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BY CAROL TENOPIR

Software Options for In-House Bibliographic Databases

THE LAST TIME I discussed micro-computer software for the creation of in-house databases (*LJ*, May 1, 1983, p. 885-888), there were only a few packages on the market. Since then, many new packages have appeared, while some older ones have undergone extensive revisions or upgrades.

Database characteristics

It may be tempting to use the least expensive software you can find for an in-house microcomputer database. This usually means a general purpose file manager program or database management system program. Most of these programs were not designed for bibliographic-type files, however, and many impose severe restrictions on the design and searching power. They must be carefully evaluated with the unique characteristics of bibliographic databases (and your particular application) in mind. Characteristics of bibliographic databases not usually found in business or other applications include:

- Composition mostly of alphanumeric character strings rather than numbers needing computations. Even when numbers are included, they are frequently treated as character strings (e.g., volume numbers, pages, etc.).

- Each record tends to have many fields, but the same or similar fields are present in most records in the database.

- Fields are frequently lengthy (titles or abstracts for instance), but the length of each field will vary from one record to the next.

- Some fields have repeating values that must be treated separately but equally (e.g., descriptors, multiple authors). The frequency of repe-

tion is usually unpredictable from one record to the next.

- Many applications require searchable access to most fields.

- Search capabilities are important, e.g., Boolean logic, word proximity, searching on a specified field or fields, and truncation.

- Information usually doesn't change quickly and the number of records will tend to grow continually.

These characteristics have a direct effect on what software is appropriate for a bibliographic database. Software that has been successfully used for bibliographic applications can be divided into two categories which can then be subdivided into different software types.

General purpose packages

General purpose software packages are designed to be appropriate for many different applications, and can usually be purchased from local computer stores or mail order distributors, frequently at discounted prices. The producers generally know nothing about bibliographic databases, so it is up to you to evaluate and adapt the packages for your special requirements. General purpose packages include three main types: Data Base Management Systems (DBMS), File Managers, and Text Retrieval Systems.

DBMS—There are many micro-computer DBMS packages on the market, and many of them have severe limitations for bibliographic applications: fixed-length fields with restricted field lengths, the inability to handle more than one value per field, and restrictions on the number of fields or size of records.

The biggest advantage of a DBMS is its ability to use more than one file at a time. Users establish a relationship between files, and link different files together as needed. For example, one file may contain records describing a library collection; another may contain information about each authorized patron of a library. A third "transaction" file might be cre-

ated by linking parts of the collection file with the patron (borrower) file. If you need such capabilities, the disadvantages of a DBMS program may be less important.

DBMS packages usually come with a programming language and almost always require some programming to make them work for your application. Expect to spend time for development, with the tradeoff that the more powerful DBMS languages allow you the flexibility of programming to meet your needs.

Another advantage for some popular DBMS packages is that there are many easy-to-use books about the packages available. Librarians who have used these packages to create bibliographic databases may even share the programs they have written. Meckler's *Small Computers in Libraries* often reproduces DBMS programs.

Library applications programs for one popular DBMS are given in Karl Beiser's *Essential Guide to dBase III+ in Libraries* (Meckler, 1987). Unlike some other DBMS programs, Revelation (Cosmos, Inc.) accommodates variable-length fields and supports repeating field values. Although it is a complex program, it seems to be ideally suited for bibliographic databases.

File Managers—File managers are distinguished from DBMS packages by their ability to support only one file. Many of them are much less complex to use, due in part to the fact that they are much less powerful. They generally do not offer powerful search capabilities or a variety of report-writing options. They may have severe restrictions on file design issues such as field length, number of fields, and values per field. They are marketed for the general user with fairly simple requirements, such as name/address files. They might work well, however, for simple, small bibliographic files. The investment in money and time is frequently so much less than other types of programs that it may pay to try them out. There are many file managers on the market, all



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of which need to be evaluated carefully for any bibliographic application.

Text Retrieval Software—Text retrieval software differs from other types of software in that it deals with unstructured text rather than information separated into fields. A common application of text retrieval software is for control of word processing files which are already in machine-readable form. It is not usually used for bibliographic fields which are more highly structured, but it could be used to provide retrieval to files that were created from downloading records from several bibliographic databases on different online vendors. If such files contain several incompatible structures and you do not have the time to edit records for compatibility, a text retrieval package can provide access to entire records.

Text retrieval packages generally offer powerful search capabilities—Boolean logic, truncation, word proximity searching—but because there are no fields, the system must search the entire database for word occurrence and there is no customizing of output.

Special purpose packages

None of the general purpose packages were designed specifically for bibliographic databases. It is up to the database designer, therefore, to evaluate the applicability of each package carefully, and frequently to make either programming enhancements or compromises in database design. Packages that have been designed with the unique characteris-

tics of bibliographic databases in mind solve many of these problems.

These packages typically are purchased from their producer or from specialized vendors and they frequently cost more than the general purpose packages. Their markets are smaller, so you will not find how-to-do-it books in the local bookstore, but the library literature and library conference proceedings discuss many of these packages. Special purpose packages include: Information Storage and Retrieval Programs, Library Applications, and Bibliography Generators.

