Can I Get There from Here?
Technology and Off-Campus Library Programs

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ABSTRACT
TECHNOLOGY CAN PLAY KEY ROLES in many ways for off-campus library programs, but three principal areas are most critical in supporting these programs. These are access to information, delivery of information, and communication. This article will address these three areas, examining both past uses of technology and current developments, and then look at future possibilities which may play important roles in off-campus library programs. References to utilization of specific technologies at Washington State University (WSU) will be presented as examples of the way these apparatuses and services have supported off-campus library programs at this institution. The promise and possibilities of existing and developing technologies will be explored. And, finally, certain questions and issues will be raised in relation to technology in general and more specifically to its place and role in off-campus library programs.

INTRODUCTION
Although the expansion in off-campus library programs cannot be ascribed to one single factor or event, the impact of technological advancements must be considered a significant influence in this development. The guidelines for extended campus library services, as prepared by the Association of College and Research Libraries' (ACRL) Task Force to Review the Guidelines for Extended Campus Library Services, were revised because of a number of factors including "an increase in technological innovations in the transmittal of

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information and the delivery of courses" (ACRL, 1990, p. 354). As
technology has played an important role in nurturing this expansion,
technology also must play a major part in the continuing development
of these programs. Technology appears to be up to the task of
addressing the needs of off-campus library activities, perhaps much
better now in the early 1990s than it has been at any previous time.
The responses to the question "Why automation?" which Lindberg
(1987) presented in his analysis of "Getting Information Technology
Off-Campus," are still quite valid. He wrote that:

> Such technology has much greater potential for providing appropriate
> information support for noncampus students than other methods.
> Institutions which can use the new technology to provide superior
> information resources to noncampus students may gain an important
> strategic advantage over their academic and corporate competitors. (p.
> 194)

ACCESS

In their article, "Providing Library Support to Off-Campus
Programs," Kascus and Aguilar (1988) identify four problems for
academic institutions with off-campus programs. "The first and most
critical problem" (p. 33) is one of access while another problem is
"timeliness" (p. 34). Technology can, and should, play a key role
in addressing these problems.

Access to bibliographic information for instructional and research
support is key to the operation of off-campus programs. And as stated
in the "ACRL Guidelines for Extended Campus Library Service"
(1990): "This support should provide library service to the extended
campus community equitably with that provided to the on-campus
community" (p. 354). Technology must come into play to allow access
to this type of information, for the off-campus patron cannot
conveniently travel to the home campus library facilities to obtain
such information.

As more institutions convert their bibliographic holdings into
machine-readable form and provide access to this information through
an online catalog of some sort, it is important that this service be
made available to remote users as well as those on the main campus.
This task, easily defined, is not so easily executed. The ideal is to
have one or more devices (terminals, microcomputers, workstations)
at the off-campus sites (if a definable "site" exists) which is in some
fashion "hard wired" to the home campus computer "host" upon
which the library database resides. Additionally, dial-up access for
students, faculty, and staff from their homes or offices should also
be available. The ideal, of course, hardly ever corresponds with reality,

and, due to a variety of barriers—technical, political, and economic—many institutions have yet to implement easy access to the online catalogs of their "home" library.

At Washington State University, the three branch campuses have access to the online library catalog (COUGALOG) within the small library located at each branch campus site. These branch campuses are located between seventy-five and three hundred miles from the main campus. Access to the online catalog is also available in microcomputer labs located on the branch campuses but not part of the libraries. Individuals can thus search the online catalog in the same fashion and at the same speed (9600bps) as users on the main campus. Additionally, local phone "rotaries" are available at each of the branch campus locations which allow individuals to dial into the mainframe where they may connect to the online catalog (and to other services as well, some of which will be discussed later). Other examples of remote access to online catalogs are documented by McCauley (1986), Power (1987), and de Bruijn and Matheson (1987), the last case being a Canadian model.

