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Schlabach, Martin L., and Susan J. Barnes. "The Mann Library Gateway System." *The Public-Access Computer Systems Review* 5, no. 1 (1994): 5-19. To retrieve this file, send the following e-mail message to listserv@uhupvm1.uh.edu: GET SCHLABAC PRV5N1 F=MAIL. (The file is also available from the University of Houston Libraries' Gopher server: info.lib.uh.edu, port 70.)

1.0 Introduction

The Albert R. Mann Library at Cornell University has built an electronic library that brings computerized indexes to journal articles, numeric data files, and the full text of journal articles and reference works to users' workstations. This system, known as the Mann Library Gateway, is used on the Cornell campus at libraries, offices, labs, and microcomputer centers. It is also used off-campus by Cornellians who are working at home or traveling. The Gateway system has been very well received and has grown steadily in usage and size over the past two years.

2.0 Gateway Description

The Gateway is a computer system that manages multiple connections to a variety of carefully selected electronic information resources. These resources may either reside on library computers or be located on computers across the country. By browsing a list of titles and the accompanying brief description for each title, the user identifies relevant information resources. Upon selecting a resource from the menu, the Gateway software completes the connection to the resource. The location of the information resource as well as the connection and login processes are transparent to the user.

2.1 Gateway System

The Gateway system currently runs on a Hewlett-Packard Series 9000 computer, but it is designed to run on any UNIX-based computer system. The system is composed of several software modules: the administrative module, the "circulation" manager, and the user interface.

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2.1.1 Administrative Module

The administrative module allows staff to create, delete, and modify all user accounts associated with the Gateway. This module allows the Gateway administrators to enable or disable access to each resource for each user. For example, the library might wish to make a "demo" account available, but deny access to a particular resource. Limits can also be established on any resource. For example, licensing restrictions on a bibliographic database limiting simultaneous access to 100 users can be enforced.

Individual accounts are created and modified by a member of the library support staff using a workform interface to the administrative module. When a large number of accounts need to

be created for a class, the accounts are generated in a more automated manner by technical staff. "Anonymous" login has also been established, but such access is limited to sessions originating on the Cornell campus. This access control provides the ability to meet the varying contractual requirements of database producers and vendors.

2.1.2 Circulation Management Module

The "circulation" management module is the entity that actually enforces the limits set by the administrators. This module also monitors hardware resources, assuring that no component becomes overloaded and acceptable response times are maintained. For example, the management module monitors the number of simultaneous users connected to each resource, and it can deny access to additional users if a predetermined limit is reached; access is again allowed once the number of simultaneous users drops below the limit.

The system also manages multiple passwords that may be required for simultaneous access to a resource. For example, if a remote system requires a unique password for each session and we have 10 passwords permitting a maximum of 10 simultaneous sessions, the Gateway circulation manager assigns available passwords when a user initiates a session to that remote system. The Gateway "knows" if a password is available or in use, and it manages the access, thus preventing the individual user from knowing or using the confidential passwords.

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2.1.3 User Interface Module

The third module is the user interface component. Currently, one version of this module exists. It supports the ANSI 3.64 (VT100) terminal emulation used by nearly all microcomputer telecommunications software. This character-based interface was deliberately chosen as the one interface available to all Mann Library patrons when the Gateway was created.

The database screen presents the user with the available resources (see Figure 1). The left half of the database screen consists of a scrolling title list displaying nine titles at once. The right half displays a brief description of the one database highlighted in the title list. The brief description changes as different titles are highlighted, and it gives the years of coverage and the frequency of update if the database is serial in nature. At the bottom of the screen are brief commands.

Figure 1. Database Selection Screen

Mann Library Gateway

Databases _____	Description_____
User Guides and Help	: BIOSIS is a database of
ABI/Inform	: citations and abstracts to
AGRICOLA	: the literature on biology,
->BIOSIS	: biomedicine, and other
CARL UnCover	life sciences.

Technical Services, and Collection Development divisions, plus a representative from the Information Technology Section (ITS).

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The Mann Library maintains five databases locally under the BRS/SEARCH software. The databases are, in order of their addition to the Gateway, Agricola (1982-present), BIOSIS Previews (1986-present), ERIC (1966-present), ABI Inform (1985-present), and Periodical Abstracts (1986-present). These databases are distributed over two DEC Station 5000 servers, requiring over 18 gigabytes of magnetic storage for the databases and their indexes. The Crop Estimates and the National Resources Inventory databases are also maintained locally.

