Systemwide Strategic Directions for Libraries and Scholarly Information at the University of California

Prepared for the Systemwide Library and Scholarly Information Advisory Committee

By the University of California University Librarians
And the Office of Systemwide Library Planning

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SUMMARY

Great universities have great libraries. In fact, great universities achieve their standing in part due to their libraries because information resources are at the core of effective research, teaching, and learning. To enable the University of California to continue to excel in its instructional, research, and service missions, the University libraries strive to:

- Enhance access to well organized, professionally managed, comprehensive collections of the scholarly information needed to realize the goals of the University's academic programs.
- Improve the availability of timely, expert, relevant, and personalized services needed by faculty and students to make effective use of these vast and complex information resources.
- Ensure persistent access to the high-quality digital materials that result from research and teaching at UC.

In achieving this vision, the University libraries must confront a number of challenges, including:

- Diminishing budgets, including the effects of budgetary austerity on the library collections, the value of which lies in part in the continued accumulation and preservation of information resources.
- Proliferation in the amount of scholarly information and the number of formats in which it is produced, and continuing hyper-inflationary increases in its cost.
- Lack of any unifying technology that would facilitate the easy capture, organization, presentation, use, preservation, and long-term management of the growing digital component of scholarly information.
- Much higher expectations among users about the speed and ease with which such information (and associated user support services) should be discovered, located, accessed, and used.
- Rapid change in information technology, and the accompanying need to adopt and adapt new technology to serve the information needs of UC's faculty and students.
- The increasing financial and operational interdependence of the campus libraries in providing services to each other and supporting shared systemwide collections and services, and the resulting effects of independent campus budgetary and operational decisions on the quality of systemwide library service.

The strategies set forth here to successfully confront these challenges continue the 25-year history of progressively growing cooperation and collaboration among the UC libraries to share collections, leverage technology, and pool financial resources. The current strategic directions for collaborative development of the UC libraries lie in five key areas:

- Expanding the development and management of shared collections (Sections 4.1 and 4.4)
- Utilizing shared facilities to a greater extent (Section 4.2)
- Extending shared services (Section 4.3)
- Ensuring persistent access to digital information that results from and supports research and teaching at UC (Section 4.4)
- Influencing the development of new forms of scholarly communication (Section 4.5)

Summary of Recommended Actions

- **Collection Management and Coordination:**
  - Develop a detailed planning and evaluation framework for shared collections in all combinations of formats that: a) explicitly specifies their key characteristics (e.g., physical location; access and management policies); b) identifies costs and resource needs (e.g., processing, shelving space and environmental requirements, access and delivery services, and requirements for infrastructure services such as bibliographic access and inventory control); c) assesses implications for campus operations, services, preservation strategies, and budgets; and d) identifies the affected user communities and their use of the collections.
  - Apply the guidance provided by this framework to implement the development of shared collections.

- **Shared Facilities:**
  - Consolidate the governance of the shared regional library facilities and ensure that they are fully integrated into planning and operations in support of the collaborative programs of the UC libraries.
  - Regularly review the policies, operations, and resource needs of the regional library facilities to ensure that they continue to support the UC libraries' strategic directions.
  - Acknowledge that the scope for continued expansion of the regional library facilities is necessarily limited (by site constraints, availability of capital resources in the context of UC capital program priorities, etc.), and begin long-range planning for this eventuality.

- **Shared Services:**
  - Develop a programmatic framework that leverages the collective resources of the UC libraries to: a) more effectively manage and deliver essential ongoing services (e.g., for bibliographic control and access, and for acquisition, processing and management of collections in all formats); and b) collaboratively develop, deploy, and support advanced user services.
  - Develop and implement pilot programs to test concepts, refine planning, establish priorities, and clarify resource needs and sources.

- **Persistent Access to Digital Information:**
  - Develop a digital preservation infrastructure in collaboration with national and international efforts that adheres to established standards and open-source practices to: a) centrally preserve the at-risk digital information that we share a common interest in (such as scholarly journals and databases and web-based government information); and b) facilitate the efforts of the campus libraries to preserve digital assets in which they take a unique interest (for example, selected collections of web-based materials, UC dissertations, digital materials produced by faculty for research or teaching, etc).
  - Investigate the extent to which the digital preservation infrastructure may assist in the preservation or protection of deteriorating print materials.
  - Coordinate closely with University units responsible for information technology, records management, and other units with a responsibility for the preservation of digital content to foster development of and support for a robust common information technology infrastructure that can meet the University's needs for the reliable archiving, management, and retrieval of digital information.

- **Scholarly Communication.**
  - o Working collaboratively with faculty, management, the UC Press, information schools, and national associations and bodies, the UC libraries will develop and implement a program to provide leadership in the comprehensive alteration of the scholarly communication process so that it is economically sustainable and ensures the widest possible access to the scholarly record. The program will identify concrete steps and necessary resources, and should evolve along a shared services model, with the appropriate use of centrally-provided services and collaboratively developed campus-based efforts. At a minimum, this program will provide:
    - Strategies and services to help faculty manage the copyrights in the works they create, including an expanded publishing services infrastructure, based on the eScholarship program and partnership with the UC Press, to facilitate innovative dissemination of their works.
    - Methods for communication and outreach to faculty to inform them about the economics and mechanics of scholarly publishing and their effect on both the distribution of scholarly work and on the quality of service provided by the UC libraries.
    - Establishment and operational application of library collection development and selection principles that account not only for scholarly value but also for service and economic sustainability.
    - Applied research to identify and gather the data about characteristics of the publishing industry and its products and about UC library operations and costs that are needed to help inform the publishing decisions of individual faculty, as well as the University's ongoing planning.
    - Mechanisms to leverage individual, campus and systemwide effort and expertise, resulting in a network of highly engaged and informed faculty, library staff, and academic administrators who can shape, support and effectively coordinate both campus and systemwide endeavors.

1. INTRODUCTION

The eminence of great universities is achieved in part through the eminence of their libraries. Libraries assemble and conserve the world's scholarly knowledge and societies' cultural record, and they make this information available in support of research, teaching, learning, and cultural and civic enrichment. Just as recent major advances in the biomedical sciences have been built upon the comprehensive assembly of information about the human genome, advances in all frontiers of knowledge require the comprehensive collections that only great research libraries supply. Further, universities leverage their libraries to recruit and retain world-class faculty whose work relies in some measure on their access to scholarly information. Maintaining the breadth and depth of collections is the single greatest challenge confronting university libraries today. Failure to successfully meet this challenge will fundamentally threaten UC's core mission — excellence in instruction, research, and public service.

The University of California has built nine campus libraries of distinction (and has launched the development of a tenth) comprising outstanding collections that give a world-class competitive edge to UC research and instruction. The UC libraries and their staffs have also won an unparalleled reputation for innovation and service. Campus library staff provide high-quality, personalized services to faculty, students, and staff, and to the people in their local communities. Their range of services extends from onsite print and digital holdings to highly specialized reference support; from instruction to students in support of information literacy to electronic reserves that are tied to locally taught courses; from websites that customize access to the world's output of scholarly knowledge to civic programs that enrich and enliven the region's cultural life. Every UC student and faculty member is served by a rich campus collection of print and digital resources that is tailored to the campus academic program and includes specialized research resources, many of which are unique. These collections are supplemented by fast, convenient access to the world-class information resources of all the other UC campuses, as well as a rapidly growing shared collection of digital resources.

