The Integrated Library System of the 1990s: The OhioLINK Experience

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The Ohio Library and Information Network (OhioLINK) will link the seventeen state-assisted university libraries in Ohio so that they will appear to the user as a single resource of some nineteen million volumes. Each institution will have the same state-of-the-art integrated library system feeding into a centralized database. Over the past three years, the OhioLINK network of subcommittees completed detailed evaluations of existing integrated library systems, including vendor demonstrations and site visits to the users of the systems being investigated. Contract negotiations with Innovative Interfaces, Inc., were completed in spring 1991, with implementation to begin in July 1991. These activities provided a wealth of information on the state of currently available integrated, library systems. In this paper, experiences are synthesized into an analysis of what is still missing, functionally, from integrated library systems. In particular, concerns that are important to catalogers, acquisitions librarians, and collection management librarians are addressed.

In a presentation in 1985, Richard De Gennaro stated that

> The standard keynote speech at library-technology conferences begins by describing, in glowing terms, the wonders of the new information processing technology and then exhorts the assembled company to embrace that technology or be left behind on the ash heap of the technological revolution.[1]

Visionary articles and futuristic papers on the prospects and promises of library technology have become a standard part of the library literature. Today, automation has become an integral part of the routine operations of many libraries. In this paper, the functional requirements of integrated library systems are examined. Many are currently within reach but not yet commonly available. Particular attention is devoted to the missing elements of library functionality, specifically concerning acquisitions, serials control, circulation, catalog maintenance, collection management, and the online public access catalog (OPAC).

The pace of technological change and innovation is phenomenal. De Gennaro indicates that "what might have been acceptable five years ago is inadequate today, and what looks advanced today will seem primitive in five years. As technology improves and costs go down, we librarians demand additional functions and capabilities and our requirements and expectations always exceed the offerings.[2] The request for proposal (RFP) process for acquiring a system continues to be the primary mechanism for ascertaining the functions available from automated systems. In this paper, eight integrated library systems are described as they existed or were planned in 1989, when the vendors responded to the RFP of the Ohio Library and Information Network (OhioLINK, formerly known as OLIS).

Background—OhioLINK

In 1986, the Ohio Board of Regents formed a Library Study Committee to address the problems of library space to house increased services and burgeoning collections. The board was reacting to a combined funding request from the state-assisted universities in the amount of $120 million for construction and renovation of libraries. The result of this committee's work was the OhioLINK Project, which as currently envisioned will:

1. link university libraries throughout the state so that they will appear to the user as a single resource of some nineteen million volumes,

2. be a gateway to the rapidly expanding world of information stored in electronic formats,

3. allow patrons to learn the status of those materials within minutes, with delivery of material provided by fax or truck within several days, and

4. have the option of managing the purchase of new books and journals in a significantly more efficient manner.[3]

Work began in earnest in 1988 with the establishment of three committees concerned with the views of users, librarians, and systems managers. In turn, five subcommittees were formed to look at the specific functional needs of acquisitions and serials control; catalog creation and maintenance; the online public access catalog; circulation, interlibrary loan (ILL), and document delivery; and collection development and management. OhioLINK's request for information (RF1) was released in February 1989 to more than sixty vendors with the purpose of soliciting information. As a result of information gleaned from this process, the OhioLINK RFP, consisting of more than 3,000 specifications, was released to approximately fifty vendors in August 1989. Eight vendors responded to the RFP by the October 20, 1989, deadline. Innovative Interfaces was selected for contract negotiation in June 1990. Contract signing occurred in May 1991, with system implementation at the first-phase universities beginning in July 1991.

Methodology

The eight systems as they existed or were planned in 1989 when the vendors responded to the OhioLINK RFP are described in this paper. The vendors examined are Ameritech (formerly OCLC Local Systems), CARL Systems, Data Research Associates (DRA), Geac, Innovative Interfaces Inc. (III), NOTIS Systems, Unisys, and VTLS. The enhancements described below reflect individual features that were not commonly available from most of the eight vendors. Individual features that might have become available since the submission of the RFP are not described. Rather, a specific moment in the history of these integrated library systems is pinpointed. In addition, it is assumed that these eight systems reflect the general state of the integrated library system marketplace for academic libraries. The capabilities and plans of other automated library systems are not addressed.[4]

The objective evaluation of RFP responses is difficult. First, there are often subtle

differences between answers. Although some vendors use the terms "not available" and "not planned" interchangeably, these responses generally have a specific meaning that is applied with some consistency *within* an RFP response from a vendor but not necessarily among the different vendors. In contrast, the subtle differences between an answer of "planned, no date available" and "planned, due spring 1990" are apparent. The vendor with a due date has at least given some preliminary planning to the feature, and it usually holds a place on the vendor's development calendar. An answer of "planned, no date" can be either the vendor's legitimate acknowledgement that the specification has merit and will eventually be incorporated or simply a means of increasing the number of positive responses submitted on the RFP.

Second, there are variations in the philosophy each vendor follows when completing an RFP. One vendor identified every specification not currently available as "planned." In addition, that vendor provided little or no written elaboration except where specifically required. Such responses were evaluated with some healthy skepticism. In comparison, the vendor who responds honestly with a mixture of "not available" and "not planned" answers would be penalized In another case, a remarkable similarity between the vendor's written documentation and the OhioLINK specifications was noted. For a particular subsystem, the module was almost entirely in planning. Thus, it was assumed that, if awarded the OhioLINK contract, the vendor intended to tailor the remainder of development for that module to the OhioLINK specifications,

Evaluation of responses must also take into account the primary market of the vendor responding. For example, if the vendor primarily serves large research libraries, its system might have many sophisticated features such as currency conversion for the acquisitions module. However, if the primary clientele is public libraries, features such as storage of search statements in the online catalog might not be available.

