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The Networked Library and Campus Networking: The CedarNet Experience"

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THE NETWORKED LIBRARY AND CAMPUS NETWORKING THE CedarNet EXPERIENCE

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THE CHALLENGES

My intent in this paper is not to review all the library literature purporting to talk about the academic library in the 21st century. Many much more qualified have done so and will continue to speak to these issues. The challenges *are* obvious and *are* daunting at times. Suffice it to say that many of us often feel like we are adrift on a sea of moving technologies and expanding opportunities. When will we find solid ground?! Unfortunately, probably never. Susan K. Martin, in an article in 1989 in *College and Research Libraries* said that ". . . the pace of change in information technologies is far faster than institutions and individuals can easily cope with; the changes are chaotic, with relatively little being truly standardized; the marketplace is offering more, newer, different products every day, and buyers are purchasing whatever appeals to them, often without carefully thinking through the implications of becoming involved with one kind of technology or another."[1] Four years later, the picture is no better.

The challenges are significant. We must function in an information-rich, format-diverse, yet financially-tight environment. We must forge an effective interaction and integration of two information systems—one print and the other electronic. We must facilitate the expansion from collection preservation, organization, and dissemination of primarily print records to include delivery of information in a variety of mediated and electronic formats. These challenges are forcing us to re-evaluate long held philosophies. We now need to move to emphasizing access over ownership (but not at the same time eliminating ownership!), emphasizing "just-in-time" over "just-in-case," and emphasizing global over local. In an interview in the *OCLC Newsletter*, Marshall Keys, Executive Director of NELINET, said:

> Libraries are going to have to stop being warehouses, and they're going to have to become gateways.... Librarians are going to need access to services and materials that simply cannot be funded through the normal channels that they have come to depend on.... They will be forced to define, much more carefully than they have hitherto, what

differing kinds of information and services they offer to what level of users. And, they will have to allocate resources to these goals in a much more conscious and deliberate way than they have done so far. Libraries that are successful in doing this will become key parts of the information infrastructure in their communities and institutions.[2]

This re-shaping must occur within a framework that provides an efficient and non-threatening environment for our staff to serve and our patrons to be served.

In this environment, what might be the concept of a "networked" college library? Let me give you one library's experience—the CedarNet story. I was interested in finding recently an article by Kenneth Marks and Steven Nielsen entitled "The Networked Local Library: Developing the Vision Thing,"[3] for it articulated a number of the concepts about local library networking that we have implemented in our library and campus academic network. From our experience the networked college library (and campus) should be built on the following concepts:

- **Microcomputer-based**
  a highly-flexible, reasonably-priced, exceptional powerful platform
- **Campus-driven**
  a broad institutional philosophy—effective networking of the library depends on effective networking of the campus
- **Uniterminal-configured**
  a "one-stop shopping" philosophy is a reasonable goal
- **Patron-friendly**
  a more critical principle than staff-friendly
- **Multi-media formatted**
  a system that functions in a

graphics and video environment

- **Broadly-scoped**
  a wide-ranging access to a broad selection of software and information for all faculty, staff and students. The influence of the network must become pervasive on the campus

Cedarville College, currently serving over 2,200 students, is a Baptist college of arts, sciences, and professional programs. The most recent addition to the academic program is a department of engineering with four year bachelor's degree programs in electrical and mechanical engineering, certainly highly technical in nature. In the late 1980s the College's strategic planning program had identified technology as one of a number of current priorities within the College's strategic plan. In addition, library automation had always been a significant part of library operations from the early connection with OCLC in 1968 to being a given in the planning of a new library facility in the mid-1980s. In that period, library operations had been "microcomputerized" as much as possible with stand alone systems, as we anticipated the eventual implementation of an integrated system. Although an integrated library computer system was planned for the new library building constructed in 1987, for a number of reasons, including timing and financing, the reality did not occur until the early 1990s in the context of a much larger consideration about campus information technology.

THE VISION

In March of 1990, the Academic Vice President, Director of Computer Services, and Director of Library Services attended a Council of Independent Colleges conference on Technology in Pittsburgh. This experience prompted a lot of discussion and indicated the need to begin to act on the institutional priority about technology. The result was the creation of the Information Resources and Technology Task Team with the following charge:

1. Evaluate the present status of information technology on campus;

2. Study the industry, the trends, the influences on education;

3. Study the technology skills that students will bring to campus in the next decade, and determine the skills with which they must leave Cedarville College based upon societal expectation;

4. Analyze what our competition is doing with information technology, or what they plan to do;

5. Within the above context, propose what direction Cedarville College should pursue with information technology (a vision); and

6. Propose a *realistic* plan for achieving that vision, including strategic move, approximate costs, and timelines.

The Task Team was composed of individuals from all areas of the institution affected by technology.

