The Triangle Research Libraries Network

Joe A. Hewitt

The Triangle Research Libraries Network (TRLN), now entering its fifth year, has been described to professional audiences in North Carolina on a number of occasions. For that reason, one assumes that readers of *North Carolina Libraries* are familiar with TRLN's origins as part of the long history of cooperation among the libraries of Duke University, North Carolina State University (NCSU), and the University of North Carolina at Chapel Hill (UNC-CH). This article will focus on TRLN's concrete objectives, its current status, and plans for the future.

Objectives of Project

TRLN's immediate objective is to create a prototype, state-of-the-art, research library network consisting of linked on-line catalogs. (The on-line catalog being developed by TRLN has been named the Bibliographic Information System or BIS.) Each library will operate a BIS supporting its own data base on an in-house Tandem computer; the systems will be linked through telecommunications facilities to form a distributed network. Users at each campus of the network will have access to each catalog separately and to the combined catalogs as if they were a union catalog of the three collections.

Long-term plans include the implementation of circulation, acquisitions, and serials control subsystems to operate in an integrated way with the Bibliographic Information Systems. TRLN is not committed to developing original software for these subsystems. For each function, we will investigate availability of source code or design specifications suitable for adaptation to Tandem and BIS environments. As of this writing (February 1984), TRLN is negotiating with a consultant to conduct a study aimed at identifying circulation software potentially usable by TRLN.

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Systems Characteristics

In order to get an accurate perspective on TRLN systems within the broad framework of library automation, it is useful to focus on the major distinguishing features of the project, which are noted briefly below.

1. TRLN development has focused on the on-line catalog as the core and first module of an integrated system rather than beginning from a peripheral application such as circulation. It is expected that this approach will lead to an on-line catalog which is free of limitations resulting from basic design decisions oriented toward other functions. The main thrust of TRLN's original software development will continue to be the on-line catalog and its future enhancements. It is in this area that TRLN hopes to establish a position of leadership among research libraries.

2. TRLN systems are being designed to address the needs of research libraries with large and rapidly expanding collections, complex organizations, and demanding clienteles. TRLN systems will accommodate an organizationally complex library system with scattered specialized collections using a variety of cataloging rules and classification schemes. Thus the BIS will represent physical holdings and bibliographic relationships to a level of detail sufficient to handle research library collections. The relatively expensive Tandem computer was chosen because of its redundancy, reliability, and expandability.

3. TRLN systems are being designed to meet the unique needs of each TRLN library, but at the same time to serve as a node of a local area network which, in turn, will be capable of linking with other local networks, state and regional networks, and national bibliographic utilities.

In general, then, TRLN should be regarded as a large-scale, complex, and somewhat expensive system explicitly designed to meet the needs of research libraries. We have completed no studies to determine the minimum collection size at which a TRLN system would be cost-effective. BIS and peripheral TRLN systems must be more fully developed before such a study could be done with

any degree of precision. TRLN staff, however, intuitively accept the figure of five hundred thousand volumes as the minimum below which a TRLN system would not be worthwhile, either for an individual library or for a group of libraries using a single TRLN system.

TRLN should also be viewed as a system designed to be a research library node in an open-access, wide-area network providing a variety of levels and types of access to all potential users of the collections of the primary members. More on this aspect of TRLN is included below under the heading *Linking and Access.*

Current Status

A long-standing and sometimes overused TRLN slogan is "providing short-term benefits while working toward long-term goals." Although abused, this phrase does tend to describe the current status of the TRLN project. TRLN has operated serviceable systems since the fall of 1980 while at the same time making considerable progress toward the development of the TRLN Bibliographic Information System.

The Archive Tape Processing System (ATS) and the Online Editing System (OES) have allowed TRLN libraries to build and maintain their bibliographic and holdings data bases for the BIS, thereby avoiding a major project at the time of implementation. Validation modules, inherent components of both the ATS and OES, provide quality control over the contents of the data bases. As of February 4, 1984, the size of the TRLN data bases aggregated to 1,047,379 records, distributed among the TRLN libraries as in Table 1.

