

A CURRICULUM-ORIENTED CATALOG OF MULTIMEDIA LEARNING RESOURCES

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INTRODUCTION

Medical schools are making increasing use of non-print learning resources. Valuable as instructional aids, these materials represent a considerable investment in planning and production. Many of the materials produced at one school are potentially exportable to other schools. The problem lies in determining what materials are available, where they are located and whether these materials are of value in other curricula.

Non-print media are different from text material in several ways. From the librarian's point of view, these differences are important in nearly every aspect of acquisition, cataloging, shelving, circulation and weeding. From the user's point of view the differences relate not only to the different impact of material presented by different media, but to the difficulties associated with selecting material for use. The librarian's role in cataloging non-print materials involves a responsibility to assist the user in making appropriate selections of these materials for a given learning requirement. The catalog described in this paper is an attempt to satisfy those needs in the context of a medical school curriculum. Because of the flexible design of the catalog, however, it is hoped that the concepts and the actual computer programs used to generate this particular catalog may find applicability in a wide variety of situations.

One of the difficulties facing the prospective user of non-print materials is the relative inaccessibility of the content for browsing. It is simply not possible to pick up, say, a videotape and thumb through it as one would through a journal. Because of this intractability of the technology-mediated material, the burden of adequate cataloging is significantly greater than in printed materials. These catalogs have other requirements greater than their text-related counterparts. They must contain descriptions of the physical media used to present the material. Often this description must include the specific model number with which the material is to be viewed or heard. Multimedia presentations are also common, so it becomes necessary to describe each of the separate media so that the user may determine whether he is able to utilize any or all the materials presented.

The non-print media catalog should therefore be more complete than one covering printed matter only. It should include the standard bibliographic citations appropriate for both print and non-print materials. It should

also include the physical description, with provision for multimedia, an increasingly important element in recent materials. It should abstract or describe the contents and their educational aims and purposes. And in addition, it should contain usage restrictions (a characteristic rarely associated with printed material). The catalog should also indicate the date of most recent update for the material referenced; unlike books, computer programs and some audio and video tapes can be and sometimes are recalled for modifications.

In addition to these necessary components of a non-print resource catalog, it is desirable to include specific references to the courses in which the material is used, and perhaps the manner in which the material is used within that course, such as group or independent study. The utilization experience of a particular resource also proves valuable in many instances, guiding the user to the number of times and ways in which the item has been used in the recent past.

We have not found in any one catalog all the components we need to serve our curriculum and our system. The National Medical Audiovisual Center's Audiovisuals for the Health Sciences¹ does not offer Medical Subject Headings (MeSH)². The Media Catalog of the Library of the College of Medicine and Dentistry of New Jersey³ has MeSH and a very useful author/title/subject/producer index, but does not offer the flexibility we desire. A comparable effort at Case-Western Reserve⁴ also contains many valuable elements but again lacks elements we desire. The authors of this paper decided, therefore, to embark on a new design for a catalog for all forms of non-print materials used in the curriculum of the School of Medicine, University of California, Davis. This paper summarizes the criteria that led to the creation of this catalog, describing the techniques used in input, editing and generation of the final result. The paper concludes with the authors' plans for future modification and improvement of the catalog.

DESIGN CRITERIA

Several factors guided the authors in designing this cataloging system. First, it was considered important for the input process to be kept under the control of the librarian, rather than delegated to data processing staffs who were unfamiliar with catalog conventions and formats. The use of upper- and lower-case data was considered important in the visual presentation of the final material, and hence provision was made from the outset for upper- and lower-case data entry (although the capabilities for lower-case input were not initially available). The designers felt that flexible design would be vital to the project, since the relative lack of published catalogs or personal experience suggested the large and continuing probability of revisions of material to be included and organization of input formats. It was also recognized that the approach could with careful planning be readily adapted to other non-print libraries with different cataloging requirements, so techniques were incorporated permitting adaptation of the program to other purposes.

Within each data field, provision was made for multiple entries. It was recognized that multiple authors, courses, subject headings and media descriptions would be commonplace and hence the approach was designed to permit multiple entries for all fields.

Because the catalog had a time value that transcended the need to be complete at the outset, it was decided to design a system that could be updated with relative ease, so that basic descriptions of learning materials could later be augmented to incorporate more detailed indexing and other descriptive material. This update process was designed to be adaptable to on-line editing techniques as well as batch review. On the other hand, it was thought that the user would be more comfortable with a printed catalog, one through which he could browse, reviewing either the multiple entry listings or the abbreviated description of the materials as his needs dictated.

RESOURCES

The combination of design criteria led to especial attention to the input and update process and to design of an acceptable output format for the catalog. These specifications had to be implemented with the restrictions of personnel and technical resources described below.

