The Hewlett-Packard Laboratories Research Library and the Internet

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Internet, World Wide Web, information access

This article discusses the experience of the Hewlett-Packard Laboratories' Research Library with the Internet and the Mosaic browser for the World Wide Web. It describes the early development of the Library's home page, the Library services available to users at their desktops, the use of Mosaic as a reference tool for the Library's information analysts, and plans for future Library products and services using the Internet. The Hewlett-Packard Laboratories' Research Library is currently the only HP library on the Internet.

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The Hewlett-Packard Laboratories Research Library and the Internet

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1. Introduction

It all started on the Friday before Christmas 1993, when our manager of corporate libraries at Hewlett-Packard, Eugenie Prime, saw a demo of the Mosaic browser for the Internet World Wide Web. After the first 15 minutes, she knew she had found a tremendous new tool for the HP Labs Research Library, and she knew that the Library's users would love it.

Hewlett-Packard has had a relatively long tradition with the Internet. Every researcher at HP Labs has access to the Internet. However, use of the Internet as a research tool has been limited because of the difficulty of accessing information and of finding the right information in a straightforward way.

2. The HP Labs Research Library

The HP Labs Research Library serves the HP research community, including researchers in all of HP's product areas: computers, semiconductors, software, medical and other instruments, networking, printers, and many others. The information we provide includes technical data, marketing information, patents, and a host of other topics.

At the Library, our information analysts were all exposed to basic Internet training and were encouraged to explore the Internet as an alternate searching tool. They found searching to be very cumbersome and the results quite unproductive. Other than the occasional sortie on-line by a few enterprising souls, they ignored the Internet as an information source. It was much more frequently used as a communications device or a delivery mechanism. Analysts joined bulletin boards, mailing lists, and topical news groups. The Library received a number of daily and weekly newsletters, reports, and other publications via the Net. We then redistributed these to our local customers at the Labs and remotely to other HP libraries and employees throughout the company.

That encounter with Mosaic, however, was the beginning of an adventure for the Library. Each new source, each new tool, each restructuring of the home page

continues to be exciting. Our Mosaic experiment has been extremely well received by our customers. At the end of the first four months, we were receiving some 10,000 inquiries a month on our home page. Kathe Gust, one of our information analysts in the Library, was the key player, not only in choosing Internet information sources but in the design and structure of the home page using hypertext markup language (html). After the first year, we hired a software engineer, Tony Carrozza, to provide the technical programming support and wizardry. These people--plus the strong support of HP Labs management--were essential in creating access to the Web that met our two goals: increasing the information available at the Labs, and increasing the ease of searching it.

3. The HP Labs Research Library: How We Did It

3.1 The Research Library Home Page

Our first job was to develop our Library home page, listing the information products and services available through the Library (see Figure 1). The home page was designed for growth, to let us add to our list of offerings without changing the page's basic appearance. Subsequent pages give the user more information about the topic he or she selected on the home page. Our home page went on-line in January 1994 with three offerings; by August it had a full complement of fifteen, and it is still growing.

Information selected for the home page must be available in electronic format. We made a conscious decision not to type in anything that was not already being typed for production by our staff. This means that some potentially popular items are not offered on the Web because we cannot get them in any format other than hard copy.

HP Labs as a whole has two home pages: an external home page, for users outside the Labs, and an internal home page, available only to users within the Labs. The Library home page is accessible only to internal users with a link on the internal home page. We chose a graphic to put on the Labs internal home page to represent the Library; it is about the size of a postage stamp, and it helps the reader quickly reach the Library link. Within our suite of pages, we also used graphics to help users identify the source of information. If the information is supplied by the Library, the home page picture appears on the page; if it comes from another source, we attempt to recreate the supplier's logo or graphic.

