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LIBRARY DESIGN IN THE AGE OF TECHNOLOGY: PLANNING FOR A CHANGING ENVIRONMENT
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Abstract

This paper explores university library design that is user-centered and inclusive. We will look at the need to create a strong, compelling vision. Discussion will include an overview of types of spaces and the need to connect libraries to the external environment to enhance the design and usability. It will look at the evolution of the library and considerations for contemporary library design which include issues of mobility, determining the role of collaboration between users, accessibility, and process. It will include examples of university library buildings, both new construction and renovations.

Introduction

The library was once a static container of books and study seats. But today—defying predictions of its impending obsolescence—the university library is undergoing a dramatic rebirth and reinvention. The continuing evolution of technology, the reassessment of the basic principals underlying teaching and learning, and ever-increasing financial limits have driven colleges and universities to rethink the role of the library on campus. Contemporary libraries function as the university's perpetual motion machine—blending books, technology, instructional spaces, academic support initiatives, and a range of study spaces.

A deliberate and inclusive design process—whether for a new building or the renovation of an existing building—can result in a library that is a powerful tool for helping a university leverage its physical and intellectual capital to meet the challenges and opportunities that lie ahead for higher education.

Librarians face a number of opportunities and challenges in the design of new spaces: they must convince funders and the potential user base of the viability of the physical library, and also create a library space that remains relevant in a constantly changing environment. Here, we offer reflections on both design and process to guide a successful rethinking of the library and planning for change.

The Changing Library

In the past, libraries were fairly fixed in their purpose, resulting in design that was often simple and static. Shelves were immobile, load-bearing floors were insufficient, and public areas were inflexible. Librarians would experience frustration with these physical spaces, created without consideration of the future. Today, this situation is exacerbated, as librarians have to be prepared for constant change. Changes in technology, curriculum, the student body, and funding models are relentless—and aging buildings are hindering adaptation. Within this changing environment, there is the growing need to rethink the design of the modern library and the learning spaces within. Librarians must focus on the physical library in particular, and achieve a balance between collections and user spaces.

The attitude towards the physical library is changing. As traditional library rules relax, students are encouraged to think of it as their intellectual home. For example, food and drink is becoming allowed in formerly restricted areas, and cafes are common. Silence is no longer the standard; new zones create both quiet, contemplative areas and collaborative spaces that encourage the vocal

exchanging of ideas. Print materials are no longer the most prominent aspect of the library, which frees up space for many types of student use.

The spaces created within individual libraries vary, yet similar themes emerge. It is common for design to focus on the student, not the librarian or print collection. The growing use of robotics and compact storage systems increases space for student use. Designers are keeping these reclaimed spaces ready for change at any moment with moveable walls, raised floors, and multi-purpose furnishings such as beanbag chairs, which are a popular inexpensive way to add colorful seating for students.

With the extraordinary preponderance of electronic devices in the library, there is now the need for charging capacity. Many libraries are not equipped to handle such a load. In addition, the locations of electrical outlets or sockets must be flexible as well. If new construction or major renovation is not possible, the library must seek creative interventions. A hybrid approach to furnishings, with some movable and some stationary, create the ability to either place the furniture near existing power, or insert the circuits directly into the furniture. The first is more of a challenge. Keeping a variety of charging stations can be a great interim solution, but they still require students to move them. Device charging is a good example of constantly changing opportunities, and librarians need to be aware of new developments.

Students differ in their needs and level of academic ability. Providing different types of library spaces can also cultivate different courses of study. A flexible environment can be the solution for this situation, with each student, or group of students, organizing the space for their needs. Increasingly, students are requiring a variety of collaborative spaces. Curricular priorities necessitate them, as well as simple learning and study styles. Many libraries also distinguish between undergraduate and graduate students. Some universities have chosen to create separate libraries for graduate students. Assigned carrels, as well as individual study rooms featuring flexible storage and movable furniture, can still maximize the experience of the graduate student without compromising space on campus.

Spaces to support innovation, both for library staff and students, have become an important aspect of library design. A growing service in libraries is the idea of "makerspaces," which house machines, and also provide service, support, and instruction. In university libraries, 3-D printers are the most common makerspace resource. Libraries are also now becoming a resource to experiment and test innovative technologies. The University of Calgary and North Carolina State University are two examples of places that now circulate technology that can be used outside the library or as part of specially designed library spaces. Project laboratories and media labs are also growing in popularity. These are exciting spaces—and it is imperative that they are designed to encompass the next change.

