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Beyond Technical Issues: The Impact of Automation on Library Organizations

Automation is not new to libraries, but the scope and magnitude of the use of technology, and the pace at which technology is developing and affecting collections, communications, and services is overwhelming. As a profession, considerable time and attention has been focused on the demands of technology: how to make automation fit the unique needs of bibliographic records, how to connect local systems to national utilities and networks, and so on. While there is a need to continue to invest time in these important aspects of technological change, there must be a shift in focus to include consideration of the impact that this expanded automation will have on the organization. For the foreseeable future it is people that will continue to make libraries effective and not machines. Automation gives people in libraries a powerful tool to reach beyond present capabilities in providing users with information and thus knowledge.

What are the organizational issues that should be addressed as a result of expansion of automation in libraries? This article identifies issues associated with changes in the organization and with the impact of automation on the individual. Within this context, this author hopes to provide some sense of the opportunities and the problems that likely await librarians over the next decade.

CHANGES IN THE ORGANIZATION

New and Evolving Roles and Relationships for Libraries and Librarians

What is exciting about automation is not that it will allow librarians to be more efficient (to do the same thing faster), but that it will provide

opportunities to reconsider current activities, identify and design new services, and from this create new roles and responsibilities for the library and librarians. Rather than simply identifying these new activities as individual situations present themselves, librarians should instead step back and begin to envision a more global view of the library. A picture of the future should be drawn that is more comprehensive and far-reaching in terms of what we might become and how we might translate traditional values of service into new activities and roles within the library environment. Unless we can conceive of a future and move toward it, others will design the future; librarians will lose the opportunity to play a valuable and central role in the information society. This is of course a daunting task, even one that is not in the absolute sense doable. But what fun to be a visionary, to let the imagination wander around the edges of reality in order to try to see new directions. This is an important process if librarians are to take charge of the future that is suggested by the new technologies, new formats, and new methods for delivery of information, all of which will have to be designed and initiated while maintaining many of the traditional services, formats, and users.

The issue of the relationship between libraries and computing centers on campus has become a hot topic. We do have to be concerned with the possibility that the role of libraries in providing access to information could be lost to the computing center. There is no reason, for instance, that a computing center cannot provide access to database searching and training of end users in conducting their own database searching. The computing center (or another segment of the university) might decide that they will offer a service to faculty to assist them in organizing databases for personal collections or in developing personal catalogs online. What would be wrong with this and why should we care? Libraries should be the provider of such services not just to protect turf, but because organizing collections, developing bibliographies, and identifying and providing access to information resources are what librarians do well. Therefore, care should be taken not to let these opportunities slip away because of failure to consider emerging demands, priorities, and requirements that result from technology. Librarians cannot afford to be complacent. We should be prepared not only to respond to new demands (such as creating databases) but also to create the demand and suggest new opportunities within the organizational environment.

Technology already provides new and developing opportunities through integrated library systems and telecommunications. For instance, libraries will surely provide online reference service. What does this offer that differs from current direct reference service, phone or written reference? In the online environment there is speed and timeliness in assisting the researcher, but there is also convenience in avoiding telephone tag.

There is also the fact that the online question can be forwarded to the librarian with the subject expertise who will be able to provide the most knowledgeable assistance rather than having a question answered by whoever happens to be scheduled at the reference desk. Also, in a fully automated network environment, the librarian responding to a reference question will be more likely to use telecommunications to communicate with colleagues within the institution and nationally in responding to particularly complex reference questions. Librarians will also have the opportunity to initiate online conference or bulletin board systems over telecommunication hookups in order to encourage and participate in scholarly communication. This would allow librarians to maintain a higher level of currency on new publications and new fields of research while making scholars aware of publications that they may not have identified. Finally, librarians must grapple with the issue of materials that are made available online but not formally published (in the traditional sense). How will such materials be made available within the campus network, how long will they be stored, and what will be the access?

These new activities will lead to a new role and new relationships within the university and scholarly community. Academic libraries are often referred to as the "heart of the university," a tired phrase and often one that is pure rhetoric. But in a highly automated environment, libraries should indeed play a central role in such matters as: (1) assisting the scholar in adapting to new activities and tools; (2) providing leadership on the campus and nationally in establishing local area and national networks; (3) determining standards and exploring new means for providing access to information while managing the proliferation of formats for storing published and unpublished information; and finally (4) wrestling with myriad ethical issues that will surface from technology and access to information. The stature and the responsibility of librarians in this new environment are both challenging and staggering.

