

## **Library Environments and Organization: Opportunities or Constraints?**

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At the turn of the century, France and Great Britain constructed monumental libraries, imposing structures designed to house millions of books and provide ample public space for readers and researchers. Simultaneously, the concept of digital information took hold, and the media trumpeted the advent of digital books. In the imagination of the public, a vision of open access formed. Librarians spoke of “a library without walls,” an “electronic library,” and a “virtual library.” The term “digital library” was so powerful that computer scientists appropriated it, although their interpretation of what constituted a library differed sharply from information professionals. Now, in the early years of the 21<sup>st</sup> century, we seek a balance between these two dimensions of what a library can be. In the past, the library was mostly about collections, and its status was determined by its size. Lately, the talk is more about service and knowledge management. Nonetheless, libraries continue to add volumes, often in sizable numbers, and the growth in publications, combined with the ability to transcend geography through the use of information technologies, has had a profound impact on the shape of libraries.

This paper addresses libraries as facilities, how library facilities are changing as a result of changes in the environment in which they find themselves, how those changes sometimes affect library organisation, and how changes in library organisations affect library design.

### **The Changing Nature of the Academy**

Libraries are, of course, a product of their environment. Academic libraries, the focus of this paper, are responsive to the culture of higher education and that segment of society that is part of the academy. Within the university, there is an increasing emphasis on scientific research. Much work is interdisciplinary in nature. At Cornell, where one of the university’s priorities is genomics, 600 faculty identify themselves as part of “the new life sciences.” Among them are physicists, biologists, engineers, veterinarians, and ethicists. Faculty in the fields of law and business also play a vital role in the education of those who will make new discoveries in genomics and bioengineering. Increasingly, both research and teaching incorporate technology strongly, and it is often an essential component. As the scope of knowledge expands beyond that capability of any individual to master everything in a discipline, let alone several interconnected disciplines, education has changed from “the sage on the stage” to the “guide on the side.” Teams of faculty teach, and students participate in a collaborative learning process.

Undergraduates in the United States and university students elsewhere embark on their studies with stronger preparation than beginners of the 1950s. Forty years ago in the U.S. libraries designated for undergraduates were very popular, with discrete collections deemed appropriate for 18-21 year olds. Underclassmen were discouraged from using graduate research facilities. Although today there still exist specialized services and libraries for undergraduates, all members of the university

community expect access to research collections and segregation is more likely to occur by type of use, rather than by the age of the user.

### **Expectations of the Modern Society**

At the same time these shifts in the academy are occurring, individual members of society are bringing with them to the university expectations that affect their sense of what is possible, desirable, and necessary. Individuals are more mobile, traveling and moving from location to location. They are becoming accustomed to span geographic boundaries through the use of telecommunications. They expect the convenience of anytime, any place access, whether through an ATM (Automated Teller Machine) for money or the web for connections to family, colleagues, or information. In an era characterized by rapid and constant change, individuals have developed immense self-reliance, and they often prefer to conduct banking, purchase items, or obtain information without mediation. In addition, as they cram more into their lives, they seek timesavers, convenience, and one-stop-shopping.

The changing environment of the university and the new lifestyle embraced by students and being adopted by faculty manifest themselves in both library facilities and the organizations which occupy them. As noted above, the dominant feature of libraries in the past had been its physical collections. With publication of books and print journals continuing unabated and the appetite for acquisitions unsated, libraries reached saturation. Yet where these volumes had been the source of pride for universities, they were now a source of vexation. The growth of holdings and the space they required collided with other interests of the university, which have been constructing other facilities such as laboratories, classrooms, and residences to accommodate expanding populations and research priorities. University administrators have been reluctant to commit to the expense of central campus expansions, and as campuses became congested, they tried to preserve the green spaces so highly prized in their micro metropolises. Out of these conflicts was born the high-density storage facility. In the United States the Harvard Depository, erected in 1986, has become a model for many other remote storage buildings.

