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"Library Services through the World Wide Web."

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1.0 Introduction

Emerging technologies, notably the Internet and World Wide Web (WWW), have profoundly changed the way we work, live, collaborate and communicate. [1]

With the rapid growth of the Internet and the Web, we have seen a move toward a new communication paradigm: a shift from face-to-face human contact to human-machine interaction; from paper-based information transfer to electronic delivery; from text-centered mode to multimedia; and from physical presence to telepresence or virtual presence. Another significant impact caused by the Internet is the creation of a virtual global community. This community bears some resemblance to the existing, physical world but is more dynamic in nature.

To meet these challenges, provide better and faster library services, and maintain a leadership role in information technology, libraries must change. They need to master a new medium of communication, develop new relationships with patrons, and adapt their resources and service structure to this newly defined technological environment. To accomplish this, libraries must take the initiative in applying various Web technologies to their public service roles and internal operations, making the Internet an integral part of the library's infrastructure.

This paper describes how Texas A&M University's Sterling C. Evans Libraries utilize the World Wide Web to more effectively serve the students and faculty of Texas A&M University. We do not suggest that our home pages should serve as a model. Rather, we see the Web as an increasingly important place to communicate with our constituency. The paper describes five concepts that have been incorporated into the Libraries' World Wide Web site: the Web page as public relations tool, instruction tool, search platform, communication tool, and museum/virtual library. The paper also introduces future directions for exploration and discusses issues that must be confronted when developing a presence on the World Wide Web.

2.0 WWW as a Public Relations Tool

The Internet and Web have an increasingly pervasive presence on the Texas A&M campus. There are 115,000 campus computer accounts allowing Internet access. Additionally, a number of former students have Internet access and use it to "check on" University events and changes taking place. As more and more users expect to find the information they need via the World Wide Web, the library has a responsibility to utilize the Web in informative and instructive roles.

In its role as a public relations tool, the Web provides an avenue for one-way communications out of the library. At Texas A&M, four full-time library employees are devoted to public relations and development. Additionally, several senior managers contribute many hours supporting this area. With its easily updated and rapidly delivered format, the Internet provides a way to reach a large segment of the campus community in a timely manner.

This is seen when dealing with important announcements that impact patron expectations of library access and service. The Libraries maintain a Web page dedicated to important announcements and utilize an email list of

deans, department heads, and university administrative personnel. [2] As the campus has a distributed style of computing operations, the email list had to be developed internally as a private list in email software. We do not rely totally on the Web for making announcements, but see it as an important ally in spreading the word to library users. Other options have included radio public service announcements, advertisements in the campus newspapers, and call trees.

As an example of a less urgent situation, the Web allows the Libraries to draw attention to something that is changing on a daily basis, the construction of a new library facility. Between 1995 and the year 2000, Texas A&M will have experienced almost \$90 million worth of library construction projects. This is definitely good news, but there is an accompanying hidden price in the form of utility outages, detours, and scrutiny of the progress.

To respond to the latter issue, we borrowed an idea implemented by the College of Engineering several years ago. There, the object of interest was the construction of a giant wooden pyre that is ignited prior to the University of Texas football game, affectionately known as the Aggie Bonfire. This Web site was heavily accessed by current and former students and sparked an idea that we could do the same for our current construction. Initially, a daily photograph of the construction site has been placed on the Web site. In the future, we may install a video camera for real-time viewing. [3]

As is true for many other libraries, our Web pages are used to pass along more traditional information. This includes library building hours, mission and objective statements, and details on available services. What may be more unusual is that we also provide information about important public relations events. The pages are used to profile the Libraries' involvement with significant organizations like the Friends of the Library and the Federation of Texas A&M University Mother's Clubs, a very powerful and generous organization on the Texas A&M campus. The Web pages allow us to reach the student body and inform them about the Libraries' use of the Library Use Fee. This type of proactive public relations has encouraged the student government to support the Libraries and work with us in an advisory capacity. [4]

3.0 WWW as an Instruction Tool

As expected, the Web lends itself admirably to support of an instructional program in the library. Depending on the individual instruction program and institutional details, the Web can be incorporated in several ways. This section highlights some of the specific ways that Web pages are being used to support library instruction at Texas A&M.