The challenge for the University's libraries is to sustain this excellence in the face of budget constraints, continuing increases in the cost of information, changing information technologies, and the shifting expectations of the libraries' users. The libraries have met this challenge to date as a result of strong ongoing campus support and a Universitywide strategic approach to the development of library collections and services. This approach has emphasized multi-campus collaboration, the application of new technology, and expanded Universitywide sharing of the information resources within UC library collections. Moreover, each successive restatement of this overall planning strategy has extended the concepts of collaboration, sharing, and systemwide leverage into new domains of library service, including expedited intercampus lending, a shared online library catalog, regional library facilities, a shared digital collection, and more. As a result, UC faculty and students have enjoyed increasingly faster and more convenient access to a broader universe of information in a wider variety of formats, even in the face of rising costs and constrained budgets.

Building on the successful collaborative programs spawned by the University's 1977 Library Plan[1] and the 1997 Library Planning and Action Initiative,[2] and with the leadership, advice, and support of the Systemwide Library and Scholarly Information Advisory Committee (SLASIAC),[3] the UC libraries have launched an ongoing planning process to identify new

strategic initiatives that will further enhance the quality and cost-effectiveness of the library program through expanded collaboration. This paper summarizes the current outcomes of that process and establishes a framework for ongoing dialog about the current state of the libraries and strategic directions for the near future.

2. EVOLUTION OF THE UC LIBRARY SYSTEM

In pursuing a strategy of more extensive resource sharing over the last quarter century, the UC libraries have passed through three stages of cooperation, and are poised to enter a fourth stage. Each stage has built upon the foundation of the distinguished collections and services of the nine campus libraries, and can be characterized by progressively greater levels of cooperation among the campuses and increased leverage of the library system's resources, which include collections, staff expertise, and funds.

2.1.   Stage I: Stand-Alone Libraries

Each of the UC libraries has built, and is continuing to build, a rich collection tailored to the teaching and research needs of its campus. Prior to the mid-1970s, however, each campus library operated largely independently. Most library users satisfied their information needs with the books, journals, and other materials acquired by their campus library. Free jitney services, established in the late 1960s, allowed the most dedicated to travel to Berkeley or Los Angeles (depending on the region in which their campus was located) to use the larger collections at those two campuses, but at a considerable expenditure of time, and with no guarantee that the materials they needed would be held in one of those collections. Items could be requested via interlibrary loan (ILL), either from another UC campus or a non-UC library, but the success of this strategy depended on the local library staff's knowledge of the holdings and strengths of other major libraries, since there was often no way to know whether or where a particular item might be held in another library. Success in acquiring information often took weeks.

2.2.   Stage II: Coordination to Support Regional and Systemwide Services

A formal comprehensive planning process for libraries began in 1976, triggered by the State of California's perception of substantial duplication among campus collections, competition among campuses to increase collection size, and concerns about the cost of housing growing collections. In response, the University made strategic use of emerging technology (an online union catalog, and support for the automation of circulation and cataloging operations) and shared physical infrastructure (two regional library facilities).

These innovations leveraged the libraries' resources to improve efficiency and services to users while containing costs. The shared space resources of the regional library facilities made it possible for the libraries to economically accommodate infrequently-used print collections and thus to devote a greater portion of their campus shelf space to current and high-use materials. The shared infrastructure of the Melvyl Catalog enabled each UC library to provide its students and faculty with ready access not only to the wealth of resources in the campus collection, but also to the expanded universe of information available throughout the UC system.

Library users could use the Melvyl Catalog to easily discover books not held by their local library and order them using interlibrary loan (ILL). If needed items were not held within UC, library staff could search newly available national library databases to locate the items and place a request. Library staff could also use the Melvyl Catalog to inspect the holdings of the other

UC libraries as an aid in developing their local collections. The addition of journal abstracting and indexing databases to the Melvyl Catalog in the mid-1980s meant that immediate Universitywide discovery and access was possible for scholarly materials in all formats, not just books. These developments greatly increased the likelihood of locating materials, improved the productivity of ILL services, and provided users with better results and faster response times. As a result, intercampus interlibrary loans grew dramatically, from about 36,000 items per year in 1975–76 to 135,000 in 1996–97. During the same period, library users also benefited from the local online catalogs implemented at each campus library. This investment speeded the discovery of information and cut the libraries' costs of maintaining their massive card catalogs.

2.3. Stage III: Cooperation to Develop a Shared Digital Collection

By 1996, the cumulative effects of unfunded inflation in the costs of library materials and growth in enrollments and academic programs had significantly eroded the quality of collections. Furthermore, library budgets had to cope with the additional strain of adopting newly emerging technologies for the publication and distribution of information. The problems were exacerbated by significant cuts to the University budget beginning in 1990–91. To respond to these pressures, the Library Planning and Action Initiative (LPAI) was launched in September 1996.[4] The report of its advisory task force, released in March 1998, ushered in a further period of library collaboration, one that has focused on the shared development of digital collections and the further application of technology to enhance library services.[5] The LPAI also recognized that any costs that were avoided by libraries through collaborative action and resource sharing would in time be eaten away by hyperinflation in the cost and rate of scholarly publishing. Accordingly, it recommended that the University search for and support alternative means for distributing scholarly publications that did not impose such debilitating costs on universities, libraries, or individual scholars. To accomplish these aims, the LPAI recommended the establishment of what was then the tenth university library, the California Digital Library (CDL).[6]

At present, the shared collection of digital content assembled through the CDL comprises more than 8,000 journal titles and 250 databases, as well as other materials. The shared digital collection represents a significant organizational innovation in collaborative collection development because the campus libraries act as a single entity. The shared collection drives down the costs associated with the acquisition of commercial electronic content. An analysis of the top 11 digital journal publishers showed that consortial purchasing by the CDL results in a 58 percent discount from the average print subscription price, and a gain of more than 13,000 additional subscriptions systemwide. This means that all campuses get access to publications they would not have purchased in print due to price constraints; in fact, the value of these 13,000 additional subscriptions exceeds $25 million, if they had been purchased by the campuses in print format at list prices. Similar savings have been achieved with database subscriptions. In addition to the negotiation and acquisition of digital resources, campuses benefit from the University libraries' Shared Cataloging Program (SCP). The digital resources are cataloged by one campus and the resulting catalog records are distributed among all the campuses for inclusion in their local library catalogs.

Now library users at every campus have, in addition to their local collections, immediate access to an extensive and growing collection of high-quality digital information. Bibliographic citations to books, journal articles, and other information resources are available online, and in many cases users can view, download, or print the information itself online. Through the CDL's Online Archive of California, students and faculty throughout the University are exposed to the

treasures of UC's special collections, archives, and museums, resources that previously were not well known or readily accessible even to those at the collections' home campuses. Through the CDL's Counting California website, library users have access to a wealth of government-produced statistical information about our state and its people, which was previously available only through local government documents collections or arcane data archives.

At the same time, the shared technical infrastructure that supports the Melvyl Catalog and the CDL has been further leveraged to enable the libraries to provide even more effective access to print resources. The patron-initiated Request service streamlines interlibrary loan by providing library users with a simple option for ordering an item on another campus directly from a record in the union catalog. As an integrated service built upon the Melvyl Catalog, Request reduces the complexities of interlibrary loan, thereby encouraging and supporting use of campus libraries as a virtual Universitywide library. In the past 10 years, the number of interlibrary loan requests within UC has more than doubled, with the greatest growth occurring since the introduction of the Request service. Another service, UC-eLinks, also builds on the foundation of existing Universitywide systems to provide enhanced access to information resources. This service enables libraries to link a citation to the full text content (e.g. an online journal article) to which the citation refers.