The vendor's responses sometimes reveal a company's proclivity for adding the latest technological bells and whistles while leaving the basic elements of the system incomplete. By comparison, another system might have covered the fundamentals very well but lacked the technological advances that generate more excitement.

Another complicating factor in RFP evaluation occurs when a vendor submits a response to individuals familiar with the system. The evaluation is then complicated by the users' ability to question the responses based on intimate knowledge of the system as it exists at their library. This can be both an advantage and a disadvantage for the particular system vendor. Although the evaluation of RFP responses is beset with difficulties, librarians should also view-it as an opportunity to advance the frontiers of library system functionality.

RFP Evaluation: General Themes

Although the OhioLINK RFP is divided into multiple sections covering individual modules of the system, several key elements missing from most systems in use today occur throughout the document. These are the provision of documentation in machine-readable form, and the availability of microcomputer and word processing features such as windowing and spell-checking capabilities.

Documentation in Machine-Readable Form

OhioLINK identified two ways in which online documentation was deemed highly

desirable: the ability to load the automated system documentation into a full-text file made accessible from various components of the system and the capability of accessing online versions of manuals, cataloging rules, format guides, etc., without exiting from the current process. Although system documentation was available online from five of the eight vendors (CARL, DRA, Geac, III, NOTIS), no vendor had taken the next step to develop interfaces with library users beyond the usual help screens. Thus the "spirit" of the specification as envisioned by OhioLINK planners was not met.

Although several of the vendors answered "available" to the second specification (the ability to consult online cataloging tools through "windowing"), the access they proposed was generally limited to viewing valid codes for cataloging fixed fields or online help screens. A project, the Cataloger's Assistant, reported by the OCLC Online Computer Library Centers Office of Research in its 1990 annual report comes closer to the intention of these specifications than the responses of the OhioLINK bidders. This prototype system is based on a Macintosh computer and provides access to (he machine-readable versions of the *Dewey Decimal Classification,* the *Library of Congress Subject Headings* and the OCLC Online Union Catalog.[5] Of the vendors responding to OhioLINK, DRA seemed closest to the desired features in its plans to use *DEC Windows* in its programming. Little detail was provided by other vendors that were planning such access in the future.

Word Processing Features

Word processing features such as windowing and spell-checking capabilities are rapidly gaining acceptance due to the popularity of such features in the office environment. However, incorporation of these features into integrated library systems has been slow. Staff and users have come to expect those same features to facilitate their use of library bibliographic systems. The OhioLINK specifications recognize that such access will compel libraries to use sophisticated microcomputer workstations. NOTIS, VTLS, CARL, and DRA can provide, or are developing, these proficiencies through the use of interfaces to sophisticated workstations from Sun, IBM, and Macintosh.

Windowing

In the cataloging environment, the OhioLINK libraries envision the use of windows for consulting authority files without leaving the record being processed, transferring duplicate data between records using a clipboard (or cut-and-paste) feature, displaying a database record and a potential duplicate record for comparison of fields, displaying cross-references and relevant subdivisions during subject authority work, and displaying relevant portions of cataloging rules while editing a problematic record. In the interlibrary loan area, windowing would permit the simultaneous display of patron interlibrary loan requests while searching the OhioLINK database, OCLC, and other databases to verify the request. In acquisitions and serials control, windows would facilitate the selection of an appropriate vendor from the vendor file while the order is displayed on the terminal. Charles Hildreth has predicted increased use of what he calls "'WIMPs' (Windows, Icons, Menus, and Pointers) at the user interface" in the online catalog as well.[6] Overwhelmingly, the vendors' responses to these various specifications concerning windowing for cataloging were that such access was planned through further development of workstation

capabilities. NOTIS' plans for a technical services workstation holds the greatest promise in this area and will incorporate products such as an online version of the cataloging rules when it becomes available. Interestingly enough, the noncataloging specifications regarding windowing were met with at least five "not available" or "not planned" answers. When an answer of "planned" was given, generally no due date was set. However, VTLS is developing an intelligent front end for users. In addition, Unisys is marketing a personal computer-based tutorial that interfaces directly with an OPAC and uses windows. Nevertheless, it appears that the majority of the vendors do not anticipate extending these windowing capabilities beyond cataloging. PC-based workstations are more costly than dumb terminals, but the benefits in productivity and service improvement cannot be ignored.

Spelling Checker

The OhioLINK specifications call for a sophisticated, language-sensitive spelling checker to alert the technical services staff to typographical errors during editing and manual inputting of records in acquisitions as well as in cataloging. The specific features of this spelling checker incorporate the ability to add or delete new words from the dictionary, the ability to offer suggested spellings for the misspelled word, the ability to report spelling errors in report form as well as online, and the ability to define fields against which the spelling checker will be run. Essentially, the vendor responses to this specification were "not available" and "not planned," Conversely, CARL indicated that it is considering such a feature, but only for its *UnCover* product, which involves the keying of table-of-contents data into a database. Geac makes available an online dictionary for consultation, but the process is not an interactive one and the system cannot detect misspellings.

