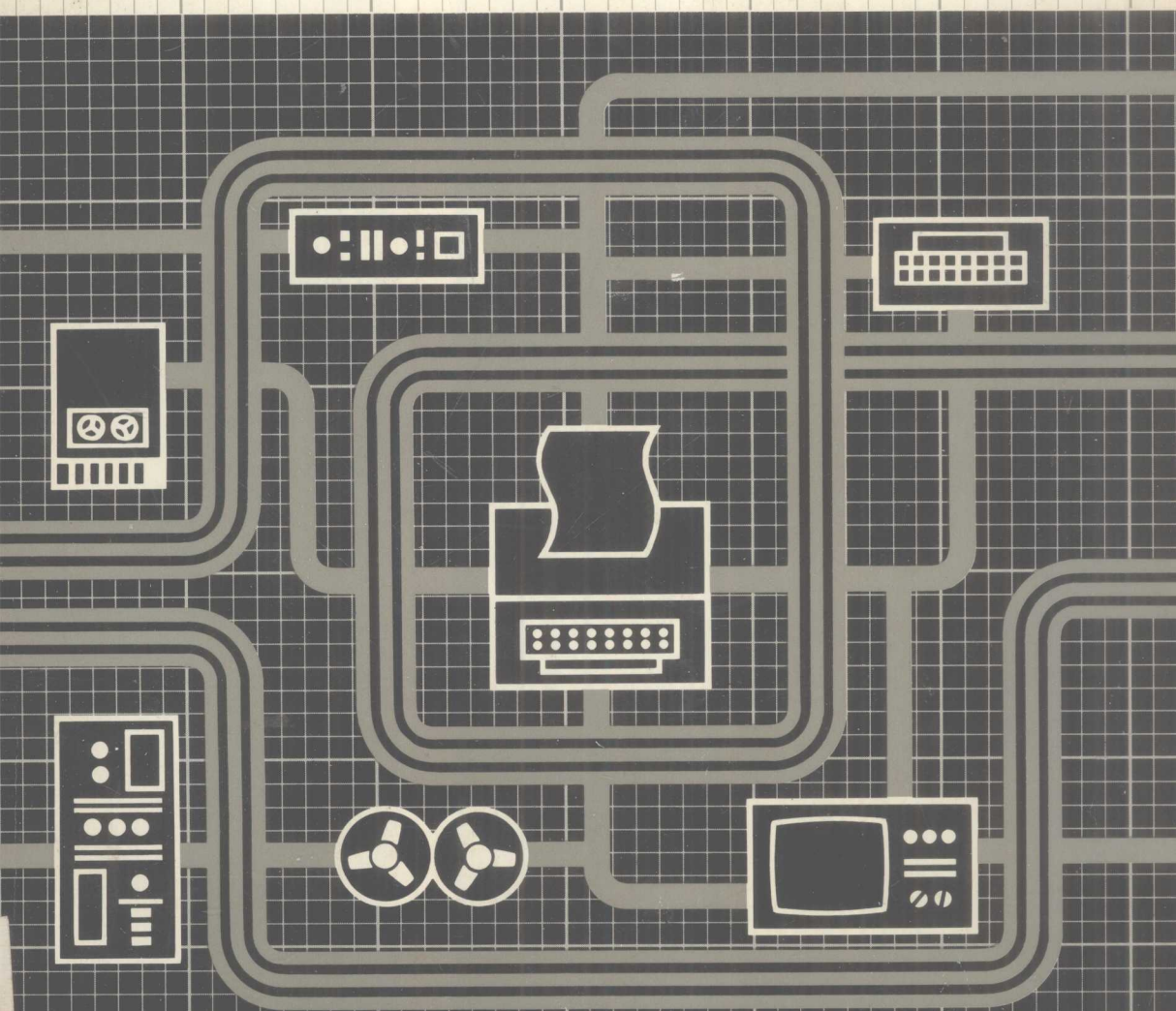
Automation, Space Management, & Productivity

A GUIDE FOR LIBRARIES



ELAINE COHEN AND AARON COHEN

AUTOMATION, SPACE MANAGEMENT, AND PRODUCTIVITY

A GUIDE FOR LIBRARIES

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R. R. BOWKER COMPANY
New York & London, 1981

For Rachel and Chip,
once again.