A relatively new twist to the issue of access to the online catalog has significant possibilities for off-campus programs. With the availability of an increasing number of library online catalogs through Internet, it is now possible to search a multitude of such catalogs from the same device, which allows access to the catalog of the "home" institution. For off-campus users, this presents an opportunity to search the databases of a number of institutions for relevant information. In cases where one of these institutions is closer to the off-campus site than the home institution, it may prove more convenient for patrons to utilize that institution's collections. (This, of course, brings up the questions of agreements and arrangements with other institutions for supporting instruction and research at the off-campus locations.) The list of library catalogs available on Internet is maintained on a file accessible to an individual with access to BITNET and/or Internet. (The file "Internet Library" is available online from LISTSERV@UNMVM.BITNET and is compiled by Art St. George at the University of New Mexico [Updegrove et al., 1990, p. 25].) At WSU, individuals with an account on the mainframe can access these other library catalogs through the university mainframe, the same machine on which the local online catalog resides. Potentially, users at the Vancouver branch campus (located in the southwest corner of the state of Washington) could access library catalogs for institutions in the state of Oregon, which may be significantly closer to them than the main WSU campus which is over 300 miles away.

Another method of expanded access to bibliographic information is the use of bibliographic utilities. These extensive databases provide much more information than a local online catalog and also can provide holdings information which identify where the materials are located. Although these utilities traditionally have been used in the technical services areas of libraries and have only been used by the public in a limited way, changes are taking place which are making more widespread use of these databases attractive and desirable. Off-campus programs could benefit immensely from these developments. Kascus and Aguilar (1988), in fact, in presenting a model for off-campus library services, suggest that: "The bibliographic utilities provide an overall solution to the problem of access, linking technology to the library and to the patron as end-user" (p. 35). They also point out that:

> The utilities offer immediate advantages for institutions providing off-campus education in that many libraries are already electronically linked to one or more of them. The utilities are interested in expanding their operations through the use of intelligent gateways that allow customized services. They are more cost-effective than alternatives like branch libraries, and they solve many of the problems created by distance and time since communications are virtually instantaneous. The utilities offer some immediate advantages to off-campus patrons as end-users by providing access to a wide variety of databases and information services through a dedicated workstation. They facilitate better, more informed choices about resources needed. They make it possible to customize information packages; and they ensure a more rapid turnaround time. (pp. 35-36)

Institutions which are members of the three predominant utilities in the United States (OCLC, RLIN, and WLN) can access these databases through regular direct connections. For relatively small off-campus programs, however, these connections may be too expensive to establish or too costly to maintain since connect time and other costs (e.g., for equipment and for less tangible aspects such as training) are high. One option, initially developed by the Western Library Network (WLN) and subsequently adopted by the other utilities, is the CD-ROM version of the online database. The WLN CD-ROM product, LaserCat, includes a large subset of the online database plus all recent Library of Congress cataloging (Herther, 1987, pp. 135-38). An institution can purchase the LaserCat product, which includes holdings of items, and "scope" the searching mechanism to allow for retrieval and display of only those items held by particular institutions. Thus an off-campus library site may wish to display only those items which are located in its geographic neighborhood. OCLC and RLIN have developed similar CD-ROM applications.

The Research Libraries Group was the first utility to make access to its database (RLIN) available via the Internet ("RLIN Databases...," 1989, p. 15). A user can access the RLIN database much in the same

manner as the local catalogs mentioned earlier. Unlike accessing these
local databases, however, fees are incurred in searching RLIN through
Internet and an account is required for accessing the system. OCLC
has taken a significant step toward supporting end-user searching
of its database with the development of its EPIC service (Whitcomb,
1990, pp. 45-50). EPIC became availabe on Internet in late 1990.

The information needs of off-campus users go beyond the
bibliographic records contained in the online catalog or in the
bibliographic utilities. Information on the contents of journals,
newspapers, and other periodical publications is critically important
in supporting the instructional and research needs of academic
programs. However, the size and cost of the publications produced
by abstracting and indexing services make it all but impossible for
the off-campus programs to have such research tools available on
site. Again, technology plays an important role in providing library
service to the extended campus community equal to that provided
to the on-campus community.

