



The Information Commons: The Academic Library Of The Future

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abstract: Increasing use of technology as a means of accessing information and the recent shift towards cooperative learning and group study have brought changes in the way students use academic libraries and library resources. Academic libraries have experimented with new ways to combine information resources, technology, and research assistance. Some have reconfigured their physical space and redesigned services to meet the new challenges by adopting the idea of the information commons or a central location that provides computers, information resources in various formats, and staff assistance. Although they may share similar goals and some common features, academic institutions have taken a variety of approaches in designing, funding, and staffing their information commons. This article is an overview of several information commons in the United States and Canada and explores some of their missions, features, and strengths and weaknesses.

Academic libraries have undergone considerable change in the past decade. With increasing use of technology to organize and disseminate information, the computer has become an important tool for accessing information. Libraries not only have to provide the technology necessary for patrons to use their OPACs, but also must supply a means for access to scholarly digital resources and a growing number of electronic databases. The physical space in libraries has been modified to accommodate the additional technology necessary to provide students with the tools to use library resources successfully and to meet their information needs. Further contributing to the way space is evolving are changes in how students search for information and use the information they find. There is increasing demand for access to information available in multiple formats and the tools that can be used to incorporate information into work product. Reliance on technology as a means to information expands students' needs for assistance in using technology, understanding how information is organized, and finding resources. It has changed academic libraries, both as information resources and physical places.

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Library as a Place

The academic library is not doomed by technology. Library buildings remain essential for a number of reasons. Foremost among them is the fact that print is not dead and shows no sign of becoming obsolete any time soon. The “prophesies of the death of print and the all-digital future [that] began in the late 1980s . . . are now declining into the oblivion they deserve.”¹ Publishers continue to publish in print and show little inclination to move to a digital format as the main mode of disseminating information. Books are published in increasing numbers every year, and libraries continue to purchase large quantities of books to add to their collections.² Similarly, there are over 100,000 academic journals, but only approximately 6 to 8 percent of them are available online in full text and more than half of those can be accessed only by subscription.³

Why does print continue to thrive in a society obsessed with technology? Digitization is expensive. Currently, the expense of publishing in digital form or converting material to digital far outweighs the cost of print. Additionally, publishers often require a print subscription with electronic access, resulting in libraries continuing to add to print journal collections even when they have full text electronic access.

Further contributing to the persistence of print is ease of use. An assistant director for the Smithsonian Institution Libraries recently noted that “[a] book’s portability and relative ease of access assures its continuing popularity for reading while the powers of electronic resources lend themselves to more targeted research.”⁴ Academic libraries generally acquire full text databases to replace journal subscriptions and/or increase access to full text journals, not for full text access to books.

Another factor influencing change in academic libraries is the shift toward cooperative learning. Recent trends in education emphasizing collaboration and group study are causing a demand for new resources. The need for “knowledge creation” workspace has encouraged librarians, faculty, and computer specialists to work together to provide the necessary technology, information, and services.⁵ Libraries have always provided study space, and are now including more group study facilities that have technology for access to both physical collection and electronic resources, as well as productivity software that allows students to work together to complete shared assignments.

A physical presence is also necessary to provide traditional services for users (e.g., ILL and circulation), work areas for librarians and staff, quiet study space, and storage for print collections. Even with the shifting emphasis from print to electronic, there is a continuing need for physical space for collection growth and for the technology to use both the physical collection and the electronic resources. The need for new services combined with the expectation that traditional services will continue to be available demand a physical library, but also forces academic libraries to examine new ways of providing the resources users require.

New Demands on Libraries

Users now expect access to information in a wide variety of formats, including print, electronic, and multimedia, leading to a greater need for research assistance from librarians. Students require the expertise of an information specialist to make the most of the resources available and find the information they need, and the librarian’s role will



become increasingly essential as students seek guidance in navigating through the many layers of electronic information resources.⁶ New sources of digital information and the broad array of electronic resources available will also require educating students to prepare them to be self-sufficient information seekers. Students will continue to rely on librarians for assistance with research strategies, managing large amounts of information in diverse formats, and evaluating and selecting appropriate information.⁷

Technical assistance is also in great demand. WebCT and other courseware, formerly the domain of the campus computing facilities, have become increasingly important in academic libraries as students rely on electronic means to obtain lecture notes, access electronic reserves, and submit completed assignments. Technology required for completing coursework has moved beyond the basics of e-mailing a document or downloading a file. Understanding how to use PowerPoint, Adobe Photoshop, and web authoring tools has become standard for today's college students. Incorporation of this technology in the library is a logical step toward providing students with the technology and information they need at the place they need it.

Even with continual electronic access (24/7), students still demand longer library hours to have a place to study.⁸ Academic libraries are a refuge for those who live in noisy dorms or need a place conducive to study. In addition to offering quiet study space, libraries are natural gathering places for groups to study and provide social space for students to meet between classes.

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These features will be more important in the future as remote access to information isolates users and students seek learning and social spaces where they can interact with others.

Academic campuses are now attempting to collocate learning resources with other services for the convenience of users. A growing trend is incorporation of non-educational services adjacent to or within the library that students can use in conjunction with a visit to the library. Many academic libraries are now adding coffee bars and cafes to lure students.⁹ Providing access to important or essential services under one roof is a draw for busy students, as are the social or community spaces provided.