Other operational systems include the COM catalog production system and the report of recent acquisitions. Two TRLN COM catalogs have been produced. The latest, distributed in February 1984, consists of 657 fiche and includes author, title, and subject listings. Four-weekly lists of recently cataloged titles arranged by location and call numbers

are produced and distributed to TRLN libraries, which in turn duplicate the lists and make them available to faculty, students, and staff.

The ATS, COM production system, and the recent acquisition service operate on the UNIVAC 90/80 at Administrative Data Processing at UNC-CH. (The ATS and recent acquisition service are being reprogrammed to run on the newly installed IBM 3083.) The OES, considered the predecessor of the BIS, operates on the Tandem NonStop II Computer located in the Davis Library at UNC-CH.

A great deal of effort on the part of TRLN Systems Advisory and Cataloging Policy Committees has gone into the development of functional specifications for the OES and the BIS. This work represents, we believe, one of the most thoroughly documented library systems design efforts at the functional level in existence. The results of this work are contained in a set of system design documents available from TRLN for the cost of duplication.

The BIS will be brought up in stages beginning in the summer of 1984. The first segment, expected in July, will include author, title, and series access as well as access by various control numbers. Call number access and shelf list browsing is planned for early fall 1984; subject access by controlled subject terms is due late in the fall, followed by the development of enhanced subject access, including Boolean operators and use of a variety of delimiters for restricting retrieval sets. Detailed design of the circulation subsystem will begin in September 1984. The target date for implementing the circulation subsystem cannot be predicted until it is known whether original software must be written or already existing programming can be adapted. Preliminary investigation of potentially useful acquisitions and serials control software will also begin in the fall of 1984.

Space does not allow a detailed description of the features of the TRLN on-line catalog. It should be noted, however, that a number of features presumed to make a system "user friendly" are planned. These include choice of guided and com-

	TABLE I		
	Distribution of TRLN records		
	Jan. 7	Feb. 4	Growth
Duke Perkins	170,938	174,390	3,452
Duke Law	16,401	16,666	265
Duke Medical Center	843	1,027	184
Duke Business	1,469	1,922	453
NCSU	430,645	433,041	2,396
UNC-CH Academic	358,094	362,505	4,411
UNC-CH Health Sciences	55,820	57,828	2,008
	1,034,210	1,047,379	13,169

mand modes; generous use of instructional and help messages; choice of display formats; limiting of searches by date, language, etc.; searching by specific collections and collection subsets; and so on. We expect that the BIS, as an on-line catalog, will be equal to other on-line catalogs in most respects while being superior in some, which is to be expected of what is conceived as a second generation system. System deficiencies, of course, are not being planned and cannot be described in any specific way at this time.

In predicting the availability of TRLN systems, a distinction must always be made between the completion of a segment of software and the availability of sufficient hardware, particularly storage space, to actually operate the new component. This is especially the case as long as the systems for all TRLN libraries are operated on the same computer at UNC-CH. The projected dates noted above are for completing the coding of software modules and their testing on small test files. Actual implementation could be delayed, perhaps considerably, by lack of funds to acquire disk drives. Current plans call for mounting the UNC-CH data base for a full-scale field test of all BIS components while simultaneously maintaining the Duke and NCSU files on-line in BIS format for data base maintenance. Potential outside users of TRLN should be aware that the network will not be fully operational until Tandem computer systems have been installed in all TRLN libraries. Although steps are underway to acquire hardware at Duke and NCSU, the timing of the required funding is still uncertain.

Organization and Financial Support

The TRLN libraries recognize that local development of a system on the scale of the BIS involves a long-term commitment to software maintenance and enhancement. Like all such systems, the BIS will be an evolving system under constant pressure to adjust to the external networking environment, to various standards as they are developed, to new generations of computing equipment, and to the growing demands of users. This substantial commitment can only be met by continuing institutional funding and by an organization capable of operating a stable network. The soft-money financing and relatively informal organization which have characterized TRLN as a developmental project will no longer be appropriate when TRLN makes the transition to an operational network.