3.2 First Conversion Efforts

We decided to start with the Library User Guide as our first on-line document. This guide was already available to employees using FrameMaker as the hypertext viewer. Although we had some previous experience with hypertext, we soon realized that the conversion process would take some time as Kathe learned to use

the new language. Some assistance was available from our Computing Services group, but we had to learn much by ourselves, and we did not complete conversion of the User Guide until the spring of 1994.

To get information up on our home page quickly, we knew we would have to look for some smaller documents that would be easier to convert. The Library receives a number of newsletters in electronic format and produces others in house; these are redistributed to our clients via electronic mail. We selected our new acquisitions newsletter, LibraryLine, to become the first item on our home page; it went on-line in January 1994. Since conversion was considerably less painful for shorter documents, we soon added other newsletters.

It was important to us that our home page should look professional, and we wanted our document offerings to look exceptional too. An early temptation was to do "too much" to enhance the newsletters. At first, we put contents lists and hypertext links in all the newsletters, but as the amount of information increased we began to publish the newsletters in a simpler format.

After our suite of pages had been up for a couple of months, the Library Board of Customers met. We gave the group a talk with slides about the new pages. Several of them had already looked at what we were doing and liked it. They requested that all the electronic newsletters should be posted to the server, to put "everything in one place." We were offering two daily newsletters, two biweekly newsletters, and five weekly titles. Posting all the newsletters in a hypertext format required a great deal of time, so we decided to post the daily and biweekly newsletters in simple ASCII format. The weekly newsletters are longer and are produced with a hypertext table of contents at the beginning. All the newsletters are left on the server for 4-6 issues, depending on title and frequency of the newsletter.

Some of the requested titles have licensing restrictions that do not allow us to share them companywide. With support from the Computer Services group, we installed a "secure" directory on the server. This allows us to post the restricted newsletters in an area that can only be accessed by one of the machines on the network at the Labs.

3.3 Leveraging Our Investment

The highly successful deployment of the newsletters made us want to find additional items of interest for our clients. We also wanted to leverage our investment to serve more of HP. HP Labs Computing Services had already created an automated listing of the HP Labs Technical Reports for the server. (A keyword-searchable subset of this list is available on the HP Labs external home page; the Universal Resource Locator, or URL, is http://www.hpl.hp.com/). It occurred to us that the Library received report notices and abstracts from several membership organizations such as Sematech (see Figure 2), and we decided to add several to

our list. Sematech Abstracts were added in March 1994, Recent HP Labs Technical Reports in April, and the Library User Guide in May (see Figure 3).

Wide Area Information Services (WAIS) searching capability was also installed for us by Computing Services, but this was the last time we were able to get assistance from them for something new. Many of the other service organizations at the Labs were starting their own home pages, and free programming assistance was no longer readily available. We decided our new library systems person would need to be familiar with Web issues. Bringing Tony on board provided technical support services, which we knew would be increasingly important if we wanted to continue development of our services.

Since images on the Web are quite clear on most users' large screens, we decided to have a little fun and enhance the electronic version of the User Guide by including photographs of the staff. Portraits were taken with a digital camera, and each person was encouraged to submit a short biographical sketch to accompany the portrait. One of our interesting statistics each month is discovering who has the most popular photo.

3.4 Mosaic as a Reference Tool

At about this same time, the Library staff discovered the value of the Mosaic browser as a reference tool. In the course of answering reference questions, we found information sources of many different kinds. We also discovered that many universities and some companies make their technical reports available on the Internet. So much material of value to our staff and clients began to turn up that we started a special page called the Information Jetport. It was modeled on the Teleporter, a collection of Internet pointers selected by Computing Services that are found on the HP Labs' internal home page.

The Information Jetport contains pointers to Internet resources that we think may be especially valuable to our staff, clients, and colleagues at other HP libraries. We developed a set of informal rules similar to the collection development policy for our Library to govern the content of the Jetport page. Items on the page must be currently functioning, readily available, and free of charge. We deliberately restricted the Jetport pointers to include only the kind of item that would have relevance in answering the types of reference questions we receive at our site. An example of such an item is EDGAR, the U.S. Securities and Exchange Commission (SEC) database. Our staff and clients are also encouraged to suggest specific URLs and types of information they would like to see on the page. The suggestions are evaluated and tested before a decision is made to add the items to the collection.