The Information Commons

The library of the future has been described as "a portal through which students and faculty will access the vast amount of information resources in the world and less a place where information is kept" as focus shifts from ownership of information to access to and management of information.¹⁰ In order to meet the new demands of users, libraries are developing new models for providing access to electronic resources and digital information and assisting students in their academic pursuits. Libraries are re-designing their services and space to accommodate the changing needs and the demands for technology. One model for providing integrated technology and information resources is the Information Commons. The Information Commons (IC) can be a

redesigned section of an existing library, a new addition, or a merged library/technology organization in a new building. It has been defined as "a new type of physical facility specifically designed to organize workspace and service delivery around [an] integrated digital environment,"¹¹ and as a "specific location designated to deliver electronic resources for research and production that is maintained by technically proficient staff."¹² In its simplest form, the IC is a central location within a library where access to technology and reference service is combined. Computer workstations are grouped together with a help desk and print reference resources nearby. Students can use workstations to access the OPAC, search the Internet and electronic databases, and use productivity software to prepare assignments with print resources, technical help, and professional research assistance readily available. This arrangement provides students with "access to productivity software and tools as well as electronic information resources from each library workstation."¹³ Other IC features generally include collaborative learning spaces, multimedia workstations, hi-tech classrooms, and group study spaces. These features are designed to enhance group learning, to encourage faculty to incorporate technology and new information resources into their curriculum, and to provide a technologically advanced setting for conducting library instruction.

There are several advantages for students with this type of facility. Students can start the research process; locate, evaluate, and select the information they need; get research or technical assistance; and complete assignments from one location. This integrated access to information and technology, combined with the availability of multimedia tools and staff assistance, eliminates the need for students to go to different locations to prepare assignments or to get help when they need it. In theory, the availability of trained staff for research assistance (e.g., professional librarians) and help with technology questions at the point of service provides students with the guidance they need to achieve academic success.

However, the IC is not without its challenges. The most difficult one is the need for trained staff. With student demand for twenty-four-hour access resulting in more library hours, an IC can be staff intensive. Assistance must either take the form of cross-trained staff that can handle both technology questions and provide research assistance, or a joint staffing arrangement with experts in both information resources and technology available to provide the appropriate types of service on demand. Training must keep pace with technology changes and system upgrades. Adequate training can involve a great deal of time and money, which are often in short supply in busy, underfunded academic libraries.

There is also the expense of additional computer equipment and upgrades. Thin client workstations that provide OPAC, Internet, and database access may be suitable for basic access, but supporting a full range of software and/or multimedia tools for preparing projects from beginning to end is beyond the capacities of "dumb terminals" and requires more robust equipment. Scanners, CD-RWs, and other hardware, combined with expensive software for web authoring and multimedia, dictate a need for substantial sources of funding. Equipment replacement costs also challenge a library's tight budget.

Ready access to information in an electronic format that can be easily printed or downloaded may also affect the quality of research. The increased access to full text



information available through electronic resources may tempt students away from using better or more relevant information that exist in print or digital formats. There is a temptation for students to settle for information that meets the “three Fs” requirement: first, fastest, and full text. The lack of proper research skills and the will to use them means students may fail to find the best and most appropriate information. The urge to “cut and paste” is also a drawback. The ability to move quickly from a full text article in a database to a word processing document can lead to short cuts and sloppy work habits. The opportunity for research skill deficiencies to develop means librarians will have to play a larger role in instructing students and providing assistance in this new joint information and technology environment.

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From Theory to Practice

How has the IC model been put into practice? Are these facilities anything more than just glorified “tech labs” or do they offer value-added services? How successful are they and what can be improved? For the most part, the IC is a feature found in academic institutions in the United States and Canada. They can be found at small colleges or large universities, and can be integrated into libraries or separate facilities in which libraries have varying levels of organizational or service involvement. The majority of data regarding individual ICs can be found on the Web. Some institutions provide detailed descriptions, along with mission statements, planning reports or proposals, or statistics. Others offer only a brief summary of their IC and its technology features. The nineteen ICs reviewed here utilize a variety of resource levels, staffing structures and funding sources, as revealed by key web pages and documents.¹⁴ See table for the IC home page URLs and an overview of features.

Mission and Vision Statements

Seven universities have mission or vision statements on their websites, including Michigan, Iowa, Toronto, Calgary, New Mexico, North Carolina at Charlotte, and Kansas State. Some consist of a single brief paragraph, while others are more detailed. Regardless of length, these institutions share the same understanding of the purpose and goals of an IC. Primary among these is the creation of a central or major access point to provide information resources and technology for the academic community that allows students, faculty, and researchers to integrate new technology into their work. Additionally, several statements note the importance of knowledgeable staff to aid those engaged in scholarly endeavors. The suitability of the library as the provider of these services and facilities is evident in that many of the ICs are located in the library and have at least some level of professional library staff.

