

MIT Libraries: Meeting Critical Needs For the 21st Century

Prepared by the MIT Faculty Committee on the Library System
May 1, 2002

Executive Summary

The MIT Libraries' mission is to select, organize, present, and preserve information resources relevant to education and research at MIT; to build intellectual and scholarly connections among these resources; and to educate the MIT community in the effective use and evaluation of information. Despite the dedication and resourcefulness of the Library staff, the Library system is struggling to continue to fulfill its mission because of such significant problems as:

- the dreadful condition of many of the libraries' physical spaces
- low budget per student as compared to our peer institutions
- the need to keep about 28% of the collection in off-site storage due to lack of on-campus space
- lack of sufficient library seating and group study space
- non-compliance with the Americans with Disabilities Act

These problems persist and grow worse because the Libraries are "underfunded, undersized, underseated, and undershelved".

The promise of digital technology to reduce the need for Library space will not be realized in the foreseeable future because of such issues as constantly changing hardware standards, vendor instability, licensing, archival responsibility, lack of e-books acceptance, and copyrights, as well as the continuing human needs of browsing, researching, studying, and obtaining librarian help in proximity to library materials.

To remedy these problems, in 2000/2001 an architectural firm was asked to perform a long-term space planning study of renovation and expansion of existing Library space. They analyzed existing library building conditions and studied the design and costs for improving Building 14 library space. This resulted in a renovation and expansion study that included using the library courtyard space, adding a four floor structure on the west side, and expanding the basement level towards the river. All this work would add only 63,000 sq. ft. of additional space to Building 14 at a cost of about \$100M. This scenario was deemed both inadequate and overly expensive, as 70,000 sq. ft. alone are needed to bring most present off-site materials back onto campus, while still not meeting needs for additional seating, shelving, group study space, growth, etc.

Thus, to meet the MIT community's library needs the unanimous FCLS recommendation is that the best solution for the MIT community is to build a new combined Science and Engineering Library, at an estimated cost of \$100M-\$120M for 250,000-300,000 sq. ft., and to renovate Hayden Library to an integrated Humanities and Social Science Library at a cost of about \$50M. The Undergraduate Association, the Graduate Student Council, the Library Visiting Committee, and the Faculty Policy Committee, support and endorse this recommendation. We ask the MIT administration to initiate a planning study to evaluate options, sites, and costs and to identify donors and other funding sources to bring this recommendation to timely fruition.

This plan must also continue the MIT Libraries' present dual paths that integrate traditional human approaches to acquiring, managing, using, and sharing information together with the use of technology to aid those approaches. The purposes of this report are to reaffirm the conclusions of the 2000/2001 FCLS that there is a need for new construction and renovation of the library system and to further rebut arguments from those who believe that digital technology will eliminate the need for library physical space. The report also identifies opportunities to remedy other MIT community needs that might be integrated with new and renovated library space to greatly improve the quality of MIT community life and thereby aid MIT's commitment to a residential campus. Finally, the report presents a vision for the MIT Libraries in utilizing information technologies in the future as a unified center for information creation, discovery, and management.

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I. Background to the Problem

A. The Libraries at MIT

The MIT Libraries' mission is to select, organize, present, and preserve information resources relevant to education and research at MIT; to build intellectual and scholarly connections among these resources; and to educate the MIT community in the effective use and evaluation of information. Being at the center of MIT's broad and vibrant intellectual life, MIT's library system offers support for research and teaching for both serendipitous and structured learning.¹ The Libraries serve a communal function by enhancing exchange among faculty, students, and staff, and by provision of comfortable and aesthetically pleasing spaces that encourage contact with others engaged in scholarly pursuits. The library can provide respite from the sometimes overwhelming demands MIT places on its undergraduate and graduate students. Life-long skills in research -- one of the most important aspects of learning -- are a crucial part of the Libraries' role in MIT education.²

Current MIT library space available for these purposes is severely limited. Present MIT Library seating can accommodate about 13% of our student body, significantly below library institution guidelines of 25%-50%.³ In 1997 MIT Libraries had shelf fullness 70-95% so that literally now for every new book purchased a book has to be removed from a shelf and sent to off-site storage. Over the last several decades, library services together with print and digital resources have dramatically expanded to meet the growing MIT education and research agenda. However, the Libraries' footprint and capacity on campus have remained largely unchanged necessitating removal of a large percentage of materials to offsite storage at the RetroSpective Collection (RSC) in Building 57 near Central Square for material delivery within 24 hours and with rented space at the Harvard Depository in Southborough, MA, about 35 miles away, for normal delivery within 24-48 hours. The collections grow some 6,200 sq. ft./yr. Presently about 28% of the MIT collection is in storage, as opposed to 20% in 1997, versus between 5 and 10% for our peer institutions. About 321,000 volumes plus 16,000 linear feet of papers are in Southborough and about 411,000 volumes are in the RSC. About 1100 items per month are requested from storage. The annual cost for storage and retrieval is about \$750,000 and growing. Another 70,000 sq. ft. of on-campus Library space could hold most of the present off-site materials. Important statistics on the MIT Libraries space, holdings, usage, budgets, and rankings are given in Appendix 1.

To sum up the current situation, the MIT Libraries are "underfunded, undersized, underseated, and undershelfed." MIT's Capital Campaign allocates just 1.3% of its Campaign goal for use by the MIT Libraries compared to 3.2% of the Capital Campaign of other leading universities.⁴ To demonstrate MIT's under investment in the Library system, Figure 1 summarizes fiscal year 2000

	<i>total student</i>	<i>grad student</i>	<i>library expend</i>	<i>serials expend</i>	<i>\$ per student</i>
Stanford	11,771	5,429	\$57.8M	\$7.9M	\$4,910
Yale	10,956	5,543	\$47.3M	\$6.6M	\$4,317
WUSTL	10,018	4,329	\$22.9M	\$4.6M	\$2,286
Duke	11,434	5,112	\$24.9M	\$6.5M	\$2,178
Vandrbt.	9,655	3,828	\$17.0M	\$5.3M	\$1,760
NW'ern	13,365	5,781	\$20.7M	\$4.6M	\$1,549
MIT	9,709	5,469	\$14.1M	\$3.9M	\$1,452

Figure 1- A comparison of library fiscal year 2000 budgets for MIT and peer institutions of comparable student body size excluding law and medicine where applicable.⁵

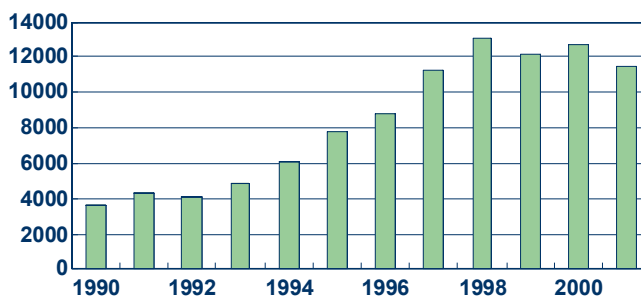


Figure 2- Growth in interlibrary loan requests by MIT over the last decade.⁵

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library budgets of MIT and some of its peer institutions with comparable student body size. A key indicator is that in 2000 MIT spent \$1,452 per student while Stanford spent \$4,910 per student. Figure 2 shows that despite the power of online information from the Internet, the number of MIT interlibrary loan requests of paper books has greatly increased over the past decade.

