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It is common in the computer trade press to joke about “Web years,” each year being a few months or weeks of normal time. The idea behind the phrase is that product development for the World Wide Web occurs so rapidly that software that traditionally would take a year to develop now must be out the door in a month and will be obsolete by next month. If software developers, accustomed as they are to rapid change, feel pressure from the accelerating pace of technology, where does that leave us in the library profession? Libraries of today may not be identical in design with the Library of Alexandria, but we focus on the similarities and continuity, not on the differences. We revel in the permanence of paper as an archival medium, and in stability in our approaches to organizing information.

The on-line revolution has been an ongoing challenge to libraries. We had to learn many new ways of doing things, throwing away first our card catalogs in favor of OPACs, then some of our reference collections in favor of surfing the Internet, and now perhaps our scholarly journal collections in favor of on-line journals. The scary thing is that even the “new” skills of last year are becoming outdated: If you learned how to use Archie or set up a Jughead index two years ago, those skills are not very useful to you today; if you spent time learning the HTML document formatting language last year, that may not be very useful to you next year when WYSIWYG HTML editors obviate the need for understanding those obscure tags and pointy brackets.

Driving change over the last year or two has been the explosive growth of the Internet as a key element of popular culture, both as a physical network and as reified in World Wide Web pages. Tony Rutkowski, formerly executive director of the Internet Society, estimates that the Internet has been growing exponentially, from under 500,000 hosts in January 1991 to nearly 10 million in January 1996 (www.genmagic.com/Internet/Trends/slide-3.html). The Comcen/et Nielsen Internet Demographics Survey (www.commerce.net/work/pilot/nienlied_96/exec.html) estimated that 24 million people used the Internet during summer 1995. Although that estimate is likely too low for 1995, it is probably an underestimate for spring 1996. As of May 1996, the Lycos Web index claims to index 40 million (a number that does not include most large Web-based databases, e.g., the million or so records in each Web-accessible OPAC). More important than the current numbers is perhaps the degree to which the Internet—and the World Wide Web in particular—has entered our collective consciousness. My last doubts about its penetration vanished a few weeks ago as I listened to a National Public Radio story on cigars and heard the pundit cite—in passing—Lycos data on the number of Web pages that mention “cigar” as evidence for the importance of cigars in American culture.

Apart from the inevitability of rapid change and the concomitant need for ongoing professional development, can we make any predictions about which changes will be most significant over the next year or two? Probably not, but here are a few trends to watch:

The Web will continue to be big news. Although current growth of the Web seems mostly in the area of advertising and marketing on the one hand, and intranets on the other, both trends are important for librarians. The Web is creating new opportunities for librarians as a cataloging, academic publishing, and communications medium.

The resurgence of Madison Avenue makes it harder for librarians to contribute to the Web; gone are the days when a list of a dozen links to specialized Internet resources plus a bit of description and evaluation qualified as an exciting Web page; at a minimum, we are all under pressure to become graphic artists, or at least to work with the graphic artists in our organizations and to make our pages visually appealing. The HTML language, originally designed as a way to describe the logical content of documents, has grown with additions designed to provide Web authors with greater control over appearance, while alternative commercial document formats for Web publication—Adobe PDF, Macromedia Director, Sun Java, Microsoft ActiveX, Apple Quicktime—have

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proliferated. Animation, visual tricks, multimedia ornaments—what some would consider the triumph of form over content—have become the norm for Web pages.

On the other hand, the commercialization of the Web also means that it has become the preferred place to look for many kinds of mainstream reference information. Why try to find a telephone book for a city in another state when you can search an on-line yellow pages such as www.niyp.com? It seems a no-brainer to predict that the Web will soon replace paper and CD-ROM as the preferred distribution tool for essentially all mass-market textual information that changes frequently. And it takes only a bit more daring to predict that librarians will have a greater role in helping the average user evaluate and choose the most useful of these on-line reference resources. We can also predict that economics and pricing will be hot topics, with some databases continuing to be free to the consumer (more and more frequently paid for by advertising spots on the Web pages), others site licensed (where the convenience of site licensing based on IP address will conflict with growing complexity as your user community increasingly gets Internet connectivity from a variety of providers with different IP addresses), and others charged on a per-hit basis. With digital money evolving so rapidly, it’s not unreasonable to believe that within a year the dominant form of access to networked information will be pay per view, with librarians, quixotically committed to freedom of information, struggling to cope. (For reviews and further references, see www.ex.ac.uk/~RDavies/arian/cmoney.html.)

The rise of intranets—Web servers for internal use—means that libraries, like every other organization, must look to the Web for techniques for reengineering their own internal processes. We can expect to see Web clients as the universal front end to other resources, both public and private. If your OPAC doesn’t yet use the Web as its primary interface, it probably will by the end of the year. If you have a database that your department uses internally, say written in dBase or Microsoft Access or 4D or Filemaker Pro, you’ll be under pressure to make it available on the Web. If you have a calendar or room schedule that you currently maintain on paper, you should be seriously thinking of publishing it on the Web too. (For examples of calendars published on the Web with one commercial tool, see www.nowsoft.com/tmn/tmnDirectory.html.) Since intranets are the rage in business, libraries that build an intranet of their own will be able to take advantage of a growing array of (expensive) special-purpose software. On the other hand, most libraries are fairly open organizations and don’t have the network firewalls that provide security and privacy to corporate intranets. As a result, libraries, like academia, will be at a disadvantage in seizing the benefits of intranets.

