

Progress of Library Management Softwares: an Indian Scenario

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Abstract: *This paper discusses the development of library management softwares over the past decades, traces out the characteristics and trends of softwares with special reference to packages available in Indian environment and compares services and facilities incorporated in library automation packages available in India against various checklists and with the help of tables and appendices.*

1. Introduction

The World is going digital. Libraries are no exceptions. In fact, librarians are one of the most enthusiastic user groups of information technology in general and computer softwares in particular. A software may be viewed as a digital version of human knowledge. Library Management Softwares (LMSs) are now established as an essential tool in the support of effective customer service, stock management and management of services offered by libraries. These are based on knowledge and experience of library professionals over the centuries.

The rapid growth in utility of hardware, software & connectivity and reduced costs gives the development of LMS a vital breakthrough to achieve a remarkable height. Current LMSs are integrated systems, based on relational database architecture. In such systems files are interlinked so that deletion, additions and other changes in one file automatically activate appropriate changes in related files. The market place for LMSs is now a mature one in India. Almost all special libraries and larger academic libraries in India have adopted a computer-based system.

2. Progress of LMSs over the years:

Software upgradation is a continuous process. LMSs are no exceptions. A critical study of development of LMSs over the years suggests that LMSs may be divided into four generations [1] on the basis of sophistication of their facilities for integration and interconnectivity. The LMSs developed in all parts of the world from mid 1970s to till date may be fitted into one of the above four compartments.

The first generation LMSs were module based systems with no or very little integration between modules. Circulation module & cataloguing module was the priority issue for these systems and were developed to run on specific hardware platform and proprietary operating systems.

The second generation LMSs become portable between various platforms with the introduction of UNIX and DOS based systems. The LMSs of this generation offer links between systems for specific function and are command driven or menu driven systems.

The third generation LMSs are fully integrated systems based upon relational database structures. They embodied a range of standards, which were a significant step towards open system interconnection. Colour and GUI features, such as windows, icons, menus and direct manipulation have become standards and norms in this generation.

The fourth generation LMSs are based on client-server architecture and facilitate access to other servers over the Internet. These systems allow accessing multiple sources from one multimedia interface.

Thus the progress of LMSs through the generations provides us an effective and straightforward user interface which supports access to multiple sources and services from one multimedia interface.

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Moreover the latest LMSs allow customized report generation and to manipulate data and investigate various scenarios and therefore they have all the potentials to be a decision support tool [1,2]. A comparative table (table 1) of features and functionalities of LMSs in four different generations may be drawn on the basis of above discussion.

Table 1: Generations of LMSs

Sl. No.	Features	1 st Generation	2 nd Generation	3 rd Generation	4 th Generation
1	Programming Language	Low level language	COBOL, PASCAL, C	4 GL	OOPS
2	Operating System	In house	Vendor Specific	UNIX, MSDOS	UNIX, Windows
3	DBMS	Non-standard	Hierarchical and Network model	Entity Relation model	Object oriented model
4	Import/Export	None	Limited	Standard	Fully integrated and seamless
5	Communication	Limited	Some interface	Standard	Full connectivity across the Internet
6	Portability	Machine dependent and hardware specific	Machine independent but Platform dependent	Multi-vendor	Multi-vendor and Platform independent
7	Reports	Fixed format and limited fields	Fixed format and unlimited fields	Customized report generation	Customized report generation with e mail interface
8	Colour	None	None	Available	Fully available with Multimedia
9	Capacity of record holding	Limited	Improved	Unlimited	Unlimited
10	Module Integration	None	Bridges	Seamless	Seamless
11	Architecture	Stand-alone	Shared	Distributed	Client-server
12	Interface	Command driven (CUI)	Menu driven (CUI)	Icon driven (GUI)	Icon driven with Web and Multimedia (GUI)
13	User Support	Single user	Limited number of users	Unlimited number of users	Unlimited number of users
14	Multi-lingual support/ UNICODE	None	Limited (through Hardware support)	Standard	UNICODE base

3. Library management softwares in India

The automation of library activities started in India with the introduction of CDS/ISIS. CDS/ISIS is a menu-driven generalized information storage and retrieval system designed specifically for the structured non-numerical databases. NISSAT with the help of other professional bodies organized a number of training courses on application of CDS/ISIS in information activities. As a result, a large pool of trained manpower developed all over the country. Some organizations from the experience of use of CDS/ISIS, MINISIS etc. developed their own LMSs e.g. DESIDOC developed DLMS (Defenece Library Management System), INSDOC came with CATMAN (Catalogue Management) and SANJAY was developed by DESIDOC under NISSAT project by augmenting CDS/ISIS (Ver. 2.3) for library management activities.