Academic Institution	Commons Name/ Date Established	Staffing/Computers	Notable Features
Colorado State University http://manta.library.colostate.edu/eic/index.html	Electronic Information Center Late 1990s	EIC Manager, 2 technicians, and reference librarians. Over 100 computers. 20 laptops for loan. 2 instructional labs.	Operated solely by library.
George Mason University http://ulcweb.gmu.edu	Johnson Center 1995	Information Desk staffed through shared responsibility arrangement. 4 25-station computer labs. 14 carrels for group use. 32 group study rooms. Instructional room.	Four story atrium, movie theater, bank, bookstore, and food court.
Kansas State University http://www.lib.ksu.edu/infocommons/index.html	InfoCommons 2001	Technology staff at second floor reference desk and reference centers on 1st, 2nd, and 3rd floors. 200 computers. Wireless laptop checkout.	Being phased in under a 3-year plan. Clusters of computers near reference service points rather than one central location of computers. Partially funded by student technology fees.
Lake Superior College http://www.lsc.cc.mn.us/lib/infocom/home.htm	Information Commons	College staff or student workers. 60 computers. Help Desk.	Small two-year college. Learning Center Help Desk offers tutorials.

Academic Institution	Commons Name/ Date Established	Staffing/Computers	Notable Features
McGill University http://www.geog.mcgill.ca/heeslib/welcome.html	Geographic Information Centre 1997	Staffed by a librarian/bibliographer and a GIS Management Specialist. GIS technology and software.	Unique geographic information and resource center.
Oregon State University http://osulibrary.orst.edu/computing/	Information Commons 1999	Paraprofessional staff. User Support Specialist is head of Commons. 100+ computers. Electronic classroom.	Two service desks: reference and consultants desk. Tutoring and one-on-one assistance available.
University of Arizona http://dizzy.library.arizona.edu/library/teams/pic/pic.htm http://dizzy.library.arizona.edu/library/teams/ust/infocomm/ic-features.pdf	Information Commons 2002	Staff includes librarians and technology expters. Reference dept. is in adjacent area. 250 computers.	Part of an Integrated Learning Center. Facts sheet of features and policies available on website. Open 24 hours a day Mon-Thurs. for students and faculty.
University of Calgary http://www.ucalgary.ca/IR/infocommons/ <u>See also</u> http://www.ucalgary.ca/InformationCommons/	Information Commons or "Information Hub" 1999	Head of Information Commons (faculty position) manages Commons. Some paraprofessionals and librarians during peak hours. Primary staff is student "navigators." 250 workstations. 13 workrooms, 2 classrooms.	Website has a planning documents and Fact Sheet with statistics and list of best practices sites. Based on the Leavey Commons at USC. 24 hours access Sun-Thurs. and 24/7 during end of term and finals.

Academic Institution	Commons Name/ Date Established	Staffing/Computers	Notable Features
University of Iowa http://www.lib.uiowa.edu/arcade/ and http://www.lib.uiowa.edu/arcade/publications.html	Information Arcade 1992	Staff is graduate students in various disciplines with advanced technology skills. Managed by half-time librarian. 26 Macs and 5 PC multimedia stations. 1 Mac and 1 DOS/Windows "retro" station. Networked classroom. Laptops.	Won ALA's Library of the Future Award in 1994. Its success led to the establishment of an information commons for the University's Hardin Library for the Health Science in 1996. It also as been a prototype for other institutions. "TWISTed Pairs" partnerships with faculty to develop materials and instruction sessions.
University of Michigan http://www.knc.lib.umich.edu/	Knowledge Navigation Center 1996 Also have a Media Union.	Staffed by professional librarians and information science graduate students. <u>KNC</u> : 9 workstations. <u>Union</u> : 500 workstations, virtual reality lab, multimedia production studio, and video conferencing suites.	Part of the campus Teaching and Technology Collaborative and provides referrals to other campus facilities for other software, hardware, and technology assistance. Website has excellent Guides and Tutorials for software and web authoring.
University of Missouri-Kansas City http://www.umkc.edu/lib/MNL/About/info-commons.htm	Information Commons 2000	Info. Commons Specialist reference staff/library faculty. 30 workstations and access ports for 44 laptops. 3 study rooms.	Completed in 4 months. Space is provided for in-depth consultations with library faculty.

Academic Institution	Commons Name/ Date Established	Staffing/Computers	Notable Features
University of Nevada, Las Vegas http://www.library.unlv.edu/infocommons/	Information Commons 2001	2 full time and 12 part time staff. 100 computers, and 50 more on 2nd floor. 2 group study rooms. Disabilities Resources Room.	Located on first floor of library with the library's reference collection.
University of New Mexico http://www.unm.edu/%7Elibadmin/Projectoverview.htm	Information Commons In planning stages.	Library faculty and staff and peer tutors. No equipment information.	Preliminary planning report and project management schedule available on website. Coffee shop (cybermart) to be included.
University of North Carolina, Charlotte http://libweb.uncc.edu/library/infocom/	Information Commons 2000	Head of Information Commons, reference librarians, and graduate students. Cross-trained staff. 108 computers. Group study and conference rooms and classrooms.	Includes Instructional Services, Media Services, Reference Services, and Research Data Services. Also has Virtual IC component.
University of So. California http://www.usc.edu/isd/locations/undergrad/leavey/IC.html	Leavey Library Lower Commons and Upper Commons. 1994, 1998	Staffed in three levels: ref. librarians, technology assistants, and student navigation assistants. 173 computers (Macs and PCs). 40 laptop connections. 29 collaborative study rooms. Two computer labs. Auditorium.	Doubled in size in 1998 and is now on two levels. Facility has express stations for printing and e-mail. Open 24 hours a day.



