Substitutes for the Card Catalog

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If this paper had been written 75 to 100 years ago its title could have read "The Card Catalog Is Superseding Manuscript, Sheaf, and Printed Catalogs," for during that period the now familiar dictionary card catalog was gradually developed, and by 1900 it had displaced virtually all other forms of library catalogs in the United States. Few librarians doubted its superiority in 1900, yet many question its arrangement today and seek substitutes for both that and its material form. We are concerned here with the physical aspect of alternatives for the card catalog, and only incidentally with the arrangements which may be in use. There does not appear to be a trend toward any device which will replace the card catalog in the near future as the basic record of each library.

The record-keeping world has learned from librarians the real advantages of a card catalog, based as they are on recording one unit of information on one card, duplicating the card in quantity, and filing copies of it in as many places as are necessary. The advantages and disadvantages deserve recapitulation below, to serve as background for what is to follow:

Advantages.

1. Flexibility. A new card can be inserted at any point in the catalog at any time, or a card can be removed.
2. Currency and completeness. Because of flexibility, a card catalog always can be maintained and revised to any degree of currency and completeness of which the catalogers are capable.

Disadvantages.

1. Difficulty of consultation. Only one card can be seen at a time. Guide cards in a catalog tray, even when freely used, are a poor substitute for an arrangement seen on a page.
2. Limited availability. Card catalogs are so difficult to prepare,
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distribute, and maintain that it is impractical to provide duplicates outside the library systems to which they apply. The principal attempt at such duplication, the deposit of Library of Congress printed catalog cards in author order only, grew to 105 sets in forty-five years, yet eighty-seven libraries have given up the maintenance of their depository catalogs since 1947, when the same information was made available in book form.

Printed library catalogs afford the converse of the advantages and disadvantages of the card catalog. They are easy to consult because many titles and the plan of arrangement can be seen on the opened pages, and they are widely accessible since they may be published in many copies. They are never current and complete, because additions are impossible once the pages have been printed. Yet the advantages of printed catalogs are those desired by scholars, while those of the card catalog are those which are of greatest convenience to librarians in administering their libraries. A good many surveys confirm this observation by showing that scholars do not make as much use of the dictionary catalog as they do of printed bibliographical sources of information.

Unfortunately for librarians and scholars, library technology has not advanced to the state where a combination of orderly arrangement, flexibility, currency and completeness, ease of consultation, and widespread availability can be provided for any library’s catalog, or for that matter for any union catalog showing the contents of many libraries, or for any indexing and abstracting service, or for any bibliography. In actuality, library technology has succeeded only in refining and combining the techniques which were known a century ago. Thus, the sheaf or loose-leaf manuscript catalog provides a compromise between the ease of consultation of the printed catalog and the flexibility and currency and completeness of the card catalog; and when the leaves are printed, the loose-leaf catalog has the further advantage of widespread distribution. The cumulative plan of publishing catalogs in book form furnishes a further compromise which overcomes the difficulty of maintaining a loose-leaf catalog but introduces the necessity of consulting a succession of alphabets if a complete search is desired. Strangely enough, the most modern and advanced substitutes for the card catalog employ the earliest form of record used in libraries, a chronological list of receipts, better known to librarians as the accessions record, because they entail sequential scanning of the complete compilation to locate information. Since an
accessions list offered no orderly author-title-subject approach, librarians gave it up long ago as a means of access to their collections and adopted various orderly arrangements—first, classifications and then alphabetic subject headings and alphabetic arrangements of author and title entries—because it was not practical to read the entire record for every search. Whereas an accessions record grew only at one end of the sequence, the orderly arrangements expanded anywhere within themselves. This situation was a real obstacle in catalog production until the card catalog provided a practical solution to the problem of unrestricted growth.

