50th Anniversary Feature—

Current Issues in Building Planning

David Kaser

It is likely that, as the result of events that occurred a quarter century ago, the amount of new or additional academic library space to be constructed during the next several years will be substantial. The passage of the Higher Education Facilities Act of 1963 made federal grants generally available for the first time for college and university library construction. Until that program wound down more than a decade later the nation experienced its most extensive boom ever in library construction on college and university campuses.

Jerrold Orne has documented the phenomenal magnitude of that great surge in library construction.[1] During the peak five years 1967–1971 alone, 462 academic library building projects were initiated in North America, at a total cost of a billion dollars, providing more than 34 million square feet of new and/or renovated library floor space! The boom continued, but at a somewhat slower rate, until by 1976 the total number of projects had grown to 647.[2] That eventful period of library construction now has direct impact upon our new building planning today.

Because academic library buildings are normally planned for twenty years' growth, all of those structures built in the 1960s and 1970s either have or will reach capacity in the next few years. Although some alternative techniques and technologies are available to serve partially in lieu of expansion, the vast majority of these aging libraries—certainly more than 90 percent of them—will have to be enlarged or replaced within the decade. This paper will discuss some of the principal issues that will have to be faced by academic library building planners in the present period.

COMMUNITY ANALYSIS

Surveys and Futures

It has long been recognized that before an effective library building can be planned, a thorough survey of the community must be made to determine just what purposes the building will be expected to fill. In a manner that is almost imperceptible to the institution, experienced consultants can sometimes gather adequate data for these surveys as part of their preliminary study and early site visits. Their imperceptibility, however, does not make them any less important. They remain a critical first step in the building planning process.

If anything, these surveys have become even more important today than they were in the past, because they must now include a more daunting "futures analysis" than would have been previously required. Not long ago "the next decade" of

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library service could reasonably have been expected to be much like the previous decade, so that planners could simply extrapolate straight-line growth characteristics from one period to another. Library life, however, is no longer so simple. Things are changing very rapidly, and the rate of change seems destined to accelerate in the years immediately ahead.

Before planning a library building today, an entire college or university community must first collectively consult its crystal ball and arrive at some consensus regarding the future of information handling and use. In the author's experience it is less difficult to arrive at such consensus today than it was five years ago. Today virtually everyone is at least prepared to admit that changes are indeed taking place; understandably, differences remain as regards the likely pace of that change. A wise academic community will anticipate the need for its library to maintain both traditional *and* nonconventional services over the next twenty years, with declining emphasis on the former and increasing emphasis on the latter as evolving circumstances warrant. Such a strategy should be geared to shielding library users from potential future shock, or trauma from too rapid change.

Corporate Characteristics

This scenario of the future must be applied to relevant corporate characteristics of the institution. What changes does it imply for its academic program? Although there appear to be many more steady-state academic programs in the nation, some changes are still occurring. Fewer new undergraduate major and minor fields are being added to the curricula, but some colleges are still establishing or expanding graduate business programs. Few new area studies programs are being proposed, but new interdisciplinary study centers are being initiated, as in artificial intelligence or cognitive science. New extension offerings continue to be initiated at sites remote from main campuses. All of these developments should be considered before an appropriate new or enlarged library building can be conceptualized.

Are teaching methods or pedadogical styles likely to change on the campus? Do faculty members anticipate that they will increasingly use videotapes in their courses in anthropology, archaeology, music, art, or history for viewing either in class or outside of class? Will teleconferencing come into greater use for instructional purposes, or will closed-circuit television delivery of courses over distances be increased, or will E-Mail become a principal medium of classroom communication for such things as distributing assigned readings? Will honors programs receive greater emphasis, and if so will their theses be optional or required? The answers to these questions will affect the kind of library to be constructed. They should be considered before building planning per se begins.

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Obviously, an institution's perception of the nature of information use in the years ahead will impact heavily upon the number and kind of study stations to be accommodated within a new or enlarged library building. An institution's confidence in interlibrary cooperative networking and in the telecommunication of bibliographic and full-text copy will influence the amount of shelf space that will be allocated for conventional materials. These two factors will be discussed in greater detail later in this paper.