Search engines, a major component of the Web since its beginnings, continue to be big business. (See www.pcweek.com/opinion/0520/20berst.html and www.bubl.bath.ac.uk/BUBL/Winship.html.) The rise of intranets means that there is a huge market for search engines to organize not just the Web as a whole but private Web. Some librarians see search engines, with their typically brute force string-search approaches, as an insult to the traditions of cataloging, but a better view is that we have for the first time major commercial investment in cataloging and indexing technologies. The rise of the Web has prompted substantial new research, much of it occurring in the library community. (See www.dlib.org.) We can predict continued prominence for vendors of search engines and for research into better ways to index and organize and dynamic Web. We can predict greater use of controlled vocabularies and thesauri in the next generation of search engines, but non-automated cataloging systems that require a person to actually evaluate a Web page as part of the indexing process seem doomed given the rate of growth of the Web and the ephemerality of many Web pages. We can predict that some Internet-wide search engines such as Alta Vista will continue to be free to end users, paid for by advertising or by sales of the search engine for use in intranets; others will increasingly offer searches for a fee. Just keeping up with the current search engines and their strengths is becoming an important job for a reference librarian.

One trend of particular importance to academic libraries is the escalating price of scholarly journals, driven in part by the escalating total production of scholarly works. Many see the Web as an antitode, and see the rapid growth of electronic journals as inevitable (See highwire.stanford.edu.) One huge area of growth is the organization and distribution of preprints. Another is traditional scholarly publishers taking their wares on line, e.g., science mag.org. A third is university-sponsored specialized journals, such as those being published by Johns Hopkins Press as part of Project Muse. (See muse.jhu.edu.) We’re in for a few years of experimentation here before the dust settles, but it’s absolutely clear that scholarly communication in 2000 will be very different from—and very much more dependent on—on-line media than—scholarly communication a decade earlier.

The Web is all about communications, but in its early years could be conceptualized as a vehicle for publishing—a repository for broadcast communications only. One can no longer ignore its evolution into the umbrella covering essentially all forms of electronic communications. (See John December’s www.december.com/net/tools/cmc.html for a survey of current software and tools.) Web browsers are becoming Swiss army knives, integrated with e-mail packages for asynchronous communications and tools for synchronous communications ranging from Internet Relay Chat clients to shared whiteboards and Internet-based telephone and videoconferencing. This evolution offers a few obvious opportunities for libraries. We can, for instance, use the technology to offer electronic reference services and help desks or use it to deliver customized bibliographic instruction. But in the larger picture there may be a tension between communications and

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All of this of course implies that students have access to the Internet. In our enthusiasm for this new medium, it is often easy to forget that this is not always the case. Eloise Greene, a participant in a distance program through Syracuse University, commented on a recent CRISTAL-ED listerv discussion: “One of the biggest challenges for my cohort was interconnective service. Most seem unable to connect to the Web, but all have electronic mail and some way of uploading/downloading files. For some it has been an unanticipated financial burden of $200 to $300 a month for the home connectivity charges” (Greene, 1995). Even in Oregon, where most areas have Internet service, access can be a problem. Several people in our program simply do not have the resources to purchase a home computer. They are therefore restricted to using Internet connections at libraries, which is not always convenient.

The Internet has not only changed the tangibles of course content and delivery, it also has helped lead to some fundamental changes in the way students approach their educational experience. We are no longer site-bound in our interactions. Students from different institutions can now connect with each other through listservs such as LIS-L (listserv@vmd.csu.uiuc.edu), a global discussion list of issues relating to library and information science students. Peer reviewed e-journals, such as the Katharine Sharp Review, edtu.lis.uiuc.edu/ Review, publish articles by library students. In addition, many schools post their syllabi on their Web pages. This allows students to gain a perspective on what is being taught in other schools. At times, it is even possible to read class lectures. All of these contribute to making library students better consumers of information.

Clearly, the Internet has made a profound impact on library education. Being a student while these rapid developments take place will no doubt help prepare us as we enter into the changing profession of library and information science. The students who are in library school now can be instrumental in the shaping of this new technology. I and many others like me find that to be a very exciting prospect.

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impact on the lives of library users. I am just not sure I like what the cards foretell about its eventual impact on my professional life, and I don’t think the crystal ball is clear about the negative consequences for all librarians concerned.

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information access. Do we, for instance, want our OPAC terminals used by our customers to send and read their e-mail? The good news is that the problem won’t be with us for long. By next Web year, we’ll have a different challenge.

J.O Johnson is Academic Education Coordinator at the University of Oregon Library. An Internet user and network software developer since 1973, he led the early introduction of networking at the UO. He currently teaches Web authoring, is Webmaster for several Web servers at UO, and chairs the campus Web coordinating committee.