In the OPAC section of the specifications, a spelling checker that could be invoked by the user was required. Specifically, the feature was expected to identify misspellings and variant spellings in searches and allow corrections without beginning a new search. The vendors' responses and in general their objections to this particular specification were strongly worded, III, NOTIS, and Unisys suggested that authority control with cross-references was a better answer to this potential problem. III also advocated the success of its "synonymization" feature, which is transparent to the user and makes it possible for users to input variant words (such as "theater" and "theatre") and have the system automatically retrieve what is desired. The extremely large vocabulary in large research libraries would, unfortunately, defeat even the most sophisticated spelling checker, Walt Crawford suggested that lists of synonyms or online thesauri that can be consulted by the searcher who is not obtaining results might be the better solution.[6] Regardless of the method eventually selected, OhioLINK support continues for the fundamental principle that users should receive transparent or unobtrusive assistance in overcoming spelling deficiencies or typing errors.

RFP evaluation: catalog Creation and Maintenance

Three major issues emerge from the analysis of the catalog creation and maintenance section of the OhioLINK specifications: augmented bibliographic records, including specialized access points and content information; the input, storage, retrieval, and display of non-Roman

alphabets; and an automated review process to enhance quality control for cataloging.

Augmented Bibliographic Records

Although the OhioLINK RFP does not explore the topic of augmented bibliographic records in great detail, the debate surrounding whether to augment bibliographic records with tables of contents and indexes rages on. Most recently, the issue of whether or not to enhance has created active debate on the *Public-Access Computer Systems Forum (PACS-L)* managed by Charles Bailey at the University of Houston.[7]

The fundamental questions in this debate are: "Can we enhance our standard records to improve online subject searching? And, even if we can, should we?"[8] The overall goal must be that "we do *not* increase the effort and expense of record creation unless we are gaining enhancements that cannot otherwise be achieved through good online catalog design or through improvements in our subject access tools."[9] On the one hand, administrators are pushing for "simplification" and minimal cataloging to reduce backlogs and manage the avalanche of published material. On the other hand, OPAC fans remark how wonderful it would be to have more entries and more notes. Walt Crawford concludes that "budgetary realities suggest that libraries can either include more items in online catalogs or enhance the contents of some items, but probably not both."[10]

The OhioLINK Project seeks to expedite the development of this enhancement by specifying the capability to optically scan printed cards, catalogs, and tables of contents. A digital page-scanning system would automatically read selected tables of contents, edit and format the contents based on rules programmed into the scanning software, and identify the appropriate catalog record to which the data are to be attached. CARL is engaged in the most active pursuit of this feature, related to the UnCover database, with a due date of winter 1990. Essentially, the other vendors responded with "not available" and "not planned" answers.

Input, Storage, Retrieval and Display of Non-Roman Alphabets

The provision of access to non-Roman alphabets is a problem that, until recently, was of consequence to only a very small segment of libraries, primarily research libraries. Those research libraries usually have materials in these languages that are available nowhere else in the United States. With the increased availability of online catalogs via the Internet computer network, demand from scholars for access to these collections is increasing. In addition, the public libraries in this country are responding to the needs of a larger population of users whose language needs span the globe. Additionally, vendors are now experiencing pressure to support this feature as they expand their markets overseas. Romanization of Cyrillic alphabets has been very successful, resulting in improved access. However, the pressure is increasing to provide bibliographic access via vernacular scripts in Chinese, Japanese, Korean, etc.

Although display and printing of non-Roman characters are largely dependent on the output devices available, efforts persist to surmount the challenge of online entry of non-Roman characters. Character entry and encoding are still the fundamental hurdle in this area. As Crawford states:

> Non-Roman characters represent a whole range of problems, depending on the script involved. Some go from right to left rather than from left to right; some require much more detailed displays than Roman characters; some involve tens of thousands of character images.[11]

OCLC, the Research Libraries Information Network (RLIN), and UTLAS have done extensive work in the provision of East Asian vernacular (Chinese, Japanese, and Korean) through their systems. Great progress has also been made with Hebrew characters. Libraries must prepare for a future in which terminals will display these special characters and diacritics clearly and economically by retaining the characters in the database.

Because of the needs of Ohio libraries, the issue of non-Roman alphabets was covered extensively in the OhioLINK specifications. The specifications require the ability to accept, store, retrieve, search, and display non-Roman character sets. Reflecting the current state of this issue, most of the vendors suggested a research-and-development effort with the OhioLINK project concerning original-language displays. Standardization is the major determinant for vendors such as Unisys, which planned delivery of Chinese, Japanese, Korean, and Hebrew as early as winter 1990. Much progress has been made with these four alphabets because they are currently standardized by the National Information Standards Organization (NISO) or are under consideration. Progress has also been one result of the work of bibliographic networks such as OCLC, RLIN, and UTLAS. The vendors' future development in this area will be driven by the work that these networks pursue as well as by alphabets brought under NISO standardization. On the other hand, VTLS was actively developing Cyrillic languages due to its contract with the Lenin State Library in the USSR. Libraries and automated systems have only touched the tip of the iceberg where non-Roman alphabets are concerned. The future challenge of incorporating them in a general database is formidable.

Review Process to Enhance Quality Control for Cataloging

As systems have assumed a larger role in the provision of access to library resources, increased attention has been focused on the quality, completeness, and accuracy of the database. Although systems provide a number of automatic error-detection routines, such as determining the absence or presence of certain types of data, records are reviewed by fewer staff members in an automated environment, and the accuracy of information cannot usually be determined by a computer. Errors that are not detected by the automated system can go uncorrected indefinitely.[12] Errors that occur in access points are of the utmost consequence because "even the tiniest error ... may prevent retrieval of that information entirely and forever."[13] However, quality control and "'reasonable care' [are] not agonizing perfectionism."[14] While it is difficult to ignore the potential for errors that occur in less critical fields, most libraries cannot afford perfection.