In the past year TRLN has made considerable progress in terms of both funding and organization. Prior to fiscal year 1983/84, TRLN's principal support came from the Department of Education's Strengthening Research Library Resources Program (Title II-C). In 1983/84, UNC-CH Academic Affairs Library was able to include in its continuing budget the cost of two systems positions as well as funds to maintain the Tandem computer being used for development. Additional funds for computing equipment were also made available. The UNC-CH Health Affairs Library assumed the cost of one programming position. NCSU added another programming position to the staff assistant position they had been funding for some time. Duke took steps to work support for the remaining TRLN positions into its budget cycle when Title II-C support ends in October 1984. These steps, taken together, ensure the continuation of TRLN at least on the scale that it has existed in the past.

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TRLN's overall strategy will be for each institution to maintain its own on-line catalog while making a contribution to the central TRLN organization which will supply software maintenance and other technical support. Means to meet the second obligation are in place or planned, but major funding hurdles remain with respect to acquiring hardware at NCSU and Duke. It is expected that this funding will be acquired through special institutional allocations or through foundation grants. Administrators in TRLN libraries are optimistic about recent initiatives in both directions, but funding for all nodes of the network remains an area of uncertainty at this time.

Throughout 1983 the TRLN Organization Committee and the directors of the TRLN libraries worked on an instrument for establishing a formal TRLN organization. As a development project, TRLN operated through a relatively structured organization but one based ultimately on an unwritten understanding among the library directors. As the time approached for a major investment of institutional funds, it became evident that a more formal agreement and organization were necessary for the governance and management of a network. A number of alternatives were explored including establishing TRLN as a not-for-profit corporation. The form chosen was an unincorporated consortium based on a *Memo-*

randum of Understanding signed by the Chancellors of the three institutions, with one of the members acting as host institution and legal agent. As of February 1984, the draft *Memorandum* had passed review at all levels of the three universities and was being prepared for signing by the chancellors.

The *Memorandum of Understanding* establishes a Governing Board consisting of the chief officers of each member library, plus one university administrative officer appointed by the chancellor of each member institution. The member libraries are defined as those institutions' separately administered libraries which are members of OCLC. Thus the charter member libraries of TRLN, each with Board representation, are the Fuqua School of Business Library, Law Library, Medical Center Library, and Perkins Library at Duke; the Academic Affairs Library and Health Sciences Library at UNC-CH; and the D.H. Hill Library at NCSU. It is anticipated that the board will act by consensus, but when a position supported by consensus cannot be found, the board will vote by institution, with an unanimous vote of the three institutions required for action.

The *Memorandum of Understanding* also establishes the position of TRLN director to manage the network and report to the governing board. The creation of this position serves to separate TRLN management from the administration of the host library and to consolidate management responsibilities previously shared by the associate director for technical services at UNC-CH's Academic Affairs Library, the TRLN library systems analyst, and the assistant director of administrative data processing at UNC-CH.

The *Memorandum* continues many of the proven organizational features of TRLN. The coordinating committee will continue in its role of overseeing the design and operation of TRLN systems through a series of advisory committees made up of staff of the member libraries. The chairmanship of the coordinating committee, until now closely associated with the position of coordinator of the Title II -C projects, will be chosen annually by the members of the committee. Both the TRLN director and the chair of the coordinating committee will attend meetings of the governing board.

UNC-CH has been designated host library for an initial term of three years. Subsequent terms of three years will be arranged with the mutual consent of the governing board and the library which is willing to serve as host. TRLN staff, until recently divided between quarters at Wilson Library and UNC-CH Administrative Data Processing, are now housed in UNC-CH's new Davis Library, as is the TRLN Tandem computer. Permanent quarters for the UNC-CH node of the network (and for TRLN staff, if UNC-CH's term as host library is extended) will be constructed in Wilson Library as part of the Wilson renovation project.

Taken together, these steps to secure funding from the institutions and to establish a formal TRLN organization have placed TRLN on a foundation far sounder than that provided by soft money during the early developmental years. That financial and organizational support will allow TRLN to become a stable component in a statewide network along the lines recommended by the King Research report and now being developed by the North Carolina Network Steering Committee. Just what TRLN's role should be in such a network is subject to definition, but as the following section suggests, TRLN will provide capabilities for accessing the state's largest collections, which can only be useful in such a networking effort.