Three individuals (the authors) were chiefly responsible for design and implementation of this catalog. They include a librarian (Ingalls) with experience in non-print materials, a computer programmer (Spedick) with background in several languages and familiarity with large scale data base systems, and a faculty member (Walters) who, in addition to coordinating the project provided liaison between the team and potential users, both faculty and students.

The technical resources available included normal typewriters (Selectric) which could accept a special character font suitable for optical character reader (OCR) input, an interactive terminal, an OCR system owned by the campus computer center, and finally a large central computer with multiple languages available, including MUMPS and ALGOL. These resources together provided all the tools necessary for the project, and all were utilized at one stage or another during creation or maintenance of the catalog.

PROCESS

After considerable discussion and many false starts, an input form was finally agreed on, as shown in Figure 1. This format has several characteristics of general interest. First, it is printed in OCR font that can be directly read into the computer. Use of a magnetic card typewriter (MC/ST) made it possible to edit the material prior to final submission of the accepted copy without retyping all the correct portions of the input sheet. The typist made corrections on the magnetic card and then ran off the final corrected copy automatically.

The fields selected for inclusion in the current version of the catalog are designated by a term preceded and immediately followed by colons. This technique permits modification of the form to introduce or delete terms as needed. Repeating fields are defined by semicolons. There are no other special characters used on the input form. All other entries are designed to conform as closely as possible to the normal cataloging rules as established by the National Medical Audiovisual Center (NMAC)⁵ and by the Anglo-American Cataloging Rules⁶. The entries selected demonstrate the bias of this catalog for support of a medical education curriculum. The course numbers, organ systems, departments and instructors may each be separately (and multiply) defined as may be most appropriate for a given item. Physical descriptions are abbreviated to include pertinent data for each medium. The accession number is selected on the basis of the most prominent medium and assigned serially within that medium. If, however a film is subsequently dubbed over to videotape and available in both media, this information can be encoded both in the heading information and in the more detailed physical description.

Data entry was done using an Optical Character Reader that converts the input form into a 9-track magnetic tape. The input process is monitored so that uncertainties detected by the scanner can be corrected as the input tape is created. Once completed, the tape is mounted on a drive of the main computer (a Burroughs B6700), where final pre-editing is accomplished as needed using the system's flexible editor. Once ready for processing, the data are read into the MUMPS language system resident on the computer, where they are converted into a global file. The input process is controlled on-line, giving the user the option to define the basic data fields to be searched for in the input forms, to specify the reformatting (including blank lines) desired in the catalog, and to review input data for possible inconsistencies not previously detected. This process is usually done for a portion of the library at a time so that the data can be carefully checked and reviewed with the librarian as required.

Once the data have been entered, the process of catalog generation is done in two steps. First, one series of programs and routines formats the basic catalog reference, with output directed to a printer that generates photo-reducible output for direct incorporation into the catalog. Several such references are assembled onto a single page for reduction to minimize the physical size of the catalog.

The second stage of catalog creation involves user-controlled selection of different fields to be retrieved and sorted. Characteristically, the user will select title, author, subject heading (using MeSH headings coded at time of input), course, department and organ system. The option is flexible, however, and the catalog can be expanded or contracted as experience and utilization requires. The specified entries are then selected using the MUMPS language and written to a separate file where they are sorted by means of a utility ALGOL program and listed on a line printer for inclusion in the catalog. Figure 2 shows samples of the types of cross-referenced lists produced in this manner.

File maintenance is accomplished in several ways. For large updates, including many new additions and substantial revisions, the same technique described above is employed, using OCR formats. For smaller data revisions, such as those encountered in routine editing, an on-line system for data revision has been designed (though not yet implemented). Off-line techniques including use of buffered terminals (cassette or magnetic card) are being tested at present, with no decision made as to the optimal procedure. Since the system is still growing to include all holdings initially identified, the selective update problem remains to be studied in detail.

CURRENT STATUS

A prototype catalog has been created to demonstrate the techniques and capabilities of the system. About thirty entries were included in the initial version. An additional 300 entries have been entered and are in the process of editing and incorporation at the present time. Once this basic group of data is complete, a preliminary catalog will be distributed to faculty and students, with request for comments and identification of additional material for inclusion. The comments received from this initial distribution will lead to proposed modifications and additions for the next version, and subsequently it is anticipated that annual or semiannual revisions will be made.

FUTURE PLANS

The system was initially designed to include instructional computer programs. Although modifications to the basic format are designed, no entries have as yet been made, partly because the number of programs available at this institution are relatively small. In the future, however, the library of programs should expand materially, necessitating their inclusion in the catalog.

The techniques described are suitable to several types of union catalogs. Initially, it is hoped that a reasonable effort at a union catalog can be made of holdings of different department within the School of Medicine and other health sciences on the campus. Subsequently, it is hoped that agreement can be reached among medical schools in the western United States for creation of a similar union catalog, one that will, it is hoped, lead to sharing of resources.