The new machines which accomplish sequential scanning of the complete record rapidly enough to be practical employ electronic devices to achieve their speed. They include two International Business Machines sorters,¹⁰,¹¹ which search 650 cards per minute; the Rapid Selector,¹²⁻¹⁵ which scans 500 feet of microfilm or 120,000 choices a minute; and the various electronic analog and digital computers,¹⁶⁻¹⁹ whose records consist of charges on wire, tape, and disks. There is already sufficient experience with the sorters and the Rapid Selector to assure the recovering of information by using them. While experts have asserted that computers can be used for storing and recovering bibliographic information, there has been no experimental confirmation of their claims.

The new machines are commonly thought of as solving the problem of subject control; and while they could be employed in searching for author and title entries, they are not being used experimentally in that way now. Yet our research librarians know that author and title entries are fully as valuable and as frequently used as are the subject entries in their catalogs, especially in the present state of cataloging and bibliography. It cannot be said, moreover, that a complete record by subjects will make author and title records unnecessary, for they are legitimate objects of search and identification in themselves. A universal catalog or bibliography will need all three kinds of entries. If the machines are viewed as opening up the possible achievement of a universal catalog, a little arithmetic soon reveals that one scanning of a universal catalog with any of the machines will still require many hours and probably many days to accomplish.²⁰ A realization of this situation has already led to searching several questions on the sorters for each use of the complete record, thus dividing the operating time by the number of questions which can be asked simultaneously.
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The alternatives to a conventional card catalog really are few. They are:

1. Sheets (Books)
   A. Bound printed catalogs
      a. Successive editions
      b. Basic catalog plus supplements
      c. Cumulative editions
   B. Loose-leaf manuscript and printed catalogs
2. Punched Cards (fully mechanized)
3. Continuous Strips
   A. Microfilm
   B. Magnetic Tape and Wire
   C. Magnetic Disks

Table 1 details the values of these devices.

The author is aware of the publication of catalogs in book form to supplement card catalogs, but of no instance in recent years in which a card catalog has been superseded by one of the substitutes in Table 1. History has so far confirmed Charles Martel’s opinion, expressed in 1926 when he was chief of the Catalogue Division at the Library of Congress: “. . . there are probably few among us that entertain any doubt that so far as the physical form is concerned, the card catalog is on the whole the best for the library’s principal catalog and for general use. The arrival of the printed card has indubitably settled the question—at least for the time being.” “It is time to get accustomed to the idea that the great centralized catalog is worth its keep . . . The card catalog may need to be kept in bounds by printing comprehensive book catalogs—to which the card catalog may be the supplement for the current accessions.”

Martel foretold accurately the action which was taken by the Library of Congress twenty years later, in stating: “The most wanted labor saving device in the business of making catalogs has not yet been found—it is a relatively cheap process of photographic or other faithful reproduction of the printed catalog card—typographical reprinting is unreliable and comparatively expensive. When we have that process one of our most serious problems will have been solved.” In the late 1930’s a committee of the Association of Research Libraries, with William Warner Bishop as chairman, proposed the photo-offset reproduction of Library of Congress printed catalog cards in one alphabet
### TABLE 1