In addition, selected tables from the Census of Population and Housing are available via a Gopher on a Mann Library server. User guides are also loaded under Gopher and made available through the Gateway in electronic form.

Other resources available through the Gateway are maintained elsewhere, and the Gateway software provides connections. The complete list of resources available as of early 1994 is shown in Table 1.

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Table 1. Gateway Resources

ABI/Inform
Agricola
Applied Science & Technology Index
Art Index
Avery Index
Biological & Agricultural Index
BIOSIS Previews
Business Periodicals Index
CARL UnCover
Census of Population and Housing (1990)
CLIMOD (Northeastern Regional Climate Center Database)
Cornell Online Catalog
Crop Estimates
Dialog (150 databases)
Dialog Bluesheets
Dialog Business Connection
Dialog Papers
Engineering Index-EI Page One
ERIC
General Science Index
GEOREF
Humanities Index
Index to Foreign Legal Periodicals
Index to Legal Periodicals
National Resources Inventory
Periodical Abstracts
PsycINFO
Reader's Guide to Periodical Literature
RLIN
Social Science Index
User Guides and Help
Wilson Combined Indexes (includes all Wilson databases in

this list)

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3.0 The Evolution of Electronic Information Services

The Mann Library is the second-largest unit within the Cornell University Library system. With its collection of over 600,000 printed volumes and almost 500 electronic titles on tape, magnetic disks, and optical disks, the library is recognized as one of the most prominent academic agricultural libraries in the United States. The library serves students, faculty, staff, and extension personnel in Cornell's College of Agriculture and Life Sciences, College of Human Ecology, Division of Biological Sciences, and Division of Nutritional Sciences. As a land grant library, it also serves the citizens of New York State.

3.1 Early Growth of Mann's Electronic Library

While the printed library collection remains fundamental to the library's mission to serve Cornellians and New Yorkers, Mann Library staff have also made providing access to electronic information a principal goal over the past twenty years. This access has steadily expanded as information technology advances have been made. Mediated online searching has been available at the Mann Library since the early 1970s, end-user access to remote online databases has been provided since the early 1980s, and access to databases on CD-ROM has been available since 1987. Library staff have also provided access to numeric data on tape and diskette since the early 1980s.

In 1988, library staff began a research project in which the Agricola database and subsets of the BIOSIS Previews database were mounted on a local VAX computer. Researchers used these databases from computers and terminals in locations outside of the library, and staff investigated whether changes in user behavior resulted from the availability of this electronic information. Meanwhile, in a study funded by the U.S. Department of Education, library staff created an online system to provide menu-driven interactive access to numeric data. As a result of these experiments, the library administration decided to make more databases available to a wider range of users--and Mann Library's electronic library began to take shape.

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3.2 The Birth of the Mann Library Gateway

An early version of the Mann Library Gateway first emerged as a result of a joint project between the Mann Library and Cornell's Division of Biological Sciences. Faculty and library staff agreed that undergraduates in biology classes needed to know how to use electronic information for their classwork. These skills would also be essential for graduates in their future jobs. Staff from the Mann Library and the Division of Biological Sciences wrote a successful joint proposal to Cornell's President's Fund for Educational Initiatives to provide hardware, software, and instruction to provide Biological Sciences undergraduates with the ability to retrieve information from databases accessible over the campus network. The databases were

to be delivered through a single point of access, the Gateway.

The development of the Gateway has been a joint effort of librarians and technical staff at Mann Library (the project team is described in Section 3.4). The project manager worked with Biological Sciences faculty and the library's collection development staff to select the best resources for undergraduates in biology. Library staff and faculty agreed that BIOSIS Previews, the premier bibliographic database in the life sciences, would be the best database to begin with. BIOSIS Previews is widely recognized among biologists and information specialists to be a comprehensive, high quality resource. Faculty judged it a critical electronic resource for undergraduates. The selection team also recognized that it would be very useful to faculty, research staff, and graduate students. The library built on its earlier experience with subsets of BIOSIS Previews, and it mounted five years of the full database on a local computer using the BRS/SEARCH software.

The project team decided that biology students and faculty should also have access to the Cornell Online Catalog, so that they could easily determine which references found in BIOSIS Previews would be available on campus. The team also agreed that other databases in addition to BIOSIS Previews should be provided to the biology students and faculty, beginning with databases that the library already had online. These were Agricola and two numeric files: Crop Estimates and the National Resources Inventory.