3.5 Improvements

Both the Information Jetport page and our home page have gone through a transformation since their first versions. In both cases, the listing of individual items grew too long for easy access. We made subsidiary pages, divided by subject, to handle the problem. Since we had designed the file structure to allow each section to stand alone, we were able to insert extra pages without changing the pointers. The subject breakdown on the Jetport page now includes Web Searching Tools, Business Information, Government Sources, Legal Sources, Bookstores and Publishers, Basic Reference Tools, Technical Reports, and other topics.

We have seen a steady rise in usage of the items we offer to our users. We also find significant and growing usage from the rest of the company as word of mouth spreads beyond the Palo Alto sites. We are at present the only HP library on the Internet. We have not done any active advertising outside of our immediate area, except to inform the other HP libraries at our annual meeting. Several smaller HP libraries in the San Francisco Bay Area are suggesting the use of our pages to their clients. In February 1995, we registered ourselves on the list of internal home pages for the company. We anticipate that our usage will continue increasing as a result of this action.

3.6 Tracking Usage Statistics

The server at HP Labs uses the Getstats statistical package from Enterprise Integration Technologies to track usage of the documents on a monthly basis. The Library tracks usage from both HP Labs and the rest of the company worldwide. The method used to collect the statistics makes it necessary to design documents creatively to ensure that statistics are taken on the items the Library wishes to track. Statistics are collected by server only, not machine connections, so the result is a lower limit of usage, not an exact count. Since none of our offerings has been available for a full year yet, we have not used the statistics to help us decide whether to remove certain items from our publishing list, but we may in the future.

4. The HP Labs Research Library: Where We're Headed

Our long-term goal at the Library is to deliver our services directly to our users. The HP network (which is a part of the global Internet) includes HP-UX workstations, and MS Dos, Windows, and Macintosh personal computers. In the past, the software applications that let users access Library services had to be developed separately for each kind of computer. Then the appropriate application had to be installed and maintained on each user's machine. Since HP has about 90,000 employees worldwide, the efforts--and costs--of this approach were obviously enormous.

Because it can be used by all types of computers, the World Wide Web provides a much more efficient way to deliver information services. The Web lets our applications and information reside on a single server machine at the Library. Patrons can use any Web browser they choose, on whatever kind of machine they have, to access the information on the server.

We intend to take full advantage of these Internet capabilities by improving library services in the following ways:

- Enabling direct communication with appropriate Library staff
- Providing improved search and retrieval tools
- Providing "intelligent" information services
- Automating Library and administrative services

4.1. Enabling Direct Communication

Users can submit inquiries to the Library directly via Web forms that we have developed (see Figure 4). Questions and service requests are automatically routed via electronic mail to the appropriate Library staff person for response or action.

We have on-line forms available or under development for such services as literature searches, patent searches, book purchases, journal subscriptions, user surveys, and general questions. Information submitted via the forms can be automatically stored in a database for analysis; this is useful for analyzing survey results, for example.

4.2 Improving Search and Retrieval Tools

The Library has come a long way from the familiar card catalog. It is providing ever-increasing access to its collections and electronic information services over the Internet. The Library's collections are cataloged on Sage, our local implementation of Unicorn (from Sirsi). In addition, we have developed a tool that lets users search technical journals and worldwide patent information, then view the full-text image of the document.

We are also developing a new version of the home page that uses graphical "buttons" to help users quickly identify the information they want (see Figure 1). New features will also be added, such as answers to frequently asked questions and direct library feedback forms.

