated by example how citation path analysis and related analytic tools applied to the scientific literature can yield hidden relationships and new knowledge. **J.L. Needham** explored how Google's fundamentally different approach to enabling discovery and access has shaped the development of its products, such as Google Scholar and the Library Links Program, and in so doing has dramatically altered the searching behavior of researchers and members of the public alike. It is estimated that upwards of 50% of the hits recorded on major open source databases originate at Google and other external search engines. Lastly, **John Helliwell** of the Union of Crystallography, argued for the need to uphold quality standards in a diverse scientific environment. He described the crystallographic information file (CIF) which allows for the seamless transfer of information for deposition and publication, and related mechanisms for checking compliance with such standards.

The following paper, published under the corporate imprimatur of the International Council for Scientific and Technical Information (ICSTI), is the Proceedings of the February 2006 Workshop in Paris. It is followed by three full-length papers prepared subsequent to the Workshop by authors Kurt Molholm; Bernard Dumouchel and Jeffrey Demaine; and John Helliwell, Peter Strickland, and Brian McMahon.

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