**Strengths and Weaknesses of Various Alternatives to Card Catalogs**

<table>
<thead>
<tr>
<th>Name of Record</th>
<th>Physical Form</th>
<th>Arrangements Possible</th>
<th>Flexibility of Interlocating New Entries</th>
<th>Currency and Completeness</th>
<th>Ease of Consultation</th>
<th>Widespread Availability</th>
<th>Speed of Searches in Subject Arrangements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card catalog (3 x 5)</td>
<td>Cards</td>
<td>1. Numerical 2. Accessions 3. Alphabet 4. Dictionary 5. Classified</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Poor—only one entry visible at a time</td>
<td>Impractical—too expensive to distribute and maintain</td>
<td>Slow</td>
</tr>
<tr>
<td>Punched cards (fully mechanized)</td>
<td>Cards</td>
<td>1. Numerical 2. Accessions 3. Alphabet 4. Dictionary 5. Classified</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Poor—requires mechanical searching for some types of information</td>
<td>Impractical—too expensive to distribute and maintain cards; requires machine installation at each place of use</td>
<td>Medium</td>
</tr>
<tr>
<td>Manuscript sheaf catalogs</td>
<td>Loose-leaf book</td>
<td>1. Numerical 2. Accessions 3. Alphabet 4. Dictionary 5. Classified</td>
<td>Poorer as entries become more crowded; leaves must be rewritten or retyped</td>
<td>Excellent</td>
<td>Good, if leaves are rewritten or retyped to preserve order</td>
<td>Impractical to make copies</td>
<td>Medium</td>
</tr>
<tr>
<td>Microfilm</td>
<td>Continuous strip</td>
<td>1. Numerical 2. Accessions</td>
<td>None</td>
<td>Excellent</td>
<td>Poor—requires Rapid Selector plus photographic laboratory equipment</td>
<td>Poor—expensive to duplicate film; requires expensive machinery for searching</td>
<td>Very fast</td>
</tr>
<tr>
<td>Magnetic tape, wire, disks</td>
<td>Continuous strip</td>
<td>1. Numerical 2. Accessions</td>
<td>None</td>
<td>Excellent</td>
<td>Very poor—requires costly searching equipment; provides slow printing of answers</td>
<td>Very poor—costly searching equipment</td>
<td>Undetermined; probably very fast</td>
</tr>
</tbody>
</table>
arranged by author entry. The activities of this committee resulted in the publication of A Catalog of Books Represented by Library of Congress Printed Cards Issued to July 31, 1942, and later its Supplement, Cards Issued August 1, 1942 to December 31, 1947, altogether 209 volumes of about 600 pages each. Familiarly known from the publisher's name as the Edwards Catalog, this set, recording about 2,500,000 titles at once, took its place among the great book catalogs of the world.

The success of the Edwards Catalog, and the realization that its depository card catalogs represented a burden most depository libraries could not long afford to bear, lead the Library of Congress to seek means of continuing the publication of its cards in book form as well as their sale for use in card catalogs. The depository catalogs had been valued as a contribution to bibliography from the first, and issue of the cards in books was advocated as an extension of this. During the investigation Theodore Besterman visited the Library of Congress, and responded to its invitation to suggest a method by advocating a printed loose-leaf author catalog. In his article, "The Library of Congress and the Future of its Catalogue," he wrote:

Any acceptable solution of this problem must satisfy the following conditions: (1) the resulting catalogue must be complete; (2) it must always be up to date in one alphabet; (3) it must be universally available; (4) it must be convenient to use; (5) it must economize space; and (6) it must not be unduly costly.

I now venture to submit a solution which appears wholly or partly to fulfill all these conditions. . . . The proposal, in brief is this:

that an entirely new catalogue be set up in loose-leaf book form; that the type of the catalogue be kept standing; that the type of new catalogue entries be continuously incorporated in the standing type; and that at agreed intervals, monthly or perhaps even weekly, every page in which any change has been made should be reprinted and substituted for the original page in the catalogue.22

The Library of Congress studied the matter seriously, and encountered the following disadvantages, in addition to the reservations expressed by Besterman in his article:

1. Whereas the Edwards Catalog had been reproduced by photo-offset lithography from cards prepared during forty-five years of printing, there was no type standing for 2,500,000 entries from which the basic sheets could be printed. In 1946 it was estimated that com-
position, proofreading, typemetal, and storage facilities to put 2,500,000 entries into standing type would cost over $3,000,000.

2. The Government Printing Office was unwilling to hold so much standing type, and in addition, was unwilling to adopt a cumulative plan of publication which would have involved holding type for periods of even five years.

3. The expense of printing new leaves and of inserting them into costly loose-leaf binders for several hundred sets was considered to be greater than subscribers would care to pay.

