COMMENT AND OPINION

2001, a space odyssey: a library for the millennium

The future is here. With the new millennium less than three years away, is everyone prepared? Are libraries ready?

Introduction

Libraries have traditionally been warehouses for books, storehouses for information. "The information explosion, automation, financial constraints, and simply running out of room have combined to place considerable additional pressure on already stretched library facilities" [1]. Down the passages of time, libraries have had to metamorphose to accommodate their changing roles. The library of the past had to worry only about shelves to store printed matter. The libraries of today find themselves wrestling with finding ways to accommodate electronic formats along with the printed format in buildings designed twenty to thirty years ago. The new millennium is just about a year away. The time is now to examine what the library of the future should look like.

The past

Dimly lit rooms walled by books, oak tables around which solemn people silently read, hulking pieces of furniture with hundreds of tiny drawers reign over the public area, severe looking women stamping books and shushing patrons—thus was the stereotypical library of the past.

Libraries began as storehouses of information, places for safekeeping recorded information. The Library of Alexandria, created by the Ptolemies in the third century B.C., was designed for storing papyrus scrolls. Other libraries in ancient times accommodated clay tablets. The first medical school was established in Salerno in the eleventh century and it contained a small library. The first medical schools in North America were established in the eighteenth century in Philadelphia [2]. These early medical schools did not have libraries as this was a time when scientists and physicians had their own personal libraries.

The major development of the medical library occurred in the mid-nineteenth century when thirty-nine libraries were founded. In the first half of the twentieth century, 200 more were created [3]. Collections were growing exponentially and it was obvious that the personal library was no longer adequate to keep up with the changing times.

In more modern times, when the advent of the printing press made mass production of books possible, the function of libraries slowly began to change. Academic libraries were not initially research facilities. Harvard's library, which was established in 1638, was the first library in the United States [4]. Individuals such as Thomas Jefferson began to collect together learned texts to store together in one place. These early academic libraries were considered museums for housing historical writings. Traditionally, early academic libraries were open only three or four hours a week [5]. Times changed, needs changed, and, with them, libraries were forced to change.

Because form follows function, these early libraries had to take into consideration the technology of the time. Any good library needs excellent lighting. Before the invention of electricity, a library had to rely on natural light. Also, there were no air conditioning or heating systems. For light, large windows were used, which also served as excellent air circulators during the warmer months. Fireplaces usually provided heat. Because steel shelving had not been invented, all shelving had to be placed around the walls for support. So, with large windows and only walls for shelving, libraries tended to be large open expanses of space.

The here and now

Clacking sounds as fingers move across keyboards; people squinting at monitor screens; the strident cacophony of dot matrix printers; rows of computers awaiting customers—such is the library of today.

In the twentieth century, building designs changed, moving toward modular construction. Modular construction is a building supported by columns placed at regular intervals. This construction, along with electric lighting, allowed for the integration of user space and shelving. Steel construction allowed for free standing shelves. Tables could be interspersed with shelves. There was now more flexibility for expansion of collections as interior space became more available [6].

The computer age revolutionized libraries. In the last twenty to thirty years, the electronic revolution completely changed the way libraries functioned and were perceived. In 1964, the National Library of Medicine took a major step into the future when it created the Medical Literature Analysis and Retrieval System (MEDLARS), followed in 1970 by the Abridged *Index Medicus* online system via TWX lines (AIM/TWX). The familiar MEDLINE system using ELHILL software soon became available to searchers throughout the United States and was the first NLM online system. It made possible re-

searchers' (primarily librarians') access to medical literature via a computer interface [7].

In 1967, the presidents of the colleges and universities in the state of Ohio founded the Ohio College Library Center, now called the Online Computer Library Center (OCLC), to develop a computerized system through which the libraries of Ohio academic institutions could share resources and reduce costs. By 1977, this regional computer system had grown to include libraries outside Ohio and soon was an international network [8].

In the beginning, the computers were for librarians' use to prepare materials for their clients or to access citations for their clients' research. Finding space for the cathode ray tube (CRT) terminals was awkward, but usually not impossible. Wires hanging from the ceiling were the most unsightly problem. The advent of computerized resources began a growing trend in technological enhancements that began a snowball effect of improvements throughout library service.