Academic Institution	Commons Name/ Date Established	Staffing/Computers	Notable Features
University of Texas — Austin http://www.lib.utexas.edu/services/computing/index.html	Electronic Information Centers. 21 st Century Study. 2000	Reference and technical support at one desk. EIC: 115 computers. 21 st Century: 40 computers and Ethernet for 25 laptops.	EICs in three libraries. 24/5 access for 21 st Century Study.
University of Toronto http://www.utoronto.ca/welcome.html/	Scotiabank Information Commons 1996	Full-time and part-time employees formerly from the Users Services Div. of the Computing Centre. 160 workstations, digital studio and NewMedia suites.	Website has virtual tour of facility. NewMedia Suites are meeting rooms with multimedia capabilities; use requires completion of 2-hour training course for use.
University of Washington http://www.washington.edu/uwired/	UWired: Center for Teaching, Learning and Technology. 1994	Staffed by computer technicians and students with a commons manager. 350 computers (as of 2000), 3 classrooms.	Combined reference/help desk.
Winona State http://www.winona.msus.edu/library/lG/ig/about.html	Information Gallery 1999	Information Gallery Librarian/Manager and staff (unspecified). 42 PC and 6 Macs. Laptops, CD-RWs and USB stations for loan. 1,400 network connections and 4 printers for laptops through out library.	Multimedia computing area on first floor of library.

Table data was collected from individual institution web pages as well as these resources:

Russell Bailey and Barbara Tierney, "Information Commons Redux: Concept, Evolution, and Transcending the Tragedy of the Commons," *The Journal of Academic Librarianship* 28 (September 2002): 277–286.

Richard Bazillion and Connie L. Braun, *Academic Libraries as High-Tech Gateways: A Guide to Design & Space Decisions* (Chicago: American Library Association, 2001), 3, 174–81.

John N. Berry III, "Arizona's New Model," *Library Journal* 127 (November 2002): 40–42.

Alison Cowgill, Joan Beam and Lindsey Wess, "Implementing an Information Commons in a University Library," *The Journal of Academic Librarianship* 27 (November 2001): 432–9.

James Duncan, "The Information Commons: A Model for (Physical) Digital Resource Centers," *Bulletin of the Medical Library Association* 86 (October 1998): 576–82.

Carol Ann Hughes, "'Facework': A New Role for the New Generation of Library-Based Information Technology Centers," *Library Hi Tech* 16, 3–4 (1998): 27–35.

Tim Lougheed, "Libraries Gain Clout and Cachet in the Information Age," *University Affairs* (October 2001): 8–11, 17. Available: <http://www.trainyourbrain.ca/uafeatures/en/university_affairs/feature/2001/october/pg08.pdf> [January 31, 2003].



Barbara MacAdam, "Creating Knowledge Facilities for Knowledge Work in the Academic Library," *Library Hi Tech* 16, 1 (1998): 91–99.

University of Arizona Faculty Center for Instructional Innovation. *Online Survey: Review Responses*. Available: <http://www.fcii.arizona.edu/ilc/survey_results.asp> [January 31, 2003].

University of New Mexico. *Information Commons Preliminary Report*, April 20, 2000. Available: <<http://www.unm.edu/%7Elibadmin/prelimreport.htm>> [January 31, 2003].

University of Washington. *UWired: History*. Available: <<http://www.washington.edu/uwired/about/history.shtml>> [January 31, 2003].

Planning Reports and Proposals

The websites of three institutions, Kansas State, Calgary, and New Mexico, include planning proposals or preliminary reports regarding the development of their ICs. These documents offer valuable insights into the way different institutions are applying the IC model to fit the particular needs of their academic communities. Kansas State's Advisory Task Force prepared a detailed report outlining the scope of its project, configuration of equipment, recommendations for staffing and funding, and assessment of the impact on other computing facilities on campus.¹⁵ Interestingly, the Task Force recommended consideration of space outside of the library for increased open access to computers. The suggestions included locating computers in other departments and in the Student Union, or the possibility of establishing a wireless network to provide greater access. It was also suggested that non-library spaces be available for twenty-four-hour use to meet user demand. The most useful feature of the report is a list of recommended computers for various areas in the library with configuration type (e-mail stations, laptops, specialized workstations, etc.), which provides an example of how the proposed goals of the IC can be put into practice by supplying various levels and types of access throughout the library and the campus.

In contrast, the University of Calgary's planning report provides a detailed outline of the goals and mission of their facility in the form of a list of desired outcomes that are matched with user goals, service goals, and a list of implementation recommendations.¹⁶ This document serves as an excellent resource guide for an institution considering implementing an IC. It matches broad goals with specific types of resources, training, staffing, or equipment. Most important is the Executive Summary, which details a communication strategy for fostering support for and acceptance of the concept.¹⁷ It includes a comprehensive list of "stakeholders" and "client groups," along with the marketing points to be conveyed to each, and emphasizes the importance of building awareness of and support for the new resource before it is built to ensure success. The use of a marketing strategy can be time-consuming and expensive, but the long-term benefit is success of the project. Acceptance is necessary for staff and users to make the facility cost-effective, and support of the concept is important to ensure adequate financial backing and future funding.