Linking and Access

TRLN has always pursued a number of goals which reflect a variety of internal and external interests. On each campus there is a need to provide access from branch libraries to the holdings of the main library, both to allow habitual users of specialized libraries to make greater use of the total resources of the institution and to allow greater coordination of collection development within each library system. There is also a need on each campus to capitalize on the widespread availability of terminals and microcomputers in departmental and faculty offices in providing access to library collections.

Among the campuses there is a need to provide mutual access to collections to support long-standing programs of coordinated collection development and to allow faculty and students to approach the three collections as a single integrated resource. Users in the Research Triangle Park, particularly at the National Humanities Center, also need improved access to the collections of the research universities. At the same time, there is a need to make the research resources concentrated in the triangle area accessible to potential users throughout the state. Related to these needs for accessibility to the collections of TRLN libraries is a need to link TRLN systems to the bibliographic utilities and perhaps to regional networks. All of these concerns fall in the general area of linking and access.

Fortunately, technical capabilities developed to meet one need will in many cases meet other

needs. The requirement on each campus for a variety of modes of access will result in a system which is also hospitable to a wide range of access for off-campus users. TRLN systems will be able to support dial access using a variety of terminals, access through dedicated lines, and computer-to-computer access in appropriate applications. The type of access most appropriate to outside libraries will depend on the volume and type of use. As a statewide network based on the concept of the zones of cooperation (ZOC) evolves, it is expected that TRLN can play a number of possible roles depending on the optimal configuration for any given library or group of libraries.

Several TRLN projects related to linking and access are worthy of note. Although general support from the Department of Education will end in October 1984, another grant application has been submitted that focuses on the linking aspects of the network. Initially, interlibrary access to the on-line catalogs will be through terminals located at each library connected via dedicated lines to the systems at the other libraries. A second level of access will be established with the computer-to-computer links, at which time any terminal connected to a TRLN system will have access to all Bibliographic Information Systems in the network. These methods will provide serial access only, that is, the capability of searching each data base in succession.

TRLN's ultimate objective is to provide access such that the three separate data bases can function from the user's viewpoint as a single union catalog. Meeting this objective will require a system design and software development effort of some magnitude. Design specifications will be prepared for operations such as query handling and terminal contention in the multiple data base environment and collecting and merging retrieval sets from separate data bases. Special display formats for merged retrieval sets will also be developed. The grant will also support coding and testing of linking software and partial implementation of the links. Although TRLN staff will have to complete this work in any case, the links will be available sooner if supported by Title II-C funds. It should be pointed out that until the fully transparent link is developed, outside users of TRLN may have to use separate connections to each TRLN on-line catalog.

The Council on Library Resources has included TRLN as an official observer of the Linked System Project (LSP). The LSP is a council-funded project involving LC, RLIN, and WLN to develop standard protocols for linking bibliographic data bases. As the work progresses, the council periodically sponsors meetings of representatives of selected systems organizations to inform them of developments with the project and to encourage the adoption of the LSP protocols. TRLN is interested in the possibility of developing linkages compatible with the LSP protocol, both to promote standards in general and to increase the possibility that TRLN software can be useful to others.

For some time, TRLN has been negotiating with OCLC to undertake a collaborative effort to develop an online interface between the OCLC cataloging system and the BIS. This project has received approval by OCLC management and preliminary planning began in January 1984. When completed, such a link will represent an important step in the direction of a rational interface between OCLC and locally developed on-line systems.

These linking activities are highlighted here to emphasize TRLN's commitment to the concept of linking local systems as a means of creating wide-area networks and service areas. Linking of independent bibliographic systems is still a somewhat neglected and underdeveloped technology, and much remains to be done before flexible, affordable linking mechanisms can be used to create a statewide network. TRLN's current work related to linking represents groundwork which in time will lead to technical capabilities on our part which will allow TRLN to be an effective partner in a statewide networking effort.

NCASL Conference

The 1984 NCASL Biennial Work Conference will be held in Raleigh, October 4-5, at the Raleigh Civic Center Complex.

If any section or committee of NCLA would like to meet in Raleigh during the Work Conference, please notify Helen Tugwell, vice-chairman/chairman elect of NCASL, immediately.

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The theme of this year's conference is "Library Media Services: Practical and Political."