

AUTOMATION IN LIBRARIES

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Introduction

Since the advent of the term automation in 1936, plethora of definitions are found in library literature. Sometime the terms 'mechanization and automation' looked overlapped, although there is a difference of one degree between the two. Mechanization was aimed at handling problems of bulk, weight and distance at replacing muscle and movement with machines. Automation is the name given to an automatic system of working. A few meaningful definitions are examined hereunder.

DEFINITION

Encyclopaedia Britannica Defines Automation

"The name given to an automatic system of working. The difference between automation and mechanization, a related term, is being mainly one of degree".

Mr. Harder introduced automation in 1936. He defined it initially as "the automatic handling of parts between progressive production processes".

Since then the term has been applied to a wide variety of automatic machinery and automatic systems, and is commonly used to describe any operation in which there has been a substantial substitution of controlled action for human efforts or intelligence.

Encyclopaedia Of Library And Information Science

Library automation is the use of automatic and semiautomatic data processing machines to perform such traditional library activities as acquisitions, cataloguing, and circulation. Although these activities are not necessarily performed in traditional ways, the activities themselves are those traditionally associated with libraries; library automation may thus be distinguished from related fields such as information retrieval, automatic indexing and abstracting, and automatic textual analysis.

Linguistic purists have argued rightly that the term "automation" applies more correctly and narrowly to automatic process control, and indeed this was historically the first use of the term. The broader meaning, however, has had the sanction of widespread usage for a number of years, and "library automation" is now by far the most commonly used term for mechanization of library activities using data processing equipment.

GENERAL CHARACTERISTICS

The characteristics of an automated system are:

1. The operations/processes are carried out automatically.



2. Avoids or reduces human action and thus saves labour.
3. It accelerates efficiency and speed in operation.

HISTORY AND DEVELOPMENT OF AUTOMATION

From centuries together libraries have sought technological aid to facilitate and augment their service to readers. For example, the introduction of a simple typewriter into libraries dates back to the late 1800s. Historically the phrase "Library automation" too has been used many a time synonymously with "Library Mechanization" which from some quarter was not considered quite accurate. On the other hand it was felt convenient to simply equate library automation with "computerization". But today without any controversy the term 'Library automation' is used extensively to refer primarily to the use of computers to perform some of the traditional library activities such as acquisition, cataloguing, circulation, and serial control etc. Conventionally the related fields such as information storage and retrieval (ISR) automatic indexing and abstracting, automatic text analysis etc. did not fall within the purview of 'Library automation'. This distinction has now almost disappeared. Information systems, is included in the context of automation. Although computers are playing primary roles in library automation today, the roles played by telecommunication technology, video technology, micrography, and reprography are of great significance because of the magnitude of support they offer to library automation.

Punched Cards Systems

Before the advent of computers, International Business Machines (IBM) and Remington Rand led the way to business technology by introducing equipment such as keypunch machines and electromechanical card sorters and collators. Although these devices were not computers, they had certain similar qualities such as they could read, compute, and manipulate data recorded in reusable form. William Saffady mentioned that as early as the 1930s and extending into the 1960s, a number of libraries in the United States had used punched cards in combination with sorters, collators, and other equipment as an alternative to manual record keeping.

In the United States Ralph Parker installed a Hollerith punched-card system for circulation control at the University of Texas in 1936 and by the middle 1940s had also experimented with its use in serial record control. In 1942 the Montclair Public Library of Montclair, New Jersey, installed "two specially designed book charging machines" which recorded individual transactions automatically in punched cards. The Library of Congress produced a book catalogue using punched cards in 1950, and the King Country (Washington) Public Library another one in 1951.

These were scattered instances of mechanized systems, however. More were installed in the late 1950s and early 1960s, but most of these were in small, specialized libraries. Typically, such systems used standard punched-card equipment, sometimes called "unit record" equipment because the punched card as a unit record was central to its operation.

Computerized Library Systems



Computers were not used before about 1961, and in this respect library automation lagged behind business, industry, and science. The lag was not due to lack of interest and enthusiasm on the part of librarians; however, computers were still assumed by most people to be satisfactory only for numerical work, and computer programs were still oriented business and scientific applications. Even unit record equipment was difficult for most libraries to obtain until their parent institutions-universities, local governments, and businesses-had obtained computers.