Communication Patterns

Research in the management literature suggests that the introduction of automation at all levels of an organization will have a profound effect on communication patterns. Computing is a social activity and therefore has an effect on the social relationships which in turn may alter or reshape relationships and the flow of information and decision-making within the organization. Several issues regarding the impact of automation on organizational communication should be of concern: (1) new communication patterns and channels open up; (2) the organizational structure becomes flatter; (3) change in structure and norms for communication occurs; and (4) communication among co-workers shifts particularly between supervi-

sors and subordinates. Again it is difficult to identify which issue comes first because each is interrelated with the others.

What happens in an online automated environment? First, people throughout the organization have access—easy access—to information that may previously have been held by only a few—usually managers or specialists. People will be more likely in the future to communicate across departmental and divisional lines without going through recognized channels as displayed on an organizational chart. Because the computer provides an almost neutral means of communication—ignoring position and status in the organization—more people are likely to communicate in all directions—up, down, across. This may well increase the quality of decisions through the increased accessibility of information. Kiesler has stated that “increasing the pool of information and at the same time mitigating the effects of status could contribute to organizational strengths. It may also contribute to organizational instability” (p. 54). Some authors in the management field suggest that organizations will become flatter with so much information readily available. They predict that the middle management group will shrink since they have been the ones in the past that acted as the gatekeepers for much of the organizational information—acquiring it, organizing it, interpreting it, and so on. It is not clear that in fact this will happen, but because of the neutralizing aspect of computing, it is likely that managers will not hold the same power because information will be more highly dispersed. Finally, there is the important issue of communication between co-workers within the library organization. Currently library organizations are places where people interact with people to get their work done with a number of people also using terminals and technology as part of their work activity. In the future, there is going to be more reliance on automation to conduct librarians’ work including interaction with one another. A major aspect of this is how supervisors will interact with the staff they supervise. Zuboff (1982) refers to this as remote supervision—i.e., the ability to assess performance through information obtained from the automated system (p. 147). How will this affect working relationships, morale, commitment, and turnover? This issue is addressed in more detail later in the discussion of automation’s impact on the individual. Communication within the library organization is going to be fundamentally changed as will librarians’ contacts with users and professional colleagues across the country and no doubt internationally. Attention must be given to the benefits that will be possible with automation and the problems that will be inevitable.

Organizational Structure

New technologies may call for organizational changes in the traditional library as would be expected from the impact on communication

patterns, work responsibilities, and working relationships. Will it always serve libraries well to maintain the public and technical services divisional organization? Will the hierarchical and bureaucratic structure serve librarians well? Are there alternative organizational structures that can be examined before it is discovered that the existing work structure has become a dinosaur which is crushing librarians' ability to be responsive?

Most libraries maintain the traditional public and technical services divisions though there is considerable overlap so that clear distinctions are not always apparent. In this environment, reference librarians provide the primary, if not the exclusive, contact with users. In the online environment, technical services librarians, with their strong language and subject expertise, not to mention their experience with automation, should become increasingly a part of the user interface. Technical services librarians can respond to online reference questions and actively participate in the user education program. They can do this by assisting users in learning and making full use of the automated environment including the organization of personal databases. Meanwhile, public services librarians should continue to develop subject expertise, enhance communication with faculty through technology, and expand user education through tutorials, bulletin boards, and conferencing systems for scholars.

As local and national networks are established and proliferate, traditional communication networks among librarians, and among librarians and users, will alter. Librarians should begin to explore different organizational structures to support and enhance services that will increasingly build on the technology. For instance, teams may be identified to work within broad subject fields; there may be a team for humanities with responsibility for selection, cataloging, user education, direct reference, collection management, and so on.