Preliminary Decisions

Still other library and institutional decisions have to be made before a rational building-planning exercise can begin. Within the library, for example, the organizational structure should be reviewed. Perhaps the college library has operated with five department heads reporting directly to the librarian. Maybe it should organize these departments into two divisions, with an assistant librarian for each. This should be decided beforehand so that

appropriate office space can be planned for the altered staff structure. Should new departments be established, or should several old departments be merged or reorganized? Are there outlying collections that should now be incorporated or changed from libraries to information centers with minimal on-site holdings?

Sometimes universitywide decisions need to be made before sound library planning can occur. If media services, for example, have not been part of the library, or indeed if they have never been organized at all, the institution ought to consider centralizing them in the library. If the college archives have been inadequately developed outside the library, or are nonexistent, the institution might use this occasion to decide their future and transfer them if appropriate. Such decisions can be fraught with emotional, political, or personal overtones that the college may be reluctant to face. However, the alternative of building a new library without space for media services or archives only to decide later that they should have been transferred would indicate poor planning. Whether it wants to or not, this is usually a good time for the college to bite the bullet on such issues.

EXPAND OR BUILD *DE NOVO*

Cost Considerations

It is decreasingly necessary to build academic libraries *de novo*, but sometimes it is still the wise thing to do. The principal reason not to build a completely new building is, of course, cost. Depending upon local factors, the cost of new library construction can range from $80 to $130 per square foot. Other costs, such as fees, site development, furniture, and equipment, can easily bring the budget for a building project to more than $160 per square foot. This enormous price tag for new construction makes it incumbent upon everyone involved in a building decision to exhaust all alternatives before opting for it.

Academic decision makers frequently overlook the fact that simply adding to an old building never represents the complete cost of the project. At the barest minimum, those locations where the addition connects to the old structure need also to be renovated, and renovation is not cheap. It is almost always desirable, moreover, to consider renovating the entire existing structure rather than just its points of connection to ensure that the total enlarged building, old space and new space, presents a reasonably uniform level of quality. If the lighting, air treatment, furnishings, and general ambience of the old space remain too inferior to those of the new, patrons will simply eschew the old and overcrowd the new. Furthermore, it is frequently necessary not only to renovate but also to rerationalize the old space and the new into a functional whole so as to assure that the total building will function as a single entity. That also carries a pricetag.

It quickly becomes clear that a completely new building may not be much more expensive than an effectively enlarged one; indeed it may even be cheaper. If, for example, 40,000 square feet of new library space, costing $130 per square foot, is to be added to an existing 30,000-square-foot library that will have to be renovated and adapted at a cost of $70 per square foot, the total project cost will be $7.3 million. On the other hand, a completely new library of 68,000 square feet (slightly smaller because no space is lost to articulation) will cost only $8.84 million, but this option will also leave the institution with a vacated 30,000-square-foot old library that can be diverted to some alternate campus purpose. If that alternate use is of high priority on the institution's schedule of approved capital projects, the combined cost of the completely new library and the diverted old one might actually be less than the cost of adding to the old library and constructing a completely new building to meet the second need. Given such a scenario, donor preferences and site considerations may actually become determining factors.

Site Considerations

Whether or not they become determinant, site considerations will often impinge upon the decision to add or build anew. Many campuses are becoming increasingly compacted, so that adequate space for an addition is frequently unavailable adjacent to the existing library building. In some cases adequate ground

area may exist, but parceled on two or three (or even four) sides of the existing building as at Delaware, a condition very likely to increase the per-square-foot cost of adding. In other cases the adjacent site may impose a contorted shape upon an addition as at Vassar, resulting not only in higher construction cost but also in permanent operating inefficiencies. As in new library buildings, the most efficient shape for library operations in an addition is almost always a simple rectangle. The rectangular addition moreover functions best when it is cobbled snugly against an original rectangle as at Brigham Young rather than set apart from it and accessible only through an umbilicus as at East Carolina and Kentucky.