Because of the decentralized structure of the MIT Libraries, a typical user visits as many as three separate libraries to do a research project.⁵ For example, Barker holds electrical engineering, but Science holds solid-state physics; Barker holds mechanical engineering but Science holds chemical and nuclear engineering; Humanities holds liberal arts yet Dewey holds recent history.⁵ The 2001 SHASS survey recommended that the holdings of each library should reflect contemporary intellectual and academic needs of interdisciplinary research rather than space concerns.¹

According to the most recent Library Usage Study, 41% of the undergraduates and 58% of the graduate students visit at least one of the Library facilities each week to read books and journal articles, to gain online access to science and technology information, and to study. Significantly, 58% of the undergraduates and 49% of the graduate students prefer to use library computers to gain online access. Of more significance is that 61% of the undergraduate students and 55% of the graduate students report that the MIT Libraries are important to them as a place to study.⁶

After extensive study of the MIT Libraries' problems and possible solutions, the FCLS in May 2001, under the leadership of Prof. John Lienhard, succinctly summarized the then current state of the MIT Library System:

*"The FCLS again wishes to convey with emphasis the need to substantially increase MIT's investment in the Library System. Apart from the dreadful condition of many of our libraries' physical spaces, MIT spends on libraries 1/3 as much per student as does Stanford, MIT's library staff are paid 1/3 less than librarians at our leading competitors, and MIT's libraries must keep 27% of the collection in off-campus storage owing to the lack of on-campus space (bottom quartile amongst peer institutions). Yet, MIT's collections are focused on the most expensive category of literature (science and technology) and are heavily used by our community. The continuing growth of information technology in libraries adds to the cost of operation but will not substantially reduce the Libraries' space needs."*⁷

The FCLS in May, 2001 then recommended that to remedy the problems of the MIT Libraries:

"MIT should build a new Science & Engineering Library, with integrated facilities supporting student life and learning....The Hayden Library should concurrently be renovated as an integrated Humanities and Social Sciences Library."

The subsequent report of the Ad Hoc Committee on the Humanities Library also underscored the need for a world-class liberal arts library.¹ A new science and engineering library with estimated cost of \$100M-\$120M for 250,000-300,000 sq. ft. and a renovated liberal arts library at an estimated cost of about \$50M would be a basic resource for the entire MIT community. The construction of spaces appropriate to the support of group learning; the design of adequate spaces, including physical upgrades for disabled MIT community members; and the planning of appropriate settings to encourage contemplative study at the Institute have the potential to preserve and enhance the communal function of the libraries and to significantly improve MIT community life, thereby aiding MIT's commitment to a residential campus.

MIT is not alone in needing significant renovations and expansions of its Libraries. The reasons that many peer institutions choose to make significant improvements are very similar to the reasons that this report identifies as MIT library problems that need to be remedied. Appendix 2

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lists some facts and related remarks concerning recent library improvements at other peer universities that are especially apropos to MIT.

B. 2001 MIT Libraries Visiting Committee Recommendations⁴

The 2001 MIT Libraries Visiting Committee report supports new library facilities that serve as landmark symbols that identify MIT as an innovative scholarly institution. They support a new Science and Engineering Library facility that:

- should be an education center that includes books, periodicals, online access, team study rooms, individual learning spaces, 24-hour food service, and convenient places to meet colleagues or friends for casual or scholarly interaction
- meets MIT's commitment to a residential campus and provides an education, social, and information resource center for collaboration and learning
- lets MIT become a world leader in the use of information technology via an "Information Resource Center of the Future"
- promotes the finding of the MIT Task Force on Student Life and Learning that the Libraries be actively engaged with the MIT teaching mission

The Visiting Committee also recommends that a Planning Study be done to determine how this new educational facility, a combination of an educational and activity center and library, can best address the issues of team collaboration, intellectual development, and social commons as part of the process of enhancing learning and research. The Study should also thoughtfully analyze the effects that the digitization of information will have on space needs over the next ten to twenty years to ensure that the new facility will be able to very flexibly reallocate space from physical storage of information resources to study space, meeting room space, and online access points.

The Visiting Committee believes that this "big picture" concept would make MIT the site for designing and developing the technology and applications for this new type of center and that many would enthusiastically support this initiative, including financial resources to implement such a compelling new initiative.

C. Faculty Policy Committee Supports and Endorses this Report⁸

The Faculty Policy Committee also supports and endorses the improvement of the Library system along the lines advocated by this report by stating "The FPC was enthusiastic about the (FCLS) Report because it plots a course for the improvement of a core resource at the Institute that has been seriously neglected for too long. ...we'd like to reiterate our enthusiastic support and endorsement of your report. A major investment in our library system is long overdue, and you have developed a very compelling case to make this a top priority... We look forward to continuing to work with you to bring this plan to fruition."

D. Information Technology Does Not Replace Libraries

In his visionary Atlantic Monthly article of 1945, Vannevar Bush described the *memex*, a mechanized device in which an individual stores all books, records, and communications, thus allowing information access with unprecedented speed and flexibility.⁹ Bush envisioned a library system that mimics the workings of the human mind, one that organizes and operates by association, not by cumbersome rules of classification and filing systems. Although he imagined his *memex* as mechanical, using microfilm as the storage medium, Bush's vision has since been appropriated as a seminal contribution to the field of digital libraries which is now here, available, and functioning today due to the great advances in computing power, the diffusion of the Internet throughout the world, and the linking and searching capabilities of the World Wide Web. These technical advances have inspired many to believe that the tools are now in place for the creation of a truly digital library, eliminating the need for physical libraries as places to go to. In this age of compact storage and nearly instantaneous data transfer, many now wonder whether we still

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need library buildings. Should we plan for additional storage for printed material? Is there still a need for MIT faculty, students, and staff to go to a physical library when so much information is now available online and electronically? We believe that the answer to this question is a resounding “YES”.

