Serving the Information Needs of ASU Science Clientele

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Abstract

In order to stay competitive and on the cutting edge of science, scientists and technologists need the most up-to-date information. It is the role of the librarian to know the information needs of his/her clientele.

In American academic libraries, librarians/information specialists have subject responsibilities and their duties involve reference and information services, teaching, design of web sites, collection development and liaison with departments in their particular disciplines. Marketing of their services has been always very important but now in the electronic age it is even more challenging. It involves orientation sessions, teaching, promoting information literacy, organizing specialized workshops with vendors and database producers to teach the users the new databases, etc.

We present a short history of the evolution of the Arizona State University Libraries over the last forty years reflecting the growth and changes taking place at ASU.

"*Knowledge is of two kinds: We know the subject ourselves, or we know where to find information upon it*." Samuel Johnson

Introduction

Part of this paper is a personal story of the first author who was educated and served the information needs of science and technology users on "both sides of the ocean."
In the early sixties the library and information science program at Charles University where I studied at the time, and the whole information scene in the former Czechoslovakia, was quite progressive. Some of the leaders of information science were also my teachers, e.g. A. Merta, I. Wiesenberger, others like L. Kofnovec, J. Toman, J. Spirit et al. were pacesetters publishing papers and books in this emerging new discipline.

In particular, I have considered Merta kind of a mentor. I met him for the first time in 1959 when he was one of the instructors in a course organized by the State Technical Library (STK). One of his creeds was that in order for the information system to function properly, you have to have an educated information specialist who is aware of the information needs of the system's user and the user should be aware of the information support available to him/her (Merta 1970).

Higher level of spending on research and education in the U.S. during and after World War II and then "the Sputnik shock" in 1957 was reflected in increased federal funding of universities and research, in particular in the science and engineering disciplines. In addition, the emerging emphasis on the importance of scientific information had its roots in two conferences – The Royal Society Scientific Information Conference in 1948 and especially the International Conference on Scientific Information in Washington, DC, in November 1958.

Arizona State University had grown from a small state college with an inferior library in the postwar years to a twenty-thousand-student university in the academic year 1967/68. It had a beautiful huge brand new library when I arrived on campus.

Since the institution was originally a teachers' college with a small number of science books, the building of science and engineering collections was a priority. My predecessors have provided all major reference works and many of the monographic and journal resources but there was still a lot of work needed on upgrading of the collection, especially in the area of unique reference sources. One of the things I found missing at ASU was a more personalized attention to meeting the information needs of science users.

The Hayden Library Years

My tenure at ASU began on May 1, 1968 as a reference librarian in the Science and Engineering Reference Service department. I was very impressed with the modern Hayden Library, then less than two years old. I tried to familiarize myself as fast as possible with my new environment, in particular our users. Besides the desk reference service, the departmental librarians were mostly engaged in weeding the collections, which contained a lot of "junk" from the pre-science years at ASU. At the same time they were involved in collection building, which was my strong interest. The also gave library orientations and presented specialized bibliographic instruction for specific classes. Reference service in North American libraries was light years ahead of this type of service in Czechoslovak academic libraries. Only special libraries (TEI centers, mostly in research institutions) could be somewhat compared to US college and university libraries in the reference service. From my interest and studies of western library/information literature I was aware of the emerging "automated indexes," offline and even online abstracts and indexes (Medlars, Eric, CA Condensates, DDC Bibliography, Psychological Abstracts, Compendex, BA, etc.).

In order to familiarize myself with our clientele I started studying university catalogs and schedules of classes. I also requested from the Vice President for Research Office a listing of sponsored projects in the science and engineering disciplines. With the assistance of our student aides we created a file of science faculty "profiles" on cards. One listing was under the professors' names, listing their teaching and research interests (based upon classes they taught and research projects they worked on). We also added their consulting interests, if they had any. The second listing was organized by major disciplines with the names of faculty who were interested in those areas. If we needed to know who was working in power electronics or water pollution, we looked it up in the cards. First this was a simple manual system. Later we tried to use a so called "peek-a-boo" system but after the advent of microcomputers and with the move to the new Noble Science Library we had the information available on the computer (Borovansky and Machovec 1985). Later this file was taken over by the Vice President of Research Office and expanded to include all non-science disciplines at ASU. Today we use the departmental web sites with web pages of individual faculty members.

