Selection Criteria for Library Automation Software

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ABSTRACT

Ready-made software packages are available in the market for a wide range of applications including library house-keeping operations, and information storage and retrieval. Their capabilities differ, prices vary and their versions keep on changing. Selection of suitable software package is an important factor in library automation systems. There are not many publications or case studies discussing the criteria for selecting suitable software. The selection is based on specific needs of the institution, its environment, budget, users, aims and objectives. The paper reviews some selected evaluation works, studies and reports. Various criteria which emerge from these reviews are discussed.

"To err is human, but to really foul things up requires a computer"

- Philip Howard, *The Times*, February 25, 1987

"The most damaging phrase in the language is, we have always done in this way."

- Rear Admiral Frace Murrey Hopper in an interview in *Information Week*. March 9, 1987, p. 52

1. INTRODUCTION

Software is a computer program for using computers and other such hardware to their optimum capabilities. As computers do only what they are told to do and therefore, the instructions given to computer should be unambiguous. Writing step by step instructions without any ambiguity to solve a particular problem is called programming. A software package can have one or more computer program- mes to solve a specific problem. A programming language provides a special type of grammar and syntax to the programmer to enable him to give instructions in a simple and understandable way.

Writing programmes and developing software packages involves special training, hardwork, time and money. For developing in-house software to solve complex problems, these requirements become severe and unmanageable. Due to these limitations, the practising librarians or

information scientists should be exposed to some commercially available software packages.

Software packages are generally available as commercial products which typically provide solutions to particular application problems. Since they are developed on a commercial scale in a competitive market for use by a variety of customers, a great amount of skill and effort is put in their development. Therefore, they are reliable, easy to use and in many instances, well-documented. Ready-made software packages are now available for a wide range of applications such as management information systems (MIS), industrial support systems, office automation systems, library automation and information retrieval operations.

2. CATEGORIES OF SOFTWARE

Computerisation of Library and information services, involves non-numeric data processing, text retrieval, manipulation of strings of characters and information retrieval, etc. Some general purpose software packages can be used for these purposes and for specific needs, special purpose software are also available in the market.

The various categories of such software and their features are:

(a) Basic software for data entry, validation, sorting and merging of files, and editing of data

(b) Word processing software to manipulate text—storage, recall, use and modify; alignment of margins, addition and deletion of string of characters, manipulate paragraphs, etc.

(c) Database management systems (DBMS) for creation and management of databases, file management systems, relational database management systems (RDBMS), network and hierarchical DBMS

(c) Text-Retrieval Packages for storage and retrieval of non-numeric records (tabular or even graphics). These are self-contained software, require minimum involvement of computer specialists, records are independent of variable length for natural language text, have access to data by context, inverted file access, user interfaces which makes them simple and easy to use. Search and indexing facilities are other important features

(d) Software Associated with Searching Online Retrieval System and CD-ROM Databases. Major online systems have their own software usually written in command language, provide access to external databases, private or personal file facility, and permit editing of search files on micros

(e) Library House Keeping Software : These have provision for acquisition, cataloguing, circulation control, serials control and statistical report generation .

Library automation software or computer based information storage and retrieval systems cover two major functional areas, namely (i) control and management of library resources, and (ii) access to documents and information. These two areas deal with library house-keeping systems and text retrieval systems respectively. Gradually, the distinction between them is vanishing. In latest software packages there is provision for both library house-keeping operations as well as public access for information retrieval.

In addition, there are software packages for re-organising and presenting information in desired format, producing publications,

and to control and manipulate statistical and financial data.

Library automation software packages can also be grouped in four categories:

(i) Word processing,

(ii) Library house-keeping operations,

(iii) Management communications and support, and

(iv) Text retrieval.

The type of software can be categorised based on the hardware or computer systems used. For example,

(a) Microcomputer-based software

(b) Mini computer-based software

(c) Large mainframe-based software

Each of these categories of software may be either In-house software that is owned and operated by the library, or shared with other libraries through a consortium arrangement—through a bibliographic information network.