2.4.   Accomplishments of the University Libraries' Collaborative Strategy

Many of the benefits that have been achieved through this strategy of progressively expanding collaboration are described in "Advances in Resource Sharing and Systemwide Library Service in the University of California: A Five-Year Progress Report" (January 29, 2003).[7] Recent efforts at a financial assessment of these benefits suggest that:

- If the campus libraries were to independently negotiate for, license, catalog, and collect user statistics for the 8,000 journal titles and 250 databases in the systemwide digital collection, the UC libraries would have to spend an additional $34 million per year.
- Through the development of the shared print journal collection described in Section 4.1 below, the libraries may avoid subscription costs for print journals of up to $3.1 million per year, plus additional savings in on-campus shelf space to house those journals.
- By depositing materials in the regional library facilities, the campuses avoid capital costs of about $11 million per year, on an annualized basis, that would have to be incurred to build on-campus library facilities to house these collections.
- If the libraries had been compelled to purchase and add to their own collections the items they were able to borrow from each other via interlibrary loan in 2002–03, the total purchase cost would have been $31 million.
- The availability of the systemwide technologies that enable the libraries to more effectively share, integrate, and present the University's systemwide print and digital library collections, including the Melvyl Catalog, interlibrary loan enhancements, and other services described in Sections 2.2 and 2.3 have allowed the libraries to avoid the substantial costs of developing these capabilities locally.

2.5.   The Next Stage: Collaborative Development and Operation of Shared Collections and Services

The UC libraries are now poised to optimize the shared management of their resources by working together to collaboratively design, develop, and share in the operation of an even wider range of services. These strategies leverage the ascendance of scholarly information in digital

form, while continuing to improve both access to print resources and advanced services for the UC community.

To accomplish this, the UC libraries must develop services and collection management strategies that simultaneously take advantage of the economies of scope and scale inherent in the systemwide infrastructure and are sufficiently flexible to allow each campus to tailor shared services to meet its needs. The libraries must therefore collaborate to design these services, pool financial resources and expertise to develop and operate them, and seek more opportunities to leverage available resources. Specific strategic directions to achieve these aims are fully described in Section 4 below.

3. CURRENT CHALLENGES CONFRONTING THE UC LIBRARIES

The accomplishments described above have provided enormous benefits for the University and its scholarly community, and have allowed the UC libraries to maintain and enhance services. However, these achievements have not fully addressed the traditional challenges facing our libraries, and have as well created new challenges that must be addressed.

3.1.   The Changing Nature of Library Collections

The information resources needed and used by campus communities for teaching, learning, and research consist of:

- *Traditional print resources*, most of which have no digital equivalents and remain essential for support of the University's teaching and research programs.
- *Licensed digital collections*, consisting of traditional scholarly publications, such as journals and books, produced in new digital formats by for-profit and non-profit publishers, and acquired for the UC shared digital collection.
- *Digital "built content,"* materials created internally by UC or converted into digital form from existing UC collections, such as manuscripts, maps, visual images, and sound files.
- *The World Wide Web,* the conglomeration of information resources in all formats (and of highly varying quality and persistence) available to any user of the Web.
- *Other UC digital assets*, such as datasets, other primary research materials, and teaching materials created in digital form by the UC community.

As recently as a decade ago, only the first of these was important in the provision of academic library services. The rapid emergence of new forms of digital library collections has suddenly raised fundamental challenges to traditional concepts of building, servicing, and preserving library collections. While the adoption of licensed digital journal collections by libraries and their patrons has been relatively straightforward (perhaps because they have print equivalents and can be treated similarly), it remains critical to gain greater understanding of the conditions under which a digital publication can be considered an adequate substitute for print,[8] and of the ways in which digital publications can be preserved in order to assure their longevity and usability. The creation of new digital content ("built collections") is also proceeding rapidly, but raises additional questions about what methods are likely to be successful, affordable, and sustainable for managing and providing access to the contents of these collections. Answers may vary according to the nature of the materials, but it is increasingly evident that traditional methods, such as library catalogs and bibliographic databases, cannot necessarily be successfully adapted to meet this challenge.

A greater challenge to traditional concepts of collection development lies in the area of information available on the World Wide Web. UC experience and national studies show that both students and faculty make extensive use of these resources, often in preference to higher-quality resources available from the library. However, information on the Internet is hard to find, of varying quality, and often ephemeral. To develop a "collection" of relevant material from the Internet, virtually every aspect of settled library practice must be answered anew, including how to identify and select relevant and authoritative resources, how to acquire and preserve them, and how to provide effective access to the content. These questions, in turn, are further complicated by uncertainties about technology, copyright, privacy, and other matters that currently characterize the national discussion about the Internet. The scope of the problem is so immense that, in the wake of a major report by the National Academy of Sciences,[9] Congress appropriated $100 million to the Library of Congress to establish a National Digital Information Infrastructure and Preservation Program[10] to begin to address these issues. The challenge of the World Wide Web must be addressed because the information resources needed for teaching and research are increasingly available only on the Internet. Examples include the publications and key documents of government agencies at all levels,[11] and virtually all of the routinely-produced government and private reports needed for economic research.

Capturing and curating digital materials produced by UC faculty, staff, and students in the course of their teaching, research, and learning activities presents a different, but no less demanding, set of challenges. These traditionally have not been within the scope of library collections, but represent assets worth capturing, managing, preserving, and making accessible. MIT's Open Courseware Initiative <http://ocw.mit.edu/ index.html> provides both a rationale and a compelling example of this kind of collection. Taking action to acquire, organize, and preserve research information and pre-publication materials brings the benefits of the libraries' information management skills to new areas of the knowledge life-cycle, promising to relieve faculty and their departments of the considerable burden of managing and preserving this information and to position the University to change and enhance the scholarly communication system.

3.2.   The Changing Role of the Library

The academic community's needs and expectations for library service change constantly as a result of evolution in the focus and methods of academic disciplines and programs, the changing demographics of faculty and students, increasing enrollment, the effects of information technology, and society's shifting expectations for the University and the outcomes of its teaching, research, and service programs. For libraries to remain a vital and essential part of the communities they serve, they must anticipate and adapt to the requirements of these ongoing changes.

While the digital revolution in the provision of scholarly information has afforded enormous leverage to libraries in providing access and services to their users, the same technologies may have, paradoxically, diminished the libraries' profile as an authoritative source of information, even while the use of library facilities and services is increasing. By most reports, more people come to the libraries than ever before. Both national studies[12] and UC research[13] show dramatic increases in the use of the digital collections that libraries provide, but nationally some traditional measures show a declining use of library collections. The Association of Research Libraries reports that, according to annual statistics provided by its members, "starting in 1996 circulation service transactions began to decline, in 1998 reference transactions began to fall, and

in 2000 both categories dropped below 1991 levels for the first time. Last year for the first time we reported data regarding in-house use, which had previously gone unpublished, that also show declines."[14] A recently-completed national study of faculty and students, conducted by the Digital Library Federation and Outsell, Inc., found that "about half (49.2%) of undergraduates reported that they used electronic materials exclusively or almost exclusively."[15]

This evidence implies that faculty and students continue to be drawn to the library, but increasingly for purposes other than checking out books. The significant contributions of the libraries in meeting the information needs of their communities through the kinds of digital collections discussed previously may be increasingly obscured by two fundamental problems:

- Many students (and some faculty) are increasingly unable to distinguish between the kinds of authoritative information provided in electronic form by the library and the welter of unverified (and often erroneous) information available on the Internet.
- The substantial contributions of the library to the provision of scholarly information in digital form — acquiring (at significant cost), organizing, cataloging, and integrating — become increasingly invisible to campus users who believe it's all "available on the Web."