Published by R. R. Bowker Company
1180 Avenue of the Americas, New York, N.Y. 10036

Printed and bound in the United States of America

Library of Congress Cataloging in Publication Data

Cohen, Elaine, 1938–
Automation, space management, and productivity.

Bibliography: p.
Includes index.
1. Libraries—Automation. 2. Libraries—Space utilization. 3. Library administration.
I. Cohen, Aaron, 1935– . II. Title
Z678.9.C57 025'.02'02854 81-38496
ISBN 0-8352-1398-6 AACR2

AUTOMATION, SPACE MANAGEMENT, AND PRODUCTIVITY

PREFACE

This book is the culmination of two years of research. During that time, the prodigious growth of the information sector became more apparent. Vast improvements were made in technology within libraries; budgets and inflation loomed as deciding factors for many projects; and systems design came into its own. Productivity, a concern for human factors, and the rate of change were major issues for librarians. Indeed, the rate of change in society as a whole, and in libraries in particular, was probably the most important aspect of those two years, and one that was especially noted during the writing of this book. Every effort has been made to include the latest technological advances and trends and to explain how automated systems can be effectively incorporated within the library setting.

Change is the underlying theme throughout this guide. How does today's librarian deal with the overflowing library shelves, the miles of computer printout, the electronic gadgetry? Faced with the certainty of change, where does one begin to sort out what is necessary for one facility and not for another, what is practical for one staff and not another, what will be best for one group of patrons and not another? These are practical questions that sooner or later each library and library staff must face. And *Automation, Space Management, and Productivity* gives practical answers. It deals directly with the problems librarians face in trying to plan and coordinate all elements of the library for the most efficient interaction with the patron. It relates the physical planning of a library with the actual people who will be using it; it relates the design of a facility to the productivity that may result.

Stressed in this guide are the impact of automation on the physical organization of space and facilities within the library and the importance of anticipating the psychological needs of patrons and personnel in adjusting to the implementation of new technology. Some of the topics discussed are: the role of the library manager in the planning, problem-solving, and staff training processes; the relationship between environmental and operational changes; general space planning and interior design concepts; physical planning for electronic systems; lighting, power, acoustics, and energy; furniture and equipment purchasing and placement; work improvement/work simplification; facility design and productivity; role of libraries in the information needs of the next two decades; and behavioral aspects of space and space arrangement.

The authors believe that the planning process for change in the library depends on three elements—aesthetics, function, and behavior—and that these elements are intrinsic to the comfortable adaptation of the human being to his or her environment.

We are indebted to a number of people for their help and good advice. Special thanks to our children, Rachel and Chip, for their work on

this project. Dorothy Freeman, Director of Research, and Ellen Hilliard, Business Manager, Aaron Cohen and Associates, offered invaluable aid. They organized the task from beginning to end while researching various subjects. We would also like to thank the staff at R. R. Bowker Company, Book Division, Professional Books, in particular, Nancy Volkman, Senior Editor, and Corinne Naden, Sponsoring Editor.