Technology rapidly changed. Computer components got smaller. They became more affordable and the personal computer (PC) became an icon of the 1980s. In the early 1980s, the face of libraries began to change. Demands for new services were beginning to surface. Where before a library might have had a typewriter for client use, they now needed a PC for word processing and database access. The PC meant a printer was required. Catalogs were now online, making the old card files obsolete. The physical card catalog was tossed and the virtual card catalog took its place.

The libraries of today are mongrels. They are the mating of the library of the past with the library of the future. They are awkward and, in some cases, unattractive. Libraries built twenty to thirty years ago have been trying to accommodate computers and electronics as best they can. The result is awkward placement of databases, unsightly wires, overloaded circuits, and the necessity to take space that was once available for study.

The future

The glowing of the computer screens casts an eerie glow over the users; the soft whoosh of laser printers whispers through the room; a scanner comes to life in the far corner, grinding as it processes and stores the information it reads—this is the vision of the library of the future.

In the last few years, there has been a monumental push to digitize libraries. There are a growing number of people who believe print materials are rapidly becoming obsolete. They see a near future when one sits at one's computer, types in a few terms, and retrieves reliable information on a topic of choice. And, because of the availability of PCs, they believe that librarians, too, are becoming obsolete. Nothing could be further from the truth. The technology has advanced quickly, making database searching much more user friendly. However, there is still a need for a unifying source to maintain the information and instruct on its correct usage.

The library of the twenty-first century will be a blended library; one that incorporates all the best of both the digital and actual library world. In the recent past, libraries worked wonders automating behind the scenes. For the present and near future, computers have moved from technical areas to public areas. This shift has created a number of effects. One of the most noticeable effects is the role of the librarian and library staff. The technology is growing so fast that the average person cannot absorb it. While library users may be expected to do their own searches via the electronic formats, they may not have the expertise to do it correctly. The result is that information is falling through the cracks; users are not finding the information they seek.

The new role of the librarian is that of technical support provider and trainer. The trend is for libraries to offer classes in the use of databases and other computer software they have available [9]. Traditional library buildings were not designed to accommodate the library as classroom. It is important for the library of the twenty-first century to provide a classroom with banks of computers for hands-on training. The librarian must be able to teach skills in an atmosphere conducive to learning. In the public areas, computers must be readily available. With the trend moving away from physical access toward virtual access, libraries must provide the means for the users to access it. Printers will be common.

The library of the next millennium must address all aspects of libraries—past, present, and future. There should be space for physical books and growth in that area. The printed book, contrary to popular belief, will not become obsolete. Extensive areas are needed for public access computers for database use, word processing, Internet access, and other research. There must be space for a bank of printers to accommodate clients' printing needs. As more and more journals are read online, researchers will require high quality printing so that illustrations as well as text are legible. Students, especially medical students, require lots of areas of study space. Group study rooms are a necessity. Individual study carrels and storage areas for heavy books and materials are needed.

Most important of all are the space requirements for training. People are not born knowing how to use computer software. Someone must teach this skill. Librarians are not becoming obsolete but becoming more necessary. Classrooms, adequate to hold up to thirty stu-

dents at a time, are needed for training. Librarians' roles will be that of teachers and trainers for the new technologies. They will provide computer support and troubleshooting for equipment.

What is the library for the next millennium? It is a place, not a virtual reality. It will include connections, links, access, outreach, distance learning, and education as well as books, journals, media, and databases. It will be a place where students and readers can come to search for information or delve into the treasures of the past. It will be a place to read today's latest medical news or to sit and contemplate. It must continue to support scholarship and research [10].

Shedlock, in his article on the renovation of the Galter Health Sciences Library of Northwestern University, holds this library up as a shining example of the library for the twenty-first century. He states that the Galter Library demonstrates the balance achieved in combining new technologies with traditional library storage and workspace for users and staff. Success in reaching this balance can surely be a hallmark of library buildings as they evolve in the twenty-first century [11].

Kane states it best: "The successful library of the future will consist of a delicate balance between materials that are owned and those that are accessed. The quality of these future libraries will not be determined by size but, rather, by how effectively they fulfill the needs of the patron" [12].

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