As a result, UC's libraries are challenged to identify the reasons that users continue to flock to the library, promote these new roles for the library as a "place" in the life of the campus, and explain and expand their roles as providers of a host of new forms of digital information. Fortunately, the UC libraries remain well positioned to explore these roles and thereby enhance their ability to serve the University community. The Digital Library Federation/Outsell study found that, notwithstanding the growing role of digital information in academic life, "the library has a commanding authority. Slightly more than 98 percent (98.2%) of those surveyed agreed with the statement, 'My institution's library contains information from credible and known sources.'"[16]

In addition to these challenges, the increasing role of digital information and of shared Universitywide collections and services threatens to blur the distinctiveness of each campus's library program. The character of each campus library, comprising its unique collections, specialized services, and overall culture, has been built over decades and partakes of the distinguishing characteristics of the campus itself. The distinctiveness of each UC library is a critical asset, as it embodies the tailoring of collections and services to meet the needs of the campus community, as well as adding to the strength and diversity of the Universitywide library collection. The challenge is to maintain and further strengthen the individuality of the campus libraries in the face of increasing economic and technological forces that lead to greater homogenization.

3.3.   Technology Infrastructure

Libraries face the challenges of continually acquiring new information technologies, modifying their operations and services to accommodate new systems, and adapting new technologies to meet academic needs. The conventional wisdom is that the application of technology increases productivity, especially in industries that devote a high proportion of their expenditures to labor costs, such as higher education and library service. There is no question that the application of technology has improved the libraries' organizational productivity and helped mitigate the increasing cost of operations, but technology has done nothing so far to alleviate the risings costs of the information that libraries must acquire to attain their mission. The production of

information in traditional formats continues unabated. As a result, the cost of new library technologies is rarely offset by savings, and represents an additional cost to libraries and their parent institutions.

Of more importance, investment in new technology is needed both to improve access to information and to support the acquisition and delivery of new forms of information. Recognizing the central importance of digital information to the University's mission, the report of the University's 1997 Library Planning and Action Initiative noted that:

> A sophisticated and robust inter- and intra-campus technological infrastructure is an essential prerequisite to the distribution of digital information and the establishment of the California Digital Library. Without such an infrastructure, the CDL cannot deliver expected content and services. It is important to emphasize that this infrastructure must be designed with the understanding that content will outlive generations of access, storage, and retrieval technology and data formats and must migrate repeatedly without loss or distortion. It is important, however, to recognize that infrastructure development will require continuous investment centrally and by the campuses. The Office of the President and the nine campuses should continue and expand their investment in information technology networking infrastructure and in equipment and software that will facilitate faculty/student/staff access to digital content.[17]

Since the LPAI report, the importance of robust technology infrastructure for high-quality library service has grown. The importance of the interaction of technology-based library services with other infrastructures and applications has also grown. Not only do libraries depend on campus technology infrastructure to provide access to and delivery of scholarly information, but they must interoperate with other campus systems for administrative information (e.g., with payroll/personnel and student systems to maintain library circulation and authentication services) and, increasingly, with academic technology services (e.g., with course management systems to integrate library resources in course Web sites). An example is the capability to authenticate authorized members of the UC community to third-party systems that host our licensed digital collections. With assertive leadership from the Systemwide Library and Scholarly Information Advisory Committee, the libraries have provided an interim solution through the use of proxy server technology, but this involves significant workload and does not scale well to the size and diversity of digital collections we can expect in the future; a broader approach will soon be required.

These trends highlight two important issues:
- The UC libraries must be involved when the University and its campuses plan and implement their information technology strategies to ensure systems interoperability.
- Neither libraries nor computer centers can be the sole source of innovation or investment for the development and operation of information technology infrastructure to meet the needs of library users. Ultimately, the University will need to develop and maintain an information technology infrastructure that is driven by the entire range of programs that it must support.

3.4.   Preservation of Digital Information Resources

To achieve the UC libraries' goal of enhancing and enriching access to world-class collections of scholarly information, these essential information resources must remain available and accessible long after they were first created, published, and distributed. While the costs and challenges of meeting this goal for the libraries' print collections are formidable, the problem and the solutions are generally well understood. For the burgeoning array of scholarly information resources in digital form (see Section 3.1 above), the challenges are even more intimidating. As described in

the project plan for the Library of Congress' National Digital Information Infrastructure and Preservation Program:

> Digital technology is radically transforming the ways that we create and disseminate information. This new technology has spawned a surfeit of information that is extremely fragile, inherently impermanent, and difficult to assess for long-term value. The technology has enabled and encouraged many creators: It is possible for everyone to be his or her own publisher on the Web, in large part because it is not filtered for content or quality, as traditional modes of publishing have been. Digital formats are no sooner created than they are superseded by others. As a result, it is increasingly difficult for libraries to identify what is of value, to acquire it, and to ensure its longevity over time.
>
> Never has access to information that is authentic, reliable, and complete been more important, and never has the capacity of libraries and other heritage institutions to guarantee that access been in greater jeopardy. Recognizing the value that the preservation of past knowledge has played in the creativity and innovation of the nation, the U.S. Congress seeks, through the Library of Congress, to find solutions to the challenges posed by capturing and preserving digital information of cultural and social significance.[18]

The issue is further complicated by the fact that in many cases, the library does not have custody of the information resources it seeks to preserve; these are often located on publisher Web sites (in the case of licensed publications), personal or departmental computers (in the case of work produced by UC's faculty and students), or distributed across the World Wide Web (in the case of publicly-accessible Web resources).

Thus, added to the other challenges in collection development and the provision of services, there is the challenge of identifying, capturing, and providing for the persistent storage and management of digital information resources.

3.5.   Governing, Managing, and Financing an Interdependent Library System

The increasing interdependence of the UC libraries has been fostered by deliberate strategy and supported by a shared infrastructure that dramatically lowers the cost of resource sharing and leverages the University's library investment to improve services for all UC students and faculty. Paradoxically, the growing interdependence of the libraries has been accompanied by a simultaneously growing decentralization to the Chancellors of administrative and budgetary responsibility. In the period of free-standing libraries before 1977, the campus libraries enjoyed substantial programmatic independence, but budgets were closely controlled by the Systemwide Administration. It was logical to locate the programs resulting from the 1977 library plan (most notably the Melvyl Catalog and the regional library facilities), and their associated budgets, in Systemwide Administration. In the wake of the budgetary difficulties of the early 1990s, the clear demarcation between campus and systemwide roles and responsibilities for components of the library system began to blur. Administrative responsibility for the regional library facilities and their operating budgets were transferred to their host campuses at UC Berkeley and UCLA, although responsibility for policy remained with the two regional library boards appointed by the Provost and Senior Vice President for Academic Affairs. In 1996–97, the University implemented the President's Budget Initiative, a program that transferred most administrative authority and budgetary responsibility (and most of the discretionary budgetary resources previously held at the Office of the President) to the Chancellors. When the California Digital Library (CDL) was launched in 1997–98, it was administratively located within the UC Office of

the President (UCOP). Its start-up funding, consisting of an initial allocation of UCOP discretionary funds and substantial new funding from the state, was included within systemwide budget provisions. However, by the time of the CDL's official opening in 1999, the scope of the University's shared library infrastructure had grown past the point that it could be supported by budgeted funds that were available at, or could reasonably be expected to be secured by, the Office of the President. To continue to achieve greater leverage through shared infrastructure, co-investment by the campus libraries was necessary.