3. OPTIONS FOR SELECTION

In recent times, libraries are not encouraged to develop the software for its use. In other words, libraries are advised not to waste efforts, time and money in developing in-house programmes for library house-keeping operations and public access information storage and retrieval. Software development is a costly, time consuming and risky job whose results may be uncertain. However, the options available for selection of library automation software are summarised below:

(i) Acquire a pre-written, off-the-shelf software package (e.g. LIBSYS),

(ii) Acquire a turnkey package incorporating both hardware and software (e.g. MINISIS, TULIS),

(iii) Write in-house programmes,

(iv) Commission writing of programmes, and

(v) Participate in the formation of, or join a co-operative that offers access to software and/or hardware and/or databases.

Rowley (20) discusses the advantages and disadvantages of commercially available software packages. She concludes, "It is sensible to choose a commercially available package, since it is too costly to write a local software package or to commission someone to do this, even though a tailor-made package designed specifically for a given application is most likely to fit all the requirements of that application."

4. GUIDES TO COMMERCIALLY AVAILABLE SOFTWARE

There are a large number of commercially available library automation software packages. Studies that enumerate, compare and highlight the salient features of these software packages are also in abundance. An effort is made here to review some such selected studies to enable one to fathom the length, breadth and depth of the problem of selecting a suitable software for one's use.

Glossbrenner (4) in his book *How to buy software: The master guide to picking the right program* describes many general and specific application software but does not mention the library housekeeping or information storage and retrieval software packages. In his coverage of 648 pages divided into three parts with 25 chapters and four special appendices, a number of software packages are mentioned which could be used for general applications and other areas related to library automation. These include packages for word-processing, database management, statistical manipulation, online searching of

databases, etc. The book is a comprehensive, user friendly master guide for selecting suitable software for specific purposes.

Hansen (6) in *Microcomputer user's guide to information online* lists more than 100 sources of information, and their access software. Rowley (20) lists some text retrieval software for microcomputer and for mainframe/microcomputer systems. Further, She adds a list of library house-keeping software, their features and suppliers. Mahajan(13) surveys some 40 software packages.

5. SOFTWARE WITH CD-ROM DATABASES

The CD-ROM databases are usually provided with information retrieval and public access software. Valas (24) gives a comparison of some well known CD-ROM information retrieval software packages.

There are not many publications dealing with the comparison of different CD-ROM information retrieval software packages. Richards and Robinson (18) suggest a model for evaluating CD-ROM software whereas, Harry and Oppenheim (7) discuss the various criteria for evaluating electronic databases. Jacso (8) describes the evaluation, selection and installation of CD-ROM software, dataware and hardware. Jasco (9) searches for skeletons in the database cupboard to find errors of omission and commission. McFaul (16) comes out with a final report on consistent interface guidelines. Tian-Zhu (23) limits his formal analysis to searching capabilities and ease of use of CD-ROM user interfaces. Sieverts (22) and others give additional programmes for testing, evaluating and comparing software for information storage and retrieval.

Most of these studies are confined to user interfaces as the principle of comparison of software packages. They usually give rules on how to rank the CD-ROM publications, how to give marks for the CD-ROM databases in addition to the software. In many cases the performance factors that are most important for professional searchers are usually missing from these collection of rules.

Valas (24) emphasises the performance factors that are considered to be the most important viewpoints for a professional searcher. "A retrieval system may be as user friendly as you wish; but you will not like it if one single search step in an intricate query may take two hours and displaying the hits may take another two; or if complicated search strategies are not possible at all."

6. INDIAN SCENARIO

Chowdhury and Chowdhury(1) discuss the automated text retrieval and library management software in India. A number of software packages have been released recently by government and private agencies. The authors provides a list of 20 and a brief overview of 10 selected indian packages released upto 1994, namely, CATMAN, CDS/ISIS, LIBRARIAN, LIBSYS, MAITRAYEE, MECSYS, NIRMALS, SANJAY, TULIPS and WILISYS. Considering the cost aspect, it is concluded that CDS/ISIS along with SANJAY (with a few modifications) might prove to be the most suitable package for most Indian libraries.