The increase in off-site storage will continue to grow in the future because shelf-space is presently full, so that for every new volume put on the shelf another volume must be sent to storage. This greatly reduces the important opportunity for the MIT community to browse among the shelves and greatly reduces efficiency and productivity since library users must generally wait for 24-48 hours for off-site materials to be obtained. To try to alleviate lack of on-campus storage space, Hayden basement had compact shelving installed in summer, 2001 at a cost of \$337.5K, which added 8,000 linear feet of shelving with a capacity to hold about 48,000 journal volumes, which constitutes 7 years of growth.

While digital technology has greatly enhanced the ability of the Libraries to promote and advance research and education, the need for the Libraries as physical places has not been eliminated, and the present space limitations of the MIT Libraries do not allow it to meet the needs of the MIT community.¹⁰

E. Architect Studies¹¹

In 2000/2001 Shepley, Bulfinch, Richardson, and Abbott Architects evaluated the potential for a combined Science and Engineering Library and for the Libraries’ Central Services and evaluated existing conditions, systems, and current Building 14 functionality as a contemporary library facility. The overall conclusion was that an expanded Building 14 could not effectively accommodate the Libraries’ needs.

1. Building 14- Hayden Library was constructed in 1948 and except for renovations to the Music Library and office improvements, the majority of the building finishes and systems are original, having been repaired or refurbished as necessary to keep the building operational. However, many systems are beyond their normal life expectancy and are in severe need of replacement.

The library user spaces are worn and dated. There are few study and seating areas designed for the use of technology or for collaborative work in small groups. The library instruction spaces are remote and not appropriate for the range of instruction the Libraries perform now or in the future. The service points and offices are worn, often accommodating many more staff than the original design intended.

Most of the major mechanical, plumbing, and electrical systems are original to Building 14 and beyond normal life expectancy putting library materials at risk. The limitations of these systems make it impossible to provide the stable temperature and humidity required to prolong the life of paper materials. In addition, the Hayden courtyard often floods and water seeps into the basement. Finally, the sprinkler system only covers portions of the building and should be expanded to include the entire facility.

Building 14 fails to meet many of the current requirements of the Massachusetts State Building Code, the Massachusetts Architectural Access Board and the Americans with Disabilities Act (ADA). Areas with greatest deficiencies include: means of egress, stair enclosures, exit signs and emergency lighting, fire alarm, fire protection, fire separation, accessible routes into and within building including inaccessible areas on mezzanines, door hardware, doors, elevator, stairs and handrails, toilet rooms, drinking fountains, telephones, signage, and accessible seating at tables and carrels.

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2. Architects' Vision- The architects initially based their plan for Building 14 on a vision of a library that would serve as a hub for research and learning in engineering and science. It would bring together a significant body of interrelated physical collections that are now scattered across campus, along with digital information resources, proactive services, and diverse study environments. This envisioned hub would enable faculty and research staff to be more productive, with a trip to a single site fulfilling the bulk of their information needs. It would give students a convenient amalgam of sci/tech books and journals, information databases, and the ready assistance of librarians. It would foster learning activities with both secluded and open individual study spaces, group study rooms, and technology supported teaching spaces. An adjacent café and 24/7 study facility would provide opportunities for informal interaction and a haven for "MIT's persistent night-owls."

3. Architects' Concept- The resulting concept included using the library courtyard space with a skylight, café, and collaborative study space; adding a four floor structure on the west side for stack shelving; and expansion of the basement level towards the River. Doing all this would add about 63,000 sq. ft. of space, still greatly short of the immediate requirements, for a cost of about \$100M; an exorbitant cost of about \$1,600 per sq. ft.. The conclusion of the 2000/2001 FCLS was that this excessively high cost for insufficient space was neither cost effective nor adequate to meet the MIT community's library needs.

F. Alternative Solutions Considered

1. Walker Memorial Renovation- The FCLS had considered the possibility of the Libraries' expanding into Walker Memorial but concluded that this was not practical because of Walker's essential food services to the east part of campus; the need for large function and exam space in Walker; and the presence of many student activities and groups housed in Walker. Most significantly, there would be very high costs for renovation and reuse of Walker, on the order of \$40M-\$50M, because of the required infrastructure improvements, including increased floor loading capabilities, asbestos removal, and making the building ADA compliant.

2. Under Killian Court- Building an underground library beneath Killian Court was considered, but because of the unusually large expense and great potential of flooding from the river, the plan was considered impractical as well as unattractive as a symbol of a scholarly institution.

3. Barker Engineering Library Expansion- was not considered practical because there is no more space available for expansion.

II. Recommended Solution

The resulting consensus within the 2000/2001 FCLS was that for not much more money a new building of 250,000-300,000 sq. ft. could provide for all the space required for a new Science and Engineering Library (\$100M-\$120M, about \$400/sq. ft.) together with renovation of the Hayden Library as an integrated Humanities and Social Sciences Library (about \$50M).⁷ This proposal has been endorsed by the Undergraduate Association and the Graduate Student Council as a priority need of the student body, by the 2001 Library Visiting Committee,⁴ and by the Faculty Policy Committee⁸. A new Science and Engineering Library at MIT offers one of the best naming opportunities that MIT could present.

The additional space from a new building is necessary to combine Science and Engineering Libraries; will allow most off-site storage materials to be returned to campus; provide for satisfactory seating, shelf, and group study space; provide for more space to accommodate technology; and can provide for about 20 years of expected growth in volumes.

The purposes of the rest of this report are to reaffirm the conclusions of the 2000/2001 FCLS; to further rebut arguments from those who believe that digital technology will eliminate the need of

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library physical space; to identify the ways that the MIT Libraries can greatly improve the quality of MIT community life; and to identify possible synergy with other MIT community needs that might be integrated with new and renovated library space. In addition, we commend and support the MIT Libraries intention to take a leadership position in developing a 21st century research agenda in utilizing information technology, colloquially called a “**colibratory**”, which will develop new ways of creating, managing, using and sharing information.

As the FCLS initiates a conversation across the campus with this report we urge the MIT administration to simultaneously initiate a planning study to evaluate options, sites, and costs, and to identify donors and other funding sources to bring this recommendation to timely fruition.

III. The Digital Technology Dilemma

In his recent annual report, President Vest poses an important question, and provides a resounding answer:

“If there is one experience common to every university president in the United States during the past decade or so, it is being accused of leading institutional dinosaurs down a path to rapid extinction in a digital age. Peter Drucker has decreed it. Editorial writers have shouted about it. Alumni and trustees have stated it. Some of our own colleagues agree. The issue is simply stated. Does the future of education, learning, and training belong to a new machine-based digital environment, or will the best learning remain a deeply human endeavor conducted person-to-person in a residential campus setting? I believe the answer is “Yes” — to both. ...We are at the proverbial fork in the road where we should, and will, take both paths..”¹²

The modern academic research library faces these same challenges, and the MIT Libraries’ answer is also “**Yes**” — we must continue to do both. We must have the resources for excellence that builds upon the traditional values libraries have fostered while incorporating the many useful advances made possible by technology.