At least four models in providing computer-based search services
to off-campus clientele can be identified. These models correspond
to points along the development curve of database searching. The
first model is one familiar to most librarians and patrons—mediated
searching. A patron can request that a search be done on any one
of the multitude of databases available through such services as
DIALOG, BRS, and WILSONLINE. A librarian conducts the search
and presents the results of the search to the patron. Up to the mid-
1980s, this was the principal way of providing online search services
and is still used extensively. However, for off-campus library
programs, the basic methodology of librarian-patron interface in this
process can be problematic. Is there a librarian on site? Can the
appropriate databases be searched from the off-campus location? How
are search strategies developed and search results delivered? Is there
a fee associated with this service?

McDevitt (1986) presents one method of addressing the issue of
"Computer Searching and the Extended Campus Patron" based on
experiences at the West Virginia College of Graduate Studies. In this
case, the U.S. mail service is utilized for the receipt of search requests
and the sending of search results. This method admittedly creates
problems when the searcher does not have the opportunity to
interview or interact with the patron requesting the search. But in
some situations this is about the only way to proceed. At Washington
State University, requests can be transmitted by mail but more often
they are made by telephone, a situation which allows for some level
of interaction. Another method of receiving requests and transmitting
results is the electronic search form; in the cooperative extension

offices and research stations throughout the state of Washington, this method has been in use for several years with good results. A similar request form for the branch campuses is also being developed.

In the mid-1980s, the database vendors began to offer a different type of search service to their customers. Known generically as "end-user searching," this service allows for patrons to search the databases themselves, usually at off-peak hours and generally for reduced fees. With this service, patrons can do their own searching on selected databases without the "mediation" of a librarian. End-user searching offers several advantages for off-campus library programs, the most apparent being the ability of the patron to conduct their own searches. There are, however, significant drawbacks. Turning unsuspecting patrons loose on a vast array of databases with little guidance can be frustrating and costly. However, with proper orientation and training, end-user searching for off-campus patrons may be a very workable solution.

Following close on the heels of the development of end-user searching techniques came the CD-ROM revolution of the late 1980s. Vendors of many of the large databases adopted CD-ROM technology and started to produce CD-ROM versions of their databases. Databases on CD-ROM are searchable by any patron with access to the device on which the database resides, and there are no online fees associated with this type of searching. For off-campus programs, CD-ROMs offer an attractive way to meet specific information needs of patrons. One or more databases loaded at an off-campus site can provide access to the equivalent of several printed indexes. The drawbacks are that unless some sophisticated method of dial-up access is available to these databases, the patron must be on site to use this service. For many off-campus programs, this is a significant drawback. At Washington State University, CD-ROM products are available at each of the three branch campuses with specific databases available according to the types of programs offered at each site. In addition, numerous CD-ROM databases are available on the home campus and individuals can request searches on these products in much the same fashion as when they make online search requests.

A fourth option available for searching abstracting and indexing databases began to emerge at about the same time that CD-ROMs were hitting full stride in academic settings. Some of the producers of large databases heavily used in the academic community began to market databases on tape to be loaded into local systems on university mainframes or other computers accessible on a network of some type (see Appendix for examples of such databases). This service provides many of the same features as CD-ROM but allows for widespread access to databases not only within the libraries but

also to individuals in their offices or homes. These databases can be "subscribed" to much in the same way as CD-ROMs although prices are significantly higher. The search software needed to access the databases generally is also part of this site license.

Loading of external databases onto the home libraries' or university's computer has tremendous potential for off-campus library programs. It can provide the properly equipped remote user with equal access to some of the more important resources in scholarship and research as that available to individuals on the home campus. Many of the same training and support issues mentioned earlier are relevant here, which raises the question, Why move to the more expensive option of loading external databases? At Washington State University, as in many other institutions, the question of CD-ROM databases versus locally mounted databases has been discussed. The answers are not crystal clear, but the issue of benefits to the off-campus programs has played an important part in the discussion.