The authors compare the common features such as cataloguing, OPAC, online help, acquisition, circulation and serials control of the selected packages. However, the criteria to evaluate such packages are not discussed. Major problem areas of library automation in India are as follows:

- Funds, manpower and retrospective conversion

- Facilities for entering data in desired format

- Downloading facilities for data

- Facilities for data exchange

- Problems in creating files in packages based on DBMS due to long fields for longer data fields (e.g., in Oracle), and use of repeatable fields which are common in bibliographic and text database (e.g. SANJAY, LIBSYS, CDS/ISIS)

7. WHY IS SELECTION DIFFICULT?

Selection of suitable software for library automation is always what Grosch (5) calls, a case of "fud" where 'f' stands for fear, 'u' for uncertainty and 'd' for doubt. This is because of the technical parameters associated with the selection of the software, such as the shape of network, computing platform, type of operating systems and various standards. Since today's software investments are likely to be for longer term than those made some three decades ago, the overall system architecture may now play a stronger role in such selection. The problems are :

(a) *A large number of software packages* : A conservative estimate shows more than 80,000 separate software packages for a variety of purposes—not all are for library house-keeping operations but a large number may include information storage and retrieval. The number of such packages is multiplying like 'coat hangers in a darkened closet'.

(b) *Over choice* : A large number of software packages give not only choice but over choice to select one that is suitable for the purpose.

(c) *Tall claims* : Advertisements for each software package tries to claim that it is one up and better than others. There is plenty of material to confuse the selector—journal articles, product brochures, direct mail solicitations and catalogues. The software producers generously distribute lot of advertising material.

(d) *Documentation* : Often the product manual supplied with the software does not provide adequate information for the installation and for using the software by the user on his own.

(e) *Cost* : At times, the software is costlier than the hardware on which it is to be used. Further, the software package is normally purchased as a one time investment.

Other common problems that make the selection of software difficult, relate to :

- Understanding the exact purpose for which it is to be acquired

- Knowing the physical and social environment in which it is to be used

- Understanding the educational and professional level, and aptitude of the persons who are going to use the software

- Knowing the compatibility, simplicity and ease of use of the software.

8. CRITERIA TO SELECT LIBRARY AUTOMATION SOFTWARE

To evaluate a particular software package, a simple procedure is to read the literature supplied by the manufacturer, look at the reviews and advertisements published in various computer magazines and to ask the salesperson for a demonstration of the programme. What is often found to be missing in this procedure is the basic conceptual understanding of what a computer does on a physical level

and how the software works (4). It is not necessary to know the details of computer components, such as accumulators, registers, clock signals, instruction set of 380 microprocessors or computer programming, etc. But, when deciding on the best suitable software, more computer knowledge is required than just how to insert a disc into the slot and press a key.

However, the following general guidelines may be useful in selecting a program.

■ Locate and evaluate a knowledgeable dealer or sales person

■ Thoroughly examine the documentation for the software you are considering

■ Arrange for a demonstration of the software

■ Prepare yourself before the demonstration

■ Put the program through its paces

■ Evaluate the quality of support you can expect from the dealer or vendor.

8.1 Criteria for selection: Study No.1

Glossbrener (4) has given the following twelve sure-fire rules for selecting software.

Rule 1: Do not take anything for granted.

There is more hidden in the advertisements than it is revealed.

Rule 2: You are not the stupid one.

Don't ever let yourself feel foolish when looking at, reading about, using, or otherwise dealing with a computer program. If its creators haven't lived upto their responsibility, it is their fault, not yours.

Rule 3: How many and how long?

How many author names can you put in that file? How long can each name be? Nothing brings a program's limitations to the surface faster than these questions.