To achieve this balance, the OhioLINK specifications are designed to save and route records for review automatically based on a table of options such as password or authorization level. Such a table could automatically save and route the work of a new or junior cataloger to a more senior cataloger, or the system could be programmed to route a particular type of record (bibliographic, holdings, authority) or a record in which a predefined number of errors was identified.

As expected, these features were largely "not available" from, or "not planned" by the various vendors. DRA came closest to meeting the spirit of these specifications by supporting an automatic-review process controlled by the authorization level of the operator. The other vendors generally supported automatic routing of all new cataloging or routing based on the issuance of a specific command when editing each record.

RFP Evaluation: Online Public Access Catalog

Although many of the issues presented above have a direct impact on the OPAC, the issues presented in this section deal specifically with features that OhioLINK libraries have prescribed as necessary for patrons' use. These include storage of search statements; provision of bibliographies in standard, user-selected formats; provision of computer-assisted instruction; availability of a design tool; and linkage of journal citations with holdings data.

Storage of Search Statements

The fundamental principle underlying the storage of search statements is the ability to reinitiate searches at a later date. The patron could reinitiate a search on command, but the system could also periodically resubmit stored search statements and retrieve matching citations that have been added since the last search statement submission. In effect, this new version of selective dissemination of information can be used to maintain a subject or author interest profile, which automatically alerts the patron to new material matching the profile. The most exciting potential for this feature is that once the original profile is constructed, additional staff and user time is not required to advance the identification of new material.

Although not commonly available in 1989, the vendor responses to these specifications were overwhelmingly positive resulting in answers of "planned, due___"most often. CARL planned to introduce Expert Mode Searching, which would permit the user to save a search statement with access limited by identification number and password. The patron would also be asked to designate a "not needed after_____" field to expedite the deletion of obsolete search statements. VTLS expected to support such a feature only on its PC-based workstations and specifically mentioned its continuing development of the capability that allows for the execution of the search statement on records added since a particular date. However, two of the vendors were emphatically opposed to this requirement, with one stating that it was easier to re-enter the search than to search through a database of stored search statements for the correct one.

Provision of Bibliographies in Standard, User-selected Formats

One of the greatest headaches for scholars is the formatting and reformatting of bibliographic information into the standard citation formats required by various publishers. Although many researchers have access to data-processing programs such as *ProCite* that automatically format these bibliographic citations, not all students have access to such sophisticated software. Thus OhioLINK planners specified that the system allow the user to generate a bibliography from a search result in a variety of standard bibliographic formats, including the *MLA Bibliography* and the *Chicago Manual of Style.* The system would display, download, save to a workspace, and print the formatted bibliography.

At least two vendors misinterpreted the intention of this requirement as indicating that the library could decide what elements were to be included in bibliographies and then all patrons would use that format. NOTIS provided the most extensive and accurate answer to this specification, stating that it uses *ProCite* software with formats available for the American National Standards Institute (ANSI), the American Publisher's Association (APA), the *Modem Language Association Style Sheet* (MLA), the *Chicago Manual of Style* and Kate L. Turabian's *A Handbook*

for Writers.

Provision of Computer-Assisted Instruction

The terms *computer-assisted instruction* (CAI), *computer-based education,* and *computer-based training* cover a vast sphere of activity occurring in libraries today. Projects such as the HyperCard staff-training program developed at the University of Tennessee, the Information Machine and the Index Expert System developed at the University of Houston, and the Gateway To Information front end to the OPAC developed at the Ohio State University Libraries fit into the category of computer-assisted instruction. However, most of these projects to date have been instigated by individual libraries, not systems vendors.

Vendor responses to OhioLINK specifications revealed at least two projects under development. Both Geac and Unisys are developing self-paced demonstrations of their systems that will be particularly useful for new users. However, at least one vendor indicated that its system was not intended as a system for providing instruction in bibliographic research or other topics and was so easy to use that CAI products were not needed. Crawford provides a compelling argument to challenge this assertion:

> Online tutorials represent little overhead for a system and considerable value for the user. Even if a specific tutorial is used only once or twice a year, it will probably require only as much disk space as one bibliographic record and call for only a single index entry. Good online tutorials offer an inexpensive way to educate users when they want to be educated.[15]

Availability of a Design Tool

In the past, many projects such as online tutorials and other computer-based instruction projects were developed by systems designers and incorporated in a basic system product. To stimulate development at the library level, OhioLINK specifications require the availability of a design tool that can be used without vendor assistance. For example, such a design tool would enable the library to develop search flows based on system responses and inform the user that it had performed a search in another index. Thus a subject search with no results would move automatically to a title keyword search. Although most of the vendor responses to the general specification concerning the availability of a design tool were "available," it was not clear whether the design tool could be used without vendor assistance or advanced system-based knowledge. Ameritech and Unisys suggested a research and development project with OhioLINK, while CARL recommended that such a tool be provided for use by trained computer operators at the OhioLINK central site.

Linkage of Journal Citations with Holdings Data

> Given the expanding use of online databases as a basic tool in the inquiry process, library patrons are increasingly approaching serial literature from the article-specific level….Patrons are rarely concerned with how a title has been cataloged or whether the library owns a particular volume or issue of a serial. Rather, they want to determine whether or not the library has a desired article.[18]

To this end, OhioLINK patrons should be able to determine local and OhioLINK-wide

holdings and availability of items retrieved through a search of the catalog. For example, when a citation is retrieved from a citation database search, holdings and availability can be determined as a second step in the search process but without requiring the user to enter the journal title separately.