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Croton-on-Hudson, New York

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INTRODUCTION

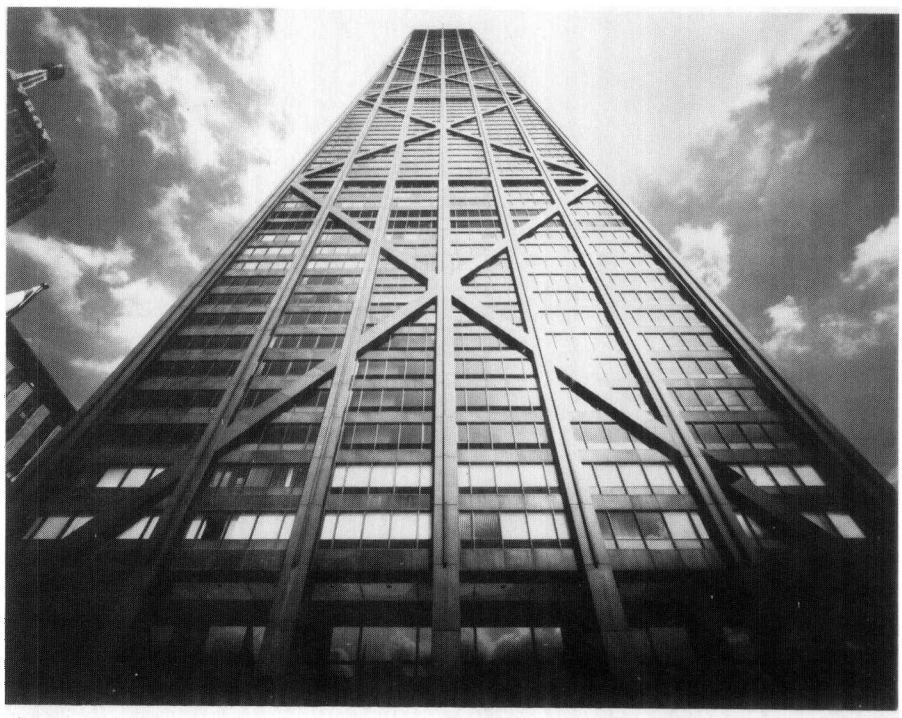
Since about the early 1950s, scientists have been predicting a computer revolution. Some people have awaited it with eagerness, others with trepidation. Computers are supposed to replace the traditional ways of doing things: Libraries will wither away;

bibliographic information, journals, and entire books will be replaced by voice-activated audiovisual devices; the only training required to use the equipment will be the human abilities of mind, vision, hearing, and speech. Machines will do the rest.

There are indications that this scenario is not science fiction. Nearly every day another publication runs an article on how computers can be made to think, talk, or see. Every other day someone announces that all the technologies are in place, and it is only a matter of integrating them. Certainly, libraries of leather bindings and printed vellum have become museum pieces, while most institutions contain at least one complex telecommunication device. The industry of electronic gadgetry appears to be growing by leaps and bounds. Computer-accessible, commercially available databases are basic tools in many areas of research.

But wait one moment! Before we throw away the last vestiges of traditional library science, let us look at library shelves. They are filled to overflowing: Books and paper are still with us. Even the computer printout requires miles of shelving. The publishing industry seems on a rampage that even recessions have not stopped. In the past quarter-century and more, a number of libraries have had to cope with collections that grew at speeds approaching geometric progression. Some double every

At the current rate of growth, by the year 2050, most major academic libraries will be required to house 200 million volumes and 6,000 miles of shelves. Their buildings would have to be 20 stories tall and each floor would take up one million square feet!



five years. All over the nation there are libraries without one more inch of space and little hope of any additions.

What causes this rampage? Perhaps it is the increase in the general level of education and the specialization in various fields. Complain as we will—with some justification—about levels of literacy, the overwhelming majority of American adolescents finish high school and a high percentage go on to college. Today, just about everyone reads something—although critics tend to dismiss most of the material and insist that, as a nation, we spend too much time in front of the television set.

There has been a vast increase in the number of popular paperbacks since the 1950s, and periodicals specific to small industries seem to pop up every day. (See tables on Book Production Growth and Book and Periodical Price Increases.) Many are free of charge, depending on advertising revenue. Another reason for this growth may be the merchandising techniques of the publishers. Best-sellers can be found on drugstore and supermarket racks as well as on bookstore and library shelves. Discount bookstore operations are prevalent. Some have worked hard to attract potential buyers by staging events. A few authors appear often on TV talk shows and there is the growth of other media forms—records, slides, films, microforms, cassettes, videotapes, and floppy disks. The differences from one type to another have a strong impact on the techniques of acquisition, cataloging, storage, reference, and circulation.

Although the field has professional status, libraries tend to pay poorly. Even so, until recently the field expanded at an unaccountable rate. And now libraries exist in fields where, in the early 1970s, they were nonexistent. Special libraries—facilities devoted to corporate or

BOOK PRODUCTION GROWTH (U.S.)
Number of Titles Published Annually

Year	National	International
1960	18,000	332,000
1970	83,000	521,000
1980	100,000 (est.)	600,000 (est.)

BOOK AND PERIODICAL PRICE INCREASES (U.S.)

