## SOFTWARE REVIEWS

**IMMEX Problem Solving Software.** Ronald H. Stevens. University of California, Los Angeles, School of Medicine, Department of Microbiology and Immunology, 43-319 CHS, Los Angeles, CA 90024; 310/825-3456. Demo disk: $30.00. Author/delivery and analysis modules, $450.00. Set of eight immunology or infectious disease cases, $129.00 each. IMMEXLITE (delivery module with eight immunology cases), $250.00. System requirements: IBM-compatible running on a local area network, Microsoft Windows 3.1.

Ronald H. Stevens, Ph.D., a professor at the UCLA School of Medicine, has developed a software package that offers not only a platform for testing students' ability to solve problems, but also a tool for learning something about the problem-solving process itself. IMMEX has been used for several years at the UCLA School of Medicine to test second-year medical students' knowledge of immunology. In its original format, IMMEX consists of a set of immunology cases, presented to the students first in practice and then in a testing environment. Case descriptions are randomly assigned to students, who attempt to identify the immunologic defect by selecting from a menu of laboratory tests and expert consultations, then analyzing and interpreting the data received.

The concept of cost containment is built into the program in the form of "time-cost units" (TCUs). The student begins with 3,000 TCUs, and each laboratory test, consult, or incorrect diagnosis reduces the number by a set amount. This encourages the student to proceed with care and logic and to avoid random selection of diagnostic tests, because the final score is determined in part by the number of TCUs remaining at the conclusion of the case. The student may, at any time, attempt to solve the problem by selecting from a list of immune defects. The case continues until the student either selects the correct defect or chooses two incorrect diagnoses. A case analysis follows a correct or incorrect solution.

The exciting and innovative feature of the IMMEX program lies in its ability to track and graphically represent the path that each student takes in the diagnostic process. The program is designed to run on a local area network, and data are stored constantly as the student works through a case. All laboratory test selections are recorded, as well as the order in which they were chosen. Time is recorded as is the expenditure of time-cost units. By analyzing this data in various ways with the IMMEX::Analysis module, instructors are presented with a visual representation of the students' problem-solving strategies. This information can be used to evaluate weaknesses in the student's knowledge, as well as to gain insight into the way an individual student or a group of students use their cognitive skills in the process of solving problems.

The authoring software, included with the purchase of the full IMMEX program, makes it possible for instructors to design and deliver their own cases. At UCLA, students also are involved in designing cases. With the authoring software, IMMEX has gone beyond immunology — can indeed be used to create any problem-solving type of computer-based activity. The authoring module requires no programming knowledge and is a Microsoft Windows "click and drag" operation. Documentation provides adequate instruction in its use.

Infectious disease cases are being offered for sale, as well as cases in immunology, for those who do not wish to become involved in authoring. Surgery cases are being developed and will be available soon. Any cases purchased or created with the authoring tool can take advantage of the IMMEX::Analysis features.

Medical educators today are involved in active discussion about the need for assuring that medical students possess adequate problem-solving skills. There is interest in evaluating not only the student's ability to produce a correct answer, but in assessing the efficiency and efficacy of the process by which that student arrives at the solution. The IMMEX software offers an excellent platform for presenting unscripted problem-solving exercises in basic science or clinical disciplines. The feedback from the data can provide valuable insight into the process of learning. Stevens is working with IMMEX and neural network software, training the software to recognize successful solution paths and review the students as they solve the cases. This type of "smart software" demonstrates the computer's potential as a coach.

The relatively low cost of the IMMEX software, as well as its ability to be customized for individual applications, makes it a recommended addition to a medical school library's computer-assisted-instruction offerings. In order to take advantage of the data-collection feature, a database of students will need to be maintained on the network with password access. IMMEX is designed to accommodate easy entry and maintenance of this data.

Barbara Collins  
Federick L. Ehrman Medical Library  
New York University Medical Center  
New York City

**INMAGIC Plus.** Inmagic Inc. 800 West Cummings Park, Woburn, MA 01801; 617/938-4442. $1,400.00

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for INMAGIC Plus for Libraries v. 1.0, r 1.0. $4,000.00 for DEC VAX/VMS. Optional services and products for IBM-compatible microcomputers: annual product support, $300.00; 10% of license price for DEC VAX/VMS. MULTI Adaptor, $175.00; MARC Adaptor, $125.00; TEST MAGIC, $65.00. A 15% discount applies to most of the products for U.S. government, educational, and nonprofit organizations. System requirements: IBM-compatible.

INMAGIC Plus is a specialized database program for creating, maintaining, and using text databases in libraries. It offers unlimited database size, up to seventy-five fields per record, unlimited field length, and multiple entries in fields. INMAGIC Plus is used by medical, corporate, law, special, academic, public, and government libraries to manage bibliographic information. The basic INMAGIC is also used by businesses and companies for tracking documentation and information. Its menu interface and SearchMAGIC allow users of varying experience to successfully search databases and retrieve information.

