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Impact of Information Technology on Library Space Requirements

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Abstract.

This brief research paper was undertaken to determine whether the digitization of information (and other new technological processes) will provide any future space savings for the undergraduate academic library. While the author found evidence that the rate of growth for shelving space in some areas such as reference and periodicals may decline, he found just as much evidence that technology itself is increasing space requirements for the modern library. A concluding table summarizes the probable impact of technology on future space needs for the various major library functions; it shows no clear evidence that technology will help ameliorate such increased needs.

Keywords: Information Technology, Library etc

Introduction

Technology is causing important changes in how libraries in general, and undergraduate academic libraries in particular, function. It is especially fueling increased user demands and expectations for information resources and their timely delivery. Yet very little has been written regarding designing libraries to take into account the impact of changing technologies.

In this author's experience, many lay people believe that there will be no need for a physical place called a library in the future, given that everything in the information realm will be accessible from the computers on their desktops. A first observation is obvious: even electronically stored information takes physical space somewhere and requires plenty of equipment and staff to accession, index, retrieve and deliver it. The second is less obvious. According to recent estimates, less than five percent of current information is in some kind of electronic form (Moreno, 1995); it may reach 10 percent by around 2001 (Reid, 1995). And for undergraduate academic library collections, which house primarily monographic types of materials, the continued likelihood that the printed form will predominate in the foreseeable future is high (Lucker, 1992).

Nevertheless, technology is affecting physical space needs in major ways: digitization is beginning to replace microforms, audio/visual resources are evolving into multimedia/hypermedia formats, and computer

equipment is pervasive throughout the modern academic library ("ACRL", 1995). Also, major projects are underway to produce extensive digital libraries (Pool, 1994). Factors such as these have led at least one major academic library (Cornell University) to conclude that the need for additional space will begin to slow after the year 2000, and may stop by 2010 (Matier & Sidle, 1993),

Other evidence suggests that "the library as a physical fact is becoming more important" (Moreno, 1995), and that the need will continue for academic libraries to serve "for self-education and discovery outside the classroom and laboratory." (Lucker, 1992)

What is needed, then, to determine future space needs for the library, is a reassessment of its mission in light of the probable impact of new technologies, and, consequently, how this is likely to translate into more specific space requirements for the various functions. The two sections follow attempt to do this.

The Likely Impact of Technology on Mission

Most would agree that the primary function of a library will continue to be to provide organized, inexpensive access to information, no matter what its form. But technological innovation is likely to add a new need to "create on the network a knowledge-management system that enables scholars to navigate through [the] resources in a standard, intuitive, and consistent way." (Larsen, 1991) This will require new expertise and equipment to accomplish.

With regard to the information itself, the trend has been for quite some time to seek resources both inside and outside the library to meet user needs. Interlibrary loan networks have diversified and will most likely migrate to a common electronic medium, the Internet (Larsen, 1991). In addition, fee-based document delivery services are being more widely uses for supply of externally-held materials. However, internal collections will continue to grow, not just in the conventional book category, but also in non-book formats, which still require space and equipment to access their contents (Holt, 1989).

Thus, if anything, technology is adding to the demands for libraries to accommodate more print and non-print materials than before. In addition, it is adding the need for ever more sophisticated telecommunication and computer systems to manage access to on site and external resources (Reid, 1995). Also, increased training and instruction must be performed by the library staff to help users cope with the new and varied systems. With regard to the need for physical space to fulfill the library's revised mission, it becomes unlikely that less will be needed than currently, and most probably more, as described below.

The Spatial Impact of Technology on Library Functions

General: Technology itself is causing increased demand for space in many areas of the library. There are growing numbers of computer workstations for patrons and staff alike and other equipment such as network file server's needs specialized and additional space often not found in existing facilities. (Lucker, 1992)

Instruction:

A growing role of the library is helping students and others learn to use the new technology to access information. This is requiring libraries to supply more space for face-to-face consultation with information professionals (Clemmer & Smith, 1992) and most often necessitating the provision of a large, well-equipped user instruction room (Bazillion, 1994). Thus, as the instructional mission of the library is becoming more important, due in large part to introduction of technology, more square footage needs to be supplied for this function.

Monographs:

As discussed above, monographic collections, especially for undergraduate libraries, are likely to continue to grow steadily. While digitization of some materials may result in some physical space savings, there are more formats that the library needs to collect; most of these require additional space for equipment to access them, not to

mention more specialized storage facilities to house them.

Periodicals:

Serials in electronic format seem to be one of the best prospects for introducing space savings in academic libraries. Journals in electronic format will no doubt continue to increase, although those in scientific, technical, and medical disciplines are doing so at a more rapid rate (Lucker, 1992). Another factor also points in this direction, that being the extra-inflationary increases in pricing by many publishers (Clemmer & Smith, 1992).

Processing:

In most "behind the scenes" areas of the library, technology is often causing the need for more rather than less space for equipment to handle incompatible systems. While this may be ameliorated in the future, the immediate space needs for areas like cataloging continue to grow (Johnson, 1992).

Reference:

While technology is driving the need for more instructional space, it is impacting positively the need for space for reference materials themselves. A growing number of resources are available in electronic form, and often from resources housed outside the library. As in serials, however, collections more heavily reliant upon information in professional and scientific areas are experiencing space savings more dramatically (Matier & Sidle, 1993).

Study Space:

A number of authors confirm this one's experience that technology is increasing the requirements for study space in academic libraries (Boss, 1987; Johnson, 1992; Lucker, 1992). Not only are more students relying on facilities like libraries on college and university campuses for studying, more space per student is required to accommodate the use of technology (e.g., laptops and workstations).

Conclusion and Summary Table

In general, use of new technologies is not relieving the need for more space in libraries. While there is some potential for capping or slowing the growth for additional physical space for some library functions, existing formulas often don't provide adequate space for the new technologies themselves, increased study space requirements, and new format storage and the equipment needed to use it (Boss, 1987). The table below summarizes the probably impact of technology on the overall space requirements for key academic library functions over the next 20 years approximately:

Impact of Technology on Space Needs:

Function:	More Space	Little Change	Less Space
Instruction	x		
Monographs		x	
Periodicals			x
Processing	x		
Reference	x		
Study Areas	x		

One, thing is certain: there will be continued need for space planning in libraries to allow for flexibility and electrification to almost all points (Bazillion, 1994; Sebright, 1994). While it is uncertain, given the analysis above, how technology may specifically change any one library function, it has become certain that it will cause change in general over the foreseeable future. This author concludes that it would be unwise to count on technology to save the library space, but that it would be wise to plan on it continually altering the mix of space requirements needed to conduct the functions of a modern academic library.

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