Anticipating the coming cornucopia of information technology, a 1938 MIT Libraries bulletin made the following point concerning microfilm, a statement that is better realized today by substituting **the world-wide web**:

*“Ninety per cent of the world's literature is said now to be easily, inexpensively, and universally accessible through (microfilm) **the world-wide web**. As printing made available manuscripts for which there was a quantity demand, so (microfilm) **the world-wide web** offers scholars, research workers, and others, books and documents, in single-copy editions from libraries and collections the world over. It is unnecessary to furnish a complete book or periodical when a single page reference is needed, and there is no heavy cost for type and composition that must be spread over a large edition to make the cost of single copies reasonable.”¹³*

Such triumphant announcements of technological advancement now seem common; the research world is digitizing, more academic journals are available on-line than ever before, and seemingly infinite resources are available at the click of a mouse. Accessing voluminous issues of daily news publications became remarkably easier once microfilm gained wide acceptance; but unlike the implications in the passage above, “ninety percent of the world’s literature” was never so easily available. With microfilm of the past and with the extensive Internet of today, publishing houses then and now print on paper, and libraries, including MIT’s, purchase and store books. Figure 2 reaffirms that MIT interlibrary requests of paper books have greatly increased over the past decade despite the easy availability of online electronic resources. The continued importance of print resources to MIT faculty was affirmed in a MIT Libraries’ survey in 1999/2000.¹⁴

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A. MIT Libraries' Present Digital Capabilities

The Internet has become an indispensable aid to research, certainly more than microfilm ever was, given the permeation of e-mail and the web into the culture of daily life. In the context of library research, the nearly instantaneous searching of MIT's collection through on-line Barton has replaced tedious hours with the old card catalog. Access to thousands of journals and electronic databases in all disciplines through VERA, and concomitant access to on-line journal publications, has allowed unprecedented speed and flexibility directly from one's desktop. With ongoing Library digitizing projects, such as DSpace, a digital repository for long-term storage, it became reasonable to ask about the role of the physical library as more and more information became available and could be stored electronically.

The university's responsibility for information resources is one of its original and enduring functions with an obligation to collect and organize the information that the university faculty needs for their work.¹⁵ At MIT today, the Libraries' mission is commonly accepted to include the selection, organization, presentation, and preservation of information resources relevant to education and research at MIT, as well as the building of intellectual connections among these resources and educating the MIT community in the effective use of information.¹⁶ To fulfill its mission the MIT Libraries have aggressively pursued a strategy of taking advantage of online resources in order to increase the productivity of the community. From 1997 to 2000 the budget for digital serial resources increased 258%, from \$344K in 1997 to \$1.2M in 2001 with over 31% of the \$3.9M 2001 serial budget being devoted to digital resources.¹⁷ Can we simply extrapolate from this data and assume that within the next decade we will no longer be purchasing print journals? And will books similarly be available online?

B. Digital Technology Issues

The answers to these questions are not simple. From the perspective of the library stacks, both journals and books appear as bound volumes, though in the online world, they are two very different genres. MIT licenses access to most major online journal packages currently available. The publishers of these packages range from scholarly societies such as the American Physical Society (APS), American Chemical Society (ACS), and Institution of Electrical and Electronic Engineers (IEEE), to the major commercial enterprises like Elsevier and Kluwer. Our total number of online serial titles is approximately 4,000 of which MIT subscribes to approximately 3,000 in both print and electronic form. Despite this large number, it is important to realize that it represents only a small percentage of the MIT Libraries' 20,000 active serial subscriptions.

Setting aside the titles that are not yet available online, we must ask if we can consider canceling the print versions of the titles we have online? For the moment the answer is a definite **NO**. The major reasons for this are the yet-to-be resolved issues surrounding the permanent archiving of e-journals, and the implications of licensing the access to the *content* rather than acquiring outright ownership. In the print environment these issues are very straightforward: a library purchases the printed volume and the library owns it forever. It is available in perpetuity for the community the library serves, used within the guidelines of fair-use copyright law, assuming, of course, that the library can provide a stable environment for storing the volume. If the volume is printed on acid-free paper and can avoid theft and/or other disasters, it will last for centuries.

The same cannot be said for digital storage media. With constantly changing hardware formats, a digital artifact is likely to last only a few years in its original storage medium, meaning that it has to be continuously and iteratively manipulated to ensure future use in the same decade, let alone for future generations.¹⁸ To quote Dale Flecker, Associate Director for Planning and Systems for the Harvard University Libraries:

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“For research libraries, the long-term preservation of digital collections may well be the most important issue in digital libraries. In certain ways, digital materials are incredibly fragile, dependent for their continued utility upon technologies that undergo rapid and continual change... Keeping digital resources accessible for use by future generations will require conscious effort and continual investment.”¹⁹

Clearly, archiving is a complex and costly challenge, but we must also address digital information access. A recent National Research Council (NRC) report states that:

“Changes brought about by digital intellectual property (IP) and the information infrastructure are challenging the existing set of policies and practices for public access.”²⁰

The NRC report details the many differences and challenges to public access to our intellectual, cultural, and social record due to the differences between copyright and intellectual property rights in the emerging digital environment and the well established rights developed in the traditional print environment such as licensing as a model of information dissemination. The report describes the threat to public access due to the current trend towards characterizing digital information as a *service* rather than a *product*. In a nutshell, buy a journal and you own it forever; pay for a journal service, and when the service is over, you retain nothing. Although some libraries are experimenting with licensing models that try to preserve traditional models of fair-use and perpetual access, many concerns remain about whether this will succeed. As President Vest stated:

“A meaningful set of changes and exemptions must be worked out in Washington if digital libraries are to realize their promise for research, scholarship, and education.”¹²

C. Digital versus Print Journals

People generally use digital and print journals differently. While content is typically identical in electronic and print versions of the same text, user interactions with the text are often very different. Anecdotal evidence suggests that readers of print journals, especially with regularly read serials, tend to skip and skim the physical volume, jumping from article to article, scanning advertisements and letters, and imbibing material from divergent subjects. In contrast, the exceptional utility of electronic journals lies in their nearly instantaneous searchability and concomitant ability to retrieve specific information. Here, anecdotal evidence suggests that users of electronic journals, rather than peruse an entire volume, instead search by topic, making connections temporally rather than spatially. Technologies of both print and electronic media, while conveying (ostensibly) the same content, actually serve two, mutually supportive but distinct roles.