Under the provisions of the Partnership Agreement with California Governor Gray Davis <http://budget.ucop.edu/NP.html> and the internal UC budget management initiative implemented in 1996–97, libraries are now considered as part of the University's requests for new state funds to support additional enrollments, salary increases, and non-salary price increases. These funds are block-allocated to campuses, where the Chancellors have considerable discretion to re-allocate them to campus programs in order to meet local priorities and needs. Funds for systemwide programs are not requested routinely, and are usually over and above the amounts provided in the Partnership. As a result, in 2002–03, for example, 91 percent of the $63.7 million UC budget for library materials was held in campus budgets, while 9 percent ($5.5 million) was in Universitywide accounts supporting shared collections. During that same year, the budget for the Shared Digital Collection was $24 million, including the cost of print subscriptions bundled with digital access. Since systemwide funds could provide only $5.5 million, or 23 percent, of this amount, the remainder, $18.5 million (77 percent), has come from voluntary co-investment of campus library collection budgets.

As a result, much of the burden of financing the shared collections and services of the UC libraries falls to the campuses. Even in the best of times, the health of this shared infrastructure, and hence the quality of service that each campus library can offer to its students and faculty, depends increasingly on the ability and willingness of the campuses to co-invest in shared programs and services, as about 10 percent of the total UC library budget, and nearly 20 percent of the collections budget, are currently devoted to shared collections and services. It is now evident that the UC libraries will share in the substantial budget cuts currently facing the University as a result of the state's fiscal crisis. These cuts come at a time when the cost of acquiring library materials continues to increase at a rate that outpaces inflation, challenging the campuses and their libraries to sustain the quality of current collections and services while adding new forms of knowledge and coping with growing enrollments. In a time of budgetary contraction, the financing of shared services can place an extraordinary strain on campus library budgets. As campus library commitments to shared solutions increase, libraries will have less flexibility to make discretionary investments (or take cuts) to meet both local and systemwide needs. In 2002–03, nearly 20 percent of the total of campus library collections budgets were devoted to the shared licensed digital collection; when campus commitments to the continuation of print subscriptions required by some publishers' license agreements are included, this number increases to about 29 percent. Owing to the combined effects of the increase in scholarly output, the ongoing increase in the cost of books and journals, and a 7–8 percent annual increase in the cost of the shared licensed collection, it is difficult to simultaneously sustain the shared digital collection and the vitality of campus collections without additional sources of funding.

Building and housing a growing collection of information resources for research and teaching is a cumulative process. Reduced operating and capital budgets not only affect current services, but have ramifications that echo far into the future. The current budget cuts present serious

challenges to the quality of campus libraries, as well as the integrity of the shared Universitywide library programs upon which all of the campus libraries depend. The impact of local decisions about library investment must now also be considered in a systemwide framework. Resource allocation decisions at one campus can have effects on all the other campuses through their impact on shared collections and services, and these effects in turn can be reflected back to the campus and magnified, owing to the high degree of leverage that characterizes the shared programs. The challenge facing the University will be to make budget decisions that balance the necessity for local library investments that support campus quality, distinctiveness, and diversity, with the need for continued investment in shared systemwide resources. The University Librarians have consulted extensively with each other and with their campuses about plans for shared collections and services in the context of local resources, and they have taken collective responsibility for planning and managing shared collections and services. However, additional funding strategies and broader consultation may be needed to strike a balance between shared systemwide and local campus investment priorities, to consider intercampus equity in the investment in systemwide programs, and to support the deployment of library resources to meet both Universitywide and campus needs.

4. STRATEGIC DIRECTIONS

In response to these issues and the opportunities afforded by technology and collaborative action, the UC libraries have launched an ongoing strategic planning process. Current directions for strategic development include expanded collaboration to manage collections in all formats on a systemwide basis, a shared infrastructure to support the cost-effective development of library services that can be tailored by each campus to meet local needs, the development of shared facilities programs (including some repurposing of the roles of the existing regional library facilities), continued expansion of UC's scholarly communication initiatives, and new efforts to communicate with the UC community about the libraries' challenges, opportunities, and strategic directions.

4.1.   Collection Management and Coordination

The University's library strategy has resulted in a carefully coordinated and collaboratively managed hierarchy of library collections and services in which the collections of the individual campuses are enriched by ever-improving capabilities to access the resources of all the others.

More recently, campus collections have been enhanced by the development of shared digital collections that are held in common and are equally available and accessible to all members of the University community. As a result, each UC faculty member and student can make use of a campus library that not only offers rich local collections, but provides a portal to the extensive resources of the entire UC system, integrated and presented by the campus library in a way that responds to the particular needs of the campus community. Of equal importance, collaboration on acquisitions and preservation helps ensure that the diversity of the Universitywide collection is maximized and increases the likelihood that information needed for research and teaching will be available somewhere within the UC system.

Looking forward, the University Librarians, building upon the University's successful experience with the shared digital collection, recently created an initial definition for the concept of a shared print collection. The overall aim of this concept is to further optimize the management of information resources for students and faculty by reducing unnecessary

duplication, leveraging shared assets (such as the regional library facilities), and expanding the information resources available systemwide, while meeting the unique information needs of library users at each campus.

For example, the libraries' first collection management action initiative, the shared print journal collection, aims to acquire an archival print copy of most journals available in the shared digital licensed collection. Campuses can then consider whether or not to cancel local subscriptions to the print copies of these journals, while faculty and students can be reassured that one print copy of each of these journals will remain available in highly secure and environmentally controlled conditions (at a regional library facility) in the event the digital version cannot be accessed. This initiative gives campus libraries greater flexibility to manage their collections, allowing them to free up financial and space resources so they can acquire new materials to meet local needs. A similar initiative to rationalize and reduce duplication in the libraries' extensive holdings of government publications promises similar benefits. Efforts to capture and ensure persistent access to digital information, described in Section 4.4, will also result in the creation of new shared collections in the digital realm.

It may be possible to realize savings in space and in the staff time required to acquire, process and manage these collections. Where collections are large and highly redundant, savings are likely to be considerable. The University Librarians are currently investigating the cost-benefit characteristics of various shared print collection concepts. The all-campus Collection Development Committee also has proposed an investigation into the utility of an online service infrastructure that will enable campus bibliographers to dynamically track what monographs are being purchased by other UC libraries. This capability promises to extend the breadth of collections that are available to users of UC libraries while minimizing the libraries' expenditures on redundant items.