The Library staff has also worked to identify good sources of information for the kinds of inquiries we get. The Library's Information Jetport is a launch pad to credible, Library-validated information sources on the Web. Supplementing the

Jetport are tools based on WAIS that we are developing to help users quickly find information in the Library's Web pages.

We are working on an Experts Resource Directory that will provide a database of information on resident experts. HP employees will be able to easily find in-house help in areas such as object-oriented design, software reuse, ISDN, and VLSI circuit design. In the future, we hope to offer patrons the ability to search for desired information simultaneously across several databases of different types from a single user screen (see Figure 5).

4.3 Providing Intelligent Information Services

The amount of information available via the Internet can be overwhelming, and we want to help our users avoid information overload. We are now working on tools that let subscribers to any of our electronic information services create their own "information profiles" to filter the information for them. Information fitting their profiles can then be delivered to them in the form they request (e-mail, fax, hard copy, etc.). In essence, users will be able to create a customized journal of information that is matched to their needs and interests.

4.4 Automating Services

The Internet has also allowed us to build applications that automate various processes. When patrons use certain Library services from their work areas (e.g., subscribing to electronic information services), these applications can extract information from the company personnel database and send it to the Library's billing system. Automated routines then feed monthly billing information to the finance department for charging costs of these services back to the subscriber (see Figure 6). These processes remove a great deal of paperwork from our staff and let us concentrate on our real job: getting patrons the information they need.

5. Conclusion

The use of the Internet via Mosaic has been overwhelmingly positive for the Library. It has allowed us to expand both the amount of information we can offer patrons and the ways in which they can access that information. Our learning curve has not been too steep, and we have discovered new information sources and new ways of streamlining our users' access to information that could not have been achieved in any other way. We expect the future to provide more of this two-pronged growth: new sources of information, and new ways of searching and filtering that information so that patrons can get exactly what they want. Since that's our mission, we are truly excited and gratified at how use of the Internet has enriched our role.

6. Captions for the HPLabs Research Library's Figures

Figure 1: The old home page (left) and the new (right) graphical user interface with hot buttons.

Figure 2: One of the lists of Technical Reports available from the Library's WWW pages.

Figure 3: The Library's on-line User's Guide

Figure 4: On-line forms that patrons may complete and submit from their desktops.

Figure 5: A single user interface shields users from the complexity of searching across multiple databases/systems.

Figure 6: The net provides the means to automate processes that require communication between various departments and systems.