The CARL system has addressed this issue most completely for the titles held in the UnCover database and those indexes that have been folded in or linked to UnCover. The strength of the CARL system lies in the relationship of check-in records to actual journal contents. NOTIS has also made progress in this area with the release of its Multiple Database Access System (MDAS) in 1990. MDAS allows NOTIS system users to search locally mounted databases with the same commands that they use to search the online catalog and then display local location, call number, order status, and holdings information for the journal in the OPAC.[17] Although Innovative Interfaces was still in the planning stage of this feature, the company viewed this as one of the most exciting parts of Ohio LINK. Specifically, the location of an individual article would be provided seamlessly to the user through the linkage of the serials control module with the journal holdings file in the public catalog. Despite the fact that this specification was not widely available in 1989, it is ranked high on the list of enhancements for most vendors.

RFP evaluation: circulation, Interlibrary Loan, and Document Delivery

This portion of the RFP deals with a fundamental building block of the OhioLINK system. Through interlibrary loan and document delivery, the OhioLINK system plans to provide transparently library materials from the combined holdings of the state-assisted universities to scholars and researchers throughout Ohio. For example, a researcher from the University of Cincinnati can locate, request, and receive material from the University of Toledo within seventy-two hours,

OhioLINK Loans

The term *OhioLINK loans* is applied exclusively to the process of borrowing and loaning material among the OhioLINK libraries. When a patron initiates a checkout request for a title not held by the local library but owned within the OhioLINK system, the material in book form is planned for delivery within seventy-two hours, including items located in storage facilities. Journal articles are planned for delivery daily via telefacsimile or in digital form. The system is expected to evaluate the patron's status before approving the checkout or renewal. If the transaction is blocked, the patron will be prompted for an appropriate action, e.g., return the book, contact the circulation desk, etc. If the patron has requested delivery, the system will indicate the method of delivery, e.g., via campus mail or delivery to the patrons library for pickup. The system will track the progress of the delivery of the loan by assigning appropriate transit codes allowing the library to know where its material is at any given time. When an item is returned to a library other than the one from which it was checked out, the material can be discharged and assigned a transit code, thus relieving the patron of responsibility for the item. When the item reaches its home location, the transit code can be deleted.

In cases where the user locates a journal citation in an auxiliary database for an article that is not available in the patrons local library, the system will automatically respond with a

menu-based ILLworkform to facilitate the delivery of the document to the patron. The menu-based workform will contain only those fields the patron needs to complete, such as the bibliographic citation, maximum charge willing to pay, expiration date of the request, and source of the citation. The patron's work-form will be reconfigured in to a staff work-form when it is retrieved by the ILL department. A cover page including fields for citation, patron information, date and time request was made, and the method of delivery requested by the patron will be printed by the system to accompany each journal article or chapter of a book being delivered. The cover page also will include blank fields to be completed by staff, such as date and time of fax transmission.

From the vendor responses it was apparent that supporting interlibrary bans as envisioned by Ohio LINK was only "planned" for most systems in 1989. For example, transit codes beyond the basics of "in process" and "in cataloging" were not commonly available. However, the NOTIS system was developing an interlibrary loan module that would interface with the circulation component and would provide many of these requirements. The idea of providing cover pages to accompany article delivery was virtually nonexistent, with only four vendors answering "planned" and the remaining four answering "not available." Much work remains to bring this aspect of the Ohio LINK system to fruition.

Interlibrary Lending and Borrowing Outside OhioLINK

Due to the size of the OhioLINK database (approximately nineteen million volumes), it is expected that a large proportion of the ILL needs of the institutions will be met within the system. In fact, at the Florida Center for Library Automation, which serves Florida state universities, 68 percent of the interlibrary borrowing and lending is reciprocal within the state.[18] Nevertheless, OhioLINKs commitment to participation in externa) interlibrary loan systems, particularly OCLC and National Library of Medicine (NLM), is reflected in RFP specifications that support electronic transmission of ILL requests to these external databases. The gains made through patron initiation of interlibrary loan requests would be obviated if OhioLINK were unable to transfer electronically those requests to OCLC or NLM as needed. The features sought for OhioLINK loans such as cover pages to accompany journal articles were required for external ILL processing as well.

III, Ameritech and NOTIS were the most outspoken in their support for interfaces with external interlibrary loan databases. However, the issue of whether formatted information could be uploaded and downloaded between the local system and the external database still needs to be explored. DRA showed strong support for the NISO Interlibrary Loan Data Elements Standard Z39.63, indicating its intention to implement once the standard was approved and adopted. Only two vendors indicated that interfaces with OCLC and NLM were "not available."

Copyright Compliance and Monitoring

As cooperative collection development and access to information via citation databases increases, the role of libraries in guarding against infringement of copyright when requesting photocopies of journal articles will intensify and become more time consuming. It is imperative that future automated systems include mechanisms to monitor this activity and alert staff to potential violations. Passive reports listing requests for titles that approach the copyright limit require staff review to detect violations of free use.[19] Instead, OhioLINK's approach is a proactive one, in which the operator is alerted to requests that exceed fair use as they are being processed so

that methods such as compensation to the Copyright Clearance Center (CCC) can be used to comply with the copyright law. Menu-based workforms to simplify copyright compliance may appear on the screen for staff completion in interlibrary loan as well as in reserve room operations. Reserve room records include data on the status of copyright permission for the copies such as "on-order from a copyright clearinghouse," "writing for permission," and "permission received and filed." CARL comes closest to meeting these specifications due to an arrangement with the CCC in connection with the *Un-Cover* project. At least four vendors responded "not available" with no additional explanation of plans to provide this enhancement. Those vendors who responded with an answer of "planned" also did not provide details.