4.1.1.   Recommended Actions

- Develop a detailed planning and evaluation framework for shared collections in all combinations of formats that: a) explicitly specifies their key characteristics (e.g., physical location; access and management policies); b) identifies costs and resource needs (e.g., processing, shelving space and environmental requirements, access and delivery services, and requirements for infrastructure services such as bibliographic access and inventory control); c) assesses implications for campus operations, services, preservation strategies, and budgets; and d) identifies the affected user communities and their use of the collections.
- Apply the guidance provided by this framework to implement the development of shared collections.

4.2.   Shared Facilities

Since the early 1980s, the Northern and Southern Regional Library Facilities have provided economical, environmentally controlled, and secure space for infrequently used library material of enduring research value. Policy oversight of the two facilities by their respective Regional Library Boards has ensured that each is responsive to the needs of the libraries in their regions. The emergence of the shared collections and shared services initiatives discussed here will require the University libraries to develop new collection management, public service, and technical service strategies to support them. The regional library facilities, as Universitywide

assets, are well positioned to assume new roles in support of these initiatives. While the nature of these additional roles awaits the results of ongoing planning, it is evident that a higher degree of coordination, consultation, and integration will be required, both between the regional library facilities and among the RLFs and the 10 campus libraries. Issues of governance, operational budgeting, financial administration, capital budgeting, and planning will need to be addressed as the regional library facilities make the transition from regional services accommodating campus-based collections to systemwide services accommodating a mix of campus and shared collections.

4.2.1.   Recommended Actions

- Consolidate the governance of the shared regional library facilities and ensure that they are fully integrated into planning and operations in support of the collaborative programs of the UC libraries.
- Regularly review the policies, operations, and resource needs of the regional library facilities to ensure that they continue to support the UC libraries' strategic directions.
- Acknowledge that the scope for continued expansion of the regional library facilities is necessarily limited (by site constraints, availability of capital resources in the context of UC capital program priorities, etc.), and begin long-range planning for this eventuality.

4.3.   Shared Services

For faculty and students to make effective use of these new configurations of print and digital collections, a new configuration of library services is needed. As discussed in section 3.2 above, library services must be tailored to the distinguishing characteristics of each campus while effectively integrating access to a burgeoning variety of information located on other UC campuses, at the systemwide level, and in other locations throughout the world. To be effective, each library's services must also integrate with its existing library automation systems and with other campus systems that support student information, business processes, course management and other functions.

In the current service environment, each campus library has three choices for the deployment of new services: develop them locally, use services provided on a systemwide basis (such as the Melvyl Catalog), or acquire them from a third party. Given these choices, libraries face an insurmountable challenge in creating locally-tailored services. Local development incurs substantial costs and requires considerable staff expertise. Because all UC libraries need all of these services in some form, independent local development inevitably means some degree of duplication of effort and expense. With centrally-operated services, either campuses lose the flexibility to meet local needs, or the central service provider faces the Sisyphean task of trying to accommodate all of the different campus needs in a single system. The same is true of services offered by third parties, except that the range of needs that must be accommodated by the vendor expands beyond the UC libraries to include the entire market for the service. And for each of these alternatives, the library must grapple with the complex requirements of interoperating with the increasing variety of systems, collections, and formats to which its users require access.

In this environment, the typical results are far from optimal for the user. For example, library users searching for relevant information must separately search the campus library's catalog, the Melvyl Union Catalog, and a variety of journal indexing and reference databases, each with its

own interface and set of services. To overcome this problem, the libraries currently employ a variety of workarounds. For example, catalog records for items in the shared digital collections are not only included in the Melvyl Catalog, but also are often duplicatively loaded in local campus catalogs. UC-eLinks makes it possible for a user to move seamlessly from a catalog record or citation to a source for obtaining the cited item, regardless of the item's format and location, but the user still has to search each of these citation sources separately.

Fortunately, the same advances in technology that have rapidly and cost-effectively expanded the universe of information available to our library users have also made it possible to design new ways to manage and provide access to this information. "Layered" service designs offer the potential for each UC library to develop flexible, innovative and customized services without sacrificing the economies that are traditionally associated with centralized services. In a layered model, a library can develop a portfolio of services that use standard methods to access repositories of information or utility services that are located locally or remotely, including resources that are developed jointly for sharing among all the campuses. For example, a library might develop a service that simultaneously searches the campus online catalog, the Melvyl Catalog, a variety of journal databases, the eScholarship Repository, and the World Wide Web, and presents the results to the user as a single unified list of relevant resources. The library might tailor this service to a particular clientele by selecting the resources to be searched (for example, by selecting a relevant subset of journal databases, preconfigured searches for the campus and systemwide library catalogs, and a preselected group of relevant Web sites). The library might want to make use of UC-eLinks, a systemwide service utility, to provide links from the search results to primary sources, and format the display of links to include particularly important local resources or highlight the sources that are deemed most useful for a particular group. Because many campuses will be interested in offering similar services, there are opportunities to develop these services jointly to ensure that they will effectively meet local needs and that development costs will be spread across a wider base.

While these concepts lend themselves most readily to the design of new services, the same factors that encourage a collaborative approach to innovative services – greater efficiency, flexibility, and tailoring to campus needs – invite rethinking of the libraries' existing bibliographic services infrastructure. This infrastructure consists of the campus and Universitywide systems, operations and services that support the creation, management, manipulation and presentation of bibliographic information. This information, or metadata, is necessary for libraries to acquire and manage scholarly materials and for patrons to discover, access, and use those materials. The parts of this infrastructure that are visible to library users include the Melvyl Catalog and the campus online library catalogs; the Request service that allows Melvyl Catalog users to directly request items on interlibrary loan; UC-eLinks, which allows users to navigate from citations to online content; and SearchLight, which allows simultaneous searches across multiple journal databases, book catalogs, and other information sources available through the CDL and the UC campuses. These services are clearly essential components of the "shared utility" that supports the layered service model, and a high priority needs to be given to adapting them to perform a new role in the layered service infrastructure.

Of equal importance is the "invisible infrastructure" that supports these services, which includes automated systems for the acquisition, processing, cataloging and circulation of library materials, and the skilled library staff responsible for these complex operations. While the libraries have

been enormously successful in exploiting the current infrastructure to accommodate new kinds of collections and support new services, it should be recognized that:

- This infrastructure has been developed over the last quarter-century from building blocks, including professional concepts, campus practices, and systems, that are rooted in the model of a single library that acquires, manages, and provides its users with access to books, journals, and other physical materials. These building blocks may no longer be adequate to deal with library services that are multi-institutional and must provide access to materials in a variety of physical and electronic formats, much of which is not owned by any library in the collaborating group.
- While information technology is essential to support these services, it is the skilled and experienced library staff who must provide the services themselves. Owing to a variety of factors – the national economic downturn, California's cost of living, a general contraction in the library labor market, the approaching retirement of a large portion of the library workforce, the University's current budgetary environment, and the libraries' changing needs for staff expertise – it is becoming increasingly difficult for the UC libraries to recruit and retain the staff needed to provide the full range of existing services and to design innovative new services.