There are other arguments in favor of loading external databases. In a recent article describing Clemson University's decision to go with locally mounted databases on their mainframe, Meyer (1990) notes that "a large collection of CD-ROMs may easily mean a large number of interfaces. Networking experiments to date do not appear to have facilitated the development of common interfaces for a variety of indexes on CD-ROM" (p. 230). It is also argued that:

> Locally mounted databases provide several advantages over CD-ROMs. The number of access points to the data need be restricted only by the number of computer terminals and dial access ports made available on the mainframe. This expands the number of points of contact with the system far beyond the walls of the library building. Furthermore, CD-ROMs often have some of the same bibliometric limitations of card catalogs and printed indexes. Building inverted indexes and storing these index points on a microcomputer hard disk drive for complete keyword access may overwhelm the disk drive, much the same way as too many cards in a catalog can overwhelm the cabinets available to house them. (p. 230)

Other considerations when exploring locally mounted databases include: (1) which databases to load, (2) the search engine for the databases, and (3) licensing and copyright issues. The last point is one which especially comes into play with off-campus library programs. To date, vendors of these services have not been very eager to have these services geographically distributed, preferring to charge per geographic site. This is problematic for many off-campus library programs where the off-campus site may be small and unable to support the charges associated with paying part of the bill for loading these databases. There does appear to be some breakthrough occurring

with vendors; some have adopted an FTE pricing structure rather than a geographically based one. Still, more sensitivity to the special problems of off-campus library programs is needed.

One other developing method of access to abstracting and indexing databases also has large potential for off-campus library programs. This is the use of Internet to access such databases. Although Internet has restrictions on commercial applications, a shift in this situation is apparent. Already the Colorado Alliance of Research Libraries' (CARL) UNCOVER service is available via Internet on a fee-based schedule. UNCOVER is a table of contents service for more than 10,000 periodical and journal titles which can be subscribed to by any organization (Pitkin, 1988, pp. 769-70). Other abstracting and indexing databases may also be available soon via Internet. Like mediated or end-user searching, access to these databases on Internet still presents issues of cost, training, and support. Access in this fashion, however, can eliminate some of the costs associated with dial-up access through value-added networks such as TYMNET and Telenet.

Moving beyond abstracting and indexing databases, access to full-text databases should be high on the list for any off-campus library program's desideratum. Full-text databases do not just provide "access" to the information; they actually deliver it (Quint, 1986, pp. 39-40, 77). A number of journals are available in electronic format and can be accessed through some of the existing database searching services. In addition, an increasing number of journals are being produced only in electronic form and are subscribed to in this fashion; such "publications" can be loaded on a computer at the home institution and can then be accessed by individuals at the off-campus sites or from their homes or offices. A combination of access and delivery is under development as part of CARL's UNCOVER service: a table of contents can be searched, then full text of articles selected for display and/or delivery.

DELIVERY OF INFORMATION

Obtaining information about an item is only part of the picture for off-campus library programs, albeit an important one. However, getting that information is critical to the needs of the extended campus community. Document delivery is identified by Kascus and Aguilar (1988) as "a second problem area in providing off-campus library support" (p. 34). In addressing this problem, the ACRL guidelines (ACRL, 1990) stress that "reciprocal borrowing, contractual borrowing, and interlibrary loan services" as well as "prompt

document delivery such as a courier system or electronic transmission" may help meet these needs (p. 355). Technology again can and should play a major role in addressing these needs and services.

Once an item is identified and located (by means of one or more of the techniques discussed earlier), a request for the item has to be generated. This may happen in various ways, from standard interlibrary loan (ILL) forms to electronic flagging of an item for delivery. Some of these options will be discussed later with an emphasis on another problem associated with off-campus library support, namely, timeliness. "Speed is of the essence in serving users," write Kascus and Aguilar (1988). "At a distance, the time factor becomes even more critical" (p. 34). What technologies might be adopted in document request and delivery which provide library service to the extended campus community equal to that provided to the on-campus community?

For the off-campus library programs, there are two types of requests that are generated. One is for material owned by the home institution but not housed at the branch campus site (which will be the norm rather than the exception). The second is the request for material not owned by the home institution. Dealing with the second category first, standard interlibrary loan procedures are probably the best method to follow in addressing these concerns. After all, users on campus must also follow these procedures (often to their disgruntlement). There are, however, ways in which off-campus library programs might more effectively participate in this activity.