D. E-Books

Moving from serials to books, we find that e-books suffer from many of the same challenges mentioned above and more.^a Whereas online journals have clearly developed market niches in many scientific fields, e-books still await their acceptance in the marketplace. During the summer of 2000, the University of California’s California Digital Library formed an e-book task

^a For two good perspectives on the issues surrounding the emergence and acceptance of e-books see Clifford Lynch’s “*The Battle To Define the Future of the Book in the Digital World*”, *First Monday*, vol.6, no.6, June 2001, http://www.firstmonday.dk/issues/issue6_6/lynch/ (4/30/02) and Terje Hillesund’s “*Will E-books Change the World?*”, *First Monday*, vol. 6, no. 10, Oct. 2001, http://www.firstmonday.dk/issues/issue6_10/hillesund/ (4/30/02)

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force to examine the current e-book market and to develop operating guidelines, principles, and potential strategies for further exploring the use of e-books at UC. They found that:

“The role of e-books in academic libraries is still not clear, and there is considerable development of standards, technologies and pricing models needed to make the market for e-books viable and sustainable. Technologies for reading and using e-books are not yet convenient enough for the longer text format to have made much market penetration. It is not clear that academic libraries can replace print with e-books as a long-term collection goal. There are still concerns about adequate rights to information to support the academic mission of scholarly communication...”²¹

The task force concluded that further observation and assessment of e-book markets was needed, and that “*academic use and needs*” would help direct further inquiry.

E. Copyright

Assuming that the many challenges associated with archiving and copyright/intellectual property can be solved for the current and prospective publication of e-journals and e-books, we are still left with the legacy of the printed (and other) formats that have been acquired and preserved for centuries. While some scholarly societies have worked with the scholarly journal archive, JSTOR,²² or on their own to retrospectively convert important journal back runs, the great bulk of older material remains available only in print. Furthermore, the Digital Millennium Copyright Act in conjunction with the Sony Bono Copyright Term Extension Act has placed additional restrictions on digitizing printed material in the public domain.²³ Of particular note is the change in the general term for copyright from two terms of 28 years (an original and a renewal term) to life of the author plus 50 years or 75 years, in the case of works for hire. This has created a serious obstacle to retrospective digital conversion projects.

IV. The Crucial Role of Libraries to the Quality of MIT Community Life

MIT needs signature spaces that reflect the Institute’s scholarly mission and that encourage positive identification of the Institute as a center of multidisciplinary learning. Student surveys identify the library as a place that represents the Institute’s scholarship. The physical space and resources should reflect the Institute’s academic mission, as the library is one of the pillars that support MIT as an outstanding educational institution. The Libraries sustain and enhance what we are about -- state-of-the-art research and education.

MIT’s mission to advance knowledge is greatly aided by user-friendly access to information. The Libraries should reflect the best efforts of MIT to be accessible, comfortable, attractive, and responsive to the ever-changing demands of learning. The Libraries should provide an intellectual “commons” -- a place for the study, research, and collaboration that characterize a first-rate institution of higher learning.

Many surveys indicate that the current absence of such intellectual commons space is a negative aspect of students’ lives at MIT. Faculty members often identify, with both nostalgia and gratitude, the provision of library space at the universities that formed them. Current MIT students do not, for the most part, signal any particular space on campus as a place that gave them the opportunity to complete their work at MIT in an inviting environment. In 2001, the UA-GSC Strategic Capital Planning Committee identified eight topics as priorities and asked students to fill out a survey.²⁴ “Topping our list of student needs is community space. This is understood in the broadest sense: space to work, to study, to socialize, to eat; this is ‘common space’ that every member of the Institute can use.” An earlier survey by the MIT Libraries found that 43% of students responding to the question, “In what ways can the MIT Libraries contribute more to your

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life at MIT?” cited physical facilities: larger, more attractive, better studying environment, more group study rooms, more comfortable seating, better lighting, and a 24-hour library.^{6,b}

A. Encourage Student/Faculty Interaction

Studies regarding student life at MIT underscore a need for spaces that encourage student/faculty interaction. The report of the 1998 *MIT Task Force on Student Life and Learning* noted that “all aspects of MIT’s design...should include space for informal interaction.”² Being a center of learning and a resource for the entire MIT community, the Libraries are places where students, faculty, and staff are likely to encounter each other outside of the classroom. There is some evidence of this occurring now; however, the existing spaces do not provide as much room for interaction as they should.

Other universities have created spaces within their libraries to facilitate these functions. Cyber cafés, rooms where group work can take place, places for comfortable armchairs and sofas are characteristics of space designed for these purposes.^c The creation of this kind of space in our own library system would encourage the informal student-to-student, student-faculty, and faculty-faculty exchange that is too often absent at MIT.

B. Use of New Technology In Learning

Studies regarding student life at MIT underscore a need for spaces where new technology can be used in learning. The library is an active environment that attempts to help people learn and understand their world by both collecting information and giving it back to the users. As noted in the report of the MIT Task Force on Life and Learning, technology is the vehicle for making information more accessible and clear:

“In the future, developments in information technology will center around issues of content rather than facilities or equipment. The library, which has historically been the heart of the university, is the ideal place to ensure that the institution makes the appropriate investment in educational content as well as providing affordable and user-friendly access to information resources. Libraries need to become more engaged with the teaching activities of the Institute. The library’s teaching role should put less emphasis on the acquisition of information per se, and more on the need for students to acquire lifelong skills in locating, filtering, evaluating, and using effectively the wealth of information available to them.”²

^b A similar attitude was found at Duke University. Duke’s neighboring institution, the University of North Carolina-Chapel Hill, has aesthetic libraries suited to an atmosphere of study and learning. Duke students often visit UNC to take advantage of the libraries’ environment. In the renovation of the main Duke University library, Duke undergraduates indicated that they wanted an attractive setting in which they could study and be proud to bring their parents. (Telephone conversation by FCLS member A. Predith with Duke library director, November 2001)

^c Cornell University Library remodeled space on the first floor of its library for a “cyber café...with plenty of comfortable arm chairs, computer ports for Internet access throughout the room, and a tempting array of snacks and beverages. Libe Café has quickly become a favorite place for ‘face time.’” <http://campusgw.library.cornell.edu/cgi-bin/dj.cgi?section=about&URL=about/about.html> (4/30/02). Other universities planning cyber cafés in libraries are Berkeley, Columbia, and Dartmouth. The University of Chicago public computing site was designed to encourage collaborative work, faculty/student seminars, and socializing – and has proven to be a great success in the 2 years it has been open. (Email communication by FCLS member A. Predith with University of Chicago library director, November 2001.)