Funding

Funding data regarding implementation and ongoing costs for an IC was difficult to locate. What information is available indicates academic libraries have used a variety of sources for obtaining the financial backing necessary to implement their ICs. Kansas State's Advisory Task Force outlined three areas of costs: implementation, ongoing, and expansion.¹⁸ No estimates were provided, but the group recommended that all costs for the new facility be paid for with new funding sources, as it was not possible for the library nor the technology department to bear the costs from their budgets. In reality, the facility's expenses were covered by three different sources: furniture and wiring were funded by the University Repairs & Restoration Fund; the network upgrade (electrical) was jointly paid for by Repairs & Restoration and the KSU Libraries; and computers and software were purchased by the Student Technology Fee fund.¹⁹

Other institutions have sought outside funding and support. The University of New Mexico, whose facility has yet to be built, plans to use \$1 million reserved by its General Library, plus \$500,000 from the Center for Regional Studies.²⁰ Additional funding includes over \$200,000 allocated by the UNM Student Fee Review Board for infrastructure construction, plus \$400,000 from Ford Motor Credit over a four-year period.²¹ The \$30 million Johnson Center library complex at George Mason University was mainly funded by revenue bonds backed by the Commonwealth of Virginia,²² and congressional grants in the amount of \$2 million paid for part of the University of Arizona's new \$13 million library complex with expanded IC.²³ The new library with information commons at the University of Nevada, Las Vegas was funded by a Lied Foundation contribution of \$15 million with the State of Nevada financing the rest of the \$41 million project.²⁴

Several published articles provide information on the implementation costs at the University of Calgary and the University of Iowa. Calgary's project was funded by a \$2.3 million (Canadian) grant from the government of Alberta and a pledge from the Student's Union for \$1 million in support over a period of five years.²⁵ Iowa's Information Arcade, established in 1992, was funded by \$752,000 from a charitable trust, with \$400,000 for subsequent renovations paid for by University Administration.²⁶

The only data on operating costs comes from a revised budget of the University of Iowa's Hardin Library for Health Science Information Commons, which indicates total costs of \$734,905 for personnel, software, and equipment for the first three years of operation.²⁷ That figure is actually lower than the original estimated budget of over \$1 million.

It is evident from the financial data available that there is no common funding pattern for establishing an IC.

It is evident from the financial data available that there is no common funding pattern for establishing an IC. Obviously, the amount of funding required for implementation, staffing and maintenance, and equipment upgrades and re-

placement will vary depending on the size of the facility and the type of institution. What is interesting is that considerable funding was obtained by some institutions from



government resources and student organizations. Libraries facing a need to expand services could consider alternative funding options, such as grants or bonds, to finance these new resources. The availability of government funding and support from student organizations are also indications of strong public support for technology resources at academic institutions and of students' willingness to pay for the development of learning resources that they need.

Statistics

The University of Calgary's website includes some interesting factual data and statistics about its IC. The information ranges from general statistics (types of questions asked, number of document deliveries, hours of library instruction) to facts about service improvements and collaborative learning efforts. Most notably, the number of reference questions far outnumbered the technical questions asked from September 1999 to December 2001 by a three to one ratio.²⁸ The IC also has seen considerable increase in use with its extended hours during both the regular term and final exam periods, although increased use is not that remarkable in light of growing student demand for more library hours at campuses all across the U.S.²⁹ Several other ICs offer twenty-four-hour access, but unfortunately no other data of this nature were available for comparison.

Evaluation

Because the information available for each of the facilities varies and there have been no formal research studies published evaluating ICs, it is difficult to determine how successful they are at fulfilling their intended goals. There are several articles about the Information Arcade and Media Union at the University of Iowa that mention staffing levels, types of services and resources, and the programs developed to encourage faculty use of the resources and technology available at the IC. However, none are research studies. Kansas State's Task Force recommended assessing the use and effectiveness of their facility through various data collection methods, but did not provide further detail. Since their facility opened in 2001, an evaluation of its first year in operation may be under way.

Perhaps an impediment to assessment in general is the inability to evaluate the multiple features of this new learning resource. The IC is a new model that extends service delivery beyond the scope of the traditional library and will therefore require new methods of assessment to determine its effectiveness.³⁰ Lack of a reliable method for evaluating the many facets of IC service may preclude evaluation even though some ICs have existed for more than ten years. ICs tend to vary greatly in the types of services and technology they provide, and finding a uniform method of evaluation may not be possible. Regardless of how difficult assessment may be, it should not be overlooked. Evaluation data can be a useful method for gaining continued program support or increasing funding. For libraries faced with administrations that think everything is on the Web and that there is no need to fund libraries as substantially as in the past, supporting data can be a powerful tool to show accountability, justify the expense of expanded services, and demonstrate the value of the resource to library users.