Patron-Initiated Functions

In a recent message to the *PACS-L Forum* concerning the Illinois library network ILLINET, Bernard Sloan reported that patron-initiated circulation transactions for November 1990 totalled 41,485.[20] These statistics support the belief that patron-initiated circulation is, and will be, a very popular feature of any automated system. The OhioLINK specifications stipulate a number of functions that can be initiated by the patron without staff interaction, including the ability to list items checked out to the patron and to renew materials. In addition, the system will block the renewal of material if exception conditions such as holds are detected and inform the patron of action required.

Although most of the OhioLINK vendors planned to permit patrons to display a list of the material checked out to them, several vendors exhibited more hesitation about patron-initiated functions such as renewal. For example, III expressed concern about public relations issues that might mitigate against having patrons process their own transactions as well as concern about how to protect patron passwords. DRA as well planned to limit most of these functions to staff only. On the other hand, CARL, reflecting the "planned" response of many of the other vendors, anticipated the release of a component in summer 1990 dealing with user-driven interlibrary loan that would meet most of these specifications. Unisys and VTLS had most of these features in their existing systems.

As an obvious extension of the concept of patron-initiated functions, the OhioLINK project supports the use of electronic mail and other means for patrons to interact with participating libraries. Patrons should be allowed to send signed or anonymous messages to the system expressing their complaints or offering suggestions. Ideally, the electronic mail system would be interactive with the catalog and other subsystems, allowing users and staff to transfer information located in the system to the electronic mail component to avoid rekeying of data. Patrons should be encouraged to place holds on material not currently available and to suggest items to be purchased. Finally, patrons should be given the opportunity to ask for reference assistance without coming to the library.[21] The primary advantages of electronic mail systems used in this manner are the savings in time and money; the ability to access the system from anywhere at any time, regardless of the library's location or hours of operation: and the immediate delivery of electronic mail.[22]

Although all the vendors responded that electronic mail systems were available with their systems, it was not clear to the OhioLINK planners that these systems were extensive enough to permit staff-to-user and user-to-staff communication at the levels required by OhioLINK. NOTIS proposed a somewhat different approach to this specification by recommending the development of electronic mail interfaces that would connect the universities' existing electronic mail systems. However, in a multi-institutional environment like OhioLINK, this could mean seventeen unique

interfaces. In addition, any change of e-mail systems on an individual campus would require the development of a new interface to maintain the system proposed by NOTIS.

RFP evaluation: acquisitions and Serials Control

In acquisitions and serials control, the five areas that require attention include the conversion of existing records to a new system, interfaces with a variety of vendors and products, a refined secondary search match for duplicate detection, enhanced serials check-in, and serials renewal prediction and cost projections.

Conversion of Existing Records

Because a number of the OhioLINK libraries have already completed the tedious process of converting bibliographic, holdings, and check-in parameter data into an automated system, a general specification was included in the RFP to provide for the automated conversion of these records to the new system. Although the specifications call for the conversion of order records as well as serial check-in records, the high cost of conversion and the inevitable loss of information led to a decision by the Acquisitions/Serials Control Subcommittee to emphasize the importance of the serials check-in records and concede to vendor concerns that order conversion is not worth the time and effort required. Jean Houghton coined the phrase "payment system migration" for the process of electronically moving payment histories from one automated system to another[23] Although not covered by the OhioLINK specifications, the ability to transfer these histories would greatly enhance the collection management analyses that are anticipated with OhioLINK without having to wait the requisite number of years to build that data into a new system.

The vendor responses to this specification have been predictable. Custom programming for each unique system to be converted was proposed with costs for such a project not included in the OhioLINK Did. VTLS was particularly confident that conversion could be completed through custom programming to map data from any system into the coded and free text fields of the USMARC Format for Holdings and Location. Others such as NOTIS were more emphatic in their "not available" answers.

Interfaces

CD-ROM and online products such *Books in Print Plus* for publisher availability, Baker & Taylor's *BT LINK* for inventory availability, and Faxon's *BookQuest* and Se*rialsQuest* for out-of-print and serial back issues are appearing in acquisitions and serials departments as stand-alone tools. "The full value of CD-ROM products will not be realized until they are completely integrated into technical service operations."[24] As a result, one of OhioLINK's goals is greater integration of these tools with the automated acquisitions and serials control system. The ability to download relevant information would eliminate the tedious verification and rekeying of data and reduce keying errors. In addition, the library is often precluded from using the electronic transmission features of these products because no interface with the acquisitions system exists.

Libraries should be able to issue cancellations, claims, and orders to vendors without

leaving their automated systems. In response, systems should accept the online acknowledgement of these items, as well as status reports and claim responses, by automatically recording them in the library's system. At this stage in the automation of the claiming process, "only the first half of the transmission has been automated. There is automated support for sending claims to the vendor, but no such support exists for handling the vendors response,"[25]

DRA provided the most encouraging answer to these specifications, indicating a current project with Baker & Taylor to transmit orders and receive acknowledgements electronically. NOTIS was working on the acknowledgement of orders, cancellations, and claims with Faxon and EBSCO. CARL planned to release a new feature to facilitate the online transmission of claims and cancellation files to major vendors. NOTIS has also worked with Southwest Missouri State University and Blackwell North America to load new title announcements, including author, title, and subject descriptor, into a local area network environment. One can hope that the next step will be to incorporate these announcements into the OPAC or acquisitions system.