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Librarians at peer educational institutions underscore these concerns. New and renovated libraries have computer clusters where students can work together, electronic classrooms and public computing sites. The notion that access to these technologies outside the library will diminish the use of the physical library space is contradicted by data collected at MIT. In the 1998 survey of MIT undergraduate and graduate students conducted by the MIT Libraries, 58% of undergraduates and 49% of graduates preferred to use the Libraries' electronic resources in one of the libraries.⁶

The Libraries' staff members have listened to this call for more engagement with teaching activities of the Institute including offering IAP and regular term library related short courses. Believing that they share with faculty "*the job of teachers...to help students assess and gather good information regardless of its source,*"²⁵ librarians evaluate and recommend web sites in subject and course-related web pages. With more students using the Internet for at least part of their research, librarians are responding to the challenge of the e-campus by showing students where to find reliable web-based information and by helping students apply critical thinking and evaluative skills to determine the accuracy and usefulness of Internet resources. Physical space is needed for this enterprise.

C. Preparation for Life-Long Learning

The library is the place where students are prepared for life-long learning and where the crucial skills of gathering and evaluating information are taught. MIT alumni/ae polled in a 1996 survey about important outcomes of an undergraduate education identified the capacity for life-long learning as one of four important skills.²⁶

In order for the Libraries to achieve the goals of teaching effective use of electronic and Internet resources and offering instruction in the use of specialized software packages and other components of information literacy, additional library instructional space is needed. The MIT Libraries are already directly involved in many teaching functions. Introduction to GIS (Geographic Information Systems) began during IAP 2002. Other workshops covered patents, copyright issues, EndNote [a reference management software product], locating social science data, and accessing scientific and engineering data from a laptop. The MIT Libraries need to provide collaborative spaces where librarians can engage and instruct students in hands-on, one-on-one, or small-group learning interactions.

The assumption that our technologically savvy students know how to use research tools is simply wrong. A survey by the MIT Libraries Web Tutorial Task Force of undergraduate students in the writing program found that 38.6% were unsure of finding a journal article on a topic in their discipline; 48.9% were unsure of finding a journal article on a topic outside their area of expertise; and 61.5% were unsure of or disagreed with the statement, "I am familiar with the major resources in my field."²⁷

D. Study Space

Current inadequacy of space leads to students' use of inappropriate study spaces. One of the most striking impressions of visitors to MIT is that students are sprawled, often in spaces that are not conducive to work, trying to complete academic tasks. Many students often use unoccupied classrooms in the evening to study, which can be potentially unsafe for students working alone. MIT students lament the absence of space for group work, work that requires careful diagramming, and space for quiet reflection. The Libraries should supply all these types of spaces, yet even the number of individual reader spaces is currently inadequate.^{10,d}

^d The Ad Hoc Committee on the Humanities Library also identified the need for "creating small group study areas, teaching spaces, carrels, lockers, consultation areas and service spaces."¹

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The exam-time and end-of-term frenzy would be diminished if students could retreat to a calm, orderly place to work. At this time, there simply are not enough spaces on the MIT campus where students can be left alone to study. Students' inability to retreat and think in a space where a sense of calm and order prevails exacerbates the grueling rhythm of MIT life. The closing of the "all night" library in the student center in the 1980's marked the loss of a space that was very important to students.

Interdisciplinary work and collaborative learning are increasing. We need library spaces where this work can take place. Currently, students often gather in dorm living rooms or empty classrooms where they may be suddenly displaced because of other scheduled activities. Other peer universities that have world-class libraries meet the need for student study space in creative ways. For example, a new Frank Gehry designed science library at Princeton University will incorporate classrooms where librarians can teach students and rooms where undergraduates can gather to work in small groups.

The Libraries should create spaces consonant with users' needs. The consolidations of the MIT science and engineering libraries and the humanities and social science libraries will result in more efficiency for library users and staff with reduced fragmentation and duplication, especially for interdisciplinary work. It is important to provide facilities that allow for the community to learn in an efficient way that conforms to MIT's mission. Rushing about from library to library to complete a project is inefficient and does not enhance the quality of faculty and student life. The organization of resources in a way that reflects learning would diminish the sense of fragmentation about which students complain. Just as the consolidation of student services enhanced the campus quality of life, so would the consolidation of the Libraries significantly decrease the sense of frenzy that characterizes some MIT experiences. The Libraries will be more user-friendly when the materials they house correspond to the intellectual life they support.

E. Library Users with Disabilities

The Libraries should provide a space where individuals with disabilities can find and access the resources they need. Many present staircases to the book stacks are not accessible to the physically disabled. Specialized hardware, software, and flexible workstations are part of the resources designed to accommodate the information-technology needs of individuals with physical, visual, learning, and ergonomic impairments. Technologies that help students learn despite disabilities should be gathered in one central place. The Libraries constitute the most appropriate place for this activity. Since use of this technology may be relatively complicated, the assisted work-study space should be near individuals trained in making resources available to disabled users. Renovated and new space will satisfy the Americans with Disabilities Act, allowing unfettered access to all library facilities for the entire MIT community.

F. Possible Synergy with Other MIT Needs

Such new and renovated space for the Libraries offers the opportunity to also provide for other campus needs such as: nearby food and café services; a Learning and Conference Center; a newly revitalized and centrally located Faculty Club including reception and exhibition space either within a new library building or within magnificently restored space presently occupied by the Libraries such as under the Building 10 Dome; and public spaces that provide cultural activities and community events.

V. The Future

A. The Role of the Libraries

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We are left with a future library environment throughout the first half of 21st century - if not longer - that will need to utilize information in all formats. We know that:

- Technological innovation does not solve all problems
- Printed books are technologically sophisticated devices that work very well for many uses.²⁸

Like other important research libraries, the MIT Libraries continues to take seriously its mission to provide a stable, historical record of the scholarship essential to the research, study, and teaching at MIT over the long term. As we plan for the future of libraries at MIT we need to plan for a future that means:

- Both print *and* electronic communication.
- Both linear text *and* hypertext.
- Both mediation by librarians *and* direct access by users.
- Both collections *and* access.
- A library that is both “edifice *and* interface.”²⁹

But now, as we face the challenge of crafting a vision for the future of the MIT Libraries, we would like to echo the conclusions of the Ad Hoc Committee on Long Range Planning for the Libraries from November of 1962.³⁰ They began by noting that:

“Since the Library is the single most important physical element of the Institute, the whole plan of the Institute should develop about a central plan for the M.I.T. Library.”

Their final conclusion on their “study of the prospects of mechanization” was

“That the planning of new library facilities proceed without concern for the possibility that the general use of micro-reproductions will greatly reduce the storage space now required for books. This will come in time, but not, we believe within the useful span of a library structure built today.”

Likewise today, we believe that great benefits may come in the future with improving digital technology, licensing, and law, but that these benefits do not remove the necessity for maintaining a physical library in the future, and certainly should not prevent the library from meeting the needs of the present.

