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Collections & Access for the 21st-Century Scholar: Changing Roles of Research Libraries

A Report from the ARL Collections & Access Issues Task Force

INTRODUCTION AND ENVIRONMENTAL TRENDS

In October 2001, ARL sponsored a forum on "Collections & Access for the 21st-Century Scholar." A prevailing theme of papers and discussions at that forum was how the changes in the environment of scholarly communication were shifting or blurring boundaries of responsibilities within the library, across campus, and externally among the many stakeholders in the system. The forum participants concurred that this fluid and unsettled environment presented both leadership opportunities and challenges for a library, especially in regard to the library's collection management decisions and access strategies. In early 2002, the ARL Collections and Access Issues Task Force was formed to follow up on the discussions at that forum, and to make recommendations on new or revised collections and access agendas for the Association.

This paper identifies what the task force believes to be the salient factors that are influencing the general climate of change for these research libraries, as well as the significant changes and emerging trends in collection management and access strategies. The findings are based on a summer 2002 Web survey of ARL member libraries,¹ a review of recent selected publications,² personal experience, and conversations with colleagues who also direct research libraries.

Transformation of the Research Institution

The task force assessment of the transformations underway in research libraries was made in the context of the ongoing change of research institutions and of the very process of scholarly communication. Transformation in a library to a large degree mirrors the ongoing change of the research institution or university, just as the transformation of the institution reflects broader societal and cultural changes. The transformation of the research library cannot be understood apart from this larger context and the cultural changes and trends that shape institutional growth. Change at the institutional or university level has tended toward the erratic, with the juxtaposition of explosive technological breakthroughs with the more conservative academic culture.

Examples of significant transformations currently underway in research universities include:

- Undergraduate curriculum reform, including the infusion of research into undergraduate education
- A renewed focus on stimulating interaction between the institution and other communities, including K-12, local organizations and residents, and the international community
- Increasing support for learning and research on global and interdisciplinary issues
- A resurgence of use of supercomputing and new network applications made possible by Internet2
- Institutional cultural changes, including an increased focus on assessment and outcomes

Also at the university level, the Web and educational technologies have:

- Improved sharing of data within the institution in ways not previously possible, including the deployment of institution-wide systems in support of academic and administrative operations
- Allowed increased opportunities for reaching more students through distributed and distance learning, including learning opportunities for alumni. These opportunities have allowed greater access to higher education, especially for non-traditional populations, although society still ascribes greater value to the traditional on-site degree.
- Provided alternative and innovative publishing opportunities for faculty, graduate students, and research scholars
- Provided new opportunities for the creation of knowledge. Web applications for course development and the conduct of research have enabled faculty and researchers to establish interest-based online communities. These communities allow for the exchange of knowledge and the iterative process of scholarly communication; they also contribute to the community building that is essential for the creation of knowledge.
- Provided new opportunities for the presentation of research to colleagues and students. Innovative applications of new technologies are significantly enhancing and expanding the way research findings are communicated.

The National Research Council recently published a report on a two-year study examining the implications of information technology for the future of the nation's research university.³ The report's conclusions include a finding that the extraordinary pace of information technology evolution is likely to continue and perhaps accelerate.

The ARL task force prepared the following report to provide a baseline picture of the ongoing transformation of the research library in the context of these broader changes, specifically in collection management and access strategies. The results of this study and the task force survey provide clear empirical evidence that significant change and innovation are occurring in research libraries of all sizes and characteristics. The task force hopes that disseminating this information will encourage further innovation and support for increased core funding for such innovations. Toward that end, this paper seeks to raise awareness of how the roles of research libraries are changing. University provosts, faculty, chief information officers, library staff, and other decision makers may find these results useful in securing support for their own library's innovative efforts.

Changing Patterns of Information Use

Within this changing environment, research libraries understand more keenly than ever the new ways in which clients are seeking and using information. Libraries see an expanding base of users and, in many instances, changing service demands. There is ample evidence that when libraries make quality content available through the Web, its use increases and it reaches more people within the institution. In addition, the user base for any individual library has expanded to include users beyond the institution. This has been achieved through more efficient resource-sharing arrangements (often statewide) as well as by targeting new user groups for digitized content and e-services (distance learners, K-12 teachers, etc.). In many cases, openly accessible digitized collections on the Web are also being used heavily by people from beyond the educational world.

Despite press accounts to the contrary, research libraries report that use of the library's physical facility remains heavy, especially for collaborative learning and research activities and for access to computers and information technologies. As a result, many libraries have moved to provide 24/5 (or greater) access to the library buildings. At the same time, there is growing evidence in the data collected from ARL member libraries that the service demands of users may be changing. Many libraries see declining use of some traditional services, such as use of some print materials, circulation transactions, and reference transactions. However, the data confirm that the demands for interlibrary borrowing and for user education are steadily increasing ([see chart](#)). These trends signal a shift in the behavior of information users that is being closely monitored.

Research on the information-seeking behavior of people is growing almost as fast as the Web itself. Some of the studies reviewed and discussed by the task force members are briefly noted below.⁴

Pew Internet & American Life Project

The Pew Internet & American Life Project⁵ creates and funds original, academic-quality research that explores the impact of the Internet on children, families, communities, the workplace, schools, health care, and civic/political life. The project aims to be an authoritative source for timely information on the Internet's growth and societal impact, through research that is scrupulously impartial. For example, in *The Internet Goes to College: How Students are Living in the Future with Today's Technology*, issued September 15, 2002, the Pew research found that college students are early adopters and heavy users of the Internet and that they think the Internet has enhanced their education and changed their social life. An overwhelming number of college students reported that the Internet, rather than the library, is the primary site of their information searches. "Many students are likely to use information found on search engines and various Web sites as research materials....A great challenge for today's colleges is how to teach students search techniques that will get them to the information they want and how to evaluate it....While few universities require college students to take courses on information seeking, many include a session on it during freshman orientation meetings. College students seem to rely on information seeking habits formed prior to arriving at college. *Teenage Life Online*, a Pew Internet & American Life Project report published in June 2001, reports that 94% of online teens have used the Internet for school research, and 71% used it as a major source for

a recent school project."⁶

UCLA Higher Education Research Institute Study of College Freshmen

The annual study of college freshmen that is conducted by the University of California, Los Angeles (UCLA) Higher Education Research Institute identified the same trend as the Pew research. The UCLA survey recently showed that 83% of new freshmen--more than four out of five students--are using the Internet for research or homework.⁷