What exists at present is anecdotal information for some institutions. Some ICs have noted issues involving their computer equipment. Oregon State University ran into difficulty with the unpopularity of thin client workstations. The machines cost less than more robust workstations, but students did not like the lack of a disk drive to save their work.³¹ In addition to struggling with shared management of the central Information Desk, George Mason University experienced some problems with students tying up productivity workstations with e-mailing, game playing, and other non-essential functions.³² Staffing, the level of staff training, and use of physical space have also been issues faced by some institutions. In response to a survey of ICs by the University of Arizona Faculty Center for Instructional Innovation, representatives of several institutions noted areas they would change, including: better integration of technology and expert help and more trained reference staff (University of Calgary), reconsidering use of multiple service points and reliance on student workers for staffing (Oregon State University), providing more group study space (University of Arizona), allowing room for expansion (University of Southern California), and finding a way to provide quality long-term service when primary staff is student workers (University of Texas at Austin).³³

Finding the Right Balance

The success of an IC depends on a number of variables. Acceptance of the mission and goals of the IC is not enough to guarantee its survival. Not only does the facility need adequate funding and support from the administration, it must have support from students, faculty, and staff. Cooperative learning requires the collaboration between students, faculty, librarians, and technology staff. Librarians may need to educate faculty about the types of resources and services an IC can provide, to encourage faculty use of the facility to incorporate new technology into their courses for the benefit of students, and to make students aware of the resources and assistance available to them. The difficulty of developing alliances between the library and computing departments can also be a barrier to successful cooperation.³⁴ Librarians are people oriented, while technology departments tend to focus on problems. Technology departments often are better funded than libraries and have the latest technology, raising difficulties when the two work together. The University of Michigan spent a year working out an agreement between the administration, computing services, and the library to find a solution to the disparity in the two levels of computer equipment in their Media Union facility.³⁵

Staffing and training are crucial issues. A well-trained IC staff is an essential to achieve the best integration of professional knowledge, technology, resources, and services for patrons. Ideally, the IC would be staffed by professional reference librarians and highly trained technology staff to provide the best quality service for users. In reality, that goal can be difficult to implement. The costs of providing double staffing or for training library staff to adequately handle technology issues can be too great for a library to consider either option feasible. Thus, it is not surprising that most of the ICs examined either combine some level of professional staffing with student workers or limit the amount of professional staffing to hours of peak use.



Two unique arrangements are found at the University of Michigan and the University of Iowa. Michigan's Knowledge Navigation Center is staffed by information science residents supervised by professional librarians. However, the residents must be replaced once they complete their two-year programs, and that has led to difficulties in the past in finding the right staffing levels for the available resources.³⁶ Iowa has had success using graduate assistants as the primary staff in both the Information Arcade and the Hardin Health Sciences Library's IC.³⁷ While this arrangement offers the advantage of subject specialization, it has the same drawback as the use of residents. Once the students have completed their studies and moved on, it can be difficult to find suitable replacements and orientation for new staff is time-consuming. Even professional staff arrangements can be challenging. Michigan's Media Union involved the merger of the Engineering Library and the Art and Architecture Library and their separate professional staffs, each with very different areas of expertise and characteristics.³⁸ Obviously, the use of professional librarians and technology staff is ideal, but is not entirely realistic. Paraprofessional or professional staffing is likely to provide better quality service than using library workers drawn from the general student population, but is also more expensive. It is clearly evident that there is no easy solution. For most libraries, the only option is to find the best arrangement possible within available resources, which is what these institutions have done with some degree of success.

A related issue is the librarian's loss of professional identity. As previously mentioned, the University of Calgary's statistics indicate a greater number of reference questions are asked at their IC, but that is not necessarily the case at other institutions. Colorado State University librarians found the greater portion of questions they received were technical in nature.³⁹ Staffing a desk where many questions are technical can be demoralizing for a reference librarian whose research skills and professional expertise are being underutilized.

Staffing a desk where many questions are technical can be demoralizing for a reference librarian whose research skills and professional expertise are being underutilized.

Constant training as technology is upgraded is expensive, and inadequate training can result in a librarian feeling unprepared to deal with complex technology questions received at a one-stop help desk.

Shared funding can also be an issue. Depending on how the facility is arranged, an IC can save the library money. If the venture is jointly undertaken with the campus technology department or computer services, there is a wider pool of funding resources and well as trained staff to draw from. However, competing interests may cause friction between the two. Libraries may want the advantages of better equipment and technical assistance for their patrons, but not the loss of autonomy in their "space." Technology departments may want to focus their budgets and staffing on their own facilities, and may be reluctant to support of a joint venture that places demands on their resources. The Electronic Information Center at Colorado State University is completely funded and maintained by the library.⁴⁰ While this gives the library the freedom to make its own decisions regarding staffing, equipment, and resource levels, it also means the library bears the entire burden of costs.

The Future

Even without objective evaluation data, it is evident that ICs have been a success at many academic institutions. There has been considerable growth in the number of ICs since the opening of the Information Arcade at the University of Iowa in 1992. There have also been a number of ICs so well received that they have been expanded to better serve their users. The success of the Iowa Arcade led to the development of an IC at the university's health science library, and the IC at the University of Southern California's Leavey Library has now doubled in size to meet demand. Obviously, these facilities offering integration of technology and information resources are providing the services users need and expect, and can provide their parent institutions with ample justification for continuing support. The information available for the various ICs reviewed here provides a glimpse of the different ways that academic libraries are using the IC model to transform their services and physical space to better fulfill their mission to foster learning and to support the educational goals of the parent institution. Just how ICs will continue to evolve remains to be seen.