	Books		Periodical Subscriptions	
Year	Average Purchase Price	Percent Increase (Compounded)	Average Purchase Price	Percent Increase (Compounded)
1972	$12.99	—	$13.23	—
1974	14.09	6.3%	17.71	51.9%
1976	17.39	31.2	22.52	93.1
1978	19.30	45.7	27.58	136.5
1980	25.30	90.9	34.54	196.2

government agency needs—have been an especially fast-growing segment. Although a shaky economy threatens this growth, there are more paper, more books, more media, and more librarians than ever before.

But, just on the horizon, signs of shrinkage appear. Technical process takes up less room than it did in the 1950s. Computerized cataloging networks are routinely accessed over telephone lines, allowing many of the simpler routines to be handled by clerks. Acquisitions also can be performed on-line, freeing professionals for other roles. Stand-alone, automated circulation systems are common, as are electronic security systems. Even totally integrated acquisition-through-circulation systems are appearing on the market. The goal is to rid the professional staff of the routine work, make clerical jobs unnecessary, and give everyone more time for direct patron service.

Indeed, the electronic revolution is beginning to have a major impact on library functions. Many facilities are changing from book and paper storage centers to places of information service. Until recently, except at the reference and circulation desks, little face-to-face interaction ever occurred between user and staff. Patrons were expected to peruse the card catalog on their own and, in open access libraries, browse the stacks on a self-serve basis. Even in closed-access libraries, patrons rarely interacted with the staff, except to speak to the pages. Instead, patrons were expected to await silently the delivery of materials and just as silently read their books. Libraries tended to be quiet by their very nature. Card catalogs were often raised to the level of icons by the staff. When confronted with the idea that there might be a large backroom staff, most patrons were stunned. As far as they were concerned, books seemed to find their way onto the shelves miraculously.

Among the many collections that have greatly expanded are foreign books and serials.

In this machine age, with the plethora of equipment, librarians are being forced out of the woodwork. New, more visible, service-oriented roles are necessary. Searches, for example, require patron interviews. Often the patron and staff member must converse extensively in order to delineate exactly how the search can be made. Those very same searches have created a tremendous increase in interlibrary loans, another area for patron-staff interaction. Copiers have become an important source of revenue for some facilities, but pirated material is such a problem that changes in the copyright laws have turned some librarians into police officers. They find themselves arbiters of what can and cannot be copied legally on their machines. Then, too, along with the increase in complex equipment, librarians find themselves assuming responsibilities of teachers, researchers, and machinists.

The functions of certain equipment are not always self-explanatory, and some machines are not especially easy to operate. Others must be kept in constant states of cleanliness or repair. Furthermore, most users are not sufficiently knowledgeable to access properly the various equipment. Few understand the variation in methods or even in terminologies from one machine to another. The terminals and other pieces of equipment vary considerably from company to company. Keyboards tend to be different; electrical connections are rarely the same. A technologist's understanding is required. For that reason, certain librarians must have specialists' knowledge in a variety of fields—becoming renaissance men and women, as it were.

For book-oriented librarians, this transformation is as unwanted as it is cataclysmic. They do not like the world of electronics and resist understanding it. Yes, they appreciate the strides made in cataloging, circulation, electronic security, and perhaps even bibliographic information, and such breakthroughs tend to make their work-a-day world easier. But when it comes to using electronics for patrons, some librarians tend to step back and look the other way. The location and comfort of microform equipment is a perfect example.

Microform equipment is often relegated to dark closets or out-of-the-way places in patron areas. In some of the more traditional libraries, the machines are difficult to find and even more difficult to use. Most people using the equipment also need space to write, but the machines are placed on tables barely big enough to accommodate them, let alone paper and pencil. Lighting is even worse. It is grim and dark. When patrons do not use the microform equipment, it is taken as proof that people will never use them. This argument is heard time and time again—even in special libraries where microforms are in constant use in other departments.

But, even here, the revolution is about to make its mark. Machines are being produced that are "friendlier" and not as prone to break down. Equally important, furniture is being manufactured that takes machine requirements and the human body into consideration. Architects, engineers, facility planners, and interior designers are beginning to create

environments that integrate the traditional needs of libraries and the requirements of the electronic revolution. Thus, the tiny library with enough funds for collection development but with little space into which it can expand will be able to grow prodigiously in terms of service. Miniaturization and computerization will allow that small library to compete successfully with larger institutions. Large physical plants that house row upon row of shelving will no longer be necessary.