In the early years, this file was used for the SDI and alerting researchers about new information resources in their disciplines. NASA provided one of the major SDI services under the name NASA/SCAN. Since this service also covered disciplines outside aerospace engineering, it was used by many ASU faculty. Also in 1970 I gave an impetus to publishing an information bulletin, the Science Reference Newsletter. In this bulletin we announced important new reference sources, new subscriptions to journals, later also new online databases. It was published monthly during the fall and spring semester, later bi-monthly.

In those years, most of the computerized indexes and abstracts were still available only offline, e.g. Medlars and DDC Bibliography. We assisted the users with filling out the required forms and mailed those to the appropriate places. A week later or so we would receive the results of the search.

In the early seventies, Dialog, SDC and later BRS started offering online searching of an increased array of computerized abstracts and indexes. ASU was one of the first universities in Arizona having access to these services. We as librarians had to be trained to act as searchers for these mediated services. This type of service for a fee became very popular and at the height of their utilization in the early eighties, we performed over 800 searches per year.

We have always strived to educate our users, in particular graduate students about the importance of information resources. They are doing the research for their dissertations and they ought to acquire all relevant information sources.

I have collaborated with a chemistry professor on the preparation of a course on the literature of chemistry, personally teaching the sections on citation indexes and patents. Later I designed a course for engineering students called "Information resources in engineering" which I taught for several years (Borovansky,1987).

With the growth of science and engineering departments and research funding at ASU, the University and the Board of Regents finally allocated funding for the new science and engineering library building. Although the funding did not become available immediately, planning for the library had commenced. Finally the funding was approved in 1979 and preparations in earnest for the library began. The library was completed in 1982 and opened for business in August 1983.

The Noble Science Library Years

The new science and engineering library had about 10,000 m^2 of assignable space and about 450,000 volumes capacity. The seating capacity was over 1,000. At the time of the move, the card catalog was closed and for the first several months the users had to use the catalog on microfiche. The new automated catalog on order was not yet available. Finally it was installed about ten months later (Borovansky 1990).

One of the most appreciated new features in the library by our users was the current periodicals room where the latest issues of almost 4,000 titles of journals were displayed. Another nice feature was the new classroom with the latest equipment which was used for bibliographic instruction and also for courses and workshops teaching librarians the use of new online databases.

All librarians/subject specialists had their individual offices that made consultations and meeting clients more comfortable. A special Solar Energy Collection room was also located in the building. Just before the move into Noble Library, ASU had become the US PTO Depository Library, the only one in Arizona. ASU had a complete file of US patents in microform beginning with the first patent. Last but not least, the Map Collection was also housed in the building. Our geologists had access to the US GS maps. Aerial and satellite photographs were available in addition to topographic maps of interest to the campus population.

This modern library was very inviting; sometimes we had too many students from non-scientific disciplines that our own students had a hard time finding a study space. More faculty used the facility, also, because it was located in the middle of the science segment of the campus. Some graduate students almost lived there. In the late eighties and even more in the nineties the demand for mediated searches was gradually diminishing. End user searching was becoming more common, especially with the emergence of new electronic databases, full text e-journals, e-books, encyclopedias and a number of reference books in electronic format. The library was heavily used. The first several years over one million users walked in annually. Later with the emergence of the Internet and online access not only to the ASU catalog but also to many journals from any place on campus, the attendance decreased. However, the reference service is quite busy and librarians are in demand when new databases are subscribed to. The Science Reference Department also offers bibliographic instruction in the newly remodeled classroom, which is also frequently used for the demonstrations of new electronic tools by vendors.

The new generation of students frequently arrives at the university with the knowledge of the Internet, especially the tools like Google and a belief that everything you ever need is right there. The web access is popular because it gives immediate answers while users are expending minimum effort but in reality they are not engaged in an involved retrieval process.