Most academic institutions participate in one or more interlibrary loan networks which generally have automated mechanisms for sending and receiving ILL requests. Where possible, it would be advantageous for the off-campus library service operations to be linked in some fashion to this mechanism. Such linkage would facilitate the timeliness of requests, especially if requests do not have to be rekeyed at a central ILL office on the home campus. Another option is to create a mechanism for online transmission of loan requests as part of an electronic mail facility or some other similar capability on the home institution's computer. Chang (1989) describes an on-campus system at Texas Tech University which can serve as a model for off-campus applications as well.

This latter option also is a good way to address requests for materials held on the home campus. Requests can also be submitted by U.S. mail, by telephone, and via telefacsimile (perhaps particularly appealing as more users adopt FAX boards/cards on their microcomputers). Another option for requesting materials from the home campus libraries is by allowing for "marking" of bibliographic

records within the online catalog. Once a record is tagged by an individual, a screen (or window) appears which prompts the patron for additional information (ID number, address, etc.). Validation of identification, holdings information, and so on can be run at the same time as the request is processed through the system. Similar to the "hold" placed on materials in "patron checkout" systems, this added feature of an online catalog may have particular value in off-campus library programs. Although this feature of the online system has not yet been implemented at Washington State University, it is being planned with off-campus users as its primary focus.

Actual delivery of documents is a complex issue in most off-campus library programs. As noted earlier, the ACRL guidelines recommend reciprocal borrowing, contractual borrowing, interlibrary loan services, courier systems, and electronic transmissions. Chances are that many off-campus library programs will adopt an "all-of-the-above" approach to delivery of documents. ILL services have been briefly discussed here: reciprocal/contractual borrowing beyond some casual references (in terms of proximity of items located in online catalogs or bibliographic utilities) will not be addressed in this article. Courier systems (as well as the "trunk delivery system" discussed by Kascus and Aguilar [1988, pp. 33-34]) have played, and will undoubtedly continue to play, an important role in document delivery to branch campuses, but the focus here is on technological options for document delivery.

Without a doubt, the use of telefacsimile has been a major boost in support of off-campus library programs. Although telefacsimile has been around for over two decades, like many applications, it has been waiting for the technology to catch up with the idea. This occurred in the last half of the 1980s; after catching on in the business world, telefacsimile has solidified its place in the academic world (Brown, 1989, pp. 343-56). For off-campus library programs, this method of document delivery for journal articles and other short documents offers many benefits. Although with most current scanning technology it is still necessary to photocopy the document before scanning it, which creates some additional labor and resource costs, the timeliness of this type of document delivery is well suited to off-campus library programs. As more individual users obtain FAX machines or FAX boards/cards on their microcomputer, direct delivery to home or office becomes feasible. With current and future developments in telefacsimile technology, additional enhancements in this type of service will be realized.

As noted earlier, full-text databases are becoming more widely available and offer another attractive method of document delivery to off-campus programs. Gillikin (1990) describes a pilot project of

"Document Delivery from Full-Text Online Files" (pp. 27-32). In addition, developments in imaging technology offer even more possibilities for capture and delivery of full-text information, with obvious benefits to library service both on and off campus.

Other developments in document delivery are taking place which utilize a combination of technologies. One such activity is the National Agricultural Text Digitizing Project (NATDP). The NATDP, a cooperative effort of the National Agricultural Library and several land grant institutions, has moved through various stages of investigation and utilization of technology for capture and distribution of information (Andre & Eaton, 1988, pp. 61-66). Phase three of this project, to begin in 1991, is "designed to explore the feasibility of transmitting digitized images between geographically separated libraries using the national NSFnet/Internet network and also between a university library and other parts of its campus using a campus network" (S. K. Nutter, personal communication, 1990). The impact of this project on off-campus programs (including agricultural experiment and research stations) may be very significant.