Information Storage and Retrieval Programs—These packages are designed to model the powerful search and retrieval capabilities of the large online systems such as DIALOG or BRS. Although they vary in exact features, most software include Boolean logic, truncation, proximity searching, set building, and some customized output design. There are few restrictions placed on record or field size, fields are typically of variable length, and repeating values in a field are accommodated.

Almost all of these packages require an IBM PC or compatible. Except for very small databases, a hard disk is recommended (and sometimes required). Like the large commercial vendors, these packages usually create inverted (dictionary) indexes to facilitate speedy searching so the software adds a high overhead to the storage capacity required. Several good information storage and retrieval packages cost less than \$1000.

Library Applications—Library applications packages offer less flexibility than IS&R packages, because the field specifications and output features are frequently preset. They are good if you have a standard library file (such as a catalog of books) with requirements that match the programs' capabilities. These often include other library functions such as circulation. Directories can be checked for a complete listing of packages in this category.

Bibliography Generators—Many information storage and retrieval programs can be used to generate bibliographies, but there is an entire category of software that primarily serves this purpose. These packages are not designed to build an online database (though some may be used for small databases); they are designed to be used to create correctly formatted features that can create bibliographies.

Their strength lies in their output features that can create bibliographies formatted according to the rules of different bibliographic styles (e.g., *Chicago Manual*, ANSI format, etc.). Users can often specify their own format as well. Bibliography generators are especially valuable to researchers, but may also be used in a library.

More detail on all these packages, plus a step-by-step guide to building an in-house microcomputer-based textual database, can be found in *Managing Your Information: the Design of Word-Oriented Databases on a Microcomputer*, by Gerald Lundeen and myself, to be published by Neal-Schuman early in 1988.

Software Source List

DBMS	Nutshell Leading Edge Products 225 Turnpike St. Canton, MA 02021 617-828-8150	Herndon, VA 22070 703-471-0030	Cambridge, MA 02139 617-661-8124	121 W. E. St. Encinitas, CA 92024 619-436-5055	Bibliography Generators
DBase III+ Ashton-Tate 10150 W. Jefferson Blvd. Culver City, CA 90230 213-204-5570	PFS First Choice Software Pub. Corp. 1901 Landings Dr. Mt. View, CA 94043 415-962-8910	ZyINDEX Zylab Corp. 233 E. Erie St. Chicago, IL 60611 312-642-2201	Sci-Mate Software System (File Manager/Editor/ Searcher) Inst. for Scientific Info Customer Servs. 3501 Market St. Philadelphia, PA 19104 800-523-4092	M/Series 10 (formerly InfoQUEST) Utlas Internat. 1611 N. Kent St. Arlington, VA 22209 703-525-5940	Notebook II Pro/Tem Software, Inc. 2363 Boulevard Circle Walnut Creek, CA 94595 800-826-2222
R:BASE System V MicroRIM Inc. 3380 146th Place SE Bellevue, WA 98007 206-641-6619	Q&A Symantec Corp. 10201 Torre Ave. Cupertino, CA 95014 408-253-9600	Information Storage & Retrieval Programs	SIRE Cucumber Info Systems 5611 Kraft Dr. Rockville, MD 20852 301-984-3539	Mandarin Media Flex Inc. 941 Aquamarine Dr. Gulf Breeze, FL 32561 904-932-5187	Professional Biblio- graphic System Personal Bibliographic Software PO Box 4250 Ann Arbor, MI 48106 313-996-1580 (Part of three-part Searcher's Toolkit)
Revelation Cosmos, Inc. 1346 14th Ave. PO Box 1237 Longview, WA 98632 206-423-0763	Savvy The Savvy Corp. 122 Tulane SE Albuquerque, NM 87106 505-265-1273	BRS/Search for Micros BRS Software Group 1200 Rte. 7 Latham, NY 12100 800-833-4707	STAR Cuadra Associates, Inc. 2001 Wilshire Blvd. Santa Monica, CA 90403 213-829-9972	Micro Library System Sydney Dataproducts 11075 Santa Monica Blvd. Los Angeles, CA 90025 213-479-4621	Reference Manager Research Information Systems Inc. 1991 Village Park Way Encinitas, CA 92024 619-753-3914
File Managers	Text Retrieval Packages	CAIRS Information/Documen- tation, Inc. Box 17109 Dulles Internat. Airport Washington, DC 20041 800-336-0800 (U.S. distributor)	Library Applications	Ocelot ABALL Software Inc. 2174 Hamilton St. Regina, Saskatchewan Canada S4P 2E6 306-569-2180	Sci-Mate Editor (see Information Storage & Retrieval Programs)
FYI3000 FYI, Inc. 4202 Spicewood Rd. PO Box 26481 Austin, TX 78755 512-346-0133	TEXTBANK Group L Corp. 481 Carlisle Dr.	INMAGIC InMagic Inc. 238 Broadway	Card Datalog Data Trek, Inc.		