B. A Vision for Library and Information Services at MIT

In today’s information rich environment, the MIT Library system must develop a new and expanded vision of how library services and resources are organized and made available. With a new Science and Engineering Library and an expanded and renovated Humanities and Social Sciences Library we propose a 21st century, state-of-the-art library system for MIT that enlarges the definition of a library by bringing together a vast range of information resources and tools for their use and manipulation. This new model is colloquially called a “*colibratory*”, an analogy to the library being a laboratory for information research, and will support teaching and learning including its own research agenda to develop new ways of creating, managing, using, and sharing information.

The *colibratory* concept envisions a hub of services for the MIT community that serves as a unified collaborative center for information creation, discovery, and management. Building on its long-standing traditions of knowledge acquisition, organization, preservation, and access, the MIT Libraries will provide a fertile environment to explore the next generation of knowledge creation and information management.

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Students, faculty, and information professionals will come together in a collaborative environment designed to provide excellent access to the wealth of resources and services in support of teaching and research at MIT, and to explore new modes of information discovery, management, access, and preservation. User-centered space will be designed to balance the many important needs associated with this goal:

- Flexible, technology-enabled study space with numerous group study options including 24/7 space.
- Ubiquitous computing resources ranging from a wireless infrastructure to powerful workstations for knowledge creation and discovery to computing laboratories for design.
- Storage for the sizeable print periodical and book collections which will continue to exist and grow.
- Preservation laboratory to insure the durability of digital and print-based materials.
- Class and seminar rooms for both computer-based and more traditional library instruction.
- Nearby café and food services for nourishment and social interaction.
- Public spaces that promote cultural activities and offer space for community events.
- Quiet spaces that promote scholarly reflection.

VI. Conclusions

A. MIT Libraries: Deferred Attention and Neglected Priorities

The Task Force on Student Life and Learning identified a central structural dilemma in MIT's ability to address Institute-wide needs, such as those set forth in this report. This dilemma, now known as "the problem of the commons," lies in the tension between Institute-wide objectives, and the Institute's largely independent schools and departments. The MIT Libraries are a prime example of how this dilemma plays out in practice. Serving all academic units, from a centrally funded base, the Libraries are essential to the research and education of every school, department, laboratory and center of the Institute, but yet the responsibility of none.

When the FCLS circulated a draft of this report to solicit comments and views of the report's recommendations, this dilemma became clear. Although all endorsed the spirit and recommendations of the report, each school also had more urgent space priority projects. And so in every case, the Libraries' needs fell to second choice. Since there is no Dean for the "commons," charged with watching over the shared needs of the entire MIT community, the FCLS concluded that this responsibility must be addressed by the faculty. The Faculty Committee of the Library System thus takes on this duty as a representative of the faculty and strongly recommends that the "common" compelling needs of the Library system be paramount. MIT must have a Library system that matches MIT's quality scholarship and that helps MIT realize its goal of having a truly high quality residential campus for the coming generations of MIT students.

The proposed renovations, new construction, and improvements to the MIT Libraries are necessary for the continued research and educational pursuits of the MIT community and provide an opportunity to remedy many other campus problems. A new Science and Engineering Library and a renovated Humanities and Social Science Library could serve as new landmark symbols identifying the broad scholarly work of MIT and offer the best naming opportunities that MIT could present. MIT's commitment to a residential campus needs these education, social, and information resource centers.

The MIT Libraries at the center of intellectual activity for the Institute have the potential to greatly enhance the quality of MIT community life. Attractive, comfortable and inviting study spaces, places where informal meetings among faculty, staff and students can take place, and the

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space to complete the many group projects that characterize MIT work could improve the MIT rhythm tremendously.

Because excellent libraries are essential to the continued success of MIT's educational and research agenda, and because the libraries have been seriously neglected for too long, a major investment in our library system is long overdue. The facilities are in desperate need of a significant redesign of services and space. Thirty years of deferred attention and neglected priorities have left MIT's Libraries out of date, out of space, and out of time. With public issuance of this report, the Libraries and FCLS plan to engage the campus in discussions on their expectations and needs for the next generation of Libraries at MIT. At the same time, we ask the MIT administration to initiate a planning study to evaluate options, sites, and costs, and to identify donors and other funding sources to bring these recommendations to timely fruition.

B. Suggested Considerations of the Library Planning Study

When we have discussed these recommendations with members of the MIT community, the first question that comes up is "Where would you put a new Science and Engineering Library?" Identification of possible site locations is a major task of the proposed planning study group. The time is right to now conduct the Library planning study so that the Library system is ready to move forward when present campus construction is completed and the next phase of MIT construction is initiated. It is recommended that the Library planning group address the entire needs of the whole Library system. The over-arching principles for the new and renovated construction are:

1. An institutional commitment to both the new Science and Engineering Library and to the integrated Humanities and Social Science Library.
2. Space that reduces library fragmentation and meets the multi-faceted needs of library users now but with flexibility that can adapt to new requirements in the future.
3. A central campus location for new Library construction that is aesthetic and memorable; a landmark symbol of MIT's scholarly mission.
4. Enough space to bring most off-site materials onto campus and to allow for twenty years of growth.

At the end of the process, MIT will have a Library system that greatly supports the teaching, learning, and research missions and provides the MIT community with an enhanced quality of life.

VII. Appendix 1- MIT Library Statistics

**Table 1- MIT Rankings Within the Association of Research Libraries in 1999/2000³¹
(Based on 112 libraries, lower number signifies higher rank)**

Volumes in Library	66
Volumes Added	98
Materials Expenditures	89
Expenditures in Monographs	89
Monographs Purchased	84
Expenditures in Serials	67
Serials Purchased	74

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Table 2- Space and Volume Statistics of the MIT Libraries

Library	Usable Square Feet (2002)	Bound Volumes (2001)	Volume Growth (2001)	Shelf Fullness (1997)	Seats (2002)	Circulation /year (2001)	Doorcount /week (2001)
Barker	25,577	265,030	7,309	84%	203	85,536	2,592
Dewey	28,561	561,770	11,926	77%	234	166,587	3,314
Rotch	24,549	206,558	4,995	78%	164	52,513	2,688
Hayden	71,806*					138,042	6,515
Humanities	17,481*	248,497	6,301	95%	139		
Science	30,290*	309,767	8,512	84%	172		
Aero	2,027	89,859	565	82%	50	12,864	592
Lewis Music	6,243	49,329	1,144		80	37,318	1,275
Lindgren	4,727	51,259	1,211	92%	50	9,098	555
Schering-Plough	3,963	11648	494	70%	51	11,943	558
Offsite Storage	68,270	732,484	37,524**			13,758	10
Other***		96,953					
Totals	235,723	2,623,154	42,457		1,143	527,659	18,099

* Hayden space includes: Humanities Library, Science Library, Institute Archives, Libraries' Administration, Libraries' Systems Office, and Libraries Technical Processing; Humanities and Science Libraries usable square feet are included in Hayden total and so are not to be added to obtain total usable square feet.