OCLC White Paper on the Information Habits of College Students

OCLC commissioned Harris Interactive to conduct a blind research study with college students who use the Internet for school-related assignments. Just over 1,000 students--89% of whom were undergraduates--from U.S. colleges participated. The study found that these students value access to accurate, up-to-date information with easily identifiable authors. They are aware of some shortcomings of information from the Web and of their needs for assistance in finding information in electronic or paper formats. According to the study, student perceptions are that library services do not meet their expectations, particularly for Web-based information services. Nonetheless, students continue to depend on the library for information resources, both in electronic and print formats, and there is opportunity for academic librarians to connect students with high-quality resources.⁸

Outsell Survey of Students and Faculty

To better understand how usage patterns are changing, the Digital Library Federation (DLF) and Council on Library and Information Resources (CLIR) commissioned Outsell, Inc., to conduct a large-scale study of over 3,000 undergraduates, graduate students, and faculty members from a wide range of academic institutions. Early analysis of this data concludes that this "population...is far from homogeneous in its level of sophistication, information needs and infrastructure requirements. Faculty and graduate students, in particular, seem to be omnivorous in their appetite for information, creative in their strategies for seeking and acquiring information in all forms, and very independent. They appear to seek tools, services, and facilities that they can use where and when they need them. So far, most faculty, graduate students and undergraduates seem to prefer a hybrid information environment in which information in electronic form does not supplant information in print but adds to the range of equipment, resources, and services available to teachers and students."⁹

Harvard University Library Survey of Harvard Seniors

A recent study of Harvard seniors looks at student use of print, library electronic sources, and non-library electronic sources in researching papers in the humanities, social sciences, and natural sciences. The results revealed that the highest percentage of resources used (75% in humanities, 69% in social science, and 65% in natural science) were print materials, which students ranked higher than library and non-library electronic sources in four out of five factors. The Internet-based sources scored high only on the factor of convenience, while print materials scored high on the factors that make a difference in the quality of research and learning: generating the information for which the student is looking, the usefulness of the material, its reliability, and the availability of assistance.¹⁰ One suggestive interpretation is that a college course of study has a tremendous sobering effect in revealing the real value of the

currently available Internet resources.

LibQUAL+™

LibQUAL+™ is a research project being conducted by ARL in collaboration with Texas A&M University to define and measure library service quality across institutions by seeking feedback from clients about their experiences with the library and the extent to which the library meets their stated needs. In the spring of 2002, more than 78,000 library users from over 160 libraries responded to the Web-based LibQUAL+ survey that asks users about their perceptions of library service quality. In the aggregate, these users said that their libraries were most successful in providing physical facilities that meet their needs and in providing trained and caring staff. The dimension of service quality for which these users have the highest expectations is "personal control," i.e., services and tools that enable patrons to easily access and use information independently. The area that users identified as especially needing improvement is access to information (e.g., complete runs of journals, comprehensive print collections, convenient business hours, interdisciplinary resources/services, and speedy interlibrary loan).¹¹

Library Responses in a Fluid Environment

The studies described above demonstrate that there is a change in how people are using libraries, but in light of the still-fluid nature of the environment, it is obvious that these behaviors have not yet sorted themselves into predictable patterns. There are differences across disciplines in terms of how information is used and to what extent new technologies are being embraced; libraries are recognizing these differences as they offer new services. There are also differences in the pace of change in different institutions; institutional cultures that allow, for example, some flexibility in personnel policies and practices as well as in budgetary reallocations, are more accommodating of experimentation and change. In this rapidly changing environment, libraries must continue monitoring trends, assessing their performance by seeking feedback from current users, and anticipating the needs of future users. To meet and anticipate these needs of the academic and research communities, libraries are collaborating as never before, forming partnerships both within and outside their own institutions, often sharing control in order to effect critical change.

While circumstances will vary from library to library, the results of the task force survey demonstrate many ways that libraries are responding to user expectations. The remainder of this report provides an overview of the current library response, and the task force survey Web site provides examples of new approaches to collections and access services that were provided by 60 research libraries.

In the task force survey, the most frequently cited examples of new approaches being taken by research libraries may be summarized as:

- Expanding E-Resources and Redefining Collections
- Expanding E-Services & Tools to Enhance User Access
- Reconfiguring Library Space to Support Learning and Research
- Emphasizing Instructional Technology Services and Information Literacy

- Making Organizational Change within the Library to Innovate and Improve Services
- Assuming Institution-Wide Leadership on Scholarly Communication Issues
- Looking for Opportunities to De-Emphasize Activities

These new approaches to collection management and access services are described in the section of this report called "What New Approaches Are Research Libraries Taking?" and actual library examples of these approaches are available in the task force survey responses on the ARL Web site <<https://db.arl.org/CAsort/>>. The Web interface is described below. Whether the library's action to pursue these strategies is proactive innovation or a reactive response to unexpected shifts in resources, the pattern of understanding and assessing to identify and meet the clients' needs through collaborative partnerships is a recurring theme.

See related article from this issue of ARL, "[Collections & Access Survey Responses Available on ARL Web Site.](#)"

WHAT NEW APPROACHES ARE RESEARCH LIBRARIES TAKING?