Rule 4: Forget about the sizzle and focus on the steak

Ask, what the program can to do and how well it can do it? The advertisement may say, "This program contains all the standard word processing features". Note, there are no widely agreed 'standard' features of any program. In short, concentrate on performance and forget the decoration

Rule 5: Whenever possible, make an effort to visualise yourself using the program.

Visualise, how much work will be involved putting all of your books, records, or magazines into database management files? Will you be able to enter each new book record? The more accurately you visualise the steps involved in accomplishing a task the more you know about how a given program will deal with those steps.

Rule 6: Read at least two reviews of any program before you buy.

Rule 7: Get a demonstration on the identical computer, configured exactly as the one you will be using.

Rule 8: Life will be easier if you stick with proven products offered by major hardware and software firms.

Rule 9: Buy only the four 'building block' programs to start with. It is easy to master a program faster and comprehensively, if you concentrate on just one at a time. The four building block programs are communications, word processing, electronic spreadsheet and personal filing or database management.

Rule 10 : Don't drive yourself crazy trying to get something to work. Ask.

Rule 11: Nothing is impossible. But the game may not be worth the candle. Computers and software are so versatile

that you can accomplish just about anything you want. But these will not save the time, effort and money.

Rule 12: Whenever you can—WAIT! Make sure the rapidly changing software market place works for you.

8.2 Criteria for Selection: Study No.2

There is another monumental work discussing various criteria to evaluate and select library automation software, particularly for the housekeeping operations. The eight volume series publication entitled *Library Systems Evaluation Guide*, is brought out by Jera (12). Since, it was published in 1983, the Guide may be a little outdated. However, the principle evaluation criteria discussed are still valid. The coverage in eight volumes of the Guide is indicated in the Table 1.

The Guide presents basic information on the requirements and techniques of evaluation of automated library applications in a concise and easily usable format.

TABLE 1: Indication of coverage in *Library Systems Evaluation Guide*

Vol. No.	Title	No. of pages	No. of reference
1.	Serial Control	194	60
2.	Circulation Control	261	97
3.	Public Service	267	117
4.	Acquisitions	252	96
5.	Management Services	234	88
6.	Interlibrary loan	248	98
7.	Cataloguing	261	168
8.	System integration	278	198
	Total	1995	922*

* No effort is made to identify the unique references. The total number of references includes a number of multiple citations.
(Source: James E rush Association Inc.., Powell, Ohio, 1983)

The Guide considers 'evaluation' as 'relative in nature'. Therefore, to determine the ability of various systems to meet a library's requirements, the systems must be compared with each other or to some reference model. The latter approach to evaluation is both easier and more objective, provided a reference model is available. The Guide provides such a reference model, which could suitably be adjusted to represent the requirements of a given library and then this model may be used to evaluate one or more number of library automation software packages. The Guide suggests an eight-phase evaluation methodology.

Phase 1: Setting objectives.

Phase 2: Fine tuning of components of the methodology to agree with objectives.

Phase 3: Selection of candidate systems for evaluation.

Phase 4: Examination of accompanying system literature and documentation.

Phase 5: Comparison of candidate systems with the functions and features table, and with the checklist of data elements.

Phase 6: On-site evaluation of candidate systems.

Phase 7: System selection and acquisition.

Phase 8: Post-installation evaluation.

8.3 Criteria for Selection: Study No.3

Rowley (20) emphasises the need to identify systems requirements before the selection of either software or hardware. According to her, the functional requirements are important. Therefore in the evaluation of any package for a given application, priority must be given to establish whether the software is capable of performing the tasks for which it is to be acquired. She gives a checklist for the

evaluation of software, which is briefly described below:

(a) General Criteria

■ *Other's experiences:* Useful in indicating the potential and problems of a software package; some users may offer help and advice in implementing the package.

■ *Cost :* Comparisons of prices of packages be made. What is included in the price of the package and what is excluded should be understood. Cost of hardware and database creation are additional costs.

■ *Originator :* The originator's reputation, and experience in developing software is helpful. An established software house is more likely to be able to offer continuing support.