COMMUNICATION

Pivotal to all the technologies discussed to this point is the creation of efficient communication links between the off-campus sites and the home institutions. Those communication links include the more technical aspects such as cabling, switching, transmission speeds, and bandwidths, but communication also includes the direct human interaction between individuals off-campus and those at the home institutions. The success of off-campus library programs often is linked as much to the human aspects of communication as to the technical aspects. This section explores a few of the technologies available for enhancing these links. Voice, data, video, and combinations thereof will briefly be discussed.

Voice

To date the telephone is probably the most essential technical apparatus in use in off-campus library programs (although some would probably argue for the photocopier). The telephone allows individuals at the off-campus library service points to communicate with students, faculty, staff, and virtually anyone in "ear-shot" of the off-campus sites. For that very reason, it can be a large albatross around the neck of off-campus library personnel; they may get almost permanently tied to the telephone. Yet there is little question that the phone probably will stay as a pivotal element of off-campus library service. With that understanding, it is important to examine certain uses of this device.

Most of these uses are well known and undoubtedly present in many off-campus library settings. One such application is conferencing. Conference calls can be extremely useful in off-campus library settings where several individuals, often in multiple sites, have to "come together" for a discussion. Utilization of speaker phones in committee meetings on the home campus allows for individuals at the off-campus sites to participate in these activities, an important (and often neglected) means of involvement for the off-campus personnel. Messaging systems, including answering services or devices and "voice mail" systems, can also play important roles in supporting off-campus library services. An added feature of the good old telephone is that, generally, the same wiring which supports telephone service can also be used for data receipt and transmission, including online database searching and telefacsimile. Integration of these services should be kept in mind in off-campus programs.

Some institutions have utilized shortwave and other radio transmission capabilities for linking off-campus services with the home campus and their clientele. Although specific library applications have been few, this is another possibility for use of voice communications. Other aspects of radio technology have been explored for data transmission. Brownrigg et al. (1984) conducted tests of packet radio for use in online catalogs. Other uses for radio as a data carrier including electronic mail and local area networks are suggested by Melin (1986, pp. 37-38, 77).

Data

Data communication has been discussed extensively in this article as it relates to access and delivery of information, but interactive communication among individuals at off-campus locations and other individuals via a data link is also important in the off-campus setting. Electronic mail capabilities should be high on the list of desired elements of an off-campus library program. With e-mail capabilities, the "timeliness" factor can be addressed, and a convenience factor comes into play as well. At many off-campus locations, the working hours of library personnel and patrons often do not match. E-mail messages can be sent at any time and stored in a user's "mailbox" to be read and acted upon in appropriate fashion. On the other hand, interaction can also be "real time" if both users are online simultaneously. Electronic mail also allows connections with individuals at the home institution. At Washington State University, electronic mail is used extensively for off-campus programs (where every student receives an e-mail account on the university mainframe) as well as throughout the library organization.

The value of electronic mail communication is not limited to "local" application within the institution. E-mail, where available, also allows an individual to connect to international services such as BITNET, Internet, CompuServe, and ALANET which offer numerous possibilities for off-campus programs. Britten (1990) offers "some tips on mastering the mysteries" of BITNET and Internet which provide a good introduction to this topic. And communication is not restricted to one on one applications. Conferencing systems (available for local systems as well as internationally) and the fast growing development of interest group forums (which Britten also addresses [pp. 105-07]) provide opportunities for off-campus library programs to link with colleagues worldwide. (An online interest group forum for off-campus library programs would be an excellent idea if one does not already exist.)

Video

Perhaps even more effective as a communication tool than voice or data transmission is a video connection between off-campus sites and home institutions. Several models of one-way or two-way video connections exist in the United States which are supplying some level of communication between extended campus library programs and the main campus. Power (1987) briefly describes the Instructional Televised Fixed Services (ITFS) capabilities at California State University, Chico, and how it has been used in supporting dial-up access to the online catalog (p. 205). ITFS, which includes two-way audio and one-way video, has been used successfully in other states, including Illinois and Washington, for instructional and library support programs (Rice, 1987, p. 215). Two-way interactive video has gained popularity and is being used increasingly for support of extended campus programs. At Washington State University, two-way video has a relatively long history of use within the state.