Expanding E-Resources and Redefining Collections

Libraries are expanding the amount and variety of high-quality information resources that are directly available to academic and research users via the Web. They are also expanding the definition of collections to include "born-digital" content that is neither owned nor licensed by the library. The varied efforts toward this goal may be characterized as follows: changing collection development policies to emphasize the acquisition of electronic resources, engaging in digitizing and electronic publishing projects, and assuming responsibility for managing and servicing born-digital content that resides outside the domain of the library. Even in the electronic and networked environment, the economic model continues to feature the library as the central agency on campus that buys and/or manages information resources on behalf of the institution.

Emphasizing Electronic Resources in Collection Development

Libraries have shifted the focus of their collection development policies to the acquisition of more electronic content, much of it via consortia. While aggregate data documenting the quantity of e-resources currently being made available by libraries has proven elusive,¹² there is data on the spending trends. Over the last decade the average percentage of a research library's materials budget that is spent on electronic resources has grown from 4% to 16%. One hundred six ARL university libraries report spending more than \$132 million on electronic resources in 2000-01. The vast majority of that was spent on electronic serials and subscription services, expenditures which have increased sharply, from just \$11 million in 1994-95 to more than \$117 million today. Also, 47 libraries report another \$15 million expended on their behalf through centrally funded consortia.

To support this increased spending on electronic content, libraries have reallocated resources from the purchase of print. The extent of such reallocations will vary depending on institutional user expectations and financial circumstances.¹³ Many libraries have adopted a policy of adding the e-version of journals when available (in some cases, also canceling the paper equivalent) and are showcasing titles of e-journals available to users via the Web by making

this a staff priority and by applying software management tools for titles included in aggregated electronic databases.

The processes for selecting, budgeting, and acquiring electronic materials are continually changing and greatly differ from those for the selection and management of print. The print process is orderly: discrete amounts of money are allocated by discipline, the marketplace is fairly predictable, and materials are selected and ordered using established procedures.

By contrast, the processes for selection and management of electronic resources are chaotic. The migration from print to electronic varies in speed and extent by discipline; electronic products are interdisciplinary and expensive, giving rise to selection by committee; projections for future funding are guesswork; and archiving and content control are problematic. Legal and negotiation skills are now mandatory. To complicate matters, decisions are often made through a consortium. The process for acquiring electronic resources turns the traditional acquisitions and user service model topsy-turvy.

In building electronic collections, libraries must also constantly respond to changing publisher behavior. The most profound influence on a library's collection management and access strategies has been the extraordinary price increases for scholarly journals, combined with publishers' use of licensing to define the terms under which a library may make the content available and to whom. It is reasonable to speculate that these phenomena, driven by some of the larger publishers but now employed widely, make up one of the forces that prompted libraries to blend the previously distinct operations of collection management and access.

Some libraries have fully embraced initiatives stimulated or endorsed by SPARC (the Scholarly Publishing and Academic Resources Coalition) and other affordable publishing venues and are using acquisitions funds as investments in the future of scholarly communication. These libraries focus acquisitions on publications from scholarly societies and less expensive publishers, nonprofit and for-profit, that provide high-quality titles at affordable prices. These less expensive titles tend to be the most highly ranked by faculty but labor intensive to obtain, since each publisher has only a few titles and often lacks sales and technical staff. These libraries try to consistently view collection expenditures as investments, and to seek out publishers likely to contribute to a sustainable future for scholarly information.

Libraries are also supporting open access projects that experiment with alternatives to the current subscription-based funding model or the current journals-based publishing model for scholarly communication. These approaches are seen as those of a good citizen, especially in an institution whose needs for funding include many urgent priorities in addition to library needs. These libraries are investing in initiatives that may help solve the long-term problem of high prices for journals.¹⁴

Digitizing & Electronic Publishing

Most libraries are also pursuing a proactive strategy to increase user access to quality information resources on the Web by digitizing materials and collaborating with others to publish digital collections on the Web. For example, libraries are:

- Creating new electronic collections by digitally reformatting existing collections in the library and institution, including the collections of senior faculty and retired faculty
- Collaborating with other libraries, academic departments, scholarly and historical societies, museums, and others to build virtual collections from originals that are geographically dispersed
- Giving greater emphasis to developing and showcasing special collections of manuscripts and rare books, foreign-language resources, images, music, maps and geospatial data, numeric data sets, and making them accessible to discovery via the Web and in other learning environments
- Supporting faculty's e-publishing efforts by consulting and by offering technological infrastructure to develop the next generation "journal" and to create Web-based research tools and resources for teaching
- Partnering with university presses and other publishers to develop new publishing models
- Partnering with faculty departments and/or societies to mount discipline-based and/or institutional e-print servers

Expanding the Definition of Collections

Libraries have expanded the traditional view and definition of collections so that the concept no longer equates with those materials that the library "owns". The boundaries have expanded far beyond the print collections on site or the electronic files mounted locally to include electronic materials licensed or managed by the library and materials available through consortia. Increasingly libraries are taking responsibility for born-digital collections (such as geospatial or numeric data sets, faculty or class Web sites) and developing tools for their management and use. In a growing number of cases, a library's collection also includes resources that reside outside the domain of the library but for which the library takes some responsibility for managing and servicing.

An example of the latter is the movement by libraries to support the development of institution-wide knowledge management systems, where an institution's intellectual capital is centralized, preserved, and made accessible. In a university, this might include collections of digital material created by faculty, research staff, and students, e.g., research collaboratives, graduate student theses, electronic records of the university's administrative offices, courseware content, and streaming audio and video resources generated from courses, conferences, and other campus activities.

The content of print collections continues to play a critical role in libraries but that role is changing, as is the way that libraries are managing print collections. Less frequently used print resources are being relocated to storage with paging/retrieval services; more convenient resource sharing makes book collections accessible to wider audiences.

Instead of describing collections as "those things owned", a better definition may be "information resources for which the library invests financial resources--directly or indirectly--to manage, service, or preserve on behalf of library users, regardless of the location of content." "Collections" now include resources owned by the library and those accessed in remote locations; the norm is now an interdependent mix of ownership and access, with the location of

the material increasingly irrelevant to users.