** Off-site storage volumes added are transfers from within the Libraries and therefore are not included in the total for Volumes Added.

***Includes volumes in Administration (1,442), Archives (36,051), Rare Book Room (40,689), Space Center Reading Room (13,489), and Technical Services (5,282).

Table 3- MIT Library Statistics for 2000

Volumes Held	2,605,490	Total Circulation	573,105
Volumes Added, Gross	45,776	Professional Staff	85
Volumes Added, Net	25,676	Support Staff	95
Monographs Purchased	19,265	Student Assistants	21
Current Serials Purchased	9,570	Expenditures for Monographs	1,017,244
Current Serials Not Purchased	10,637	Expenditures for Serials	\$3,906,955
Total Current Serials	20,207	Misc. Materials Expenditures	\$101,531
Microforms	2,318,891	Total Materials Expenditures	\$5,025,730
Manuscripts and Archives	13,384	Expenditures for Binding	\$200,846
Cartographic Materials	117,052	Professional Salaries & Wages	\$3,758,037
Graphic Materials	447,271	Support Staff Salaries & Wages	\$2,828,353
Sound Recordings	23,097	Student Assistant Wages	\$315,616
Video and Film	3,244	Total Salaries & Wages	\$6,902,006
Computer Files	8,997	Other Operating Expenditures	\$1,976,259
Total Interlibrary Lending	13,708	Total Library Expenditures	\$14,104,841
Total Interlibrary Borrowing	12,763	Total Fulltime Students	9,709
Group Presentations	173	Total Fulltime Graduate Students	5,469
Presentation Participants	2,491	Ph.D.s Awarded	475
Reference Queries	66,112	Ph.D. Fields	27
Initial Circulation	421,654	Total Teaching Faculty	

906

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VIII. Appendix 2- Renovations and Expansions of Peer Institution Libraries

1. Stanford University³²-Some of Stanford University President Casper's remarks in dedicating the Bing Wing of the Green Library best summarize the purpose of this report:

"While the digital world has expanded at a dizzying speed since 1992...electronic alternatives to libraries were already well established and heavily used by, for instance, the legal profession. ...Catalogs of the library holdings of many universities are available to researchers without the necessity of undertaking a physical trip to those libraries. Today, data banks with scientific, demographic, economic and political information are accessible worldwide, as are legal decisions, not to mention newspapers. Increasingly, complete texts from world literature can be consulted online, as can be scholarly journals and preprints. Entire archives are being created worldwide: Government documents can be found in their entirety, photos can be reproduced, film and audio material can be downloaded. Because these data bases can be searched with great specificity and because links to relevant sites and documents are easily created and accessed, there are possibilities for research that, not long ago, could not even be dreamed of... The web is wonderfully unlimited, robust and wide open, catholic and chaotic. It has no physical location and, other than for its servers, it needs virtually no space. ...

... As far as I am concerned, I have little doubt that, before long, the university library, as we still assume it today, will experience extraordinary challenges. We are in a transformation period...The search, and that means, research capacity that has come with the digital storage of information is already offering us extraordinary opportunities... The electronic medium makes possible, even in areas of traditional humanities scholarship, a thoroughness that was previously unattainable. ...

While it is clear that in this virtual world we will continue to need "librarians" as managers to provide navigational aids and comfort, what about libraries as physical spaces? Even the most futuristic of thinkers would have to admit that we are likely to have physical libraries and paper books for decades to come. We are far from the point where everything we need is on the web or where the web is the preferred method of distributing and receiving knowledge. Also, navigation devices remain primitive, the mapping function rudimentary. ...

...You will be much relieved to learn that we do, indeed, need the Bing Wing. It will not only bring 1 million of Stanford's 7 million volumes back to the main campus and provide a central place for rare books, manuscripts and archives, but it will refer students and faculty to the subject specialists and curators in the two resource centers for humanities and area studies, on the one hand, and the social sciences, on the other, that will be located in the Bing Wing. As a sign of the digital future, these traditional functions will be supplemented by humanities digital information services and by a social sciences data center. Power and telecommunication links will be available at the places of study. In short, the Bing Wing comprehends two worlds, the old world of printing and the new world of digitization.

Also, and perhaps even more important, it will restore to our students a place of relative solitude, a place for reading, not deciphering, a place where there can be... joyful and painful oscillation between losing and regaining intellectual control or orientation in relation to intellectual complexity. This Romanesque library is a powerful reminder of the need not only to be "with it," but also to be "away from it." I may quote Jacques Barzun:"Making research profitable and ecumenical has brought about a damaging shrinking of time within the university. Time now flows there at the same rate as outside, which accounts for the pressure and strain that every academic denizen groans under. . . Good work takes time, not alone for reflection but also for non-purposive reading." "

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2. Duke University³³-The Perkins Library has documented inadequacies of being complex in layout, difficult to navigate and use, outdated in terms of technological infrastructure, and inadequate with respect to study and training spaces. Survey respondents generally characterized it as dingy, musty, grim and depressing; some noted that they avoided using it and preferred to go to the nearby University of North Carolina Davis Library because it had better study spaces. Duke also has a need to consolidate science and engineering libraries because the present separate arrangement does not support inter-disciplinary research and teaching efforts. Such concerns are remarkably similar to the poor physical state of the MIT libraries and to the fact that some MIT students prefer studying at more comfortable and attractive Boston area libraries.

3. University of Chicago³⁴- Provost Stone remarks at the dedication of the Regenstein Library emphasize the role of libraries:

“At some universities, the heart and soul of the institution resides in the football stadium. At others, it is in the student center, or the basketball arena, or the performance center or even, astonishingly, in the administration building. But at the University of Chicago, the heart and soul of the institution are in the Library. At the University of Chicago, the Library is not only the symbol of who and why we are, but it is also quite literally the life blood of the institution.... A great research university needs a great library. The University ... exists...to advance knowledge, plain and simple....”

4. Yale University^{35,36}- Reflections of Librarian Prochaska help define the obligations of a research library:

“A library's primary task is to provide access to the world's fund of knowledge, meeting its patrons' myriad needs for information with systematic, up-to-date catalogs and well-ordered shelving. But a great research library also presents its users with sources of knowledge they did not know they needed and opportunities to make connections they had not imagined. It builds and maintains a deep and wide-ranging collection of print and microform resources as well as strong collections of unique and rare materials. Increasingly of late, a research library augments these traditional collections with access to electronic materials, including large and costly databases to which individual scholars would have difficulty gaining access. These aspirations challenge a research library to continue meeting the demands of traditional library use while innovating along with current research and anticipating the needs of future scholarship...”

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