Online access to binders' automated systems with downloading and uploading capabilities as well as interfaces with institutional accounting systems were specified in the OhioLINK RFP. An online interface between the integrated library system's binding module and the vendor's automated system would eliminate the need for transferring information on paper. In addition, the library could more effectively track the progress of material at the bindery in response to patron requests for material. CARL was the only vendor who had an existing interface with a binder's system, specifically the Denver Book Bindery. The majority of the other vendors responded that this specification was "planned," usually involving custom programming as needed.

Interfaces with institutional accounting offices offer many opportunities to eliminate duplication of effort while improving the accuracy and synchronization of financial records. Because the library's internal system is an unofficial record, the often painstaking information recorded in it must become part of the official system, usually through a paper trail. Reconciliation of the official accounting reports with internal records rarely occurs in a timely fashion. Unfortunately, the barriers to communication between accounting systems are not always technical. There are many cases of the library being prepared to pursue this development but the institutional accounting office being resistent and adamant about the retention of longstanding paper methods. Again, custom programming is usually required for *most* vendors to develop interfaces with the myriad accounting systems encountered in institutional accounting offices. Both Unisys and NOTIS have existing interfaces with a single user.

Refined Secondary Search Match for Duplicate Detection

The first level of automatic duplicate detection occurs when a match on a title identifies a potential duplicate. However, for acquisitions and serials work with many common titles, this first level of detection is often inadequate. The OhioLINK specifications require a secondary search match using full or truncated author or main entry fields (1xx), publisher, and date. Although success in this area has eluded vendors for many years, it would appear from the vendor responses that progress is being made. For example, CARL uses an algorithm that compares OCLC number. Library of Congress Classification Number, International Standard Book Number/International Standard Serial Number, author, and title to determine potential duplicates. However, the process proposed by Geac comes closer to the goals of the OhioLINK requirement. Once a duplicate is located at the first level of detection, the operator will issue a command to March and compare the additional data elements of the two or more matching records. Only those records that continue to

have matching elements are reported. The majority of the vendors simply present a list of potential duplicates {based on title matching) that the operator must evaluate.

Enhanced Serials Check-in

Three of the OhioLINK specifications reflect needed improvements in serials check-in—the implementation of the Serials Industry Systems Advisory Committee (SISAC) barcode, an alert to prompt the revision of check-in parameters, and the ability to upload serials holdings to union lists. The SISAC "barcodes on individual issues offer the possibility of scanning and automatically checking in issues, and so alleviate some of the danger of operator error."[26] The standard is in the final stages of approval. Kluwer, Elsevier, and Pergarnon already either print the barcode on issues or are committed to its provision in the near future. Vendor responses to the requirement for support of the SISAC barcode reveal a "wait-and-see" attitude that is not uncommon until a standard is fully accepted. DRA expressed the sentiment behind most of the vendor responses by indicating its commitment to implementing SISAC standards, once approved.

In another enhancement to serials check-in, OhioLINK specifications require the provision of an alert that check-in parameters might need to be revised based on past receipt patterns. There has been much discussion in the serials community about overclaiming as a result of automated serials control systems. A delicate balance is required to maintain credibility with subscription agents and publishers while remaining fiscally accountable for serial expenditures and receipts. James Rash has asserted that mechanisms to predict the next issue should be accurate for 90 percent of the tides received. However, he indicates that, in reality, most are only 60 percent effective. Understandably, "a system that cannot accurately predict the next issue of a serial cannot reliably indicate when that issue is overdue and should be claimed."[27]

Vendor responses to this specification betray a lack of understanding of the intent of the issue. With the exception of CARL, the "planned" or "available" answers dealt only with the ability to maintain receipt history online. However, CARL's "spinning" feature comes closest to dealing with the difficulties in determining predictions. "Spinning" copies the previous year's re-ceipt pattern to the next year, thus eliminating some of the guesswork inherent in the prediction process. Unfortunately, this process alone does not take into account internal or external circumstances that have affected the receipt of the title apart from its publication pattern.

Finally, the OhioLINK specifications require the ability to upload serials holdings from local systems to the OCLC Union List System; the NLM SERHOLD database; and other regional, local, and campus serials lists. Growing recognition that access is a realistic alternative to ownership, as well as the increased access to citation databases linked with journal holdings in the OPAC, has caused libraries to pay increased attention to the completeness and accuracy of serial holdings in their local systems. Legitimate fears that libraries will abandon their commitment to bibliographic networks such as OCLC and RLIN are being extended to the maintenance of union lists as well. This upload capability is the only way in which libraries can maintain their commitment to union lists on a long-term basis. Ideally, when a local systems detailed check-in is completed, the information can be collapsed and transmitted to a regional, state, or a national database.[28]

All of the vendor responses to this specification were "planned" or "not available." Specifically, CARL expressed confidence in its ability to transfer these data, given their success with other types of data transfer. Both Geac and NOTIS indicated that this feature was one of their long-term development goals. Unisys proposed cooperative development with OhioLINK while

III correctly noted that OCLC currently could not accept such uploads on an ongoing basis.

Serials Renewal Prediction and Cost Projections

Published cost studies are of limited use for most libraries in budget projection, because they reflect data on general costs and not the library's unique mix of titles. Predicting how much money is needed to cover serial renewals demands accurate data as the basis for further analysis by the automated systems. One of the fundamental difficulties with using data from automated systems for cost projection is consistency, This does not mean whether an invoice is paid in July or November, but rather whether it is paid on the same basis every year. Successful projection also depends on a large enough statistical pool to blur inconsistencies, or a small enough pool to do an item-by-item check.[29]

Given these competing needs and concerns, the OhioLINK specifications require the preparation of serial renewal cost projections by individual title. Calculations of projected costs use previous payment data and anticipated proportional increases supplied by the library. Individual variations based on data such as country of publication and payment history can be accommodated. Among the OhioLINK vendors, only Geac and III plan to provide this specification. The III program that calculates renewal costs was released in February 1991; however, its projections are not on an individual title basis. The Geac program is under development, but given the availability of this feature in the earlier Geac system, expectations for similar features are high.