Finally, there is the issue of how the hierarchical, bureaucratic structure of the library will be—or should be—affected by technology. Will the current structure serve the emerging new needs well? Veaner (1985) in his two-part article on academic librarianship in the next decade, suggests that the existence of microcomputers and networks is “already fostering the growth of a new kind of librarian—the entrepreneur who seeks out clients in an active ‘marketing’ mode rather than waiting for patrons to come to the institution” (p. 297). How will this type of individualized behavior work in the hierarchical environment? As librarians work even more closely and independently with faculty and students will conflicts arise? Or more important, will the bureaucratic organization stifle the opportunities that could be exploited? Will decisions in the library be reached more informally, ignoring the lines on the organizational chart and the roles and status of individuals that are currently acknowledged? Will this lead to greater innovation and better service or to conflict and chaos? Robbins-

Carter (1985) says that, "it will be extremely difficult, if not impossible, to foster productive competition and entrepreneurial attitudes if we maintain our present functional structure." She does go on to say, interestingly enough, that it is "ironic that the radical change in organizational structure that is required can be facilitated by the hierarchical bureaucracy that now permeates our libraries."

There is no single answer to what specific type of organizational structure academic libraries will end up with. After all, there are considerable variations currently within a somewhat standard structure. What is likely is that new means will have to be considered to bring about decisions and activities to encourage entrepreneurial behavior while maintaining some control over commitment of resources and policies. Certainly libraries will have to consider how to shorten the time line between idea and implementation. It is not enough to encourage innovation if ideas are always buried under an avalanche of study, debate, and committee investigation. Librarians are not known for risk-taking, but they will have to cultivate not only abilities to be analytical and good planners but also a good sense of when to move and when to take a chance. If librarians are always looking for "perfect" solutions or approaches, they will get bogged down and someone else will be at the gate and win the race before it is realized that they are no longer even in the race. Libraries and librarians only recently coming to terms with participatory management (with a move from an authoritarian structure) will now find that they cannot be leisurely in their discussions and analyses but must move quickly to keep up with today and be in step with tomorrow.

IMPACT OF AUTOMATION ON THE INDIVIDUAL

All of the issues raised thus far will have a direct impact on the individual but some specific areas of concern can be identified: (1) responsibilities and assignments of library staff; (2) training and development of library staff; and (3) work environment including the physical environment, work flow, and working relationships.

Responsibilities

Increasingly librarians will be expected to operate in a sophisticated, fast-paced environment with a new set of knowledge, skills, and abilities. Research conducted by Powell and Creth (1986) which focused on university librarians in the first nine years of their careers showed that librarians already recognize the need for the following knowledge and skills: management skills (specifically planning, personnel, and training) and automation. Other areas in which librarians perceived to have needs were in

writing, systems analysis, program evaluation techniques, and inferential statistics. These indeed are going to be skills needed to some degree by all librarians. The new environment will also ask librarians to rethink the traditional, to let go of certain activities and standards, and in particular to strike from their vocabulary the phrase "because we've always done it that way." Librarians will have to cultivate a willingness to be risk takers, to be assertive, and to be visionaries. In addition, librarians have a responsibility to consider carefully the changes in duties and requirements for support staff because as the activities of librarians change so will those of the staff who work with them. Librarians should be careful not to exaggerate requirements for positions through exploitation of people who are available in the market in order to avoid the responsibility for training and developing people who meet basic requirements and who can grow and learn. Also opportunities must be provided for support staff so that they have a role in decision-making regarding their own work and operations and, as appropriate, the broader context of library services. Librarians in many libraries do not do a very good job of that right now, but it will become more critical to provide this opportunity if a mechanical response from staff is to be avoided because of a mechanical environment.

Training and Development

Another activity which will become increasingly demanding of library organizations but in which librarians have not yet excelled is training and development of staff. Somehow the financial and personnel resources to devote to training and development must be carved out; without highly skilled and highly motivated staff, librarians will have an albatross around their necks. Training will become an increasingly critical issue in the automated environment because it will be harder to cover up mistakes. After convincing the institutions to pour millions into these systems, there will be no sympathy if staff are inept in handling the system, display poor attitudes toward it, or lack creativity in expanding services through the technology.

New work patterns and new work will require new training approaches within the context of accelerated change. Training will have to accommodate both the traditional and automated environments for the foreseeable future, so librarians will be doubling training requirements rather than replacing current ones. An increasingly diverse staff will require greater flexibility and imagination in training. Supervisors will have to become more sophisticated in their understanding of the relationship between learning and performance and will have to devote the time and energy needed to respond to training needs in the electronic library. Equally important is that librarians will have to put far more effort—a

sophisticated and polished effort—into educating and training the users: first, educating them to the advantages of the highly automated environment (after all librarians are asking that users provide, in some manner, the dollars to purchase these systems), and then training them to work within this new context. If training and development are approached with sufficient time and energy and a true commitment to staff, the issue of resistance to change will become a most mute one.