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An addition may prove to be undesirable because the site of the original library is no longer appropriate. The direction of campus growth since original construction may have been away from the library, leaving it too isolated from classrooms and dormitories, as at Scranton. Or the dominant student population at the institution may have shifted from residential to commuter, calling for a new peripheral library site nearer to parking areas. Different from library functional requirements, which are almost solely the librarian's to decide, site considerations tend to become everyone's business, including trustees, alumni, students, certainly donors and architects, and sometimes even the local press.

Technical Considerations

Some library buildings are simply easier to enlarge than others. No single element in a library building is peskier to contend with than a multitier structural stack. The use of structural stacks was well-nigh universal in American academic libraries from the 1880s until World War II. Very few new ones have been constructed in North America since midcentury, however, and many have been replaced. Nonetheless several hundred are still in use, mostly in prewar structures that were enlarged rather than replaced during the building boom of the 1960s and 1970s. The large university libraries with substantial investments in the status quo found them especially difficult to replace, as at Harvard, Michigan, Illinois, and Berkeley. However, many smaller institutions still have them as well, such as Wake Forest, Franklin and Marshall, Bucknell, and Vanderbilt.

Multitier structural stacks are barriers to effective, welcoming, open-shelf library service and, except for closed storage, should be replaced at almost any cost. They were invented in the 1850s by the celebrated French architect Henri LaBrouste solely as a method for storing compactly a maximum number of books in a minimum amount of space, a purpose they served admirably for a hundred years. First introduced on this continent at Harvard in 1877, they were soon adopted by most academic and many public libraries. They were never intended, however, to serve as publicly accessible spaces, and they remain totally devoid of any humane qualities that would make readers comfortable in their midst.

Multitier structural stacks are totally inflexible and cannot be moved. Their installation required the erection of an immoveable grid of vertical steel stack posts every 36 inches in one direction—the length of book shelves—and every 54 inches in the other direction—the on-center dimension between ranges. These posts do more, however, than simply support the shelves. They extend the full distance from the floor to the ceiling and serve as the structural members that support similar configurations of posts and shelves on the tiers above. Thus if a single stack post were to be removed, everything above it all the way to the roof of the building would collapse.

Their vertical dimension is equally constraining. Since stack attendants of average stature could reach books about 70 to 80 inches above the floor, these stacks came universally to adopt a tier-to-tier di-

mension of 7 feet 6 inches. When lights and ducts were hung below these low ceilings, their in-the-clear heights dropped to 6 feet 6 inches or lower and became hazards for taller people. Floor levels elsewhere in the building moreover had to meet the levels of every other stack tier, imposing 15-foot floor-to-floor dimensions throughout. At first this was a felicitous relationship, because high ceilings were needed in old-fashioned reading rooms for large windows that could admit plenty of daylight and exhaust heat buildup. Given modern artificial lighting and air treatment, however, they are excessive. Thus matching an addition to those floor levels can result in the construction of as much as 20 percent of superfluous cubage. This not only drives up the initial capital cost of the addition but also requires the continuing expense in perpetuity of heating and cooling the excess enclosed space.

Academic libraries, especially in baccalaureate-level institutions, that are still operating multitier structural stacks in an open-shelf mode should look at any proposal to add to their present buildings with a severely jaundiced eye. Since midcentury almost all new library construction has been modular in concept, employing few if any load-bearing walls, so that only columns and floor slabs are fixed permanently in place. Such structures are easier, cheaper, and more adaptable to changing needs than were the fixed-function structures that preceded them.