See related article from this issue of *ARL*, "[What's in a Name? Collection Management...Content Management...Knowledge Management.](#)"

Expanding E-Services and Tools to Enhance User Access

Libraries are increasingly providing users with services and tools that enhance access to electronic resources and support an integrated approach to discovering and receiving this content--along with library services--in classrooms, on the "desktop", and on PDAs. In many cases, libraries deliver unrestricted content and services to users far beyond those affiliated with the institution. Libraries are pursuing this in many ways, including offering new services, adapting the role of the online catalog, experimenting with the Open Archives Initiative (OAI) metadata harvesting protocol, and writing or adapting software tools.

New Services

New library services frequently mentioned in the survey responses include:

- Timely self-service resource sharing and other user-initiated services (for example, user-initiated ILL or document delivery, renewals, book-delivery requests), which make access to books and other print resources almost as easy as access to electronic information
- Electronic-only reserves and streamlined procedures for faculty submission of course reserves
- Virtual/chat reference service
- The integration of content and library services into course management software, K-12 curricula, and educational programs of museums and libraries
- Portal software that enables customized searching across both licensed and freely available information resources as well as links to supporting services, such as document delivery, ILL, and virtual reference
- Online tutorials in addition to in-person basic instruction on learning and research skills as well as training in the use of software for managing digital data, numeric and spatial data sets, and images
- Packages of e-content and/or services to alumni, government agencies, small or start-up companies, and other sectors of the community, either as a contribution to the community or as part of a service-for-fee program

Role of Online Catalogs

Survey respondents described new approaches to library service that indirectly, and in some cases implicitly, involve the online catalog. Below are a few examples of new approaches to the library catalog.

- Efficient, consortial, resource-sharing arrangements based on linked catalogs and the ability to search across them
- Software tools such as portals and other search engines programmed to search across all kinds of databases, including online catalogs
- Testing the usability of the online catalog both before and after a system migration

- Outsourcing English-language cataloging to reallocate funds into digitizing projects

It is clear that the role of the online catalog has changed. That catalog has become one of many databases available to users; libraries are linking to and from the catalog to integrate all of these resources. In recognition of this broader role for the library catalog, some libraries are considering modifying cataloging to favor timely access to a wider variety of formats. One proposal called for reallocating funds that are devoted to describing books and journals to materials that are proportionately underrepresented in today's catalogs, such as films, music, photographs, and digital objects.¹⁵

Libraries are also reconsidering their current efforts to collect and catalog free Web resources, concluding that these labor-intensive activities can be avoided by perfecting nascent machine harvesting and cataloging techniques.¹⁶ A small number of libraries and library organizations are participating in experiments funded by The Mellon Foundation to test the application of harvesting and search engine technologies. Using the recently developed OAI metadata harvesting protocol, these libraries are delivering information from the "hidden Web" not normally found by Internet search engines and from databases with retrieval formats that present special processing or presentation problems (archives and image databases, for example).¹⁷

Library Development of Software Applications

There are a number of examples in the survey responses of research libraries writing software, working with open source software, or working with consortia or commercial firms to develop or adapt software to streamline or transform library operations. For example, several libraries are working with vendors to adapt existing portal software into multifunctional products with features and services desired by users in research communities. Other examples of library involvement in development of software applications are ILL management systems, instructional tutorials, management of content and services for digital libraries, and institutional repositories.

See related article from this issue of *ARL*, "[The Role of Print in Research Library Collections](#)."

Reconfiguring Library Space to Support Learning and Research

There has been a shift in the sense of "importance of place" for the research library's physical facility and a new appreciation for the value of ennobling space for learning. Although where information resides matters less to the user, the library as place--the physical entity--remains more important than ever and performs a host of functions vital to learning and research. Much research library space is busier than ever before.

Library facilities are being reconfigured to provide space for collaborative learning and research. There are classrooms and media labs where faculty and librarians may interact in providing student learning experiences, group study spaces, and community spaces where students can meet to discuss ideas.¹⁸ The transformation of library space has also become an opportunity to attract new academic collaborations such as writing studios and academic skills

tutoring. Library space is now seen as learning space on an equal footing with classrooms and laboratories.

Libraries are being renovated to expand e-access and foster community by providing electronic classrooms, wireless data networks, offering laptops, and expanding library hours. Libraries are establishing spaces called "information commons" (also called "learning commons" or "knowledge commons") where library reference services are offered jointly with information technology support. At the same time, libraries are responding to decreasing use of in-person reference service by combining service points (eliminating format-driven service points) and shifting resources to online reference service and online tutorials.

To make the best use of prime real estate, libraries are adopting new approaches to managing large print collections by using storage centers with delivery services for less frequently used materials and engaging in cooperative approaches to long-term preservation copy retention.

The branch or departmental library remains valuable but its role too is changing. While access to information and library services is far less geographically based, branch and departmental libraries still play a role in development of community and serve as sites for collaboration. Yet, in the Internet world there are opportunities to rethink the role of multiple libraries and their configuration within an institution. One library reported establishing a program to replicate the opportunities for personalized services and contacts that characterize branch library service without the cost of creating additional branches. Some of the same opportunities for reorganization may present themselves when libraries work in collaboration with other libraries outside their institutional boundaries.

Emphasizing Instructional Technology Services and Information Literacy

Libraries are active participants in building awareness among researchers, faculty, and students of uses of high-quality content and information technology in teaching and research.