■ *Supplier :* Sometimes the supplier is the same as the originator, if the supplier is a separate agency acting as an intermediary between the user and the originator, it may hinder direct communication between the user and the originator.

(b) Technical Criteria

In addition to the general criteria of the selection, the following technical criteria should be considered, both when selecting between packages and also in assessing whether any specific package is suitable for a given purpose.

■ *Language :* The programming language in which the software is written. Whether a compiler or interpreter is available on the given system to run it efficiently in terms of machine time and storage requirements.

■ *Operating System :* The package must be suitable for running under the operating system on the hardware being used. Whether it is a single user or multi-user operating system that will function on a network.

■ *Hardware :* Compatibility with software, its various versions and also ability to run other necessary or useful software on the computer system.

■ *Ease-in-use :* The quality of the operator - machine interface, menus, commands, screen displays, documentation, etc. will enhance ease in use of the software.

■ *Supplied format :* Software must be supplied on disks, tapes, etc., that can be run on the system and when required transferred to another medium such as hard disk.

(c) Support Criteria

It is an important criteria for using the software and to fully exploit the various features of the software.

■ *Documentation :* It includes both printed documentation and online help facility. The documentation should cover introductory exploration of the basic features, a full account of all features, a list of commands, an online help system, additional tutorial support, choice to interface at different levels depending on user's experience, etc.

■ *Advice to setting up :* Assistance in installing and implementing the package must be provided. This may cover creation of databases, input formats, report formats, initialisation, etc.

■ *Training in the use of software package.*

■ *Maintenance :* This may include removing any bugs or errors that might become evident in the software as it is used for a greater variety of applications and improving the software so that it incorporates new facilities and concepts (e.g., mouse, windows, pop-up menus).

■ *User groups :* Many of the larger and well-established software packages (e.g., CDS/ISIS, LIBSYS) have user groups or

user clubs. These groups share expertise and experience in application of the software, discuss problems and limitations in using the software and present a concerted front to the software supplier for solving problems and asking for improvements.

For the actual checklist, please refer to the Appendix 1 and 2 of Rowley's contribution on automation options (20).

8.4 Criteria for Selection: Study No.4

Grosch (5) discusses some procurement and evaluation factors together market trends that may affect the future of library systems. The major system evaluation and selection criteria according to Grosch is the availability of the capabilities and product enhancements of the application software at the time of its installation. The other criteria include examining hardware platform options, operating system requirements, directions of the system developers towards open systems, conversion support, training, ongoing software support, record of old and new versions of the software, ease-of-use, etc. The advice is : 'Setting realistic goals that are attainable in your selection of a system, biting off only what can now afford but providing a goal enhancement base for future years, will result in an easier systems transition'.

9. CONCLUSION

Electronic spread-sheets crunch numbers. Word processing programmes crunch words. Library automation and information storage and retrieval programmes crunch information. They help to deal effectively with information explosion. The purpose is important. If the selected software cannot retrieve right information at right time in right format for the right user, the sophistication and decor of the package is worthless.

The categories of software explained before help in fixing the appropriate category of the software for the purpose of library automation. Based on what one has in terms of physical environment (computer) and social environment (users, staff) and what one can afford, suitable software has to be selected. There are many options and a large variety of software packages. It is suggested to acquire a commercially available software package. These are developed for use by a variety of customers. A great amount of skill and effort is put in their development. They are expected to be reliable, easy to use, well documented and they are available for a wide range of applications. Even then the selection of suitable software is difficult because of their availability in large number, over choice, tall claims, varied cost, technicalities involved, etc.

It is necessary to know the various criteria that could be applied in selecting the suitable software. The four selected studies, by Glossbrenner, *Library Systems Evaluation Guide*, Rowley and Grosch provide a variety of selection criteria. This *wider perspective of such criteria will be* helpful and provide better pitch and outfield to play the serious game of selecting the suitable player—that is, the required software package.

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