### **The Effect of the Changing Environment on Libraries**

The offsite storage library, with its highly efficient shelving of materials organized by size and depending on delivery mechanisms of daily van service or scanning of items has recently entered a new phase. As more and more of these ‘big boxes’ have been constructed, at a fraction of the cost of onsite storage, they have forced reconsideration of this approach. At the Massachusetts Institute of Technology (MIT), for example, campus space constraints have resulted in over 75% of MIT’s library collections being housed offsite; the librarians are warning that this imbalance of access is putting its readers at a disadvantage. They are laying the groundwork for the construction of a \$100 million science library and a \$50 million renovation of an existing library, enabling them to support browsing and direct access to a much higher percentage of their collection. Librarians are beginning to assess the proportion of their collections that must be available to users for onsite consultation. On one hand, MIT asserts convincingly that 25% is an insufficient number. Elsewhere librarians are challenging the assumption that a significant proportion of their holdings must remain in central stacks. Harvard’s Widener Library, the great treasure house supporting the distinguished faculty and students of the College of Arts and Sciences, now sends 68% of its newly acquired publications directly to the Depository, and they estimate that within the decade more than 60 % of Widener’s holdings will be located off-site. At Ohio State University, where the library conducting a campaign for a \$100 million renovation of its main building, the planners propose reducing the amount of space devoted to shelving. Informing these decisions are several factors. Automated circulation systems have enabled libraries to determine that substantial parts of their collections never circulate. As publishers and

entities such as JSTOR digitize retrospective holdings of journals, patrons rely more on electronic access, making it reasonable to transfer paper volumes to remote storage. Universities seeking the most cost-effective means to store items often collaborate to reduce overhead. First gradually, and now with increasing rapidity and frequency, librarians are questioning the need to duplicate titles held in these repositories. There is a movement toward establishing a library of record for maintaining access to and preserving paper copies, freeing other institutions to deaccession their holdings. The consequences are lower capital and operational costs, institutional interdependence, and a greater ability to hold central libraries to zero collections growth. Other benefits of remote storage are environmentally superior conditions and protection against thieves.

Over the past 15 years libraries have shifted from an emphasis on ownership to access, and there is increased focus on services. Certain traditional staples of the library have altered their shape. The card catalog, once the starting point for scholars seeking entrée into the library's collections, receded in importance as libraries brought its contents online, and as users began to prefer the Web as the point of departure for discovery. Similarly, as libraries provided access to more electronic journals, the periodicals room declined in popularity. Reference transactions have also fallen steadily, perhaps a casualty of the greater independence of information seekers who conduct much of their information seeking online. As a consequence of these changes, libraries are reconceptualizing their space in innovative ways. The vast amounts of floor space freed up by removal of the catalog now are often occupied by computer workstations. Libraries have converted periodical rooms into cafes or group study rooms, taking into account the trend toward one-stop shopping and the blurring of the boundary between reference and information, libraries unifying service points. For example, they may combine access to materials formerly separated by format, creating a single service desk for inquiries for newspapers, microfilms, and general reference. The complexity of information resources makes navigation for readers much more difficult than in the days of the book-dominated culture. Thus libraries have greatly increased the amount of instruction, adding wired classrooms to their domain. As general collections have grown more homogeneous, owing to online aggregations of serials or to restricted budgets which force libraries to cut back on acquisition of monographs, special collections have ascended in prominence. There is greater attention to primary source materials as students begin research earlier in their careers, and as samples mounted on the Internet whet the appetite for access to originals and entire collections.

One of the major challenges facing libraries and their users is the integration of print and digital and place and space. Not only do library patrons need access to dispersed manifestations of knowledge in a variety of locations and formats, but also they themselves are now creating new knowledge through the incorporation of diverse sources. Increasingly they seek modes of expression that are multidimensional and for which they employ computers, software, and the raw material of library holdings. No longer is the monastic study carrel with its narrow ledge and bookshelf sufficient for the thesis writer. Now she desires a small enclosed room with electrical outlets and Internet connections for her laptop. The comfort and convenience of home need to be reproduced in the library, with soft chairs, warm lighting, and an inviting atmosphere encouraging learning and research. Users need quiet zones where they can concentrate, interactive areas where they can work with one another utilizing the latest technology, connections to online services and live experts, and space for social intercourse and community building.

To produce audio and video components, she needs access to high-end multimedia workstations loaded with advanced manipulation programs and access to staff competent to guide her through unfamiliar software, tools to assist her creative expression. Wireless Internet connections are part of a general trend to build flexibility into library design, which increases in importance in a very dynamic world. Photocopy services, which reproduces texts required for offsite consultation or detailed analysis, are now building in digitization operations to scan texts, images, and other materials. The

demand for technology support has led to the development of areas called media commons, requiring a reorientation of space to accommodate the multiple spatial requirements of users who need computers, color plotters and printers, GIS programs, scanners, projectors, and a host of other technological devices not envisioned by the creators of the codex. Because the new order combines traditional and new technologies, libraries must allocate even more space for users.