Curriculum review and changing expectations for teaching faculty present opportunities for libraries to contribute expertise and resources. Libraries provide classrooms; training and consulting in finding and evaluating information; and assistance with creating electronic theses and dissertations, displaying and visualizing data, publishing journals on the Web, and using geographic information systems (GIS) and remote sensing. Recognizing that disciplines are adopting new technology at different rates, librarians are:

- Working with faculty to integrate information literacy skills and digital content into the course curricula
- Expanding the number of people reached by offering basic information literacy and fluency training through online tutorials
- Assisting researchers in acquiring, accessing, displaying, and visualizing spatial and numeric data by providing training in use of software and partnering with faculty to provide classroom instruction in its use
- Developing systems and instructional tools for pedagogical use of digital resources, including images
- Managing campus instructional technology initiatives

Making Organizational Changes within the Library to Innovate and Improve Services

Libraries are embracing change--being willing to change *what* libraries do and *how* it is done--and, as a result, are reorganizing their operations and re-deploying staff to respond to the new environment. Examples of recent organizational change in ARL libraries include:

- Many libraries report having instituted an integrated approach to collection management, bringing together the activities of building, maintaining, and providing access to library resources in all formats, both in-house and remote, both acquired and locally created.
- Many libraries also report taking interdisciplinary approaches, training library staff to perform across traditional roles and to build bridges between the culture of the library and that of the faculty and information technology. An example is the creation of information commons jointly staffed by the library and information technology, often developing services in collaboration with faculty.
- Others report organizational redesigns to achieve a system-wide view of services to coordinate communications with all library users and to deploy staff more flexibly.
- Libraries are experimenting rigorously with organizational transformation reflecting strategies for team-based decision making, learning organizations, and quality management.

Assuming Institution-Wide Leadership on Scholarly Communication Issues

Libraries are assuming leadership within their institutions to advocate for enduring institution-wide knowledge management policies and programs that contribute to a robust system of scholarly communication. Some libraries are accomplishing this goal by:

- Sponsoring scholarly communication seminars to broaden faculty and graduate student awareness of trends that threaten the long-term sustainability of the current system of scholarly communication
- Advocating for institution-wide intellectual property policies that balance the rights of copyright owners and those of users and libraries in educational settings, including the development of principles that guide the licensing of electronic resources for the institution
- Promoting individual behavior and building institutional support that contributes to the long-term health and viability of scholarly communication channels, including developing infrastructure for such alternative publishing practices as publishing open access journals or creating institutional repositories

Looking for Opportunities to De-Emphasize Activities

The task force reviewed the survey results for evidence of how libraries are able to find the staff and financial resources to undertake some of these new programs. While the survey did not pose this particular question, there were indications from the information submitted that some of the new programs were possible because of shifts or reallocations away from other activities or consolidation of activities. Examples of these shifts in activities include:

- Canceling subscriptions to paper editions of selected journals (also received electronically) to reallocate the subscription fees to other purchases
- Replacing mediated or staff-assisted ILL largely with user-initiated ILL to contain costs or

- reallocate staff to other assignments
- Shifting the purchasing of library material from the individual library to consortia to obtain better prices for the content
- Outsourcing cataloging to contain costs and reduce local staffing needs
- Replacing paper reserve operations with e-reserves to make it easier for faculty to submit items and for students to access and read them
- Conducting freshmen tutorials online to allow concentration on face-to-face tutorials for upper-level and graduate students, thus stewarding use of existing staff and allowing them to reach more students
- Consolidating separate service points and redeploying staff to new assignments

INNOVATION AND CHANGE: WHAT ARE THE INFLUENCING FACTORS?

The task force examined eight factors that may influence the general climate of change and innovation in collection management and access services: library or institution size, opportunities for collaboration, ability to share control, facilities and human resources, institutional flexibility, extent of cultural convergence within the institution, digital preservation strategies, and risk taking.

Does Size Matter?

All research libraries--regardless of size--that participated in this study are innovating and adapting to the changing needs of their patrons, as well as to the changing requirements of their institutions. There is no clear evidence to suggest definitive trends in change based on the size of the library collection.

There are specific types of innovation, however, that seem to be related to library or institution size. There is anecdotal evidence that library size has been influential in the development of digital library programs; libraries with more mature digital library programs tend to be libraries with larger collections and more staff members. On the other hand, smaller institutional settings may encourage innovative collaborative activities, either because of the financial necessity to join forces to make something happen or because of the potential in smaller communities for more interaction across campus units.

There is also anecdotal evidence that the institutional climate for change and the active support of groups and key individuals within the institution play a central role in the library's orientation and opportunities to innovate; to the extent that the size of the institution impacts this climate, size may be a contributing--if not driving--factor.

Willingness to Collaborate & the Kind of Consortia in Place

Research libraries' ability and desire to collaborate with other research libraries, with non-university libraries, or with other organizations and industries will determine the success of many library programs. Motivations for collaborations vary greatly and include leadership, political support, the lure of available funding, and the desire to transform the library, to move it into the digital age. An increasingly important collaboration is consortial buying of print and electronic content and services.

Consortial buying and licensing for access to electronic resources have become central in every research library's arsenal of strategies for acquiring information more economically than could be accomplished by acting alone. Many libraries find user-initiated consortial borrowing combined with rapid delivery a successful avenue for making their users' access to books as easy as access to electronic resources. There is evidence that fast delivery of books within a consortium has increased book use, especially by undergraduates. Consortia also offer accompanying services that greatly expedite the discovery and delivery of non-book content for users affiliated with libraries participating in the consortium; some consortia are centrally managing image data banks, electronic theses and dissertations, and other digital materials.

Consortial structures vary and reflect the political framework of the state or region in which they operate and the institutions they represent. In some cases, a state legislature appropriates funds centrally to support consortial activities on behalf of libraries; in others, individual libraries pay to a common fund. External funding facilitates the process of individual institutions' making the adjustments and compromises that consortia require and tends to support consortial relationships among libraries of varying sizes and characteristics. Consortia funded solely by the participating libraries tend to be formed of libraries of similar size and characteristics.

Consortia are on the front line of controversies between libraries and publishers about pricing, the terms of use defined by licenses, and publisher practices that make it difficult for a library to cost-effectively tailor its purchases from the publishers' lists (with financial incentives favoring a bundled choice) or to reduce the total amount of money spent with that publisher. The tendency of consortia to acquire or license electronic resources from the larger, commercial publishers raises concerns that content from scholarly societies or other smaller publishers will be overlooked.