The general-purpose computers that were widely available in the 1960s opened new era of library automation systems. Punched card equipment remained in use, but played only secondary and insignificant role. Most of the computer systems common in the 1960s used punched cards for input and thus the information was fed into the system in a way like unit record systems. But once the data were entered many other operations could be performed during a single processing. More important aspect was that the system could "remember", storing information regarding book orders in progress, books held or on loan, periodicals received and so forth all on magnetic tape. Moreover, the information could be transferred automatically in and out of the computer "core" storage as needed for complete operations.

Availability of computers on wider scale, subsequent improvement in data processing capability, and reduced cost together gave impetus to growth and rapid development of library automation in the 1960s. Another realization that computer could be used effectively for non-numerical work further augmented interest in computer use.

While the 1960s saw the emergence of computer applications in libraries and the 1970s ushered in the online era, it has only been in the 1980s that automation has become a feasibility rather than a goal for the future for large number of libraries in the world. It makes the first half of the 1980s quite different from the previous decades but the later half added new dimension providing unimaginable facilities through variety of automated methods used for library operations.

NEED FOR AUTOMATION

Various factors have contributed to bring about change from conventional to automated library operation. Broadly speaking the main reasons behind this change are as under.

1. Growth Of Document

The amazing growth of documents especially in areas of sciences, social sciences and technology in the form of book and non-book material forced the library planners to utilize new technology for the organization of information since the traditional library methods failed to cope with the task.

2. Users Services

Heavy influx of documents added new dimension to user's needs. It is only the computers which can ensure improved and quick service. For example the manual work of housekeeping such as acquisition, cataloguing, circulation, serials control, etc. can be done with greater

speed and efficiency with no arrear and backlog kept pending. Automated cataloguing provides variety of access points to a greater volume of information. Online catalogue has made it possible for a reader to press the key of the typewriter like terminal and have access to large bibliographical databases and obtain information in whatever field. It can be viewed on screen and if it is needed a printout can also be obtained. Modern services such as current awareness service and selective dissemination of information can also be introduced efficiently.

3. Greater Efficiency

The workflow in the library may be made more rapid, more systematic and efficient with the help of the computer. The records in the computerized store are more accurate, more reliable and more accessible than the manually prepared records. All sorts of housekeeping jobs and information works can be performed with more speed, accuracy and greater efficiency.

4. Cooperation And Resource-sharing

No single institution, however resourceful can now collect, organize all documents available all over the world even in a specific field. Nor any one organization can collect all documents in the areas of interdisciplinary and multidisciplinary subjects. During the last two decades there has been an increase in cooperation and resource-sharing on the part of libraries by developing computer-based systems. It has two advantages: (a) access to more documents and information sources due to coordination and cooperation of many libraries in a system and (b) less expenditure, because the total cost is shared by a number of library in the system. The computer-based library systems, such as Online Computer-based library centre (OCLC) in the United States, the University of Toronto Library Automation System (UTLAS) in Canada and the Birmingham Libraries Cooperative Mechanization Project (BLCMP) in the U.K. are functioning successfully with increasing databases and multidimensional services.

The advantages of library automation are far-reaching. Housekeeping jobs aside, the facilities of time-sharing and online services have made library automation more effective for efficient and appropriate service. Today only computerized library can take part in computer networking and information networks at national and international levels. It is the only way in which efficient standardised and faster service is assured, besides access to a world of information and data.

COMPUTER APPLICATIONS IN LIBRARIES

The application of the computer to library operation has two aspects namely housekeeping routines and information storage and retrieval. The housekeeping routines include acquisition and ordering work, cataloguing, circulation control, serial control, and keeping of records, statistical for overall management purpose. The application of computer to information service comprises generation and collection of information, information retrieval, current awareness services, selective dissemination of information, computerized databases, information transfer and distribution etc.

In the field of housekeeping routines, the job description amenable to computerization in each area is outlined as follows:

1. Acquisition Work

- (i) Selection of material
- (ii) Checking of duplication
- (iii) Ordering work
- (iv) Preparation of order cards/slips
- (v) Sending orders (offline or online) to suppliers/vendors
- (vi) Updating record file
- (vii) Verification of books with order file and invoices
- (viii) Accession work
- (ix) Print out of received and non-supplied documents
- (x) Control of book budget i.e. expenditure incurred and balance.