### **Modern Libraries Are a Beehive of Activity**

Although headlines in newspapers often suggest that Internet traffic has supplanted the physical library, the fact is that at research libraries, visits remain steady or are even on the rise. The library, far from being a mere warehouse for books checked out by clerks, is a critical component of social and intellectual fabric of the university. The inspirational reading rooms of the 19<sup>th</sup> and 20<sup>th</sup> centuries still exert a powerful pull on readers. The University of Washington has just celebrated the restoration of its magnificent Gothic reading room, and Columbia, Yale and Harvard have all invested significantly in maintaining the tradition of the reading and reference room, albeit in an updated form with access to power and data.

Access to physical collections is one reason to use the library, but equally important is the need for discourse and discovery with others engaged in academic pursuits. Cyber cafés, imported from progressive bookstores, have taken off like wildfire in U.S. libraries, taking advantage of relaxed prohibitions on mixing books and food, and drawing on the pleasure of human interaction in an ever-more technological world. Libraries have expanded their role in curating exhibitions, sponsoring lectures, and planning other activities that attract people celebrating the life of the mind. Correspondingly, libraries are expanding the amount of space dedicated to these activities.

### **New Roles and Partners for Libraries**

In the past several years libraries have taken on new roles and partners in order to serve their public's needs and to meet their expectations. Both the library's physical environment and the library organization have changed as a result. The need for ubiquitous technology and deep technological expertise and the rising number of electronic resources have led to the collocation of information technology and library staff in neighboring service points, team teaching, and in some cases, the merger of units. At Dartmouth College, for example, architects planned a new library addition that places IT (Information Technology) and librarians in adjacent offices and public service desks. At the University of Georgia, construction of that campus's most expensive building, the Georgia Student Learning Center, is underway, with the library director at the helm of the planning group that has recommended a spacious building combining group study rooms, electronic classrooms, and a traditional reading room. The building will be 100,000 square feet, housing an electronic teaching library with 500 network stations, 2200 seats, many electronic classrooms, plus the ubiquitous coffee house and lounge chairs for students. At Northwestern University, in Chicago, Illinois, there is a library building called "Two East," which is a version of media commons. In it the university has located collection managers, digital media services, and academic technologies. Although organizationally separate, the university library and academic information technology support work together to offer their clients a library training facility, a reference classroom, and digitization services where they can assist faculty in creating courses that employ digital content.

Expertise gained by librarians in the management of digital resources has made them key resources in other cultural units who are just developing digital activities or products. Thus librarians assume responsibility for museums or university presses, with the consequence that both facilities and staff can overlap. Cornell University manages the operations of the arXiv, a physics pre-print server, and directs Project Euclid, an online service for publishers of mathematics journals, with a

concomitant increase in staff and space needed to house their operations. Some libraries partner with other academic units in teaching and research. At New York University, the dean of libraries oversees not only the libraries, but also the television station, media services, and the New York University Press. The group of related organizations enables sharing of staff expertise and often leads to integration or adjacent placing of staff and services. The preparation for classes, meetings with other professionals and students, and laboratory space all place new demands on library facilities for different configurations. In addition to more square footage, the fluid and dynamic organizational changes create a need for space that is very flexible and easily altered.

### **Architectural Solutions to Spatial Constraints**

In their quest to accommodate the variety of dimensions of the library and its users, universities and architects have presented many ingenious solutions that respond to the constraints of space. In 2001 Princeton University announced that it will build a \$60 million Frank Gehry designed building, consolidating several science libraries. Smoothing the way for this momentous decision are several factors: a willing donor, the desire by researchers to liberate space for laboratories, and the increasing availability of online scientific information online. Another popular solution to limited on-campus space, as we have seen, is displacement. Most frequently, libraries move books off-site to high-density storage facilities. Of late institutions are also shifting staff from central libraries to office space located at some distance from the library. Harvard moved its cataloguing operations out of Widener Library to an office located a mile away in 2001. It transformed the former cataloguing workroom into an inviting current periodicals reading room.

Many other institutions are re-examining the necessity of locating all staff near public spaces. One solution to total separation is to establish an area in a central location for “hoteling”, where staff can reserve temporary offices and business services to use for a few hours or days.