The Library of Congress also was aware of the potentialities of fully mechanized punched card installations, of the Rapid Selector for high speed subject searching and reproduction of selected information, and of the rapid development of electronic computers, but these were recognized as inadequate for making the catalog widely available. The cumulative catalog method, adopted late in 1946, was a carefully chosen compromise which took advantage of conditions peculiar to the Library of Congress to obtain the best results possible in printing a book catalog from catalog cards. Photo-offset lithography was considered the most effective printing method, and it was readily available at the main buildings of the Government Printing Office. Philip L. Cole, then Director of Planning there, suggested that a great deal of space could be saved, in comparison with the Edwards Catalog, which reproduced only eighteen cards to the page, if the slugs of type could be rearranged to eliminate the white spaces before the cards were photographed in page form. Secure in the knowledge that the rearrangement could be done in the Branch Printing Office, located in the Library's Annex Building, Cole and R. C. Smith invented the Card Aligning Device on which the cards could be laid out and taped to cardboard to form pages for the camera, at about thirty-eight or thirty-nine entries per page.

The Library then adopted the following schedule of cumulative publication for what is now called the Library of Congress Author Catalog:

* Effective with 1953, the Library's book catalogs are issued in five sections and have consequently undergone another change of title:

* The Library of Congress Catalog—Books; Authors
* The Library of Congress Catalog—Books: Subjects
* The Library of Congress Catalog—Films
* The Library of Congress Catalog—Maps and Atlases
* The Library of Congress Catalog—Music and Phonorecords

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Monthly Issues: January, February, April, May, July, August, October, November, and December.
Quarterly issues: January–March, April–June, July–September. (The January–March number replaces that of January and February, for example.)
Annual volumes. These replace the three quarterly and three monthly numbers which make up one year's issues.
—ennial volumes. The largest cumulation to date is quinquennial, now in preparation to replace the annual volumes of 1948 through 1952.

The adoption of the cumulative style of publication solved the problems of flexibility and currency and completeness by requiring the user to consult more than one alphabet, but provided alphabets which are large enough to compensate for the need to consult several. The adoption of the printed book format meant that any arrangement could be used for the entries, that searching could be done faster than in any card catalog, and that users outside the Library of Congress would have the catalog available in what has since proven to be eight times as many locations as formerly. Sixty-three sets, of both the Author Catalog and Subject Catalog, are used within the Library.

The value of adopting a method which permits any arrangement was demonstrated in 1950, when the Library of Congress Subject Catalog was first published. Its entries are alphabetically arranged by the subject headings regularly assigned and traced on the cards. Variations of the cumulative catalog technique are used in the Library of Congress for its copyright catalogs; and further variations, employing a numerical record plus author and subject indexes, are utilized in the Department of Agriculture Library and the Armed Forces Medical Library to publish the Bibliography of Agriculture and the Current List of Medical Literature, respectively.

Since no library catalog is a complete record of the holdings of its library, and since few catalogs provide more than limited subject access to the cataloged material, librarians and scholars rely heavily on bibliographies, indexing services, and abstracting services, and on the published catalogs of large libraries, for access to information in their own libraries and for notice of information contained in other libraries. Collectively these published catalogs, bibliographies, in-

Each of the last three sections will contain an alphabetic subject index referring to the main entries in alphabetic order for full information about the cataloged materials.

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dexes, and abstract journals are more than a substitute for the card catalog, as just noted, yet there is no evidence that any one or any combination of the current publications in this field can be used to replace the card catalog of any research library or of any large public library. All libraries have possessed publications for many years which are not listed in these services, and notably acquire them currently before they are listed. No published register is likely to supersede, for flexibility, currency, and completeness, a library’s individual card catalog as an author record of its materials. It is too difficult, for one thing, to transfer the list of a library’s holdings from one edition of a catalog to a later edition, or from a number of small cumulations to a larger cumulation. It can be considered impossible to display a library’s holdings in any of the services which are arranged by subject, when they do not show the headings or class marks under which individual entries are made; and impractical even if such entries are traced, as they are to a very large extent in the Library of Congress Author Catalog.