PROGRAM REQUIREMENTS

Spatial Rules of Thumb

Fortunately there are plenty of rules of thumb to aid planners in calculating the spatial requirements of library buildings, but they must all be approached with caution. Some of them are downright wrong, and all of them will benefit from interpretation and understanding. The most complete aggregation of rules appears in the second edition of Keyes Metcalf, where, however, they are not always well indexed, and in the third edition of Godfrey Thompson, where metric dimensions are given. Both of these sources tend to emphasize traditional library activities.[3,4]

A recent volume by Richard Boss proposes some useful spatial formulas for meeting the needs of more recent information technologies in libraries.[5] To benefit fully from its advice, an institution must decide just what kind of use it will likely make of library technology before applying any formula. Boss correctly observes, for example, that the traditional allocation of 25 square feet of floor space per reader station will be inadequate in libraries where public-access electronic equipment is widely provided. He proposes that 35 square feet is more appropriate. This does not necessarily mean that a 1,000-seat library must now allocate 35,000 square feet to seating instead of 25,000. After all, some of those 1,000 seats, perhaps 25 or 50 or even 75 percent depending upon local circumstances, will continue to serve solely as reader stations in the traditional sense and will therefore continue to require only the time-honored allocation of 25 square feet each.

ACRL's "Standards for College Libraries" cites some spatial formulations that can be misleading to the unwary.[6] In the first place, the percent of FTE enrollment that will be studying at any given time in a college library, today or in the future, is unlikely to attain the 25 percent called for in the 1986 revision of the "Standards." When students can, without leaving their personal computers, search databases, read abstracts, check library holdings, determine current circulation status, ask reference questions, or request by E-Mail the hand or FAX delivery of desired library materials to their dorm rooms, the amount of physical library traffic will certainly decline somewhat if not precipitously. In some institutions this decline in in-building library use is already apparent. It is therefore not surprising that many new library building planners are already calculating seating for only 20 percent of FTE enrollment instead of 25 percent.

The number of volumes per square foot of floor space suggested by the "Standards" for planning purposes can also be misleading. Except in cases of less-than-full-height shelving, or very large volumes (art books or bound periodicals per-

haps), and/or very wide stack aisles (some reference collections, for example), considerably more than ten volumes can be shelved in a square foot of floor space. More realistic expectations, based upon experience and experimentation, can be derived from the aforementioned works by Metcalf and Thompson. In most cases, at least fifteen volumes can be comfortably shelved in a square foot of conventional floor space.

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Finally, it should be pointed out that in the "Standards" their net assignable space allowance for library functions other than those for books and readers is substantially too low. The experience of any large sample of recently built college libraries will demonstrate that about 25 percent (rather than the 12.5 percent called for in the "Standards") of book and reader space is necessary to accommodate other requisite library activities (technical services, administration, bibliographical laboratory, public catalog, receiving/shipping and storage, staff room, etc). Building planners should be alert to this problem.

There are some library activities for which there do not exist well-formulated spatial standards or guidelines. Greater attention is needed to the proper spatial allowances for college archives and media services in four-year college and university libraries. It remains reasonable in most situations to expect that the net-to-gross ratio of academic library floor space will continue to approximate three to one. It would probably be unwise, however, to attempt to impose that figure as a rigid standard because this relationship is sometimes affected by factors that are difficult if not impossible to control.

Other Program Guidelines

It has become fashionable in recent years to leave library lighting requirements for architects and lighting consultants to determine, but in retrospect this decision appears unwise. Architects like to consider lighting as part of the interior ambience, in the manner of colors, fabrics, and finishes, and therefore as an appropriate part of their domain to propose, if not dispose. In most kinds of buildings this may be a reasonable attitude, but it does not fit libraries in quite the same way. Public service areas in academic libraries, which after all utilize more than four-fifths of libraries' assignable space, have only one single purpose, and that is to sustain intensive reading and study. Given this singleness of function, it must be argued, they should therefore be uniformly lighted at a relatively high level of intensity.

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Some have said that the *quality* of library light is more important than its quantity. Quality of light is indeed important, but a relatively ample quantity of illumination must also be present if the purpose of this large portion of the building is to be served. In the writer's experience few people are able to read intensively for a sustained period of time without at least fifty foot-candles of light on their reading surface, regardless of the quality of that light. The patron should be able to read anywhere in the public service area of the library. This calls for uniform light distribution. That, as well as the amount of light, should be regarded as a functional requirement of the building, to be defined in the building program document rather than being driven, as has been allowed to happen in some recent library buildings, by esthetic considerations.