Work Environment

Work environment is an umbrella term for several critical issues facing librarians in a highly automated environment including physical environment, work flow arrangements, routinization of work and related stress, and working relationships within the library organization. To determine how the organizations will function within this new environment is going to be the most perplexing problem librarians face. As Kantor (1983) would ask, What is the organizational culture that we want to encourage?

Physical Environment

What does life at a workstation suggest? After all, people have sat hunched over paper and pen for centuries and in front of typewriters and calculators and hooked to phones for decades. So why this sudden increase in concern related to terminal use? Primarily it is one of scale: so many jobs in so many sectors of society will now have staff conducting their work at terminals. The health concerns identified so far include back and neck strain, eye strain from intense use of the monitor, and concern with radiation, particularly for pregnant women. There are ways to address these issues but costs are involved such as in rescheduling of work and possibly restructuring of jobs. Related to the obvious physical problems that have been identified, there is a secondary problem of stress associated with the highly automated environment. This is very much related to work flow and working relationships.

Work Flow

Clearly with an online integrated system available in a library, location of information and access will be literally at one's fingertips—not a room, a floor, or a building away. How materials are moved about should alter, and how records are created and maintained and by whom will be reconsidered and no doubt changed. The decisions that come out of this new environment will affect the location of staff and the way materials are or are not moved about the library as they go through the various stages of processing. A related and important issue, however, is one of routinization of work. While undoubtedly much work in the library is becoming

more exciting and challenging, other work is becoming less interesting as it becomes even more controlled by technology. Because of the high control offered by technology, will librarians move increasingly toward an assembly-line approach to work? Malinconico (1983) indicates that electronic data processing technologies have allowed information work to take on "the characteristics of mass production jobs: mechanical pacing of work, repetitiveness, minimal skill requirements, predetermined use of tools and techniques, surface mental attention, and minute subdivision of labor" (p. 2222). The challenge for librarians will be to use technology to move into the information age effectively and efficiently and avoid the assembly-line environment with the all-too-familiar problems. After all it would be a shame if the joke about the automobile industry (never buy a car made on a Monday) was translated, in some form, into library services.

Work Relationships

Libraries have certain attributes that make them an attractive place to work despite low salaries. Libraries are viewed as people organizations both because they are labor-intensive (there are many people), and because they are service organizations. The library is seen as a place where social contacts and relationships are the way that work is accomplished. If library work increasingly involves people interacting with terminals rather than with other people, how will that affect people's desire to work in the library? The potential for alienation in the highly automated environment has been pointed out by researchers.

Of course there are already problems within the existing organizations that do not foster constructive working relationships and indeed create tensions between public and technical services staff and between professional and support staff. These existing situations will need to be addressed, as well as the difficulties that will emerge, from the highly automated environment in which staff will be more removed from interpersonal interaction with one another.

A very important part of the issue of working relationships has to do with the supervisor and his/her staff. Zuboff (1982) refers to this new environment as generating computer-mediated work; work in which supervision will, to a large extent, be conducted remotely. What does this mean for staff? One author has stated that:

Continuously supervising every aspect of the job can destroy employee initiative and creativity. Workers who feel they are in an electronic straitjacket are reluctant to volunteer information to improve the system or respond more effectively in a crisis. One public employee remarked that, before monitoring, "when we had to meet a deadline, there used to be teamwork." Since computerized supervision there is little incentive to do anything but meet one's individual quota. (p. 144)

CONCLUSION

How do librarians minimize the negative impact that technology will have on the workplace? Part of the answer is to recognize the potential and take steps to prevent it from happening. Another is to look for benefits for individuals in the new environment: what useful skills will they learn that can be applied in other environments? How can staff access to electronic mail add a social contact into the workplace which would be worth supporting?

The future of technology is here; there's no turning back. As Kiesler (1986) has said: "Today we can perform more and more technical miracles with computers, but . . . [the real excitement] . . . will come from asking what social miracles we can perform with them" (p. 60).

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