RFP evaluation: collection Development and Management

The fundamental concept behind the specifications in the collection development and management section were to convey a sense of the data to be retained and the general types of analysis required. Much of this data is normally considered transitory and not retained by automated systems. It was the intention of OhioLINK to convey early in the vendor-selection process that new demands for storage and analysis would be required for the OhioLINK libraries to provide collection management data. Three areas pose a challenge to the current state of automation in this field: online mounting of the North American Collections Inventory Project (known as the Conspectus), collection measure analysis, and a collection managers' workstation.

North American Collections Inventory Project (Conspectus)

The specifications call for the maintenance of an online North American Collections Inventory Project (NCIP) conspectus database, including subfiles, for conspectus data from each OhioLINK institution. By way of definition, NCIP "relies on a *computer* database of data about collection strengths and weaknesses where information about collections is recorded by LC call number."[30] For each subject descriptor, participating libraries assign a code (0 through 5) for their level of easting collection strength and a code for their current collecting intensity. The Ohio-LINK specifications go a step further in requiring the mounting and integration of that database with the OhioLINK system.

The vendor responses to this requirement were an odd mixture of "available," with the

necessary caveats, and "not available." Although CARL answered "not available," it indicated its willingness to add this to its development schedule and elaborated that it had completed a collection-analysis project for CARL member libraries using the conspectus. Ill suggested that the database simply be mounted as another database on the system. The details of how to integrate the database with the online system were not addressed.

Collection Measure Analysis

Collection measure analysis includes the ability to collect and summarize data on individual institutions to provide comparative information. It is in this area that the transitory nature of much of the information desired comes into play. For example, the system should gather data on items circulated, their frequency of circulation, reserve room waiting time, in-house use, items sought but not found, and titles that have not circulated in a given period of time.

Recent serials cancellation projects have raised faculty awareness about the costs of selected journals. However, the review process would have been enhanced if circulation and usage information could have been integrated with the cost data from the acquisitions and serials control system. Add the incidence of ILL requests for titles, and libraries have a powerful, management-oriented tool to justify difficult decisions. In the final equation, it is the system's ability *to* capture and massage transitory data and "die sophistication of the report generation facility ... [that] will determine how much of this information can be generated automatically and presented in a form that allows comparative assessment."[31]

Vendor responses to the entire collection management section revealed the inadequate level of understanding of collection management that exists within the vendor's organization. Ameritech's ties to OCLC resulted in its use of the OCLC Collection Analysis CD-ROM to address these specifications. Most of the other vendors anticipated using their report-generation software and cooperative development efforts to meet these specifications. In fact, CARL's answer that it can retrieve and analyze virtually any data, so long as they are available in defined fields and entered consistently, reveals the root of the problem—data must be in defined fields and entered consistently. None of these answers were entirely satisfactory to OhioLINK, and considerable attention is being paid to ensure that data are captured initially so that analysis capabilities can be added to the system at a later date.

Collection Managers' Workstation

Although the OhioLINK specifications did not call for a collection manager's workstation as envisioned here, the groundwork was laid to provide the elements and linkages necessary to see such a project to fruition. Increasingly, the interfacing and analysis capabilities of automated systems are moving libraries closer to this reality. For example, artificial intelligence techniques could be applied to bibliographic databases in the acquisitions environment to "facilitate collection development by suggesting titles for purchase, to develop profiles of buying patterns, or to produce selection lists somewhat like an approval plan."[32] After searching external databases such as *BIP Plus,* the collection manager could download relevant data on availability, including reviews, into a selection request file. Once a final decision to purchase is made, those data could be uploaded to the acquisitions system, which would verify the electronic signature of the collection manager and authorize the addition of the title to the order file. Selection profiles could he

developed by downloading enrollment data, research grants and project data, and data on faculty productivity from administrative academic records.[33] Collection development policies and manuals describing policies and procedures for acquisitions and collection management in machine-readable form would be readily at hand for consultation.[34] Lynden and Welsch provide extensive descriptions of additional features imagined as a part of these workstations .[35,36]

Conclusion

The ILS as it existed in 1989 lacked general features such as documentation in machine-readable form and sophisticated word processing features. Augmented bibliographic records, non-Roman alphabets, and enhanced quality control for the cataloging process represented the future for cataloging modules. Capabilities for enhanced user features such as storage of search statements and linkage of journal citations with holdings data can be expected as standard features in the 1990s. Circulation development can be expected to focus on extended resource sharing, copyright compliance, and patron-initiated functions. Acquisitions, serials control, and collection management systems will be enhanced to improve access to material at all stages of the selection and acquisition process.

Existing integrated library systems establish a firm foundation from which libraries can build for the future. Many of the early growing pains are behind us, but the next steps will have their own dilemmas, turning points, and obstacles to be overcome. As Richard De Gennaro has said:

> The point is that our field thrives on visions. Some of those visions turn out to be pipe dreams; others .. . eventually become realities—one way or another. The fun and frustration of it all is that it is so hard to distinguish the pipe dreams from the prophetic visions----Our task is to pool our knowledge so that we can do a better job of telling one from the other.[37]

The OhioLINK Project is the beginning of that vision for the state of Ohio.

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