INMAGIC Plus, v. 1.0, r. 1.0, is the eighth release by Inmagic Inc. in eleven years. This new version features menus and pop-up windows listing database choices, field names, term and keyword indexes, and report formats. Users can alternate between the menus and the command-line interface. Additional features include phrase and proximity searching, prompted searching, linking fields into a single search prompt, data validation options, and the option of immediate or deferred indexing. INMAGIC Plus’s main menu enables the user to define a new database, open a database, or use utilities for importing records, exporting files, or reconfiguring defaults. There is a tutorial in addition to INMAGIC’s context-sensitive help.

A small database named SAMPLE is included with INMAGIC. SAMPLE provides users with experience in using INMAGIC’s capabilities and many of its features. In addition to the basic INMAGIC software, INMAGIC Plus includes the library guide, a set of eighty predefined data structures and report formats for creating catalogs and managing serials, loans, and orders. Other related products include SearchMAGIC, which lets libraries offer a public, or read-only copy of the databases created with INMAGIC Plus. This product is useful for setting up an online public access catalog. The MARC Adaptor allows libraries to build or update databases with bibliographic records in MARC format. MULTI Adaptor allows conversion of records from other sources such as online services or other software programs. TESTMAGIC is a demonstration version of INMAGIC that functions fully, except that the database is limited to fifty records.

Defining the data structure, or record, in INMAGIC involves key decisions and determines exactly what information you will be able to obtain from your database. For each field in your data structure you will delineate a field label, field name, indexing scheme, a sort code, and an emphasis code. Selection of an order key determines which field or fields INMAGIC defaults to when sorting records after searches. Other sorts can be selected for reports. Indexing decisions affect the way information is retrieved, the speed at which it is retrieved, the time required for loading the data, and the space the database requires on the disk. It should be stressed here that you choose an indexing scheme; you do not have to do programming. INMAGIC provides a default list of stop words and leading articles but allows you to choose additional or other words in foreign languages. It limits your stop word list to 255 characters and the leading article list to 127 characters. INMAGIC has nine different field sort codes for sorting numbers, codes, dates, universal decimal classification numbers, and text with or without embedded numbers. The documentation thoroughly guides you through the process of defining your data structure with numerous examples, text, and illustrations. An important advantage of INMAGIC’s Library Guide is the reduction of the learning curve required for making indexing decisions and designing reports. Reports can be used as they are or customized to your library’s needs. Additional fields can be added to a database, and changes can be made in indexing decisions at any time.

When opening a database for searching, a pop-up window lists available databases. To search an INMAGIC database, the user chooses between a search screen with prompted searching or a command line interface. In the menu interface the search screen displays prompts such as “author,” “title,” or “subject” at the bottom of the screen. Prompts displayed either default to the first five indexed fields in the database or conform to a customized search prompt screen. Additional fields can be included in a search statement via pop-up windows. Tabbing to the desired prompt, the user either types in characters or presses a function key that pastes items chosen from the term or keyword indexes for a particular field. The Boolean operator defaults to “OR” when more than one term is typed or pasted after a prompt; “AND” or “NOT” are chosen with function keys. For more complex searches, such as those searching nonindexed fields, the command-line interface is required. You can search seldom-used fields that do not appear on the default search screen with either menus or commands, but using commands will be faster.
In the Maintain Menu, records can be added, deleted, or edited. Utilities used within the Maintain Menu enable you to import records from an ASCII file, allowing final or multiple edits before large blocks of records are entered. A word-processing program that produces a plain ASCII file without reformating or inserting non-ASCII characters can be used. Users can also enter records individually using INMAGIC’s built-in editor that automatically displays a blank form with prompts indicating what data are to be filled in. The editor has many features in common with a word processor, including word-wrapping and a keyboard template. A third method for entering data is to copy an existing record and revise and edit it, creating a new record. Default settings enable users to automatically add the same information such as date and cataloger’s initials to new records being entered. Text can be cut and pasted within the same record or between different records.

Installation of INMAGIC was simple and straightforward. The program requires a hard disk, at least 640K RAM, and MS-DOS v. 3.0 or higher. The documentation is excellent, well indexed, and is arranged in several separate soft-cover books. The books are easy to handle, open wide enough to lie flat on a work surface, and are well written in plain English with numerous examples and illustrations. Inmagic’s product support by telephone is very good, but it does not provide a toll-free number. The company offers workshops around the country and on-site training. The company’s newsletter, *Inmagic Inc News*, is published quarterly and features Inmagic clients with a description of their use of the software. There are organized user groups.

INMAGIC Plus provides the flexibility to meet the bibliographic database management needs of health sciences libraries. Staff with training or experience in searching bibliographic databases will quickly learn the INMAGIC commands. The reviewer has used INMAGIC to create an online and printed catalog of a small special hospital library’s collection, an online catalog of a special collection within a research library, and a database of publications by institutional authors.

*Judy W. Roberts*
*Information Center*
*Pennington Biomedical Research Center*
*Louisiana State University*
*Baton Rouge, Louisiana*