Editorial for Special Issue on Internet Research

As an object of research investigation, the Internet presents a rich environment. It has received considerable scrutiny by researchers in many disciplines. Global high-speed networking presents many challenges for researchers in telecommunications, electrical engineering, and computer science. Protocol development and standardization for interoperability, access, and scalability are important research areas being undertaken in these fields. The Internet also presents a wealth of research areas for investigators in the social sciences and humanities, studying how users interact with the tools and resources made available by the Internet.

This issue of Information Research reflects the diversity of Internet research being undertaken, with contributions from researchers in the physical and social sciences. Papers appearing here represent a variety of research problems covering access, use, and usability research problems.

As digital libraries become more common, users will be able to access increasing amounts of information in electronic format, traditionally found in traditional information agencies such as libraries and archives. Duff and Cherry present an analysis of the usage of research information resources available in three formats: electronically through an Internet-based digital library, as microfiche documents, and as traditional paper-based documents. Results of the administered survey, analysis of log sessions, and user focus groups, reveal that for users with experience with all three formats, more than half indicated web-based documents were most useful for their work, although authenticity of electronic documents remains a concern. Based on the study findings, the authors have made 26 recommendations for the improvement of the digital library studied.

The Internet, and more specifically the World Wide Web, is argued to be the world's largest vanity press, allowing anyone to make any document available to anyone connected to the net. Scholars have taken advantage of this medium by developing electronic journals—of which Information Research is an example--for the dissemination of research findings. Koehler *et al.* analyze the characteristics of selected electronic journals in Information Science and compare them to a leading print-based journal in the field. The authors conclude that the medium used, whether print or electronic, does not appear to influence the nature of the journal.

Bibliographic instruction has taken on new connotations in the past decade with the wider availability of electronic resources. Librarians have been working with instructors to develop ways to educate students about how to effectively use Internet-based information resources. This is particularly true in the college/university environment. Ward and Reisinger present a framework for librarians to work with instructors in incorporating Internet-based resources and assignments in their courses. The authors also provide examples of the different types of Internet assignments that are encountered in academic environments and how they may best be structured.

With the wider availability of Internet search engine usage data, researchers are now able to unobtrusively study how end users make use of search services. In a Research Note, Spink and Xu summarize findings of user search behavior using large query data sets made available by Excite@home. The authors found that users do not make extensive use of search features, such as Boolean operators or relevance feedback, and expend little effort in query formulation or browsing. Queries represent a broad range of topics, but do not seem to map well to the content distribution of Web sites.

This raises the question whether end users are finding what they are looking for. With numerous search sites now available, end users, unaccustomed to the range of search features available in many information retrieval systems, may be struggling to formulate effective queries. Jansen examines the effect of query structure on search engine results. The author compares the results returned by five search engines using variations of the same fifteen queries. Overall, increasing the complexity of a search by introducing advanced search features has little effect on the returned results, indicating that users, in general, will receive similar results from the search services studied regardless of feature usage.

How users perceive the nature of the Internet is also receiving investigation. The World Wide Web and associated browsers have made access to Internet resources user-friendly; but the size of the Web and

its intangible qualities may leave users struggling to understand what the Web really is. Ratzan presents preliminary findings of a study called the Internet Metaphor Project examining how users make sense of the web through the use of familiar metaphors. These metaphor images change as users become more familiar with the content of the Web.

Finally, the distributed nature of the Internet presents challenges for maintaining timely access, challenges which many users are unaware of until they experience slow responsiveness. To alleviate this problem, web caches have been developed to reduce the amount of traffic and delays on the Internet. However, as caches may be distributed around the world, maintaining cache coherency while not generating excess data traffic, which negates the purpose of caches, is of great importance. Belloum and Hertberger present an overview of the difficulties of maintaining cache coherency in a distributed environment. Through the use of simulation experiments, the authors demonstrate the impact of different factors on Web cache coherence. They conclude that both 'weak' and 'strong' document coherence strategies may be improved by applying pre-fetching techniques.

The papers presented here represent just a small part of the rich research environment presented by the Internet. Many more topics await investigation, promising to keep researchers busy for decades to come.

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