Research library staff are actively working with their partners in consortia to assess the benefits and challenges of consortial licensing and to influence publisher behavior in favor of scholarly communication needs.

Willingness and Ability to Share Control

A closely related factor to collaboration is the degree to which the organizations involved in a joint effort are willing to share control, at both the intra- and the inter-institutional levels. This sharing of control has implications for many activities such as archiving; consortial buying; expanding online resources; collaborative efforts with faculty, information technology groups, instructional technology centers; and cooperative publishing projects.

Libraries are promoting team operations to advance collaborative projects and to encourage a convergence of different organizational cultures where control is truly shared (for example, between the library culture and faculty culture and computing center culture). Many research libraries are willing to establish new partnerships and share control in order to innovate.

Opportunities to Leverage Strengths of Space and Human Talent

Research libraries' ability to recognize their strengths and their willingness to leverage those strengths influences the success of library integration into the research institution. Libraries

have a special kind of space on campus, space that is seen as politically neutral and representative of the intellectual commons--public-good space. This nature of space gives libraries leverage to attract and nurture collaboration with other parts of the institution. Libraries also have human talent they may deploy for the institution. Research library staffs have a wide range of expertise that can support new approaches to meeting user and institutional needs. Many libraries are leveraging their space and human resources to the advantage of the institution, for example, in creating an information commons, establishing an institutional repository, or providing campus management of copyright clearances.

Extent of Institutional Readiness for Change

A major factor in innovation is the degree to which research libraries and their institutions are willing and able to embrace change. The willingness of the library leadership (at all levels) to change its vision of what a library is and does, and to transform library operations to reflect that vision, obviously influences innovation. However, the culture of the institution itself also influences how the library engages and supports change.

What is the institutional perception of, and underlying philosophy regarding, the large print collections in the library? How do the research library and its institution approach the issues of growth of print collections and use of traditional measures of research libraries? How do they approach the issues of growth of digital content and use of emerging new measures? Are key leaders within the library and the institution ready to embrace new measures reflective of the new environment as either complements to or substitutes for traditional measures? How questions like these are answered will affect the pace of library change and innovation.

Many research libraries find themselves in the impossible position of being expected by some disciplines to implement systemic change while continuing to be responsive to the needs of other disciplines that have slower rates of adoption of new technology.¹⁹ During this period of transition, this is a major factor influencing how libraries implement change and how that change is received within the institution.

Readiness of People to Work in Different Cultures

The degree to which people in the institution exhibit "interdisciplinarity" or demonstrate effectiveness in working with the various cultures of the institution--library, faculty, and information technology cultures--is another important factor in innovation. Success in collaboration depends on some degree of convergence of these cultures.

Convergence or integration of cultures is being approached in several different ways. Examples include convergence of cultures in shared space; convergence of technical and bibliographic expertise; and convergence of human capital to consolidate efforts, encourage cooperation, and provide institution-wide access to the latest equipment, software, and support as well as a wide and deep collection of high-quality content.

Experience reported in the task force survey suggests there is a need to support greater cultural integration. Some libraries pursue this goal by establishing cross-cultural task forces, developing cross-training and mentoring programs for effective performance across and outside traditional roles, adopting position classification schemes that reflect the changes

required of staff, providing opportunities for staff to cross boundaries, and (most often expressed) by giving people time to work through the process of cultural convergence.²⁰

Strategies for Preserving Digital Content

Converting existing collections and new acquisitions from paper to electronic-only is currently inhibited by the nascent state of strategies for preserving digital content. Internationally, publishers are working with national libraries (or their proxies) for them to assume the role of the publishers' archives for digitized texts;²¹ the reliability and terms of use of these archives are still being determined. When library, publisher, and technology communities reach consensus on how best to manage the preservation of digital resources, the transformation of library collections to largely electronic will accelerate.²²

Willingness to Take Risks

In this rapidly changing environment, there are many opportunities for entrepreneurial activities, which often require the financial risk of investing resources in new activities even as budget pressures tighten. Entrepreneurship may also create new activities that bypass or challenge the standards, rules, and policies that are part of library operations. Success depends on the library's ability to reach informed judgments, usually with less than complete information, on the strategic importance of an opportunity and whether it warrants the financial and other risks that accompany change.

CONCLUSIONS & RECOMMENDATIONS FOR THE ARL AGENDA

Developments in digital technology, the introduction of the Web and the Internet, and new methods of creating, sharing, and using knowledge have changed dramatically the traditionally understood definitions of library collections and access services. Building collections and creating access to them are no longer achieved just within the walls of the library. Broadly defined, collections and access responsibilities are no longer distinct spheres within research libraries. Collections and access responsibilities are inextricably linked--with each other, with other functions in the parent institutions, and, indeed, they reach into other institutions. This interdependent and fluid environment presents challenges, but more importantly, it presents opportunities for librarians to take leadership roles in creating new information services in support of research and learning and thereby diffuse the library throughout the institution.

This new world is described in the examples of new approaches to collections and access culled from the summer 2002 ARL survey and the above analysis of the survey results that elucidates the most influential factors in these transformations.