Audiovisuals also promise to have a vast impact on book and paper storage. The library with a tiny listening center may soon find itself circulating videotapes, videodisks, computer graphic cassettes or disks. Certain fields of education, especially the sciences, are more easily understood in visual rather than verbal form. Medical surgical techniques are routinely taught by film. Various management techniques are also more quickly understood through films, especially when accompanied by charts and graphs.

Because of the growing emphasis on media, one could say that school libraries have been in the vanguard of the electronic revolution. This statement may surprise many, but since about the early to mid-1960s, school librarians have had to handle a multiplicity of media. In fact, long ago many libraries changed their names to "multimedia libraries" or "learning resource centers" to indicate that they are more than book-oriented.

In the field of computerized information services, special libraries have tended to lead the way. There are several well-known special libraries housed in small rooms that contain the electronic ability to gather information stored in huge record warehouses. Some of their databases are full text.

While special libraries led the way in the field of information services, academic libraries forged ahead in computerized cataloging. Automated circulation systems have been the special province of public libraries. When considering automation, most academic libraries regard their extensive card catalogs as the first areas of attack. Public libraries tend to be more interested in first solving the problems of circulation. Obviously, cross-referencing of electronic systems from one type of library to another is becoming common. This is particularly true as the systems become less costly and easier to use. Now that the difficulties are being worked out, automated systems that are a function of such machinery have broad applications to all libraries, regardless of size and type.

Yes, automated systems—processes and/or materials handled by machinery in a systematic manner—have wended their way from factory to office to library. One reason has to do with simple economics; salaries and benefits are more expensive than the capital and operating costs of equipment. Then, too, why waste human resources on routine, repetitive tasks that can be handled more quickly by machines? Why not free valuable staff for more productive jobs? A greater volume of services may be accomplished with the same, or perhaps, fewer staff and at

lower operating costs. Such an idea is particularly attractive at a time when inflation and productivity losses are on everyone's mind. Library management is especially interested in productivity since operating costs have increased in staggering proportion to fixed costs over the last few years.

Lately, it would seem, library collections are affected by every salary increase and/or every repair to the physical plant. The collection budgets have not kept up with the basic inflation rate, and cuts in operating costs make matters worse. For example, the basic inflation rate of journals combined with the increase in the number of foreign subscriptions and the devaluation of the dollar have made the cost of maintaining foreign journal collections exorbitant for many facilities. The growth within less well-endowed institutions has come to a halt. Monies must be diverted elsewhere—sometimes to other parts of the collection, at other times to keep the facility in repair, or to pay employees.

This is an unhappy state of affairs. After all, patrons usually visit libraries because of the information that can be gained there. Without the collection growth or the ability to use other methods to retrieve information, libraries face difficult tests of survival. That is why a national periodical center has been a topic of conversation for many years and why electronic information retrieval makes sense.

The major challenge, then, is to provide a high level of information services while holding the line on costs. The new technologies should aid this effort. The aim is to make people working in libraries more professional and more productive. That idea implies that the number of low-level clerical jobs will shrink. It also implies that people trained in the latest methods of information recognition, information retrieval, and systems approach to automation will be at the forefront of the revolution. Then, too, because of increased reliance on miniaturization and computerization, the space set aside for simple storage will cease its constant expansion. In fact, when it comes to space, facilities that do not have to maintain large research collections may actually contract. Only up-to-date materials will have a place on the shelves; the rest will be accessed by a variety of methods, many of which will be electronic.

Of course, substantial staff reorganization will be required once a decision is made to change from a book storage center to a more service-oriented operation. Such a reorganization will require an understanding of the resource, staff, and user requirements of a more service-oriented mode. Of the three, user needs are the most important. This is difficult for some to understand, perhaps, because so little face-to-face contact takes place between backroom staff and patrons. The technical process staff, in particular, are accustomed to working only among themselves. Although user needs do filter through to them in traditional facilities, demands are not immediate. Suddenly, the staff are asked to change long-entrenched ways of doing things—and the reasons are not always clear.