In summary, a layered service approach allows campuses to cost-effectively provide an expanded range of services specifically tailored to its campus community through:

- Tools and utilities that are collaboratively developed and financed and available to all
- A shared infrastructure that supports collaboratively-developed tools and utilities and facilitates their use for accessing information resources available at the campuses, systemwide, and outside the University

The experience of both the libraries and campus technology officers suggests that success will also require the libraries to effectively surmount the following challenges:

- *Transitional financing.* Building the infrastructure for layered services will require investment in the development of new tools and utilities and the re-engineering of many existing services. Because it will not be possible to put a new infrastructure in place instantaneously, support for existing operations must continue while new services are developed, tested, and brought into production.
- *Adequate investment in basic infrastructure.* Because the infrastructure that supports layered services is shared across the University, it presents many of the issues of financing, governance and management that characterize the UC libraries' shared collections (see section 3.5 above). The effectiveness of the layered service model depends on the reliability and robustness of its infrastructure components: communication networks, shared utility services, information repositories, and the equipment and software that support them. Adequate financing is therefore essential.
- *Strengthening partnerships with IT at the campuses and systemwide.* Development in this direction not only promises better and more flexible library services at the lowest possible cost, but also tracks the development direction for other technology-based services provided by the campuses for student information, course management, business operations, and other functions. There are substantial opportunities to gain further leverage and avoid costs by aligning the development of technology-based library services with campus and Universitywide strategic directions for information technology, but as discussed in section 3.3, success depends on effective partnership with the University's CIOs and other information technology leaders.

- *Building the capacity within campus libraries to effectively plan, build and use tools and infrastructure services.* The shift from purely local or entirely centralized services to a layered service model creates new opportunities for libraries to achieve their service ambitions and provide campus communities with library services carefully tailored to meet user needs. This shift also requires campus libraries to assume greater responsibility for development of these tools and services (whether they are created locally or collaboratively) and to integrate them with other campus systems and Universitywide information repositories, utilities, and other infrastructure components. It will be necessary for the campus libraries to make investments in staff, organization and technology in order to capitalize on these new opportunities. At the same time, the planners of systemwide services must acknowledge that the capabilities and aspirations of the campuses will develop differentially, and plan accordingly.

Because the issues involved in developing shared services are complex and require development of new relationships and partnerships, particularly with campus CIOs, action for this strategic direction should be initiated with a series of planning and experimenting steps that can help further define the problems and opportunities and set a course for further development.

4.3.1.   Recommended Actions

- Develop a programmatic framework that leverages the collective resources of the UC libraries to: a) more effectively manage and deliver essential ongoing services (e.g., for bibliographic control and access, and for acquisition, processing and management of collections in all formats); and b) collaboratively develop, deploy, and support advanced user services.
- Develop and implement pilot programs to test concepts, refine planning, establish priorities, and clarify resource needs and sources.

4.4.   Persistent Access to Digital Information

Addressing all the intellectual, organizational, technical, legal and financial issues involved in the digital preservation challenge described in Section 3.4 above will require a lot of work over many years. Indeed, many of these issues cannot be addressed by a single institution, but must be attacked at national and international levels. Numerous collaborative initiatives in this area, such as the Library of Congress National Digital Information Infrastructure and Preservation Program[19] have emerged to address various aspects of the problem, and the UC libraries are involved in many of them.

However, UC cannot wait for external solutions, and collectively we can begin addressing these problems with two constructive steps. The first is to provide the UC libraries with the technical means to successfully manage digital information assets. To ensure long-term access to the digital scholarly information that supports and results from research and teaching at UC, the libraries require digital preservation repository technology and the accompanying tools to support the identification, capture, organization, and persistent management of digital scholarly information. This capability should be developed as a utility infrastructure, sharing common components and accessible Universitywide, but available for each library to use to meet campus needs. Also included will be a host of tools that will enable the effective use of the utility infrastructure, including implementation guidelines, support services, and guidance for collection planning, rights management, and other key components of the preservation process. This model

will enable the UC libraries to cost-effectively act as guardians over UC's digital scholarly assets without having to individually invest in the requisite deep technical infrastructure.

A shared digital archival repository infrastructure will enable the libraries to ensure persistent access to:

- **Licensed content.** In support of faculty research and teaching, the UC libraries have developed substantial collections of licensed content, including online scholarly journals, at an annual cost of more than $20 million. Unlike collections of paper journals that remain on library shelves even after subscriptions are cancelled, online journals are volatile and at risk. Although the UC libraries have succeeded in including perpetual access clauses in their subscription licenses, they lack the means of implementing those provisions should the need arise. Journal publishers are no better prepared than libraries to persistently manage online journal content. Accordingly, the UC libraries assign the highest priority to developing the means of persistently managing online journals. To this end, the libraries are in discussion with some of the largest journal suppliers about partnerships through which the libraries will preserve the vendor's online journal publications.

- **Web-based information.** Information publicly available on the World Wide Web is an increasingly vital part of the scholarly and cultural record, and it is increasingly at risk. It is also an essential means of collection development. In many areas where the UC libraries have substantial and historic collection strengths, information is being made available largely (and in some cases, exclusively) via the World Wide Web.

- **Digital objects managed or created by the UC libraries**. The UC libraries have produced millions of digital objects, including bibliographic records for monograph and serial holdings, finding aids that assist users in locating materials held in archives and special collections, and digital surrogates for selected analog materials in a great variety of formats. By capturing these assets and bringing them into persistently managed collections, the libraries will protect the very substantial investments they have made in creating them.

- **Online research and learning materials created by UC faculty**. Presently, we have a very limited ability to provide support for the digital scholarship our faculty create. Without easy-to-use systems that provide the capability to capture, persistently manage, and encourage re-use of the research, learning, and course materials that scholars and teachers digitally produce, individual faculty are often left to grapple with these problems alone. As a result, we may be deprived of some of the very best scholarship that UC has to offer. We also place at risk one of the greatest intellectual assets of UC.

A second important step is to gain a greater understanding of the range of needs for the reliable preservation of digital information that exists throughout the University, and assess the extent to which the libraries' digital preservation repository infrastructure can be leveraged to address those needs. Increasingly, the vital records of the University — about students, staff, budgets, and myriad business transactions — are created and maintained only in digital form. These are subject to a bewildering variety of policy and legal requirements and constraints. Both the technical and operational responsibility for their maintenance is widely distributed throughout the University. While it is not, and should not be, the responsibility of the UC libraries to manage this information, the application of the libraries' digital repository infrastructure to these problems may have potential to enhance cost-effectiveness, improve operations and services, and more equitably distribute the responsibility for building and maintaining a shared technical infrastructure for the persistent management of digital information.

4.4.1.   Recommended Actions

- Develop a digital preservation infrastructure in collaboration with national and international efforts that adheres to established standards and open-source practices to: a) centrally preserve the at-risk digital information that we share a common interest in (such as scholarly journals and databases and web-based government information); and b) facilitate the efforts of the campus libraries to preserve digital assets in which they take a unique interest (for example, selected collections of web-based materials, UC dissertations, digital materials produced by faculty for research or teaching, etc).
- Investigate the extent to which the digital preservation infrastructure may assist in the preservation or protection of deteriorating print materials.
- Coordinate closely with University units responsible for information technology, records management, and other units with a responsibility for the preservation of digital content to foster development of and support for a robust common information technology infrastructure that can meet the University's needs for the reliable archiving, management, and retrieval of digital information.

4.5.   Scholarly Communication

Scholarly communication, defined as the range of systems and services that disseminate and manage the products of scholarship, is at a crossroads. The traditional models of scholarly communication have become expensive, restrictive, and increasingly limited in their ability to make information accessible.