The first task was to investigate and propose a vision for technology at Cedarville College that would be acceptable to the entire college family and be do-able. That vision needed to address questions like what relationship do we want between technology and Cedarville College? How can we maintain a balance between classic education, the family environment we foster, and the advantages proffered by a more technologically-oriented education? How can we maintain technological integrity, and be sure we "practice what we preach" to our students? The final version of the vision is a technological

philosophy which seeks to enhance the educational experience the College offers and increase its perceived value.

Cedarville College is committed to providing its faculty, staff, and students with an integrated, broadly-accessible information, voice, and video communications technology infrastructure.

To this end, the College should:

1. Assure that its personnel and students can access and maintain, through appropriate technology, the information necessary to fulfill their roles;

2. Continually assess information technologies and seek to implement appropriate hardware and software that enhances individual and organizational effectiveness;

3. Make available to personnel and students instruction and reinforcement in the use and application of information technologies; and

4. Foster an environment that encourages responsible use of technology, yet maintains a sensitivity to technology's effects on its users and environment.

The information technology arena is a dynamic one, but the fulfillment of these objectives will equip the College's faculty, staff, and students with the technological capabilities and analytical skills needed to serve our Lord in a world growing increasingly dependent upon information technology.

THE PLAN

What followed the acceptance of the vision was over a year of research, telephone calls, surveys of students and faculty, campus visits, consultant visits, and intense deliberations and frequent reality checks. The result was the recommendation in August, 1991,

to establish a campus-wide, PC-based information network with computers in every dormitory room and every faculty and staff office. The network would not only provide computing capability for routine tasks like word processing, but it would make possible access to the library catalog, electronic communications with faculty and students, and the delivery of instructional software. Faculty members would also be incorporating network software (tutorials, presentations, textbook applications) into coursework. The specific recommendations from the Task Team were as follows:

1. Installation of a fiber cable backbone on campus to allow for communication between locations, and permit common equipment to serve multiple locations.

2. Installation of a PC-based academic computer network operating over the cable backbone. It would provide a computer in each dormitory room and faculty office to overcome access barriers and encourage use of technology. This network would also include access to a UNIX server, replacing our current academic computer.

3. Computerization of the library catalog, accessed by the network.

4. Cabling of classrooms to tie into the network.

5. Installation of multimedia/technology lab equipment in centralized locations, to encourage consolidation of resources and provide access to a variety of presentation formats for work done on the academic network.

To reduce coordination problems and assure effective implementation of these physical plant recommendations, we also encourage personnel changes and additions:

1. Expanded accountability of Computer Services.

2. Implementation of Technology Boards for both academic and administrative computing operations.

3. Addition of a media lab equipment manager, network manager, network technicians, and academic technology facilitator.

4. Training program for current personnel.

In the final configuration, the network would be built on several key concepts. First, it would be *student-funded*. This would be done through a two-tiered fee system for the 1992/93 academic year—a basic fee of $75 per quarter for all students for access to the network and an additional fee of $165 per quarter for those students who had a computer in their dormitory rooms. Second, the network would be *comprehensive*. The project would include the entire campus community with all faculty, staff, and students having access to the same network. Third, it would be *integrated*. All college-owned computers would eventually be connected to or interconnected with a single network service facilitating communication and access. And fourth, it would be *diverse*. A wide range of general and discipline-specific software would be provided in addition to access to other campus databases, the library, and electronic mail.

Without knowing it at the time, the Task Team had reached a conclusion similar to that reached by the Research Libraries Group in 1991 at a workshop for provosts and library directors. "Provosts and librarians share an image of the future of information resources on their campuses. They all strongly prefer a future in which there is universal access by faculty and students to multiple information sources in all possible media via a single multifunctional workstation,"[4] and might I add "or campus network."

THE REALITY

Administrative approval for the project was gained in early 1992, with the implementation of Phase I to be completed for the Fall of 1992. The first phase, funded primarily by the new student network fee, would include a computer and printer in every room in two dormitories, the establishment of 4 campus network computer labs for students without computers in their rooms, the provision of a multi-media lab for graphics input and output, the computerization of the library, network compatible computers for all faculty, E-mail for campus communications, and a wide range of application software (see Table 1). This meant that over 600 computers would be hooked up to the network in phase 1.