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Fundamental to all the project team's work was the belief that access to these databases must be made very simple. A single point of access to all resources must be provided. Although the databases resided on different computers in different buildings and required different login protocols, these differences should be transparent to students and faculty. Users should only be required to learn one computer address and login protocol. To achieve this goal, the project team created an interface that presented an easy-to-use menu. This menu listed Agricola, BIOSIS Previews, the Cornell Online Catalog, National Resources Inventory, and Crop Estimates. Upon making a selection from the menu, Telneting and logging in were handled behind the scenes by the Gateway software. This system was the first version of the Mann Library Gateway. Soon after this Gateway was created, the RLIN system was also added to the menu.

Access to this early Gateway system was provided in Spring 1991 to biology students and faculty in campus microcomputer centers, in Mann Library, and at other networked locations. Dial-up access via modem was also provided, and it was the most common means of access outside of the microcomputer centers and the library. Most faculty and staff did not have connections to the campus network at this time, and they relied on dial-up access.

In Fall 1991, library staff and biology instructors conducted BIOSIS training for over 100 introductory biology students. These students worked their way through a tutorial and a searching assignment. In Spring 1992, instruction was expanded to all 700 introductory biology students. Meanwhile, biology faculty were using the Gateway for their research and were planning future instructional uses of BIOSIS Previews and other databases. Initial instruction for biology faculty and teaching staff was done by members of the project team. The bulk of the

instruction for undergraduates was provided by biology teaching assistants. The system and the instruction sessions were received very favorably.

3.3 Production Version of the Gateway

After the completion of the grant-funded project and the success of the first version of the Mann Library Gateway, library staff decided to expand the system to include subject areas beyond biology and agriculture and to expand the user population beyond the original biology clientele. At this time, the original grant project team was disbanded and a new team was formed. This new group, the Gateway Production Group, was responsible for maintenance and expansion of the Gateway system.

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In Winter 1991-1992, use of the system was opened to all faculty and students in the colleges and divisions served by the Mann Library. In 1992, use of the Gateway was opened to all Cornellians. Use of the system is limited to the Cornell community at present due to contractual requirements of some database producers. Access to the system is controlled by passwords issued at Mann Library.

A "public" version of the Gateway will eventually be available to anyone. This "public" Gateway will provide access to all resources except those which must be limited to the use of Cornellians because of cost or contractual requirements. This "public" Gateway will enable Mann Library to fulfill its role as a land grant library in the electronic milieu.

3.4 Project Team

The membership of the project group has varied over the last four years depending on the focus of Gateway development activities at the time. Library-wide and campus-wide input has been crucial to the development of a successful product.

The project team has been coordinated by Marty Schlabach, a librarian from Public Services. A systems analyst/programmer has always been a part of the group to provide leadership in Gateway programming work. In addition, the Head of the Information Technology Section has been an active participant in the group. The Head of ITS provides the library- and campus-wide view for technical discussions, and he brings to the group the authority to make Mann Library hardware and software decisions. An Interface Designer joined the Project Team soon after the project began and has been a key influence in the development of an easy-to-use system. A part-time Instruction Librarian was hired to work with faculty to integrate the use of the Gateway and its electronic resources into courses. The Head of Collection Development coordinated the process of selecting databases to be added to the Gateway. Another programmer and the Bibliographic Files Librarian joined the group as we became more heavily involved in mounting bibliographic databases locally.

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The current Gateway Production Group membership is:

- o Marty Schlabach, Gateway Coordinator, Public Services (Chairperson)

- o Bill Fenwick, Programmer, ITS
- o Bill Garrison, Interface Designer, ITS
- o Tim Lynch, Systems Analyst and Head, ITS
- o Oya Rieger, Numeric Files Librarian, Public Services
- o Linda Stewart, Bibliographic Files Librarian, Public Services

4.0 Training

Mann Library staff believe that providing instruction in the use of electronic information and information technology is a fundamental role of libraries. Library staff have provided online searching classes and instruction in the use of software for over ten years. As the Gateway has been made available, online searching instruction has evolved from demonstrations of remote vendors' databases and local CD-ROM searches to hands-on classroom sessions. The Stone Microcomputer Center at Mann Library includes a classroom with twenty networked workstations. In this classroom, users receive instruction in basic and advanced BRS searching, use of the Dialog Menus software, CARL UnCover and RLIN searching, and use of numeric data--all resources available through the Gateway. Almost every session offers the opportunity for structured hands-on practice with several trained searchers, who are available to answer user questions.