It is clear that libraries have evolved beyond the traditional services provided in the past and continue to transform as places. The future of the academic library will continue to be molded by user demands and driven by technological advances. Wireless networks, virtual reference, and remote access have altered the way libraries serve patrons, but have not meant an end to the physical library or the need for skilled librarians. Provision of more access points through Ethernet and network cards has not replaced computer workstations, and libraries have seen increased demand for workstations with expensive productivity software. Librarians will continue to organize information, provide research assistance, and to teach users the best ways to access, evaluate and select the best information their specific needs, but by using new methods in an evolving physical setting.⁴¹ To remain viable, the future library must provide the resources students need along with the physical amenities expected, whether skilled research assistance, the latest technology, or comfortable study spaces. The resulting new library will be more a "learning and information center rather than a collection of bookshelves and study spaces."⁴² No one knows what, if any, changes handheld or wearable computers will have on academic libraries or how the ephemeral nature of electronic information will impact libraries' collections in the years to come. What is likely is that technology and electronic information will continue to challenge libraries and librarians, but will not replace them. However, libraries will need to keep pace with whatever changes the future brings. What will the academic library of the future look like? It will be a constantly evolving information resource with knowledgeable and skilled staff that provides fast, flexible access to digital and print information resources, fosters scholarly research in a comfortable and supportive environment, and promotes cooperative learning. The IC is a first step in that direction.

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Notes

1. Walt Crawford, "Paper Persists: Why Physical Library Collections Still Matter," *Online* 22 (January/February 1998): 43.
2. Thomas Mann, "The Importance of Books, Free Access, and Libraries as Places—And the Dangerous Inadequacies of the Information Science Paradigm," *The Journal of Academic Librarianship* 27 (July 2001): 272.
3. Tanya Schevitz, "A New Chapter for Libraries," *The San Francisco Chronicle* (February 10, 2002): A1. Available from <<http://web.lexis-nexis.com/universe/>> [January 31, 2003].
4. Mary Augusta Thomas, "Redefining Library Space: Managing the Coexistence of Books, Computers, and Readers," *The Journal of Academic Librarianship* 26 (November 2000): 409.
5. Rod Henshaw, "The Library as a Place," *College & Research Libraries* 55 (July 1994): 284.
6. Joel Clemmer and David Smith, "Trends and Issues" in *Libraries for the Future: Planning Buildings that Work*, Ron G. Martin, ed. (Chicago: American Library Association, 1992), 4.
7. Sarah Michalak, "Planning Academic Library Facilities: The Library will have Walls," *Journal of Library Administration* 20, 2 (1994): 99.
8. William A. Gosling, "To go or not to go? The Library as a Place," *American Libraries* 31, 11 (December 2000): 45; William Miller, "The Library as a Place: Tradition and Evolution," *Library Issues* 22, 3 (January 2002): 2–3. Available: <<http://www.libraryissues.com/pub/LI220003.asp>> [January 31, 2003].
9. Mark Clayton, "Food for Thought: Campus Libraries Add Cafes to Lure Students from their Computer Screens," *The Christian Science Monitor* (January 22, 2002): 12. Available: <<http://www.csmonitor.com/2002/0122/p12s01-lehl.html>> [January 31, 2003].
10. Patricia A. Wood and James H. Walther, "The Future of Academic Libraries: Changing Formats and Changing Delivery," *The Bottom Line: Managing Library Finances* 13, 4 (2000): 173.
11. Donald Beagle, "Conceptualizing an Information Commons," *The Journal of Academic Librarianship* 25, 2 (March 1999): 82.
12. Allison Cowgill, Joan Beam and Lindsey Wess, "Implementing an Information Commons in a University Library," *The Journal of Academic Librarianship* 27, 6 (November 2001): 432.
13. Helen M. King, "Academic Library Buildings for the Next Century: Insights from the United States," *LASIE* 29, 1 (March 1998): 27.
14. George Mason University, *Johnson Center Building History*. Available: <<http://jweb.gmu.edu/design/history.htm>> [January 31, 2003]. *Johnson Center Facts and Figures*. Available: <http://jweb.gmu.edu/design/facts_figures.htm> [January 31, 2003]; Kansas State University, *Information Commons Advisory Task Force Proposal* (May 19, 2000). Available: <<http://www.lib.ksu.edu/infocommons/final.html>> [January 31, 2003]. *The K-State InfoCommons: How*. Available: <<http://infocommons.ksu.edu/how.html>> [January 31, 2003]; Oregon State University, *Information Commons Overview*. Available: <<http://osulibrary.orst.edu/computing/overview.htm>> [January 31, 2003]. *Virtual Tour: Information Commons*. Available: <<http://osulibrary.orst.edu/tour/tour3.htm>> [January 31, 2003]; University of Arizona Faculty Center for Instructional Innovation, *Review Responses*. Available: <http://www.fcii.arizona.edu/ilc/survey_results.asp> [January 31, 2003]; University of Calgary, *Executive Summary*. Available: <<http://www.ucalgary.ca/IR/infocommons/commplan.htm>> [January 31, 2003]. *Information Hub Planning Document*. Available: <<http://www.ucalgary.ca/IR/infocommons/conceptdoc.htm>> [January 31, 2003]. *Information Commons Fact Sheet*. Available: <<http://www.ucalgary.ca/informationcommons/facts.html>> [January 31, 2003]; University of Iowa, *Information Arcade Mission and Vision Statements*. Available: <<http://www.lib.uiowa.edu/arcade/mission.html>> [January 31, 2003]; University of Michigan, *Knowledge Navigation Center (KNC): Mission Statement*. Available: <<http://www.knc.lib.umich.edu/about/mission.html>> [January 31, 2003]; University of Missouri-Kansas City, *Miller Nichols Library Information Commons*. Available: <