Acoustical considerations should also be a matter of program requirement in library building planning. Although ap-

plied acoustics is still a very inexact science when it comes to library use, attention paid to it can make a space much more effective for library purposes than would occur otherwise. Since librarians tend to know little about acoustics, they are often reluctant to address the subject. They do know from ample and sad experience, however, that such things as atria, mezzanines, open wells, and stairways do transmit obtrusive sounds vertically, and they should therefore not be loathe to proscribe them in drafting their building programs.

Although it is much clearer today than it was five years ago how and where in libraries electronic, telecommunication, and computer activities will take place, these are rapidly changing fields, and it is not possible to anticipate fully just how they will be used a decade hence. This means that libraries constructed now should be as flexible as reasonably possible to assure that they can be economically adapted as needed later on. This need for "smart buildings" is not limited to libraries but exists in many other industries, so architects are often able to apply recent experiences to our needs. Building program documents should therefore call for this kind of input from architects.

BUILDING PROGRAM DOCUMENTS

The importance of library building programs remains as great today as it ever was. It is nowhere truer than in library building planning that "you get what you ask for; not what you want!" Because there is already an ample literature on the preparation of building programs, however, little more need be said about it here.[7] It will be useful nonetheless to emphasize several characteristics of desirable program documents that have gained special significance for the current building environment.

"Zero-Based" Programs

When preparing building programs for additions to existing structures, inexperienced planners are understandably inclined to describe only what is perceived as needed in the additions. This is seldom the best approach to take. It is almost always better to prepare what might be thought of as a "zero-based" program describing an ideal total configuration of spaces for the entire expanded building, with no references at all to the old portion and the new portion. It should be the architect's responsibility to retrofit as many of those programmed needs into existing spaces as possible consonant with human economy and the most efficient operation of the enlarged structure. This process ensures that a complete rethinking be given to the total interactivity of all of the functions throughout the expanded building.

Simplicity

Concurrent with our recent emphasis on the user-friendliness of our library systems, we seem to have lost sight of the need for user-friendliness of our buildings. If, as was hypothesized earlier in this article, fewer people come to library buildings in the future, then greater attention will have to be given to making buildings easier for infrequent visitors to use. There is a profound but inexorable logic to every public function that should be immediately apparent to every person entering the building. Too often locations of library services and functions within a building are determined not by where those services and functions "want to be" but rather by where space for them is available. To permit this is to allow form to drive function rather than the reverse.

A good program document should describe cogently and fully what relationships exist among library functions, how strong those relationships are, and what proximities and adjacencies should be dictated by them. Patron needs, moreover, should take precedence over staff needs in determining those proximities and adjacencies. Simplicity of use by patrons, especially inexperienced patrons, must be the principal criterion by which the quality of any academic library building can be properly judged.

The library building program should be thought of as a single-purpose document, and that one purpose should be to communicate textually to the architect all of the library's functional requirements. It can properly be viewed as a codicil to the

architect's contract detailing everything that the architect must incorporate into his or her drawings and specifications to enable a contractor to build the building. The building program should not attempt to be a public relations document, or a litany of past frustrations, or a peroration on the inadequacies of the present building. It certainly should not attempt to usurp the architect's prerogative to mass or design the building or to determine its esthetic qualities or to influence its appearance. It should address only the functional requirements of the building.

CONCLUSIONS

Many academic library buildings appear destined to be enlarged or perhaps replaced in the next five to ten years. It can be reasonably expected that, nationwide, less new floor space will be required by this generation of buildings than was required by the last generation. If present trends continue, this may be the last occasion some institutions will have to expand their library facilities. Except where multitier structural stacks are involved, additions should be easier to make than they were the last time. Simplicity of library building use by patrons should be today's driving design consideration, even to the extent where possible of simplifying the existing structure as part of the enlargement process.

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