In 1998, the Library Planning and Action Initiative's Advisory Task Force acknowledged the University's opportunity and responsibility to influence the change in publishing and the distribution of scholarly information in order to maximize benefits for the academic community:

> The free flow of information required for scholarly and scientific communication is now threatened by rising costs in a monopoly-like marketplace that is increasingly dominated by large commercial publishers and information vendors. Universities subsidize the costs of faculty research. Faculty then give the results of that research to publishers, who sell it back at ever increasing costs and, in the case of digital information, with unprecedented new restrictions on distribution and use. Libraries have been among the first partners in the scholarly and scientific communication system to feel the ill effects of this model, but in the long-term, it will restrict the entire flow of scholarly discourse. Libraries have been first because the effect of changes in the information marketplace has been coupled with the growth in demand for digital documents and with minimal relief in the demand for print and other formats. This has resulted in a non-sustainable "business model" for campus libraries individually and for the University as a whole. Old formulae developed for State funding of libraries are no longer relevant to new situations and no longer operational under the University's budget compact with the Governor. UC's librarians are in an increasingly untenable position of trying to mediate between and among faculty/student needs and increasingly onerous budgetary constraints.[20]

To address this persistent structural problem, the task force recommended that "to capture and distribute effectively the fruits of the knowledge developed by UC faculty requires new forms of scholarly and scientific communication. Since such a transformation also promises a long-term solution to the financial problems facing our libraries, the newly formed California Digital Library should play a leadership role in developing, supporting, and implementing practical opportunities for faculty to publish and archive material in digital form."

The problem has continued to grow in the ensuing years. The report from a recent series of UC faculty seminars on scholarly communication, co-sponsored by the Academic Council leadership and UC Systemwide Library Planning,[21] includes the following succinct statement of the issues and challenges:

> There is widespread agreement and a wealth of supporting data for the proposition that the current model for scholarly communication is not sustainable. Three factors combine to create and fuel the model's dysfunction:
> 1. The cost of scholarly publications is – and has been – rising at rates that are several times higher than inflation.
> 2. The number of scholarly publications of all forms is – and has been – increasing exponentially.
> 3. University budgets, and library budgets in particular, are remaining relatively flat when adjusted for inflation, even as collection and service expectations rise.
>
> While the unsustainable factors have been operating for some time, they have been brought into sharp focus at the University of California due to several recent events and trends:
> - the current California state budget crisis and the direct diminution of UC library purchasing power and resources available for service development;
> - the emergence of computer and network-based alternative publications that have the potential for experimental reconfiguration of one or more elements of the traditional model;
> - increased communication with and understanding by UC's faculty of the traditional model, its unsustainable elements, and their role and power as the primary stakeholders in scholarly communication.

If the University of California Libraries are to continue to provide the high-quality collections and services that their users both demand and deserve it is vital that the economics of scholarly publishing become more sustainable and, concomitantly, that scholarly communication systems evolve in order to continue to support the production of knowledge.

4.5.1.   Recommended Actions

- Working collaboratively with faculty, management, the UC Press, information schools, and national associations and bodies, the UC libraries will develop and implement a program to provide leadership in the comprehensive alteration of the scholarly communication process so that it is economically sustainable and ensures the widest possible access to the scholarly record. The program will identify concrete steps and necessary resources, and should evolve along a shared services model, with the appropriate use of centrally-provided services and collaboratively developed campus-based efforts. At a minimum, this program will provide:
    - Strategies and services to help faculty manage the copyrights in the works they create, including an expanded publishing services infrastructure, based on the eScholarship program and partnership with the UC Press, to facilitate innovative dissemination of their works.
    - Methods for communication and outreach to faculty to inform them about the economics and mechanics of scholarly publishing and their effect on both the distribution of scholarly work and on the quality of service provided by the UC libraries.

- Establishment and operational application of library collection development and selection principles that account not only for scholarly value but also for service and economic sustainability.
- Applied research to identify and gather the data about characteristics of the publishing industry and its products and about UC library operations and costs that are needed to help inform the publishing decisions of individual faculty, as well as the University's ongoing planning.
- Mechanisms to leverage individual, campus and systemwide effort and expertise, resulting in a network of highly engaged and informed faculty, library staff, and academic administrators who can shape, support and effectively coordinate both campus and systemwide endeavors.

NOTES

[1] *The University of California Libraries: A Plan for Development 1978-1988*, Berkeley, CA: University of California, Systemwide Administration, Office of the Executive Director of Universitywide Library Planning, July 1977.

[2] *Library Planning and Action Initiative, Advisory Task Force Final Report*, University of California, March, 1998 (<http://www.lpai.ucop.edu/outcomes/finalrpt/>).

[3] See <http://www.slp.ucop.edu/consultation/slasiac/>.

[4] For the Library Planning and Action Initiative see <http://www.slp.ucop.edu/initiatives/lpai.htm>.

[5] For the report of the LPAI task force see <http://www.lpai.ucop.edu/outcomes/finalrpt/>.

[6] See http://www.cdlib.org/

[7] Available at <http://www.slp.ucop.edu/documents/Expanded_Progress_Report.pdf>.

[8] The University's Collection Management Initiative (<http://www.ucop.edu/cmi/>) has begun to address this issue in the case of journal publications.

[9] *LC21: A Digital Strategy for the Library of Congress* (Washington DC: National Academies Press, 2000 (further information and an online version available at <http://www.nap.edu/catalog/9940.html>).

[10] Information about the Library of Congress program is available at <http://www.digitalpreservation.gov/index.php>.

[11] At the federal level, many, but not all, such resources will be captured and archived through an innovative collaboration between the Government Printing Office and the National Archives and Records Administration, but the Web-based documents of state, local and foreign governments and agencies in most cases currently elude capture and control.

[12] Amy Friedlander, Dimensions and Use of the Scholarly Information Environment: Introduction to a Data Set Assembled by the Digital Library Federation and Outsell, Inc. Washington, D.C.: Digital Library Federation and Council on Library and Information Resources Version 11/7/02 (<http://www.clir.org/pubs/reports/pub110/contents.html>, accessed 7/29/03.)

[13] University of California Libraries, Collection Management Initiative (<http://www.ucop.edu/cmi/>).

[14] Martha Kyrillidou and Mark Young, "ARL Statistics 2001-02: Research Library Trends," June 12, 2003 (<http://www.arl.org/stats/arlstat/02pub/intro02.html>, accessed 7/29/03).

[15] Friedlander, *op cit.*

[16] Friedlander, *op cit.*

[17] University of California, Library Planning and Action Initiative Advisory Task Force, Final Report, March 1998 (<http://www.lpai.ucop.edu/outcomes/finalrpt/>, accessed 8/27/03).

[18] Preserving Our Digital Heritage: Plan for the National Digital Information Infrastructure and Preservation Program, Washington, DC: The Library of Congress, October 2002, p. 1 (available at <http://www.digitalpreservation.gov/repor/ndiipp_plan.pdf>, accessed 1/14/04).

[19] *Ibid.*

[20] Library Planning and Action Initiative, Advisory Task Force Final Report. University of California, March, 1998 (<http://www.lpai.ucop.edu/outcomes/finalrpt/>).

[21] *Challenge and Change: Scholarly Communication and the UC Community: A Report from University of California Scholarly Communication Seminars, Fall 2003* (available at <http://libraries.universityofcalifornia.edu/scholarly/fall_03_facultyforums.html>).