The programs were initially written in a dialect of MUMPS available on the B6700. As the new Standard MUMPS language becomes available, however, it is anticipated that the system will be expanded as it is translated into Standard MUMPS, with incorporation of new editing and retrieval features suggested by the designers and users of the existing system.

The system described above is in the public domain and available to interested parties. Inquires should be addressed to Medical Learning Resources, University of California, Davis, 95616.

ACKNOWLEDGEMENTS

This research was supported in part by Merck Foundation.

REFERENCES

1. National Medical Audiovisual Center, Catalog, Audiovisuals for the Health Sciences, U.S. Department of Health, Education and Welfare, 1974.
2. National Library of Medicine, Medical Subject Headings, Washington, D.C., NLM, Annual.
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5. National Medical Audiovisual Center, Cataloging Non-Print at NMAC: A Guide for the Medical Librarian, Atlanta, Ga., NMAC, 1971.
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1-62

:ITEM NO: 1-62

:TITLE: Immunologic Aspects of Organ Transplantation :MEDIA: MP

:SERIES: Upjohn Mini-text, 1 {9-110}

:SPONSOR, PRODUCER: Upjohn

:PRODUCTION DATE: 1971 :LOCATION: Kalamazoo, Mich. 49001

:INFORMATION SOURCE: Mini-text Catalog

:RELEASING AGENT: 'Professional Communications, Upjohn :COST: \$26.00

:USAGE RESTRICTIONS: Copyrighted, may not be reproduced in any form...
without express written permission of the Upjohn Professional
Communications Department.

:MINUTES: 8 :FORMAT: MP-1 reel, sound, color, 16mm

:NOTES: "An excerpt from the Upjohn Vanguard of Medicine series film
'Visceral Organ Transplants,' c1965."

:ABSTRACT: Foreign tissue acts as an antigen, & stimulates in the
recipient an immunological reaction which destroys the graft. This is
demonstrated in dogs, with both skin and kidney homografts. In first-
set response, the process which leads to impaired function &
destruction is primarily cellular. Second-set response, characterized
by rapid rejection, is essentially a humoral reaction. Both are
illustrated with sequential photomicrography.

:AUDIENCE: Medical students; Health professionals

:MESH: Transplantation Immunology G1-63-54

:HOUSED: MLR :DATA BY: ECI :DATE: 11/74

Figure 1. Input format for non-print media catalog.

TITLE/SERIES

AMERICAN COLLEGE OF PHYSICIANS. MEDICAL SKILLS LIBRARY	(MP)	9.16
AMERICAN COLLEGE OF SURGEONS TRAUMA MOTION PICTURES COMPO	(MP, VT)	9.114
ANGIOCARDIOGRAPHY IN CONGENITAL HEART DISEASE	(SL)	3.4
APPROACH TO VECTORCARDIOGRAPHY (RECTILINEAR V.C.G.)	(SL)	3.5
ASPECTS OF SEXUAL INTERVIEWING - THE IMPOTENT HUSBAND	(VT)	2.67
ASPECTS OF SEXUAL INTERVIEWING - 'FRIGID' WIFE	(VT)	2.66
ATROPHIC		
COURSES		
BASIC INS		
BLEPHAROS		
MS430 SURGERY CLERKSHIP -	CLINICAL OPHTHALMIC ECHOGRAPHY	(VT) 2.94
MS432 MATERNAL-CHILD HEAL	ATROPHIC DISEASE AND ABERRANT	(SL) 3.90
MS433 PSUCHIATRIC CLERKSH	ASPECTS OF SEXUAL INTERVIEWING	(VT) 2.66
MS433 PSYCHIATRIC CLERKSH	ASPECTS OF SEXUAL INTERVIEWING	(VT) 2.67
MS433 PSYCHIATRIC CLERKSH	INTRODUCTORY FILM FOR MEDICAL	(VT) 2.65
MS433 PSYCHIATRIC CLERKSH		
CORTICOST		
DIFFERENT		
DIPLOPIA		
EARLY PRO		
ECHOCARDI		
EYE & SYS		
EYE IN EN		
FEMALE ST		
FRIGID WIF		
AMERICAN COLLEGE OF	TRAUMA MOTION PICTURES	(MP, VT) 9.114
AMONETE, REX A., M.	OFFICE TREATMENT OF SKIN CANC	(VT) 2.81
ARSHAM, GARY M., M.	OPHTHALMOSCOPY - BASIC SELF-IN	(SL) 3.1
COLENSRANDER, AUGUS	OPHTHALMOSCOPY - BASIC SELF-IN	(SL) 3.1
COMMITTEE ON TRAUMA,	TRAUMA MOTION PICTURES	(MP, VT) 9.114
DEBROVNER, CHARLES H	DIFFERENTIAL DIAGNOSIS OF PELV	(VT) 2.98
AUTHOR/PRODUCER		

Figure 2. Lists by Title/Series, by Course, and by Author/Producer, Cross-Referenced to Catalog Item Number.