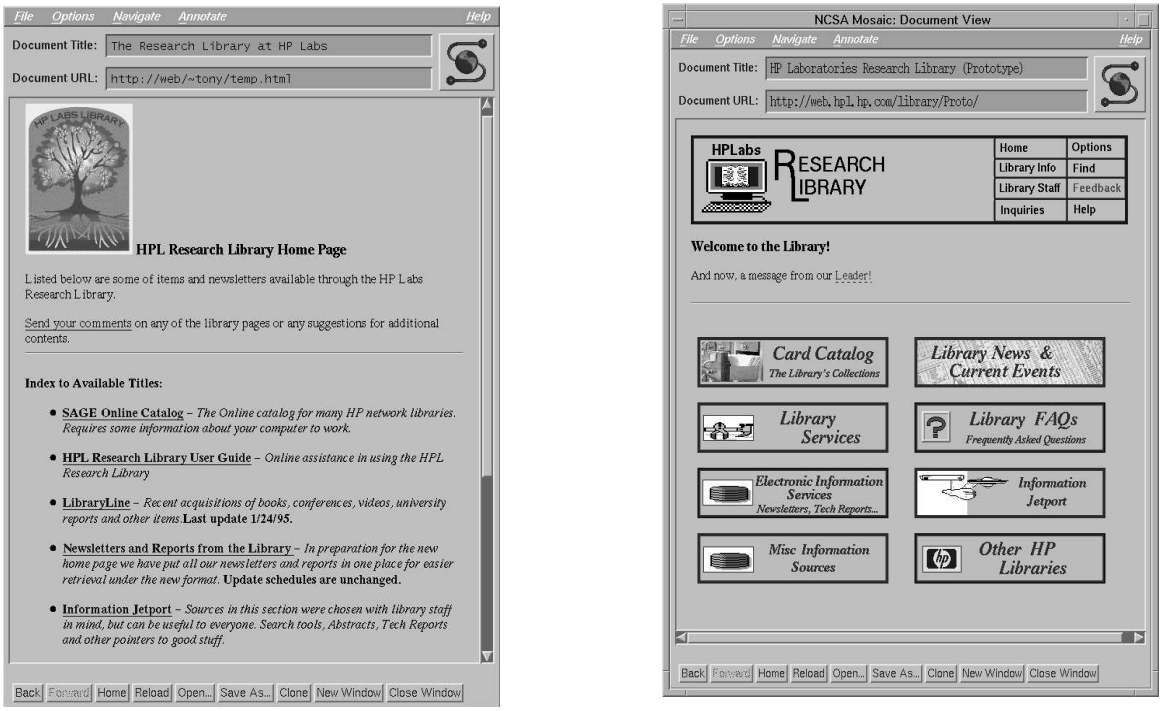
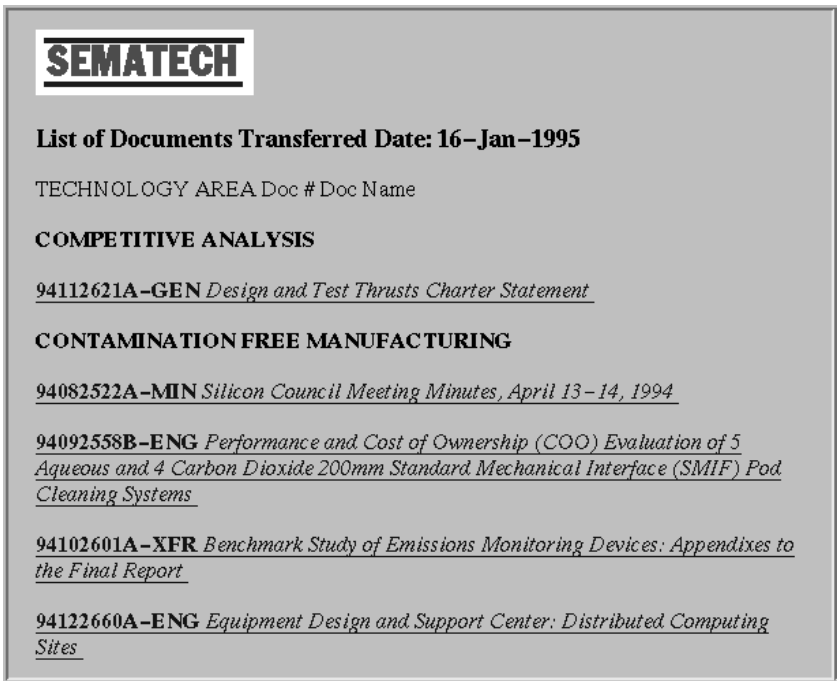


Figure 1: The old home page (left) and the new (right) graphical user interface with hot buttons.