For many libraries, the initial inclination is to design Web pages that mirror printed guides, duplicating resources and textual contents on the computer screen. However, with its interactive characteristics, the Web environment is very different from print. Using HTML (HyperText Markup Language), documents can have live links to other relevant information. The primary drawback with Web-based information guides is that what looks good on the screen may not print well. To facilitate printing, it may be necessary to put a text version of the guide in Adobe Acrobat (.pdf) or WordPerfect Envoy (.evy) formats. At Texas A&M, an Instructional Services Librarian is currently investigating using the Acrobat format for this purpose. [5]

Library administrations should realize that developing Web resources is costly in terms of software and computer requirements, as well as staff time. Even if HTML-literate students are involved in the conversion process, it is still the responsibility of the librarian to establish the format and style of the Web pages. One option is a virtual tour, which can be designed for patrons unfamiliar with the library. [6] As mentioned in the section on public relations, the Web can be used to anticipate and answer questions. In instruction, these can take the form of Frequently Asked Questions or FAQ documents and may address issues relating to electronic resources or the online catalog. [7]

4.0 WWW as a Search Platform

The Web serves as an invaluable tool for the Evans Libraries in organizing access to remotely accessible databases. The databases offered through the Libraries' home page fall into these broad categories:

- Web-based databases loaded on either local servers or consortia servers (for example, 12 databases accessible through the OVID Technologies WWW Gateway product);
- Web-based databases loaded on the servers of commercial vendors (for example, Cambridge Scientific Abstracts and Information Access Company's Insite);
- Telnet- or TN3270-accessible databases which can be used in a WWW browser through the use of a helper application. This helper application is launched automatically when the user clicks on the link for a Telnet- or TN3270-based database (for example, the ABELL [Annual Bibliography of English Language Literature] Online database and the NOTIS online catalog).
- Databases which require users to download and install a software client onto their local computer. For example, the Evans Libraries provide access to 11 database titles using Ameritech's InfoShare server software. To access these databases, users must download a WinSPIRS or MacSPIRS (Silverplatter search-and-retrieval) software package and install it on their local computer. After the client software has been installed, users can access InfoShare databases by establishing an Internet connection and launching the SPIRS software. In this case, the Web primarily serves as a tool for publicizing the availability of these databases, as opposed to providing active links for database access.

While access to library databases is still less than seamless, the creation of a databases Web page allows all of these resources to be drawn together at a central point for remote users. [8] Texas A&M users working at campus desktops or from their homes can, by dialing in to the Computing and Information Services (CIS) modem system, currently access over 40 database titles, eight of which contain significant full-text content.

One important planned enhancement to the Evans Libraries' Web page is the inclusion of a Web-based online catalog, WebPAC. In contrast to the TN3270-based NOTIS system mentioned above, WebPAC will permit users to perform searches and to display, print, and save searches.

Additionally, the Libraries are currently applying the Web model to the organization of information resources on public service area workstations. An HTML menu system is being created for these machines. In addition to the resources listed above, library users will be able to access approximately 80 CD-ROM database titles through this Web-based menu. A software program, W3Launch, permits both DOS and Windows CD-ROM software programs to be launched and used from within a Web browser. This menu system offers two advantages: it permits the Libraries to reduce the number of licenses for a vendor-produced menu software package, and it provides users with an intuitive menu structure built upon a familiar model.

In short, the Web, despite being a relatively new phenomenon, has dramatically altered the ways in which the Evans Libraries serve their users. The ability to deliver a large number of commercial databases to our users in their homes or offices gives realism to the concept of a "library without walls."

5.0 WWW as a Communication Tool

The Web can be used to establish interactive services between library users and the library staff and to provide for customer feedback on library services. One example of a Web-based interactive service offered by the Evans Libraries is an interlibrary loan form.

Because of the sheer size of the university, with nearly 45,000 students and faculty members, the task of offering Web-based interlibrary loans had to be carefully considered. With an anticipated increase in interlibrary loan transactions (based on the ease with which Web-based requests can be submitted), a way had to be found to reduce the amount of time that interlibrary loan staff members spent processing each transaction.