Divestment is a more drastic form of dealing with overcrowding, but some libraries have chosen to contract out services such as cataloguing with the consequent savings in staff space. Cleverly, Yale, Harvard, and the New York Public Library have created additional space within existing buildings by filling in light courts, fresh air intake courts, and atria. These renovations have resulted in buildings within a building, and the transformation of previously wasted square footage into elegant public and staff space. At Cornell a prohibition on library buildings on central campus drove the library to expand underground. Emory filled in the space between the Woodruff and Candler libraries with a glass enclosure that houses its advanced technology and that creates a porous connection between the two.

### **Restructuring and Merging Organizations to Optimize Service and Facilities**

The relationship between form and function is often apparent in library facilities. The relationship between facility and organization is sometimes less visible, but equally important. The collapsing of service points in libraries can be the result of organizations being consolidated or can lead to the reconsideration of organizational arrangements. For example, rather than having separate service points for reference, information, newspapers, microfilms, and media centers, some libraries are seeking to combine departments or locate them in proximity to one another. This enables the library to have more efficient staffing and makes it simpler for the patron to reach the service he needs quickly, without being directed to different areas of buildings.

Libraries can be aggregated by discipline, almost invariably with an impact on the structure of the administration of the library. Decades ago the chemistry, physics, and astronomy departmental libraries at Cornell united to form the physical sciences library. In 1998 the Engineering, Mathematics, and Physical Sciences Libraries units consolidated administratively, but remained three

separate physical units. Princeton and other institutions have carried this concept further by merging many departmental libraries into a single science library, usually managed by an Associate University Librarian for Science. This allows the library to streamline its staffing, eliminating separate unit heads. Policies become standard across a broader swath of academic disciplines. To avoid duplicate subscriptions is essential, saving not only the expense of acquisition, but also in order to avoid multiple processing and redundant storage.

### **Rethinking Core Library Services**

One of the most important developments now occurring is the rethinking of what is essential to offer for library services. This reordering of priorities, coupled with the evolution of strategic alliances, has an impact on library space and is, in part, a reaction to the limits libraries are experiencing on library space. As librarians contemplate and implement shared storage facilities and regional depositories, they join their collections in ways that present new service options and new relationships. They can imagine increased reliance on a third-party for document delivery, ceding responsibility for storage and preservation of materials to other entities, either commercially operated or collaboratively with other institutions. They can expand their use of the cataloging of others developed through their experience with utilities, outsourcing ever-greater portions of it. They can redefine their priorities to concentrate on those services that are most valuable to their public, and for which local knowledge and specialization is critical. They can focus on teaching and instruction, for example, rather than developing, in a multitude of institutions, production facilities for digitization.

### **Libraries Thrive in an Era of Change**

Library environments and organizations are in a heightened state of change. Far from becoming deserted or anachronistic in the digital age, libraries are enjoying a renaissance which manifests itself in the widespread renovation and reconceptualization of library facilities. Modern libraries or historic buildings that are rejuvenated to reflect contemporary functionality are experiencing immense popularity as destination spots. The challenge of book storage of collections that seem to grow inexorably offers opportunities to rethink the very nature of a library. Is it necessary to own a title? Is it necessary to make it available for immediate consultation and browsing? Responding to the pressure placed on buildings has resulted in an array of creative solutions and services that alters the relationship of libraries to each other and of patrons to collections. A trend to return library space to users is occurring, with collections and staff being moved off site and new user space being created out of unused terrain. Successful facilities are likely to accommodate boundary spanning in organizations or to house multiple units that engage in collaborative support for teaching and learning. Because the institutions are so much in flux, library facilities are being designed to be flexible, capable of further reconfiguration as the structure of organizations shifts and new needs emerge. At the beginning of the 21<sup>st</sup> century, the public venerates the traditional role of libraries as custodians of knowledge and culture, and they celebrate the iconographic character of grand reading rooms. They seek out libraries for the community space they provide at the social and intellectual crossroads of society. To integrate into the digital information age, they require that the library incorporate state-of-the-art information technology and services which bridge the analogue and digital worlds. Both physical facilities and the organizations which reside in them are still evolving. The transformation requires our imagination and flexibility. The evidence, as manifested in the construction and reconfiguration of the past few years, is that these qualities abound.

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