SEMATECH

List of Documents Transferred Date: 16–Jan–1995

TECHNOLOGY AREA Doc # Doc Name

COMPETITIVE ANALYSIS

94112621A–GEN *Design and Test Thrusts Charter Statement*

CONTAMINATION FREE MANUFACTURING

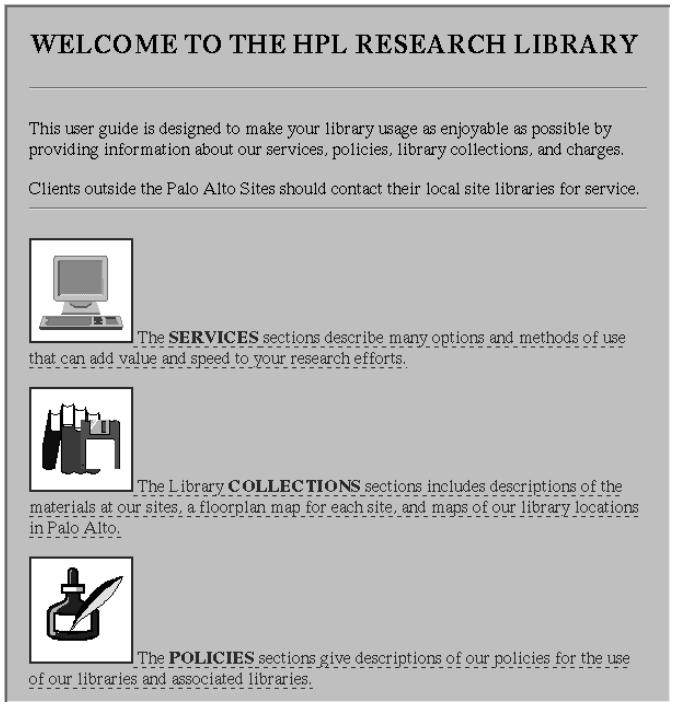
94082522A–MIN *Silicon Council Meeting Minutes, April 13–14, 1994*

94092558B–ENG *Performance and Cost of Ownership (COO) Evaluation of 5 Aqueous and 4 Carbon Dioxide 200mm Standard Mechanical Interface (SMIF) Pod Cleaning Systems*

94102601A–XFR *Benchmark Study of Emissions Monitoring Devices: Appendixes to the Final Report*

94122660A–ENG *Equipment Design and Support Center: Distributed Computing Sites*

Figure 2: One of the lists of Technical Reports available from the Library's WWW pages.



WELCOME TO THE HPL RESEARCH LIBRARY

This user guide is designed to make your library usage as enjoyable as possible by providing information about our services, policies, library collections, and charges.

Clients outside the Palo Alto Sites should contact their local site libraries for service.

The **SERVICES** sections describe many options and methods of use that can add value and speed to your research efforts.

The Library **COLLECTIONS** sections includes descriptions of the materials at our sites, a floorplan map for each site, and maps of our library locations in Palo Alto.

The **POLICIES** sections give descriptions of our policies for the use of our libraries and associated libraries.