Flexible design is not without its challenges. Two major difficulties that come with updating existing library design is finding the money for the furnishings, and keeping up with safety codes with the additional space and people gained. Sufficient staffing is a key consideration, and positions are often reconfigured to meet these new needs. Engaging regularly with the various stakeholders— students, faculty, and other users— helps guide the creation of innovative and flexible library spaces that meet the needs of a changing environment.

In planning for change, we've identified a number of broad themes:

Mobility
Whether library resources, staff, or users, very little today is fixed in place.

Traditionally, library services and resources were dispensed from a very authoritarian counter, in a manner befitting the great and powerful Oz. We now find staff becoming more pro-active, coming out from behind the counter and offering support through a more user-friendly concierge model,

roving the library with headsets or even offering virtual support through online services (e.g., Skype, IM, email).

Likewise, students and faculty are utilizing the library in a more fluid and dynamic way. Information is gathered from a variety of sources, both hard bound and electronic, and displayed in a variety of modes: scanned, printed, projected, and manipulated. In the course of a library visit, the means of study and research frequently transitions from solitary contemplative thought to group engagement and back again. A student may meet with a tutor in the writing center and then study individually for a period of time before meeting up with a group of students to work on a project.

Collaboration
Due to emerging technologies, teaching and learning style are undergoing a dramatic shift. Teaching and learning—and research and scholarship—are project-based, collaborative, and customized. It is important to understand the range of collaboration occurring in today's library:

Student to student. It is common today to find cohorts of 4–6 students being assigned a project to work collectively toward a multimedia presentation to a larger class. The dynamics of how these groups work (meeting together to assign tasks, breaking apart to work individually, and then coming back together to report findings) needs to be accommodated.

Student to staff. Academic enrichment programs such as math centers, writing centers, and internship centers are becoming more common on campus. Because they are not tied to any one department or discipline, these programs often find themselves situated on common ground: the library. We must consider the particular spatial needs of these programs and the interactions they sponsor.

Staff to staff. In today's more user-centric library model, the traditional departmental divisions among library staff are eroding as more and more blending of skills and expertise force new models of staff collaborations.

Faculty to faculty. Some of the most exciting breakthroughs in science and technology are happening at the seams between traditional disciplines. Interdisciplinary collaborations are now the norm, and as the academic common ground, the library finds itself sponsoring and supporting much of this research.

Partner to partner. Particularly in the United States, public-private partnerships are becoming a predominant model for science and technology research initiatives. Incubation spaces, makerspaces, and flexible meeting spaces are all examples of library spaces required to support these efforts.

Accessibility
Users engage with today's library in a much more fluid and dynamic way. How this movement is choreographed becomes critical to the design of the library. We must carefully consider the sequence of engaging information, support services, and fellow scholars so that the act of accessing the information, manipulating, and discussing it becomes seamless and effortless. The most successful library designs today focus on the circulation spaces between rooms as much as they do on the rooms themselves.

Process
In the context of all this change and evolution, how does one move forward with the renovation of an existing library or the design of an entirely new building? It can seem a bewildering exercise, fraught with potential misconceptions and missteps.

The important first step is to recognize the individuality in each institution and its library. There is not a one-size-fits-all library design. There are a myriad of good ideas being tested, and a number of thoughtful and inventive library buildings have been constructed over the past several years. As you

embark on your own particular initiative it is useful to look at these benchmarks, but only if you pass them through the filter of the values and mission of your library and your institution. A brilliant solution at one institution may not translate well to another.

A successful design and implementation process engages relevant stakeholders, including campus units, donors and other funding bodies, students, and the community. Their support is needed throughout the entire process, and even after the initial project is complete. Depending on the complexity of the project, consideration should be given to creating two committees: an executive steering committee and a user group committee. The former concerns itself with visioning and alignment with the values and strategic mission of the institution, and the latter concerns itself with issues of functionality. The process of programming and design should be at a brisk pace—work sessions spaced approximately 3 weeks apart--to keep the momentum going and collective memory of key issues alive within the committees. Communication should be regular and transparent. There should be no hiding or delaying of tough calls.

Many libraries now employ marketing professionals to keep the university library, both physical and virtual, a continual and exciting topic of conversation. Advisory groups, group activities, surveys, and focus groups are some methods for continuous engagement. In the United States, the Academic Library Advancement and Development Network (ALADN) was created to support these types of activities.

The end result of a highly participatory process and conscientious communication is an innovative library space to which everyone feels connected.

Academic libraries are enjoying a tremendous resurgence. Both the physical and the online elements of library service have become dynamic and creative. With the physical library building, many design opportunities have evolved. The library building must be created to be both an iconic centerpiece for a campus and a flexible environment poised to embrace and create change. The libraries and the larger university must create a strong vision to guide the design of the building and its services. It is an exciting time for libraries, and their design.