- commons.htm> [January 31, 2003]; University of New Mexico, "New Information Commons" by Robert L. Migneault, excerpt from the *UNM General Library Annual Report, 1998-1999*, p. 27-8. Available: <<http://www.unm.edu/~libadmin/Projectoverview.htm>> [January 31, 2003]. *Preliminary Planning Report*. Available: <<http://www.unm.edu/~libadmin/prelimlnrpt.htm>> [January 31, 2003]; *Preliminary Report* (April 20, 2000). Available: <<http://www.unm.edu/~libadmin/prelimreport.htm>> [January 31, 2003]; University of North Carolina, Charlotte, *Information Commons*, with links to "Mission" and "Goals." Available: <<http://libweb.uncc.edu/library/infocom/>> [January 31, 2003]; University of Toronto, *Scotiabank Information Commons Vision Statement*. Available: <<http://www.utoronto.ca/welcome.html/about/vision.html>> [January 31, 2003].
15. Kansas State University, *Information Commons Advisory Task Force Proposal*.
 16. University of Calgary, *Information Hub Planning Document*.
 17. University of Calgary, *Executive Summary*.
 18. Kansas State University, *Information Commons Advisory Task Force Proposal*.
 19. Kansas State University, *The K-State InfoCommons: How*.
 20. University of New Mexico, "New Information Commons."
 21. University of New Mexico, *Preliminary Planning Report*.
 22. George Mason University, *Johnson Center Building History*.
 23. D.A. Barber, "Library Staff Prepares to Enter Fifth Floor . . . and the Library Café," *LQP Online* (2002). Available: <<http://uanews.opi.arizona.edu/cgi-bin/WebObjects/UANews.woa/wa/LQPStoryDetails?ArticleID=4962>> [January 31, 2003].
 24. Gordon Wright, "Cutting Edge Libraries: New Facility at the University of Nevada, Las Vegas Showcases as Automated Storage and Retrieval System," *Building Design and Construction* (September 1, 2002). Available from <<http://web.lexis-nexis.com/universe/>> [January 31, 2003].
 25. Tim Lougheed, "Libraries Gain Clout and Cachet in the Information Age," *University Affairs* (October 2001): 11. Available: <http://www.trainyourbrain.ca/uafeatures/en/university_affairs/feature/2001/october/pg08.pdf> [January 31, 2003].
 26. Creth, Sheila D., "The Information Arcade: Playground for the Mind," *Journal of Academic Librarianship* 20, 1 (March 1994): 23.
 27. James M. Duncan, "The Information Commons: A Model for (Physical) Digital Resource Centers," *Bulletin of the Medical Library Association* 86 (October 1998): 577.
 28. University of Calgary, *Information Commons Fact Sheet*.
 29. Gosling; William Miller.
 30. Beagle, 87.
 31. Richard Griffin, "Technology Planning: Oregon State University's Information Commons," *OLA Quarterly* 6, 3 (Fall 2000): 13. Available: <<http://www.olaweb.org/quarterly/quar6-3/griffin.shtml>> [January 31, 2003].
 32. Charlene Hurt, "The Johnson Center Library at George Mason University" in T. D. Webb, ed., *Building Libraries for the 21st Century: The Shape of Information* (Jefferson, NC: McFarland & Company, Inc., 2000): 102.
 33. University of Arizona Faculty Center for Instructional Innovation, *Review Responses*.
 34. Barbara I. Dewey, "Beyond the Information Arcade™: Next generation Collaborations for Learning and Teaching at the University of Iowa (1998): 6. Available from ERIC (Accession # ED428659) [January 31, 2003].
 35. Michael Miller, "Anticipating the Future: The University of Michigan's Media Union," *Library Hi Tech* 16, 1 (1998): 81.
 36. Barbara MacAdam, "Creating Knowledge Facilities for Knowledge Work in the Academic Library," *Library Hi Tech* 16, 1 (1998): 97.
 37. Carol Ann Hughes, "'Facework': A New Role for the New Generation of Library-Based Information Technology Centers," *Library Hi Tech* 16, 3-4 (1998): 29.
 38. Michael Miller, 73.



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39. Cowgill, Beam, and Wess, 435.
 40. Ibid.
 41. Richard M. Dougherty and Mignon Adams, "Campus Libraries: Time to Market an Undervalued Asset?" *Library Issues* 22, 2 (November 2001): 1.
 42. Heather M. Edwards, *University Library Building Planning* (Metuchen, NJ: The Scarecrow Press, Inc., 1990): 130.