The Libraries decided to use a solution supported by OCLC's ILL PRISM Transfer, which allows libraries to upload interlibrary loan requests to their OCLC PRISM Review Files via the Internet. In order to use ILL

PRISM Transfer, libraries must develop scripts to support the generation of dynamic HTML documents for request forms and acknowledgment messages, for converting the information input to an acceptable format, and for transporting the request data to OCLC.

In Texas A&M's case, staff took a publicly-available solution created at the Olivet Nazarene University (ONU) Library and significantly modified and enhanced it for local use. For example, the scripts provided by Olivet Nazarene treated each book or article request as an independent request. As a result, a user requesting four items would have to enter his or her personal information (name, address, telephone number, email address) four times. Texas A&M enhanced the scripts to create a "stateless" environment, in which personal information would be carried forward across multiple interlibrary loan requests.

The finished product reduces the amount of time which staff members spend with each request, in comparison to the previous method of paper-based interlibrary loan requests. [9] In effect, the job of keying in the request information to the OCLC PRISM system has been transferred from the library staff to patrons submitting Web-based requests. Interlibrary Loan staff members simply enter the OCLC PRISM system, review the information entered by the patron, make any necessary modifications, and submit the request.

This example also illustrates the importance of cooperation when approaching the establishment of Internet services. In this case, the Olivet Nazarene Library provided the Evans Libraries with scripts created by its library staff. As noted, these scripts were significantly enhanced by Evans Libraries' staff. The Evans Libraries benefitted through this cooperation because, by using the ONU Library's efforts as a base, the burden of creating a Web-based interlibrary loan request form was greatly reduced. Conversely, the enhancements created at Texas A&M were shared with ONU, providing a model for maintaining data across interlibrary loan transactions on the WWW.

In addition to interlibrary loan forms, users can submit book purchase requests and reference questions to the Libraries via interactive forms accessible from the Libraries' Web page. [10]

6.0 WWW as a Museum/Virtual Library

Its multimedia-capable features make the Web an ideal environment for displaying manuscripts, photos, and data in other special formats. A successful site using the Web as a virtual museum was created by the Cushing Memorial Library, which serves as the rare book, manuscript, research collection, and archive repository of Texas A&M University.

The Cushing Memorial Library's Web page contains an exhibit section that features "The Joy of Wood Engravings," the works of Kent Kessinger, and a collection of autographs, from the famous to the infamous and the noteworthy to the nearly noteworthy. [11]

To see an autograph, one can select the person's name from a list and then click on the thumbnail version of the desired document. The Web browser will automatically display a scanned image of the actual document with the person's signature on it. Without the Web, these art works and autographs would remain inaccessible to many users.

Like Cushing Memorial Library, other departments of the Sterling C. Evans Libraries create Web-based virtual libraries of links, bookmarks, bibliographies, and other materials dedicated to specific fields of research and study.

The Web pages created by the Document/Maps/Microtext Department serve as a central point for collecting and disseminating government information. The Evans Libraries have served both as a selective depository library for federal documents, and a Patent and Trademark Depository Library. As such, the Document/Maps/Microtext Department selects, receives, and retains approximately 80 percent of the publications distributed by the Government Printing Office. The department also contains comprehensive patent information, including databases on patents and trademark searching. Library users visiting the Web pages will find helpful guidance on

the access, circulation, and physical arrangement of these publications and databases. [12] The Web pages also provide links to preselected sites, facilitating the use of information relating to federal, state, local, and foreign government documents and intellectual property materials, such as patents and trademarks.

The Web pages created by the public service units of the Libraries are moving toward the inclusion of subject-oriented Web collections. The West Campus Library maintains a critical list of agriculture information sources. [13]

The site provides links only to selected resources that have significant information content. The librarians also find the Reference Department home page useful as a central place for sharing Internet knowledge and searching skills. [14]

The Reference Department has compiled a bookmark page which provides links only to those sites and tools frequently used by librarians and experienced Internet searchers. This bookmark page is convenient when assisting users at the Reference Desk.

7.0 Future Applications

To fully utilize the potentials of Web technologies, we must keep exploring new areas for improving library services. These opportunities may require sophisticated computer equipment or specially trained staff. Often ideas can be implemented in stages or at varying levels, depending on the needs of the user community.