Figure 3: The Library's on-line User's Guide

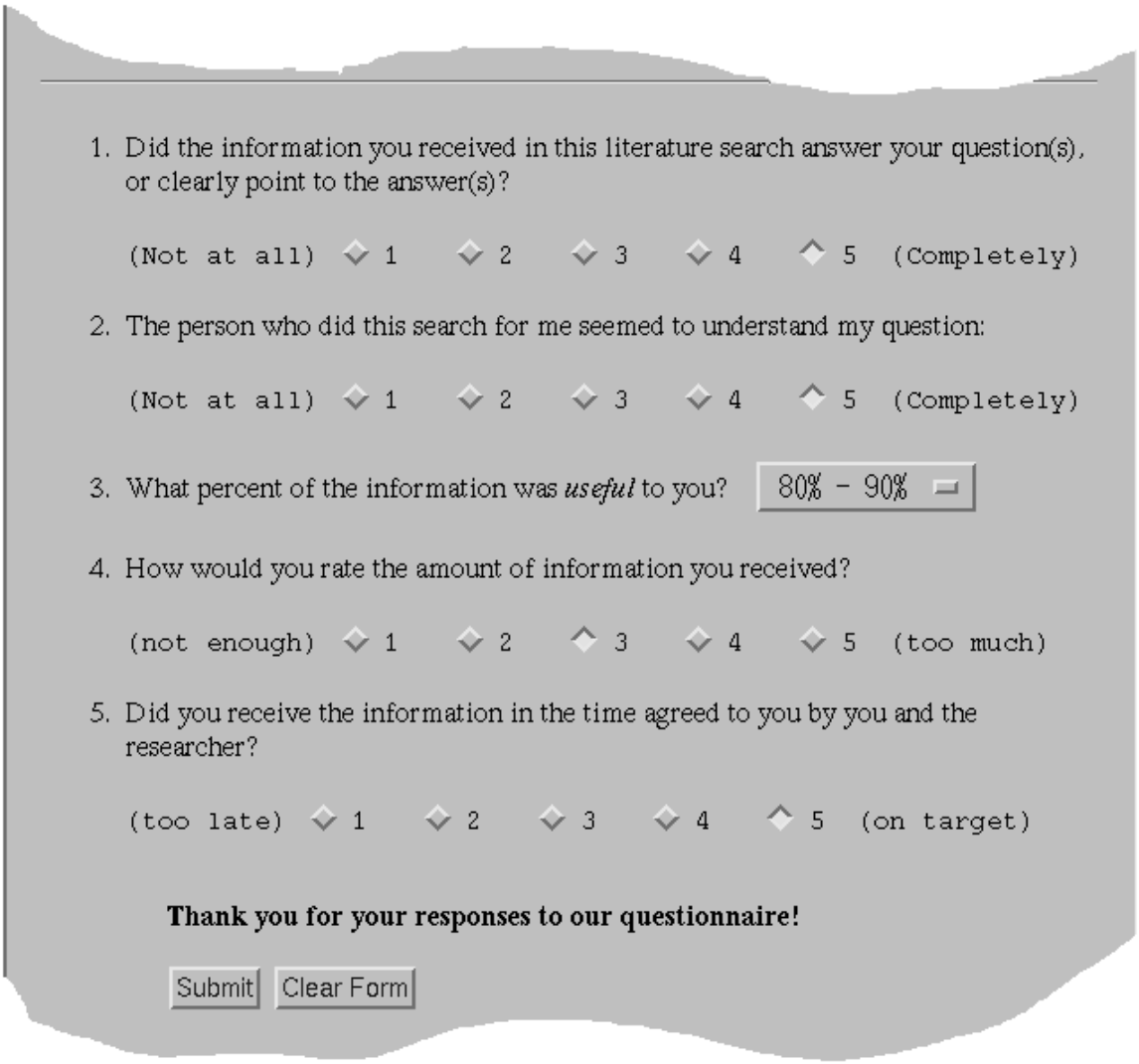


Figure 4: On-line forms that patrons may complete and submit from their desktops.