Ironically, as backroom staff are having their difficulties, front line

staff may find that reorganization is not to their liking either. Telephone reference centers, for example, have become exceedingly popular. There are users who want information quickly, do not have the time to research the proper text, and do not care to fiddle around with impersonal machinery. They want answers from a friendly human voice. Reference librarians, whose previous tasks required them to work with and direct users to various sources, may find themselves employed behind the scenes answering phones and continually interacting with machines.

Obviously, such job changes require advance and systematic planning. The staff must understand that their jobs will differ as points of service change. In some facilities, the information desk may be the hub around which everything else revolves. The information desk concept not only implies job changes, but substantial reorganization of space layouts.

Most traditional libraries do not have information desks. In those facilities, clerks at the circulation desks are expected to field most directional questions and refer patrons to reference for the library service questions. But in the information-oriented facilities, an information desk is a necessity. It is directly in view from the entrance, and it is from that point that professional librarians are expected to offer immediate service. Tasks include ready reference as well as directional responses, teaching patrons how to use the new COM (Computer Output Microfilm) or on-line catalogs, aiding patrons in the use of other important library machinery, and perhaps fielding some quicker on-line search questions. The information desk must be fairly large and certainly highlighted architecturally. It must contain shelving space for reference book storage, counter space for machines, adequate electrical and telephone connections, and, perhaps, even seating space for users.

Obviously, the area around an information desk will be noisy. This is a far cry from the more traditional "quiet please" libraries. In fact, some service-oriented libraries have acoustical problems. In any facility where conversation, machine noise, and study take place simultaneously, there is bound to be an acoustical problem. Some facilities will approach the bustle of a large open office—architects and interior designers take heed!

It is obvious, then, that these new, more service-oriented facilities are more complex to create. Architectural, interior design, machine, and human factor requirements must be integrated into library service needs. Problems arise, for example, when distributors of electronic systems do not incorporate simple human factor principles in their layouts. Although the equipment may be first rate, if it is improperly placed it may be less than helpful. What good is a word processing unit that uses an impact printer in an area where quiet is desirable? Or what good are compact shelving units that house frequently used materials and are located across the facility from the primary patrons? Work flow and traffic patterns of people and information must be evaluated. It is necessary to

Electronic equipment is evident and in use at the main entrance and circulation desk of the Atlanta Public Library.

define clearly what new services are supposed to accomplish, what special equipment is needed, and how that special equipment is to be placed in terms of the users and staff. Guidelines should include location, square foot requirements, lighting, electrical, and ventilation considerations, floor loading requirements, and so on. It must be understood that library planning is no longer a matter of installing book shelving, staff work stations, and patron tables—if it ever was. To meet the challenge of the electronic and automation revolutions, library planning must incorporate techniques of industrial engineering. Library facility planning has become very complex, even for some of the small facilities.

In the following pages we will deal with many of the problems of automation and how these problems affect library facilities. We will concentrate on management techniques, work flow, and physical design. Through our seminars and consulting practice, we have discovered that the planning process for the large and small libraries tends to be the same. The differences lie only in scale. For example, computerized equipment depends on good electrical and telephone distribution. A facility with inadequate distribution can only make poor use of these technologies until renovation proceeds. We intend to outline the steps in the process so that they are clearly and easily understood.

CURRENT LIBRARY TRENDS

1. Prodigious materials growth
2. Inflation—increased cost for materials, other resources, staff, and services
3. New user requirements and/or expectations
4. Changing demographics
5. Technological developments
   a. Computerization
   b. Miniaturization
   c. Audiovisuals
   d. Security
6. Cooperative library networks
7. Prodigious growth of profit information services
8. Penetration of other and very aggressive professions into traditional library fields
9. Developing or proposed national systems
   a. Nationwide bibliographic system
   b. National periodical system
   c. Library of Congress activities

It is difficult to guess the future. The beginning of the twenty-first century surely will bring many changes that cannot be envisioned at this moment. What is certain is that if the current rate of change continues, libraries in the year 2001 will be vastly different than they are today (see Current Library Trends). Some will be far less concerned with the written word, and more emphasis will be placed on the audiovisual. To meet this challenge, we must become more flexible and less rooted in the traditional technologies.