Though a challenging undertaking during a short period of time, the first year's experience with the network was very positive; it has made a significant impact on the learning and living environment of the campus. The areas where the most difficulties arose were people related, not hardware and software. The learning curve for people is much longer than the speed with which technology can provide applications. Weaknesses were observed in the level of training where we relied too heavily on self-learning and students helping students; in lab staffing and the training of student assistants; in network staffing levels where several staff members were stretched very thin at times; and in the faculty needing to be brought up to technological speed a little faster than the students. These issues are being addressed in detail for the second year of the network, 1993/94.

While preparations for Phase I of the network were proceeding, the library staff were in the midst of preparing the automation plan, evaluating system vendors,

participating in system demonstrations, visiting other libraries, and ultimately making a final decision about the system to be installed in the library. The system selected, by Innovative Interfaces of California (III),includes the library catalog, circulation control, acquisitions and budget management, and serials control systems. The system runs on a MIPS 3230 computer housed in the library and is accessed through 18 system terminals in the building, 10 for public use and 8 for staff use. The catalog can also be accessed on CedarNet, the campus network, and by INTERNET users around the world. System installation began in July, 1992 with the data load from OCLC tapes processed by Library Technologies, Incorporated (LTI). The on-line catalog and circulation system were ready for the Fall quarter, 1992. The serials module was activated in December, 1992, and the acquisitions module was activated in January, 1993. The entire process, from system selection, to contract negotiations, to implementation, to operational status has gone quite well with few difficulties and unexpected events. With the addition of campus networking and library automation, over 70 computers and computer terminals are currently in use in the library.

THE FUTURE

As we were in the midst of completing Phase 1 of the network project, planning and preparation for Phase 2 (1993/94) was already in process. For the Network, Phase 2 meant expanding to computers in the rooms of three more dormitories, expanding network staff and training program, upgrading computer servers and computer lab capabilities, and expanding software offerings. The total number of computers on the network in Phase 2 will number

over 1,000. For the Library, Phase 2 meant providing on-line access to periodical indexing on the library system and the campus network, with consideration being given to some full-text capability and document delivery. This planning for Phase 2 forced the library staff to look more broadly at what kind of information delivery system we wanted to build and what elements would be included in the system. Consideration had to be given to access to regional networks (like OhioLink), to CD-ROM local area network capability on CedarNet, to on-line access to local and distant databases, to information service vendors (like OCLC FirstSearch and CARL UnCover), and to information highways like INTERNET—all of this in some type of integrated campus/library network system.

With this realization, the library as gateway is closer to becoming a reality at Cedarville College. As Gregorian, Hawkins, and Taylor articulated in an article in *Cause/ Effect*, "the library of the future will differ greatly from the libraries of today. It will continue to provide access to information and guidance for navigating the informational seas—but it will no longer do this solely by acquiring and archiving information. The library of the future will not only be a place where information is kept, but a portal through which students and faculty will access the vast information of the world. To provide information and services effectively, libraries must bring together users and information resources without constraints of a physical environment. . . .The library of the future will be about access and knowledge management, as well as about acquisition, organization, and preservation of scholarly information."[5] Thus is described the electronic library, the virtual library, the transparent library, helping users discover relevant

information anywhere and in any format.

As a result of our foray into campus and library networking, we have arrived at a first concept of an *automated* information access configuration for the library and campus network (See Table 2). The intent is to provide locally what we can efficiently and economically, but gateway off-campus for services that can be more effectively provided by other service vendors—not reinventing the wheel. Elements of the configuration include local reference databases and local optical servers for CD-ROM products, stand-alone CD-ROM servers in the library for specialized and low-used reference sources, gateway software to access periodical indexes, abstracts, full-text services, and document delivery through INTERNET, access to on-line databases (like DIALOG), access to other library catalogs around the world, and access to the wide variety of information resources available through INTERNET.

THE TASKS AHEAD

Most of the basic building blocks for a networked college library and campus are now in place. The possibilities seem to exceed our ability to respond or implement, and these possibilities are forcing the library staff to redefine library roles in information delivery, technological integration, staff development/training, and patron orientation and communication. This redefinition finds its source in the impact of our campus network, the revolutionary influence of the library automated system on all library operations, the rapidly expanding information environment brought about by these technological advancements, the integrative nature of technology by which jobs become more

interrelated, and the growing expectations of faculty and students which exposure to the power of technology and broadened resources seems to bring. We have thus identified a number of demands and challenges that require attention as a result of our expanding technological environment.

INFORMATION DELIVERY

- Adapting instructional and reference services to the new realities of the automated environment
- Developing a comprehensive information delivery plan
- Investigating creative methods of re-allocating limited financial resources to incorporate new methods of information delivery.