A test was made at the University of California Library at Berkeley to ascertain whether the Library of Congress Subject Catalog, which has been since 1950 the world’s most comprehensive listing of general publications in a subject arrangement, could be substituted for its subject card catalog without recording California’s holdings in the printed volumes. The report on it includes the following:

The results of this investigation give partial support to the idea of substituting the LC Subject Catalog for our own subject cataloging. A sample comparison of the cards and LC Subject Catalog for the letters A and B, excluding UC theses, shows that 65 percent of the locally manufactured subject entries produced in 1950 were found in the LC Subject Catalog for 1950. On the other hand, of the 2,789 1950 imprints in letters A and B of the LC Subject Catalog for 1950, only 16 percent were found in the CU file. Other parts of the investigation showed that as time goes on more and more UC acquisitions appear in the LC Subject Catalog and theoretically it can be assumed that in the course of time substantially everything acquired by the University of California will appear in the LC Subject Catalog. Nevertheless, this information is imbedded in the record of vastly larger LC acquisitions and the probability of increasing numbers of abortive searches by users of the LC Subject Catalog as a local substitute is certain.

Consequently, it has been concluded that the substitution of the LC Subject Catalog (and for more recent publications, the Cumulative Book Index) for local subject cataloging is not feasible.24

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The daily experience of the Union Catalog Division staff in using the National Union Catalog at the Library of Congress provides another view of the great complexity of what has been termed bibliographical control. That catalog, with some 12,300,000 cards representing approximately 8,500,000 titles held in hundreds of U.S. and Canadian libraries, is the most comprehensive author catalog in existence. There is no accurate information of how complete a record it provides of North American holdings, but year after year the staff is unable to locate 25 per cent of the requests which reach it by mail, telephone, and personal inquiries. This record is not an undue reflection on the catalog and its staff, but rather emphasizes the remarkable improvement over the record of thirty years ago, when 75 per cent of similar requests could not be located. The present effectiveness is achieved with the additional aid of any catalog, bibliography, or indexing and abstracting service which the individual searcher chooses to use; but balanced against these remarkable resources are exceedingly difficult searches, for most of the titles have been sought by competent librarians in their own libraries before being sent to Washington on behalf of the persons needing the material, most of whom are well qualified in their own subject fields.

Since the National Union Catalog was microfilmed in 1952, and can be purchased in its entirety on 2,706 rolls at a cost of $10,824, for use in any microfilm reader accommodating 16 mm. film, it is physically available to any library as a substitute for its author catalog. There have been no purchases to date, however. In spite of its comprehensiveness and usefulness for locating books, there are the following disadvantages to the microfilm copy:

1. It is expensive, although not prohibitively so for very large research libraries.
2. It is filmed in several alphabets.
3. Although current receipts are filmed, they cannot be photographed in convenient arrangements.
4. It must be used in a microfilm reader.
5. Although a majority of the cards bear classification symbols, subject headings, or both, these are not coded, and consequently the film copy cannot be searched by subject with the Rapid Selector.

Are these disadvantages sufficient to prevent purchase, or has its undetermined incompleteness prevented purchase?

Published library catalogs, bibliographies, and indexing and abstract-
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ing services have been recognized almost since their first appearance as supplements to the catalog of any one library, and as the possible foundation of a universal catalog or bibliography. In recent years librarians have been seriously concerned about the deficiencies of these tools, which may be summarized as inadequate coverage and inadequate analysis (both author and subject); uneconomical duplication of entries by various individual publications; lack of currency; uneven distribution of the published volumes; and the high expense of production, purchase, and use. With the weaknesses so numerous it would seem that none of the services could be of much value, yet most of them are self-sustaining and actually are invaluable to their purchasers and users.

One of the favorite indoor sports of the library profession is to discuss and publish remedies designed to achieve the international integration of bibliographical services. A true measure of the difficulty of solving the problem, however, is that none of the efforts undertaken in the past century has succeeded, and that there is no plan which enjoys any widespread approbation and support at the present time. There is a most comprehensive survey which brings the reader to 1950 in Bibliographical Services, Their Present State and Possibilities of Improvement, prepared by Verner W. Clapp and Kathrine O. Murra for the Unesco/Library of Congress Bibliographical Survey.26 Neither that nor this paper, however, indicates that any technique will become available in the near future to replace the card catalog as a library’s basic record, or that there will be an improvement over photo-offset reproduction of catalogs in cumulative book form as a means of publishing a library’s catalog.

References

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