Rice (1987) presents an overview of the Washington Higher Education Telecommunication System (WHETS) with a special consideration of its potential for use in bibliographic instruction of off-campus students. Authorized by the state legislature in 1983, WHETS was established and is managed at Washington State University. Utilizing an interactive microwave system within the state, courses were first offered on WHETS in the fall semester of 1985. The two-way interactive video and audio signal allows students at one or more of the branch campus locations to participate in classroom instruction very much in the same manner as if they were at the home campus. The success of this method of instruction has resulted

in a tight scheduling problem for WHETS administrators, although increased channel capacity is in the works which should ease this burden for the coming few years.

The value of WHETS is not limited to regular classroom instruction, although that is its primary intent. WHETS has been used for conferencing, meetings, interviews, and even the bibliographic instruction purpose which Rice envisioned several years ago. The addition to the main library at Washington State University will include a WHETS "conference" room in which staff meetings and other small gatherings (including bibliographic instruction classes) can take place. For librarians and other staff members at branch campus sites, this will allow participation in meetings and activities taking place on the home campus. Efforts are also underway to include WHETS capabilities in larger lecture halls on the Pullman campus so that such events as faculty senate meetings could be held with participation from faculty members (including librarians) around the state. This particular point is an important one when tenure requirements for faculty at the extended campus sites include service to the university; such service could be facilitated through the use of WHETS.

WHETS has also provided other opportunities on campus. A subchannel of the microwave signal on WHETS is now dedicated to data transmission. Since Pullman is located in the remote eastern edge of the state, being able to use WHETS for transmission of data has eased some economic and technical problems.

POSSIBILITIES AND PROMISES

This article has examined several of the existing technological applications that are of value to off-campus library programs and has suggested other changes which may enhance support of these programs. There are a number of other developments in the broad arena of information technology which bear watching as they too may have significant impact on library services both on and off campus. A few of these are discussed briefly here.

Some of the possibilities and promises of technological solutions to problems of off-campus library services are linked to further developments in the technology of information delivery. Increased transmission speeds and bandwidth are expected to increase dramatically the capability for moving large amounts of data more effectively through existing and expanded networks. While it was not long ago that a 1200bps speed for searching databases was viewed as "state-of-the-art" (and many of us can remember 300bps very clearly), 9600bps is now considered slow. Within the next few years,

substantially increased speeds and increased capabilities for transmission of large amounts of data will be available over the networks.

Within the same time frame there should be major developments in the standardization of network protocols, user interfaces, and various other areas of information technology. The move toward the Open Systems Interconnectivity (OSI) model, already taking place within the Linked Systems Project, presents several intriguing possibilities for library and other information systems. The development and adoption of the Information Retrieval Protocol (Z39.50 standard of the American National Standard Institute [ANSI], also called Search and Retrieval) will set the stage for easier and more efficient interchange between bibliographic and other files. Standardization of common user access and graphical user interfaces within library applications (or any applications, for that matter) will serve as a major benefit for users at any site.

These and other developments are being fostered by new coalitions of librarians, other information professionals, the academic community, and the computing industry. One such coalition is INFORMA, a forum for users of IBM technology in libraries, which was established in late 1989 and held its first conference in May 1990 (with the second planned for spring 1991). A broader coalition, and one which may set the stage for information technology in academic environments for the next several years, is the Coalition for Networked Information, established in March 1990. This coalition of nearly 120 institutions is sponsored by the Association of Research Libraries (ARL), CAUSE, and EDUCOM. (CAUSE is The Association for the Management of Information Technology in Higher Education. EDUCOM is a nonprofit consortium of 590 colleges and universities with 120 corporate associates, founded in 1964 to facilitate introduction, use, and management of information technology.) It was established "to advance scholarship and intellectual productivity by promoting access to information resources through existing networks and the proposed National Research and Education Network" (CAUSE, 1990, p. 1). Such activities as those of the coalition clearly have significant promise for off-campus programs, for the theme of networkability, key to both the coalition and to off-campus programs, resides at the center of this activity. Also significant is the proposed National Research and Education Network (NREN). Although the 101st Congress adjourned prior to acting on the High-Performance Computing Act of 1990, which would have authorized the National Research and Education Network, the concept of NREN has gained support in Congress and other federal agencies as well as in the national academic community. Further legislation related

to the NREN is expected in the 102nd Congress. It will be important
to monitor the implementation of the NREN; this will be perhaps
one of the most significant developments for off-campus library
service programs in the early 1990s and beyond.