TECHNOLOGICAL INTEGRATION

- Grappling with the potential of the electronic or transparent library.
- Exploring the ramifications of network and computer technology on Media Services.
- Integrating the campus networking environment into all levels of the library operation.

STAFF DEVELOPMENT AND TRAINING

- Redefining job responsibilities
- Evaluating library organization
- Responding to the multiplying training needs of the staff

PATRON ORIENTATION AND COMMUNICATION

- Responding to the potential of information overload for our patrons
- Upgrading the technological sophistication of library use instruction and orientation.
- Intensifying efforts to bring faculty members into the information technology environment.

The jobs in the library, service

parameters, and resources are being redefined.

THE LESSONS LEARNED

We certainly are early on in the networking game as a college and as a college library. But we have learned some things in the process that merit mention. First, **technology does not replace a traditional library and its purpose, it complements it.** The carriers of knowledge might change, but the purpose must not. As Michael Gorman said in his article in *The Journal of Academic Librarianship* entitled "The Academic Library in the Year 2001," "The purpose of libraries is, and always has been, twofold: (1) to acquire, store, disseminate, and allow access to carriers of knowledge and information in all forms, and (2) to provide services based on those carriers of knowledge and information. The fact that there are now new carriers and new technologies (t'was ever thus) has not changed that enduring purpose one whit."[6] We must not get so enamored with the car (technology) that we loose sight of the road (purpose and direction).

Second, **the pace of change is faster than institutions and individuals can easily cope with.** Sensitivity to the impact of technological change on staff and users is critical. Again, Susan Martin said, "Librarians cannot become too carried away by information technologies that they are far ahead of their users."[7] For library staff members, participative management methods and effective communication systems are becoming increasingly important in minimizing the trauma of technological change. As Marilyn Mason said in her article in the *Library Journal* entitled "Managing Innovation," "The bridge between an organizational structure of any type and the need for innovative

solutions to complex problems is communication—frequent, formal, and informal communication across lines of authority."[8]

Third, **proactive planning rather than reactive clamoring is critical to informed technological advancement.** It has been said that the absence of planning leads us to become victims of our future. Educational institutions, and libraries in particular, are notorious for their inattention to effective, proactive planning. While I am not attempting to advocate a particular planning system, the strategic planning model seems most effective in handling rapidly changing environments like technology. The elements of strategic planning include the formulation of a mission statement; the analysis of the institution (or library)—strengths, weaknesses, threats, and opportunities; the analysis of the external environment that bears on the institution or library; the preparation of a plan, or agenda, that pushes forward the mission, maximizes the strengths, and minimizes the weaknesses; and the regular evaluation and adjustment of the plan as the institution and its environment changes. The cliche, "those who fail to plan, plan to fail," is particularly applicable in the higher education environment.

Fourth, **the library's success in the integration and funding of new ways of information access is directly connected to an** *institutional* **commitment to the technological environment.** We must promote a shared vision of what information technology can do not only for the library but also for the entire institution. Without a shared vision, we face the potential of an "us versus them" atmosphere within our institutions. Again, Susan Martin shares, "Decision makers at the corporate level want their entire institution to be in the forefront, and if the new services

proposed by the library are also desired by the users of the library, a significant barrier can drop. Where automation of cataloging and circulation procedures can make a nonlibrarian's eyes glaze over with boredom, the concepts surrounding the ability to use innovative technologies to access any kind of information located anywhere in the country or in the world are appealing to the visionary instincts of many institutional leaders."[9] Many have argued that the biggest hurdle in transitioning into the technological environment is money. But I would argue that money is *not* the key commodity, *vision* is! Institutions find money to do that to which they have given priority. To rephrase a recent political statement, "It's the vision, stupid!"

Though Cedarville College has just begun to travel down this new road—this new priority, the process has been challenging, the challenges have been stimulating, and the results have been encouraging. As Michael Gorman has concluded, "All the challenges we face are worth addressing. Change should be welcomed and recognized as a sign of health. The academic libraries that we serve are of great importance to culture and education. They are worth striving for, and from that striving comes creativity and innovation."[10] From that willingness to innovate, to take risks, can come significant quality advancement for the institution, but more important, great profit for our students and graduates preparing to serve the Lord in a rapidly changing technological world. The question then is not *if* campuses or libraries should innovate technologically, but how we should *manage* the innovation that must come to remain technologically progressive.

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Quattro Pro for Windows
RightWriter
Spanish WordPerfect 5.1
WordPerfect 5.1
WordPerfect for Windows

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