One of the key Web-application projects at the Evans Libraries is the proposed Electronic Reserve Program. This program will utilize sophisticated and up-to-date technologies. Required hardware will include a Windows NT server, a high-speed scanning workstation, and a Web server. Software will have to be used for file conversion, linking, and indexing of the documents. Additionally, a Web interface will be needed for the online catalog. When the system is installed and running, it will provide a Web front-end interface that allows faculty members and students at Texas A&M University to electronically search and download the desired materials from a remote site. This will significantly increase material availability and should decrease the number of transactions currently being handled by the Reserve Desk.

Instructional resources are another area that could be enhanced by various Web technologies. There are several ways to expand instructional services in a Web environment, including interactive tutorials and demonstration searches. As with many Internet resources, these can be designed using tools with varying degrees of sophistication. With minimal skills, librarians could use HTML files and email operations to create a two-way communication of exercises. A more complex tutorial might include PERL (Practical Extraction and Report Language), CGI (Common Gateway Interface), or Java scripts. Alternately, multimedia authoring software, such as Authorware, might be used to develop a tutorial exercise. The exercises would then be accessed within the Web browser using appropriate helper applications. Similarly, educational demonstrations of bibliographic database searches could range from a sequence of still screen captures in a Powerpoint presentation, to a Lotus Screencam emulation, to a full-motion video clip with accompanying sound.

8.0 Additional Considerations

There are several oversight groups which are involved to some degree with the Evans Libraries' Web pages. A Campus Web Page Design Committee recently implemented a redesign of the Texas A&M University Web page. The newly-designed Texas A&M home page enhances the ability of users to access Evans Libraries' pages by making them accessible from a link placed in a prominent position on the top level of the Texas A&M home page. Additionally, for the first time, users can perform complex queries on library documents from the Texas A&M home page. For example, users entering the search term "autographs" from the Texas A&M home page search engine will retrieve images of selected autographs which are available through the Cushing Memorial Library's home page. Entering the search term "medline" retrieves help sheets for the database, along with hyperlinks to the database itself for the Texas A&M user community.

While the upper-level Evans Libraries' pages are maintained by the Digital Librarian on a day-to-day basis, an internal library Web Advisory Group performs an important oversight role in the organization of the Libraries' Web page. As one example, group members created the subject breakdowns for the available Web-based databases. In a number of cases, this involved consultation with subject specialists outside the Web Advisory Group. Group members also evaluate instructions which are placed online to assist users in accessing databases through the Libraries' Web page and generally oversee the overall direction of the Web page effort.

In summary, the Evans Libraries' Web site is the product of collaboration by a number of individuals, each bringing their talents and expertise to the effort. In order to enhance its presence on the Web, the Evans Libraries must meet several challenges: (1) hire and train staff members capable of working with Web technologies; (2) invest in the necessary technical infrastructure; and, (3) most important, approach the task of Web building in a truly collaborative fashion.

Notes

1. This article is based on material presented by Dr. Fred Heath at the Eleventh Texas Conference on Library Automation on April 25, 1997. The authors wish to acknowledge the assistance of Brian Carpenter, Elaine Gass, and Jeannie Miller in identifying relevant Web addresses referenced in the presentation and article.
2. See <URL:<http://www.tamu.edu/library/announce.html>>.
3. See <URL:<http://www.tamu.edu/library/announce.html>>. Click on the link for "Construction Update."
4. See <URL:<http://www.tamu.edu/library/develop/homepage.htm>>.
5. See <URL:<http://www.tamu.edu/library/reference/handouts/helppage.html>>.
6. See <URL:<http://www.tamu.edu/library/reference/virtual/tour00.html>>.
7. See <URL:<http://www.tamu.edu/library/reference/nts-index.html>>. The documents are accessible from the relevant departmental Web pages.
8. See <URL:<http://www.tamu.edu/library/campweb/dblist.html>>.
9. See <URL:<http://staff-library.tamu.edu/ILL>>.
10. See <URL:<http://www.tamu.edu/library/evans.html>>.
11. See <URL:<http://www.tamu.edu/library/cushing/cushing.htm>>.
12. See <URL:<http://www.tamu.edu/library/govdocs/dmmhp.html>>.
13. See <URL:<http://www.tamu.edu/library/wcl/aghtml.html>>.
14. See <URL:<http://www.tamu.edu/library/reference/refhomep.html>>.

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