PROBLEMS AND ISSUES

This article has focused on the existing and possible technological
applications for off-campus library services, but it has not dwelled
extensively on the problems and issues associated with these
applications. Clearly cost is an important factor in addressing any
of these technological solutions to service issues. Limited budgets
and dwindling buying power in certain areas of library resources,
most notably collection development, make the decision to go with
a technological solution even more difficult. It is impossible to specify
any broad guidelines to use in determing the cost/benefit of any one
of the solutions discussed earlier. However, the question should be
asked, Can we afford *not* to move in one or more of these directions?
It is possible that the technology solution, although expensive in
its initial outlay, may be the best long-term solution.

Related to this is the issue of training, support, and maintenance
of these technological possibilities. In the face of hardware/software
considerations, providing staff support for training users, providing
support to off-campus users, and troubleshooting the technology,
expenses can be underestimated or even overlooked. The problem
may be more acute in the off-campus setting where there might not
be a full blown support mechanism in place. These points should
be kept in mind when purchasing hardware or software. If support
is not available at the off-campus site, will support be available from
the home campus or from a relatively close service point?

The technology itself also can be a problem or issue. Is the off-
campus site utilizing different types of machines or software than
the home campus (e.g., Macintosh equipment versus DOS or OS/
2 machines)? Are the protocols used on the off-campus site different
than those used at the main campus (this can be particularly
troublesome in trying to do remote support or troubleshooting)?
Invariably the patrons, even if they *have* appropriate equipment,
will have a mixed bag of hardware and software which makes training,
support, and other services particularly challenging.

Yet these problems are often the same whether addressing on-
campus or off-campus concerns. The important point is to undertake
a sound planning process prior to committing to any of these or
other technological solutions.

CONCLUSION

Technology has long been viewed as the impetus for the library (or university) "without walls" and off-campus library programs (and off-campus programs in general) are, in part, the realization of this concept. Thus it is fitting that these developments come together. Technology can and should become the catalyst for addressing the information needs of the extended campus programs. Once again, to highlight a phrase from the ACRL guidelines: "This support should provide library service to the extended campus community equitable with that provided to the on-campus community." As demonstrated in this article, there are already many technologies in place which can move in that direction, and there is much that promises that off-campus library support will be achieved even more effectively in the coming decade. It may not be possible to provide full support for off-campus library programs with "three terminals, a telefax, and one dictionary" as Brown (1985) describes the solution for an external learning center at DePaul University. But then it may be possible, and you might not need the dictionary.

APPENDIX

Examples of Databases Available from Vendors for Local Systems

Vendor	Databases
BRS	ABI/Inform
	Academic Index
	AGRICOLA
	Arts & Humanities Index Search
	Compendex
	Life Science/Clinical
	Disclosure
	Dissertation Abstracts
	ERIC
	INSPEC
	Magazine Index
	MEDLINE
	NTIS
	PsychINFO
ISI	Current Contents Search
	SciSearch
	Social SciSearch
	Arts & Humanities Search
	ISTP&B (Index to Scientific & Technical Proceedings & Books)
Information Access Co.	Academic Index
	Business & Company ProFile
	Business Index
	Computer Database
	Expanded Academic Index
	General Periodicals Index
	Health Index
	Legal Resource Index (LegalTrac)
	Magazine Index Plus
	National Newspaper Index
WILSON	Applied Science & Technology Index
	Art Index
	Bibliography Index
	Biography Index
	Biological & Agricultural Index
	Book Review Digest
	Business Periodical Index
	Cumulative Book Index
	Education Index

Essay & General Literature Index
General Science Index
Humanities Index
Index to Legal Periodicals
Library Literature
Readers' Guide Abstracts
Readers' Guide to Periodical Literature
Religion Indexes
Sears List of Subject Headings
Social Sciences Index

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