Recommendations for Further Actions

Given these emerging transformations, the task force recommends that the ARL agenda include the following priorities:

1. Integrating Content and Services with Research and Learning

Identify and promote access strategies that facilitate the integration of information

technology, content, and library services with research and learning. Such strategies for integrating content and library services into courses or research projects include:

- Application of portals and other resource-integration tools
- Provision of instructional technology training and consulting services for students and faculty
- Integration of information literacy and fluency skills into course curriculum
- Development of systems and instructional tools for pedagogical use of digital resources, including images

2. Expanding the Availability of Resources

Promote strategies that expand the availability of resources (particularly e-resources) and expand the definition of collections and the organizational models for how they are built, maintained, discovered, delivered, and preserved. Such collection-expanding strategies include:

- Consortial buying
- Digital libraries and other electronic access strategies
- Patron-initiated reciprocal borrowing
- Enhancing the accessibility of little-held, rare, or unique materials, including special collections and foreign-language materials
- Facilitating the management of knowledge resources not in the library domain, including born-digital and other resources emanating from science, technology, medicine, the social sciences, and humanities

3. New Uses and Functions for Physical Library Space

Identify issues and engage the discussion of new uses of, and functions for, the physical library space, including contributing to a comprehensive strategic response to managing print collections over time.

4. Organizational Implications of New Roles for Libraries

Address the human and organizational consequences of new roles for libraries by showcasing examples of library organization that cross the traditional boundaries of collections and access functions and that support the information needs of student or researcher in a hybrid digital/print world.

The task force also underscores the importance of several ongoing ARL initiatives that will contribute to new approaches to collection management and access services. In particular, the task force urges that ARL:

- Continue to define and promote the skills and competencies required for librarians to carry out the new roles of reaching out to interact with faculty and working collaboratively with others within and beyond the institution for the:

- Deployment of information technologies
- Creation of knowledge
- Design and management of digital repositories
- Continue to promote library use of new assessment measures including those that may integrate with institutional assessment initiatives. For example,
 - Monitor the changing user environment by highlighting new research on the information-seeking behavior of people as well as lessons learned from LibQUAL+ and other library user surveys.
 - Continue to support the development of new measures for assessing the library that more fully recognize the new environment.
 - Continue to promote and support activities that contribute to the positive transformation of the system of scholarly communication and of the laws that affect use of intellectual property for educational purposes.

The findings of the task force underscore the ever-changing nature of our environment. The findings reinforce the need for libraries to monitor these trends and to continue assessing library responses to change and user perceptions of library performance. ARL's data, the new measures projects, publications, workshops, and Membership Meeting discussions and programs should continue to track North American trends. ARL must continue to provide member libraries with the information, tools, and skills necessary for proactive delivery of collections and access services for the 21st-century scholar.

ENDNOTES

1. Sixty libraries responded to the task force survey, providing over 150 examples of new approaches to research library collection management and access services. Library responses to the survey are published on the ARL Web site <<https://db.arl.org/CAsort/>>; see [sidebar](#) for more information on the survey and on the Web interface for searching the results. [back to text](#)
2. Case studies written by Suzanne Thorin and Dan Greenstein, *The Digital Library: A Biography* (Washington, D.C.: Digital Library Federation, Council on Library Resources, September 2002), and essays such as the one by Wendy Pradt Lougee, *Diffuse Libraries: Emergent Roles for the Research Library in the Digital Age* (Washington, D.C.: Council on Library Resources, August 2002), describe the deeper, archetypal changes that are radically transforming the ways in which libraries are perceived, created, and used. Thorin and Greenstein describe the process by which digital library programs in six large research libraries are evolving along a continuum of maturation, while Lougee elaborates her vision of the role for the research library overall, focusing on the role of collaboration in order to bring about diffusion of the library into the culture of the institution. The task force wants to acknowledge the influence of the Lougee paper, in particular, for providing a vocabulary that captured perfectly the trends under study. Any use by the task force of the phrase "diffusing the library into the culture of the institution" is attributed directly to the Wendy Lougee essay. [back to text](#)
3. *Preparing for the Revolution: Information Technology and the Future of the Research University*

- (Washington, D.C.: The National Academies Press, 2002). [back to text](#)
4. There are many other use and usage assessment projects underway both within and beyond libraries. To illustrate: the University of California libraries are studying the behavior and attitudes of users when selected print journals for which electronic access is provided are relocated and primary use is of the electronic version [<http://www.ucop.edu/cmi/>](http://www.ucop.edu/cmi/); Canadian scientists are being asked about the impact on their research of the availability of electronic journals via the Canadian National Site Licensing Project; OhioLink regularly publishes data on the use being made of the electronic resources offered via that consortium; and the Ingenta Institute--an arm of Ingenta, a company in the management and distribution of published scientific, professional, and academic research via the Internet--is a frequent sponsor of research and conferences on user behavior in the networked environment. [back to text](#)
 5. See [<http://www.pewinternet.org/>](http://www.pewinternet.org/). [back to text](#)
 6. See Steve Jones, *The Internet Goes to College: How Students Are Living in the Future with Today's Technology* (Washington, D.C.: Pew Internet & American Life Project, Sept. 2002), [<http://www.pewinternet.org/reports/toc.asp?Report=71>](http://www.pewinternet.org/reports/toc.asp?Report=71); and Amanda Lenhart, Lee Rainie, and Oliver Lewis, *Teenage Life Online: The Rise of the Instant-Message Generation and the Internet's Impact on Friendships and Family Relationships* (Washington, D.C.: Pew Internet & American Life Project, June 2002), [<http://www.pewinternet.org/reports/toc.asp?Report=36>](http://www.pewinternet.org/reports/toc.asp?Report=36). [back to text](#)
 7. See L.J. Sax et al., *The American Freshman: National Norms for Fall 1998* (Los Angeles: Higher Education Research Institute, UCLA Graduate School of Education and Information Studies, 1998), [<http://www.gseis.ucla.edu/heri/press98.html>](http://www.gseis.ucla.edu/heri/press98.html). [back to text](#)
 8. See "How Academic Librarians Can Influence Students' Web-Based Information Choices" (Dublin, Ohio: OCLC, June 2002), [<http://www2.oclc.org/oclc/pdf/printondemand/informationhabits.pdf>](http://www2.oclc.org/oclc/pdf/printondemand/informationhabits.pdf). [back to text](#)
 9. 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.: Council on Library and Information Resources, 2002), [<http://www.clir.org/pubs/abstract/pub110abst.html>](http://www.clir.org/pubs/abstract/pub110abst.html). In addition to publishing this report, all 659 tables will be posted on the Web and CLIR will deposit the raw data tapes with the Inter-University Consortium for Political and Social Research (ICPSR). [back to text](#)
 10. Harvard University, "Class of 2000 Senior Survey," data supplied by the Harvard University Library. [back to text](#)
 11. *LibQUAL+TM Spring 2002 Survey Results* (Washington, D.C.: Association of Research Libraries, 2002), vol. 1, *Aggregate Statistics and Graphs*, [<http://www.libqual.org/documents/admin/AggregateNotebook.pdf>](http://www.libqual.org/documents/admin/AggregateNotebook.pdf). [back to text](#)
 12. The ARL E-Metrics work is a multi-year effort to develop new statistics and measures that will describe electronic resources, the use made of them, and library expenditures to acquire them. For information on the project, see the ARL Web site [<http://www.arl.org/stats/newmeas/emetrics/>](http://www.arl.org/stats/newmeas/emetrics/). [back to text](#)
 13. Reallocation of acquisition funds has not only been necessary to support the transition to electronic resources and services; it has also been a necessary tactic to sustain library subscriptions to key journals and other serials (in any format) in the face of extraordinary price increases. ARL libraries are spending nearly three times as much money on serials (\$570 million in 2001) than they did 15 years ago and yet they are receiving 5% fewer