2. Cataloguing

- (i) Preparation of Authority file/thesaurus or subject Heading list
- (ii) Original cataloguing (offline or online)
- (iii) Arrangement of catalogue cards into classified, alphabetical or subjectwise alphabetical.
- (iv) Preparation of shelf-list
- v) Preparation of list of catalogued item (accession list) in any desirable form.
- (vi) Provision of access points in a variety of ways and in an appropriate physical form.
- (vii) Centralized/cooperative and shared cataloguing possible.

3. Circulation Control

- (1) Registration of members
- (ii) Issuance of borrower cards
- (iii) Charging and discharging of items
- (iv) Preparation of overdue and recall notices
- (v) Updating of record file
- (vi) Managing of book reservation system



(vii) Calculation of necessary fines for overdue books (viii) Detection of problem borrower at the point of issue.

(ix) Maintaining statistics in variety of forms.

4. Serial Control

(1) Selecting suitable title for purchase

(ii) Generating purchase orders; renewal and new

(iii) Receiving issues and claiming issues not received

(iv) Preparing catalogues of serials and other records.

(v) Keeping current and accurate details of serials holdings.

(vi) Allowing access to details of current holdings.

(vii) Routing individual issues to various members.

(viii) Organizing completed volumes of serials for binding.

(ix) Exercising budget control and producing management information.

In the area of information retrieval process three tasks are generally performed by the computer, i.e. indexing, storage or organization of information in a desired format, and retrieval or recall of information whenever required. Job description amenable to computerization is outlined as under:

Information Retrieval Process

(1) Indexing of documents

(ii) Preparation of Thesaurus

(iii) Abstracting

(iv) Inter-library loan

(v) Reproduction of documents

(vi) Compilation of Union Catalogue

(vii) Bibliographic work

(viii) Searching and providing printouts of relevant information

In order to meet demand of the user, libraries have to build up their own databases with the help of computers. Catalogues, indexes, bibliographies, union catalogues are, in a sense example of databases. They only need conversion into machine-readable form. These jobs are now widely done in libraries. Databases on specific subjects, interdisciplinary and multidisciplinary areas are also being created in the library for anticipated and potential use of the patrons. The kinds of databases prepared in the library are usually known as in-house

databases. But their creation, organization, arrangement, storage, retrieval and distribution is entirely based on automation.

Libraries too have access to external databases. These databases are created, promoted, and maintained by local organization, national and international agencies to provide access to comprehensive information resources on specific areas for their own research and need. Some scientific and technical organizations also establish databases and make them available to customers on commercial basis. The only condition for the libraries to have access to the external databases is that they must have a compatible computer system, be prepared to process software packages or be connected by online facility within the country or outside the country.

The databases may be divided broadly into four groups according to their purposes and contents, viz, bibliographic databases, non-bibliographic databases, textual/numeric bases, and catalogue record databases. The bibliographic databases such as INSPEC, SCISEARCH, COMPENDEX, CHEMABS, MEDLAR, BIOSIS hold comprehensive data on science, science citation index, engineering indices, chemical abstracts, medicine, biological sciences respectively. There are many other such computerised bibliographic databases. The non-bibliographic databases are of the directory type. They hold actual text or information rather than references in machine readable form, They mostly concern with business, financial statistics, industrial data, social sciences, economics, banking, marketing etc. Librarians are closely concerned with these databases. Such databases are accessible via the similar channels as bibliographic databases. Textual/numeric databases are also non bibliographic and include numeric, textual-numeric, properties and full text databases. The catalogue record databases are online computerised catalogues of national libraries like the Library of Congress, National Library of Canada etc. These are all machine-readable catalogues (MARC). If a library has a set of compatible computer, the MARC tapes can be used in great variety of purposes. For example printed catalogue for public use can be obtained out of the MARC tape mechanically.

In the United States and Europe, computer is heavily used for current awareness service. The users are kept informed of the latest information in their respective field. Selective dissemination of information (SDI) has been computerized in number of libraries. The service comprises two kinds of jobs: description of documents received and preparation of users profiles indicating their areas of interest. Computer easily does matching function and transmits information with the least human involvement.

Thus the use of computer in various library activities has proved Landau's concept of 'Library-in-a disk' a reality. This revolutionary concept which envisages 'Paperless Information System' or according to Lancaster 'Paperless Society' has brought about drastic changes in library outlook. As stated before, in developed countries manual library operations are fast vanishing giving way to automated systems. These modern and dynamic innovations are providing library service as "Libraries without walls with an ability of free access (or paid) to world information. But the role of librarian has not diminished in this changed scenario; it is being modified to make him an Information Specialist.

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