Responsibilities of reference librarians/subject specialists

In the early years the main responsibilities of librarians were reference and information assistance to users, collection development and management (weeding collections) and giving orientations and teaching special classes at the request of professors. These instructional activities varied according to the level of clientele, e.g. undergraduates, graduate students, frequently with faculty.

Most of the librarians in those years didn't have science background, they learned on the job, by self-study and taking science courses. As more science educated librarians became available, they were assigned specific subject areas according to their background and became subject specialists. They were responsible for their disciplines in the collection development activities, instruction and special advanced reference. To these responsibilities was also added the liaison activity, i.e. being the resource person for their particular discipline(s) and maintaining close contacts with their departments. For this activity our "Science Faculty" profiles were useful in enabling new librarians to become acquainted more quickly with their clientele. The profiles were also a good PR tools; researchers appreciate if "their subject specialists" are familiar with their interests. Last but not least, the librarians and the profession earn increased respect for their expertise.

Advances in technology have had a profound influence in the manner that librarians perform their responsibilities. Reference service has evolved over time to utilize technology in all modes of communication in order to assist users remotely as well as on campus. Librarians have created subject guides and web-based tutorials. Other avenues to reach users are live chat and email. It is not unusual to provide assistance to a student while never meeting him/her in person. However, this explosion of technology has not fully replaced personal contact. Librarians provide research consultations and assistance to individuals. In addition, there are requests for specialized reference assistance by faculty preparing grants or students working on research projects. Librarians also continue to engage students at all levels, including summer programs for undergraduates participating in the Research Experience for Undergraduates (REU) program, undergraduate classes, and graduate students. Activities include instruction in the use of the proprietary databases, standards, as well as the USPTO patent database. Working with the Engineering and Applied Sciences Graduate Student Association the librarian developed workshops specifically addressing advanced search techniques. This collaboration is especially rewarding because of the involvement of the students in all aspects of the workshop. Content was developed with direct input from the students. In addition, the students advertised the session and supplied snacks and beverages. The

response from the students who attended was very positive and more workshops are planned for the fall. In addition to the specialized databases, the students have also requested a workshop on searching for patents that will be scheduled in the summer. This increased interest by students in patents parallels the increase in technology transfer at Arizona State University.

Collection development and management is also greatly assisted by the tools available through technology. The collections and the allocation of space have also evolved to accommodate the changing technological landscape and the research emphasis of the faculty. Since the United States Patents are now freely available online through the United States Patent and Trademark Office (USPTO), we decided that it was no longer necessary to be a Patent and Trademark Depository Library in order to serve the needs of our users. However, as noted above, interest in learning how to search the USPTO patent database is increasing and we expect that it will continue to do so.

Many of the serial publications have migrated to electronic format and the library now subscribes to a large portion of the science and technology journals and conference proceedings in electronic format only. Our current periodicals (paper format) have been moved to a room less than one-third of the size of the previous current periodical room. This allowed the conversion of the previous current periodical room into a large "quiet study" room with individual carrels. In addition, if we have access to the backfiles of a journal in electronic format, the paper copies of these publications have been transferred to a newly-constructed off-site storage facility. The trend to "electronic only" extends to handbooks and monographs as well. The library subscribes to online books both in packages and individually. Usage statistics assist in the management of these collections.

In keeping with the interdisciplinary and transdisciplinary nature of modern research endeavors, any segment of the collection may serve many different users. Allocation of funds to purchase materials in transdisciplinary areas assures that areas of study that cross discipline boundaries will be served.

Liaison activity ensures that librarians function as resource persons for designated disciplines and interdisciplinary areas of study. Librarians are also active in the accreditation process for the Ira A. Fulton School of Engineering. They prepare reports on the status of the libraries' resources and services and meet with the visitors from the accreditation organizations to demonstrate these resources and services. Librarians are also involved in the "Academic Program Review" process mandated by the Arizona Board of Regents. Understanding the information requirements of the research and teaching activities of the assigned departments and maintaining a strong working relationship with individual faculty facilitates this activity.