titles. The acquisition of books and other monographs has also been adversely affected by the need to spend more on serial subscriptions with the number of monographs purchased dropping 9% over the last 15 years. Reallocation of library acquisition funds is a complex series of decisions made in part to respond to rising prices for journals and in part to respond to user demand for increased availability of high-quality content via the Web. [back to text](#)

14. The authors acknowledge and thank Jeanne Richardson, Arizona State University, and Margaret Landesman, University of Utah, for articulating these trends in the task force survey and allowing their statements to be adapted for this report. [back to text](#)
15. See Sarah E. Thomas, "Abundance, Attention, and Access: Of Portals and Catalogs," *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC* no. 212 (October 2000): 1-3, <<http://www.arl.org/newsltr/212/portal.html>>. [back to text](#)
16. See Louis A. Pitschmann, *Building Sustainable Collections of Free Third-Party Web Resources* (Washington, D.C.: Digital Library Federation, Council on Library and Information Resources, June 2001), <<http://www.clir.org/pubs/abstract/pub98abst.html>>. [back to text](#)
17. See Donald J. Waters, "The Metadata Harvesting Initiative of the Mellon Foundation," *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC* no. 217 (August 2001): 10-11, <<http://www.arl.org/newsltr/217/waters.html>>. [back to text](#)
18. For information on model "collaborative facilities" on college and university campuses, see the Collaborative Facilities Web Site developed by the Coalition for Networked Information and Dartmouth College <<http://www.dartmouth.edu/~collab/>>. See also related articles by Betsy Wilson and Barbara Dewey in *ARL: A Bimonthly Report on Research Library Issues and Actions from ARL, CNI, and SPARC* no. 222 (June 2002): 1-5, <<http://www.arl.org/newsltr/222/>>. [back to text](#)
19. Recent research on how different fields of scholarship use electronic media in scholarly communication concludes that we are likely to see field differences persist even as overall use of electronic communication technologies increases. See Rob Kling and Geoffrey McKim, "Not Just a Matter of Time: Field Differences and the Shaping of Electronic Media in Supporting Scientific Communication," *Journal of the American Society for Information Science* 51, no. 14 (Dec. 2000): 1306-1320. [back to text](#)
20. For a summary of how nine research libraries are addressing computing and library cultural convergence, see Richard Meyer's report to the task force, "Addressing the Cultural Dimensions of the Convergence of Computing and Library Staffs," October 10, 2002, <<http://www.arl.org/collectaccess/CAmeyer.html>>. [back to text](#)
21. For context on these efforts, see the joint statement on the archiving and preserving of digital information by the International Federation of Library Associations and Institutions (IFLA) and the International Publishers Association (IPA), "Preserving the Memory of the World in Perpetuity," June 2002, <<http://www.ifla.org/V/press/ifla-ipa02.htm>>. [back to text](#)
22. The issues yet to be resolved are not to be underestimated. Laura Campbell, Director of the National Digital Information Infrastructure and Preservation Program at the Library of Congress, has observed that while there is broad consensus on the urgency of the problem of how to preserve digital materials and agreement on the need for solutions to be distributed and decentralized, there are still many unresolved issues, such as legal issues, scope (what to preserve, by whom, and at what level), balance between

preservation and access, and economic and technical issues. See Laura Campbell, "Update on the National Digital Infrastructure Initiative," in *The State of Digital Preservation: An International Perspective* (Washington, D.C.: Council on Library and Information Resources, July 2002): 49-53, <<http://www.clir.org/pubs/abstract/pub107abst.html>> and the Initiative's own Web site <<http://www.digitalpreservation.gov/ndiipp/>>. A useful article for the generalist is "Data Extinction," by Claire Tristram in *Technology Review, MIT's Magazine of Innovation* (October 2002): 37-42. To stay abreast of the considerable efforts underway internationally to address this array of issues, see "What's New in Digital Preservation," a joint service of the Digital Preservation Coalition and the National Library of Australia's PADI (Preserving Access to Digital Information) Gateway <<http://www.dpconline.org/graphics/whatsnew/>>. [back to text](#)

"Collections & Access for the 21st-Century Scholar: Changing Roles of Research Libraries." A Report from the ARL Collections & Access Issues Task Force. *ARL*, no. 225 (December 2002). <<http://www.arl.org/newsltr/225/>>.

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□ [Back to top](#)

[Table of Contents for Issue 225](#) | [Other Current Issues Articles](#)
[Other Collections Articles](#) | [Other Access Articles](#)



[ARL Bimonthly Report Home](#) [ARL Home](#)

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