The Mann Library provides instruction for classes at the request of faculty, and it also conducts "open workshops" for any interested members of the community. BIOSIS Previews instruction for freshman biology students continues, and it is in its third year. During the 1992-1993 academic year, library staff taught over two hundred classes to almost 2,400 users.

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5.0 User Support

Mann Library staff provide support to users of the library's printed and electronic collections. When the Gateway was first made available to users in 1991, library staff had much more experience with supporting users of printed materials. The library administration's goal was to use the reference desk as the front line of support for electronic library users, just as it is for users of the traditional print library. Initially, however, members of the grant project team provided support to Gateway users. They answered the questions and kept records of all questions asked and answers provided. These records were later analyzed so that Gateway support documentation and training could be provided to reference desk staff.

From the Gateway's earliest days, questions about which telecommunications software to use, how to connect, how to correct display problems, how to search, and how to save search results came in person, via telephone, and through e-mail. Many questions also came in from people who had forgotten their user IDs and/or passwords. During the initial months, these questions were answered by two librarians, a systems analyst, and the administrative assistant in charge of managing user IDs and

passwords.

In Spring 1992, the front line of support for Gateway users was moved to the reference desk. Most desk staff were experienced bibliographic searchers and were easily trained to answer questions about searching databases available through the Gateway. Questions regarding logging in and use of telecommunications software required more training. Workshops presenting information about telecommunications software were developed and presented by reference librarians and systems analysts. Members of the Gateway Production Group prepared an informational notebook for use by reference desk staff. This notebook contains handouts explaining use of various databases, detailed login procedures, and brief guides to major telecommunication packages used with the Gateway.

At present, most telephone calls and in-person requests for assistance with the Gateway arrive first at the reference desk. Most questions are answered at that point. When necessary, reference staff refer questions to experts on the Mann Library staff. E-mail requests for assistance arrive at the general e-mail address for the Reference department, and, when necessary, are also referred to experts.

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In Spring 1993, an online method for distributing Gateway handouts was developed and made available as a choice on the Gateway menu. Now, users often find their own answers. This has been an important supplement to other support services.

While Mann Library remains the main source for Gateway user support, other libraries in the Cornell University Library system have taken on significant support responsibilities for Gateway users in their own user populations.

6.0 User Response

The Gateway system has been very well received, as evidenced by the huge increase in sessions per day. When the system first became available, the usage averaged fewer than 100 Gateway sessions per day. The average use now often exceeds 700 sessions per day. In May 1992, the system supported a monthly total of 1,989 sessions; by May 1993, the monthly total was 5,188 Gateway uses. November 1993 saw a new high of more than 15,000 Gateway sessions.

The library has also received many favorable comments about the Gateway from students, instructors, researchers, and extension personnel.

7.0 Future Plans

An additional group has been formed to plan and develop the next version of the Gateway. The Gateway Development Group, which includes some members of the Gateway Production Group, began its work by inviting a few people from the library to join in a brainstorming session about what the next Gateway should be able to do. This resulted in two documents which were used as springboards for discussion in a number of focus groups. The focus groups included representatives of faculty and staff who use the Gateway for research and instruction as well as library and technical staff from across the campus. Suggestions from these focus groups were described in a recent article. [1]

The Gateway Development Group then drafted a requirements

document that summarizes the features and functions desirable to have in the next Gateway. Client/server architecture and a window-based user interface are the key technical foundations of the next Gateway environment. The requirements document is currently being discussed and the planning and design process is underway. The Gateway Development Group's goal is to have an operational prototype available by Summer 1994.

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8.0 Conclusion

Information resources are increasingly available in electronic form. Given recent advances in networks, telecommunications, and computers, librarians must provide access to electronic resources in a distributed manner. In addition, it is the librarian's responsibility to organize and facilitate easy access to those resources.

The Mann Library has taken steps toward providing that ease of access by creating the Gateway. In addition to offering the library's clientele a wide diversity of electronic resources, the Gateway provides a single entry point to this panoply of databases, and it assists users in identifying and selecting appropriate resources.

The Cornell community has accepted and embraced the system, and increasingly it expects additional resources, services, and capabilities. Usage continues to escalate, as electronic resources are integrated into the daily lives of faculty, researchers, and students.

Although the system is sophisticated in its capabilities and it is easy to use, it is technically "primitive." The Mann Library is now utilizing newly available technologies to meet users' expectations by developing the next generation of the Gateway.

Notes

1. Susan J. Barnes, "An Electronic Library Grows," *Computers in Libraries* 13 (September 1993): 12-15.

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