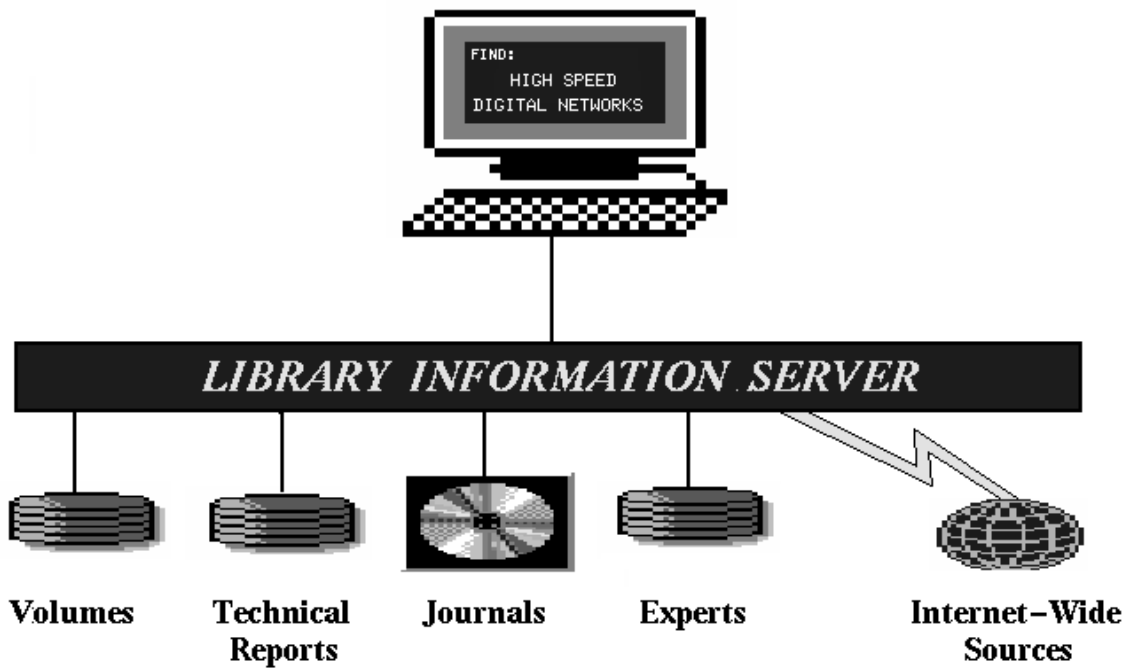


Figure 5: A single user interface shields users from the complexity of searching across multiple databases/systems.

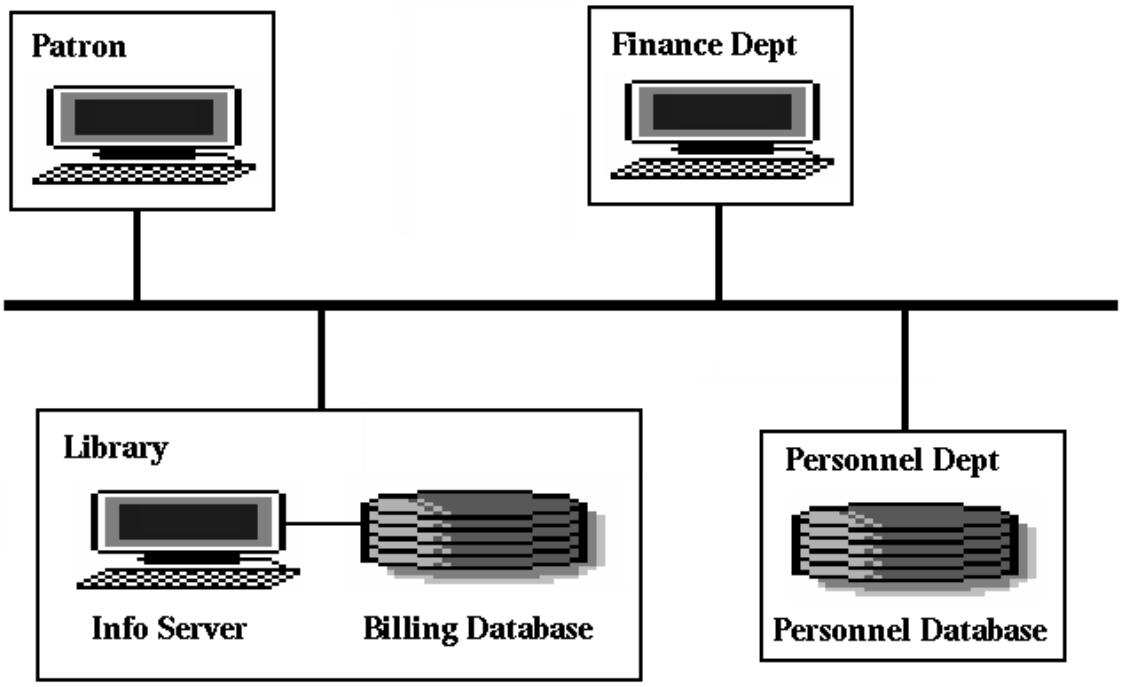


Figure 6: The net provides the means to automate processes that require communication between various departments and systems.