Assessing needs of various types of users

The library serves a variety of needs. In addition to the information needs addressed by the collections, students use the library as a quiet place to work and also to work in

groups. In order to assess information needs of the graduate students in engineering, a voluntary survey was conducted in 2002 and 2003 during the library portion of the departmental orientations for new graduate students. The survey asked questions such as: "How do you find journal articles and conference proceedings?" and "Have you used the following databases?" Databases listed included Compendex (Engineering Index), ACM Digital Library, Bioengineering Abstracts, SciFinder Scholar (Chemical Abstracts), Dissertation Abstracts, IEEEXplore, INSPEC, Web of Science (Science Citation Index), Knovel (2003), Safari (2003), and the USPTO. The results varied depending upon the department. Based upon the total of those returning the survey approximately 42% of the students indicated that they had not used any of the databases listed. However, some students indicated that they had searched other databases that were not listed, such as Pubmed and GeoRef. Google was frequently mentioned as the means of obtaining journal articles (Young 2004). In a less formal way, feedback is often solicited at the end of instruction sessions for classes. This feedback is useful in planning to meet the needs indicated by the students.

The library also serves as a place for individual and group work. Both Hayden Library and Noble Science and Engineering Library are wireless zones. Because many students now own laptops they can work anywhere in the library. The group study rooms are popular with students and are equipped with white boards and dry erase markers. To accommodate the large numbers of students engaged in group-work, we have also designated the first floor as an appropriate place for students working together. With the conversion of the large room that previously housed the current paper periodicals to a quiet study area, the library addresses a variety of needs. Another recent change is the addition of a café in Hayden library. Although Noble library doesn't have a café, we now allow food and beverage on the first floor.

Marketing

With the advent of remote access, many students do not physically come to the library. Therefore, in order to reach our users, we use web pages and new services. However, we also promote the library in person at events where we can interact with our users. In addition to orientations and instruction, we participate in Engineering Awareness Day, an event aimed at recruiting undergraduates into engineering. We have a table of information on the library resources and services on the mall along with the student groups and departments. We also participate in the "Research in Engineering & Applied Sciences" event. This event, organized and sponsored by the Engineering & Applied Sciences Graduate Student Association, is an all day program. Graduate students present their work through paper and poster sessions. The library table is associated with the poster session and we distribute information on resources and services that support the programs in engineering. We give flyers of information about the library to the graduate student advisors to distribute to students and we also place handouts of library information in the computer lab/study room in the Del E. Webb School of Construction. Since many students, especially in the fall semester, are new to ASU, the librarians in Noble Library have taken an information desk outside to the mall in front of the library

for the first few days of the semester (Clemens, Craft, Duvernay, Hofstetter, & Shackle 2004). The librarians at "The Information Oasis" offer assistance in locating classrooms and other resources. We also distribute bottled water and highlighters advertising our "Ask A Librarian" chat reference service. We continually brainstorm ways to reach our users both electronically and in person.

New Services

Technology has also had a tremendous impact on the kinds of services that the library offers. The University Libraries offers a 24/7 "Ask A Librarian" live chat to enable users to obtain assistance anytime and anyplace. The user also has the option of sending an email. Emails are responded to within 24 hours during Monday-Friday. In order to make our subject specific web pages more interactive, we have begun to incorporate streaming videos to illustrate how to access the libraries' resources. We began with the web page for distance engineering students and plan to expand this to other subject and course specific web pages.

Conclusions

With the arrival of president Michael Crow, the quest at ASU to become more competitive on the global scene has intensified. ASU has been already strong in many of the science and technology areas, e.g. materials research, bioengineering, cancer research, astrobiology, Parkinson disease, and photosynthesis but has added more emphasis on areas of excellence like flexible electronic display, wireless technologies, sustainable systems, and especially the new Biodesign Institute with its ten research centers covering many aspects of nanobiotechnologies.

New courses have been added and the first graduates in these areas entered the work force. All these endeavors brought increase in federal and private funding and higher patent productivity. These university based research activities benefit the Arizona knowledge economy to compete for highly skilled research workers and in the area of new products and spin-off companies.

For the researchers to be on the cutting edge of their disciplines it is necessary to have access to the most recent information resources. ASU librarians continue to actively evaluate the needs of its clientele, acquire resources, and provide new services to support all areas of the teaching and research mission of the University.

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