Library without Walls: Digital Library Developments at LANL's Research Library

During the last several years, the conceptual paradigm of special research libraries has changed from a focus on buildings, which house physical collections, to information services, which are bound neither by the walls of a library building, nor the traditional book and journal collections. In this new paradigm, library users connect remotely and use computer technology to access local and worldwide information providers—a concept known as the digital library.

A variety of factors have propelled digital library developments to the forefront of information science. These factors include rapidly advancing information technologies coupled with rising customer expectations; plans for a National Information Infrastructure, with its associated requirements for storing and accessing vast amounts of digital data over the information superhighway; and limited financial resources for the acquisition of ever-growing scientific publications, which continue to outpace inflation.

During the Laboratory reorganization, the Research Library was placed within the Computing, Information, and Communications (CIC) Division. The reorganization provided the Library with an opportunity to raise the visibility of several major strategic initiatives focusing on information management. One of the most significant is the Library without Walls project.

Vision for a Library without Walls

The Research Library's vision for library services seeks to combine the best information resources, staff, and technology to deliver world-class service to our research community. Our vision embodies the belief that we will become leaders in providing access to global electronic information resources by anticipating and meeting customer needs. One manifestation of those needs is the delivery of information to researchers' desktops—wherever and whenever needed—from digital library resources. This concept is the essence of the Library without Walls.

Several key goals and principles define the Library without Walls initiative:

• The digital library is not a single entity at Los Alamos, rather it requires the seamless integration of other digital library resources through technology linkages;

• We should provide worldwide access to the digital resources of the Research Library and the Laboratory's scientific research;

• The convergence of many distinct efforts encompassing a variety of fields will be required to support the Library Without Walls;

• We must incorporate new multimedia, interactive compound documents and digital artifacts that extend beyond the linear capabilities represented by print publications; and

• Systems and products must be measured by their ability to enhance new forms of collaboration among our users.

The long term goal is to create a network of knowledge systems and machines that facilitate synergy and collaboration between people.

Laying the Foundation

Before embarking on a digital library initiative, we needed to establish the infrastructure to improve our information technology foundation and provide appropriate tools to build our service capabilities. The following capabilities were integrated to provide that foundation:

• The automated library system and on-line catalog were upgraded to provide external public access. The on-line catalog is publicly available through either telnet (library.lanl.gov), Gopher, or the Web (http://lib-www.lanl.gov). Installation of a smaller system will allow similar support for classified technical reports at a later date.

• A robust Local Area Network (LAN) was deployed to support CD-ROM databases and provide access to Internet resources. Today the CD-ROM network supports 23 discreet databases and a full-image business database with 320 business publications. We are initiating support for Laboratory-wide connections to the CD-ROM databases which allow users to access the Library's CD-ROM systems. Access for UNIX machines is provided through an X-window client, providing the full capabilities allowed by the CD application in native PC mode.

Current Library Without Walls Projects

The heterogeneous computing environment at the Laboratory places a premium on the ability to deliver services across multiple platforms via TCP/IP. The exponential growth of the WorldWide Web has significant implications for library access and application development. Consequently, ubiquitous access to the Web is driving several efforts to provide library information through web clients to the desktop.

Constructing the Library without Walls involves several interrelated projects that are at varying stages of completion, each solving different facets of the digital library goals. Following are brief descriptions for two of these efforts.

Accessing Published Scientific Literature

Access to published literature in the form of indexes, abstracts, and alert services remains vital to track developing multi-disciplinary research. To address this need, the Library has invested in CD-ROM database products, which provide access to citations, full-text, or images. This approach, however, does have impediments. Mixing a variety of CD products from different providers creates severe limitations in searching across multiple years and imposes the need to learn different user interfaces. These limitations, in addition to the high cost of providing external access, impede access in a heterogeneous environment.

To work within our goal of delivering information services via Web clients, such as Mosaic or Netscape, the Library Without Walls embarked on a development effort to test the delivery of the Science Citation Index (SCI) database via Web clients, with Verity's Topic serving as the search engine underneath the Web clients. SCI was chosen for the pilot effort because of the comprehensive range of science it covers, the corresponding appeal to the interdisciplinary research interests of the Laboratory, and the proven value of citation trails.

A prototype of the SCI database with abstracts is now running and we are preparing to load 7 million SCI records, dating back through 1985. Of special research interest is the fact that this database grows rapidly (80 MB weekly) and the full set is large enough to require significant processing to support broad multi-year queries. To date, this is the only existing effort to provide access to the SCI database via the Web.

Providing an Image & Full-text Database of Technical Reports

Researchers desire access to end-products rather than information about the end-products. To meet this expectation we must solve the issues surrounding access to and retrieval of full images.

The Library without Walls project is tackling these issues by providing desktop digital access to unclassified Los Alamos technical report images. Our initial goal is to put the full-text and scanned page images of over 5,000 unclassified Los Alamos technical reports into a locally mounted network-based server with an easy to use retrieval protocol. LA reports will then be available in PDF format to Laboratory users and external machines connected to the Internet. Unclassified Los Alamos technical reports were logical documents to begin with because they are a part of our institutional memory and no copyright issues exist. These technical reports date back to 1943 and contain reports of research, conference proceedings, and environmental reports. Furthermore, this effort will support our goal of making the products of Los Alamos scientific research widely available to the public.

In order to improve search and retrieval of LA reports, the project is linking these digital reports to the library's on-line catalog. Currently, we are working on improving our prototype Web/HTML form interface which can be used to query the on-line catalog.

Conclusion

The Research Library has taken significant steps to not only deliver digital information to the Laboratory, but also to the worldwide scientific community and the public via the Internet. These initial steps can be viewed as setting the foundation for further developments in providing research materials to the desktop.

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