The LMSs presently available in India may be ranked in 2nd, 3rd and in between 3rd and 4th generation on the basis of their features as listed in the table 1. As far as the origin and application domain is concerned, the LMSs available in India may be grouped (table 2) as below: -

Table 2: LMSs available in India

Origin	Application Domain		
	Large System	Medium Range System	Small System
LMSs of foreign origin	Alice for WINDOWS (OASIS) BASISplus & TECHLIBplus TLMS	NA	NA
LMSs developed over LMS of foreign origin	DELSIS (Over BASISplus)	SANJAY (Over CDS/ISIS)	TRISHNA (Over CDS/ISIS)
LMSs of Indian origin	LIBSYS MAITRAYEE MECSYS SOUL SUCHIKA TULIPS ULYSIS WILISYS	DLMS GRANTHALAYA Krvger Library Manager; LIBRA LIBRARIAN LISTPLUS NILIS NIRMALS	ARCHIVES CATMAN GOLDEN LIBRA LIBMAN LIBRARY MANA- GEMENT; LIBRARY MANA- MANAGER; LIBRIS LIBSOFT LOAN-SOFT SALIM; SLIM

(Please see Appendix I for details)

As it is not possible to discuss every LMS listed in the table, only ten LMSs are selected for discussion on the basis of their popularity and features.

3.1: Alice for Windows/OASIS

This LMS developed by Softlink International, Australia is an international software package and is marketed worldwide through a number of agencies based in America, Australia, Britain, Iceland, India, Malaysia, New Zealand and Singapore. This software is marketed under the name of Embla in Iceland, Alice elsewhere in Europe, OASIS in South East Asia & Australia and Annie in America and other parts of the world. Recently Softlink International decided to call the software *Alice for Windows* [3,4] all over the world to maintain consistency in nomenclature.

The main features of Alice are as follows:

- It has four distinct versions – Public library ver. , Special library ver., Academic library ver. and School library ver.
- The package is modular and modules are grouped into one of the three sets –

- Standard Set: Includes Management; Reports & Utilities; Circulation; OPAC
- Advanced Set: In addition to standard set it includes Acquisition; Periodicals; Journal Indexing; Multimedia; Web Inquiry
- Special Set: In addition to Standard & Advanced set it includes Reservation; Interlibrary loan; Patron self checking; Rapid retrospective conversion; Multilingual features; Self circulation; Union catalogue

- The LMS is backed by a number of support services which include onsite training programs, continued R & D, feedback system through user groups, free newsletters etc.
- Besides traditional library materials, it can be used to manage slides, audio & videocassettes, paper clippings, maps, charts, electronic documents and www sites. Location of documents in library could also be seen with the help of the library map. It is possible to maintain consistency in recording of items through the use of authority files. Alice has a capacity of holding 99 lakhs records.
- It supports a total of eleven search criteria to search the database from any machine (UNIX/MAC/Apple etc.) through Internet or Intranet. It helps to generate customized reports in addition to 800 preformatted reports available with standard set.
- It supports barcode technology and has in built communication function. As special features, the LMS provides data protection functions, rapid retroconversion facility and online tutorial & help system

3.2: BASISplus & TECHLIBplus

BASISplus & TECHLIBplus are products of Information Dimensions Inc. (IDI), USA and NIC, New Delhi is the value-added reseller of the packages in India. BASISplus is a client-server relational database system for text and mixed object documents that adheres to fundamental principles of open systems including interoperability, portability and scalability [5]. The database engine provides user authentication, document access control, concurrency control, deadlock protection and recovery. The features of the LMS are as below:

- Relational DBMS
- Client-server Architecture
- Active data dictionary
- Enhanced security feature
- Complete backup & restore capabilities
- Power search facility
- Full text retrieval
- Mixed object management
- Thesaurus and controlled vocabulary
- Screen customization
- Document converters
- Immediate & Deferred updating (online & batch)
- Content based retrieval
- Component-level retrieval & image management
- Networking (LAN & WAN)
- Open Application Programming Interface (API) for heterogeneous client access to BASISplus database server.
- GUI based easy user interface for retrieval, display and data entry
- Intelligent search assistance and thesaurus manager
- Converter technology which allows user to import and export over 30 different word processors file formats

TECHLIBplus is a comprehensive library automation package developed over BASISplus and customized to perform all the operation and activities of a fully electronic library [6]. TECHLIBplus supports OPAC, Catalogue maintenance, Circulation, Serial management, Acquisition, Processing and MARC cataloguing. The LMS provides direct access to information in Current Contents.

3.3: DELSIS

DELSIS, developed by DELNET, is basically a library networking software and is suitable for library networks, universities with branch libraries (big campuses) and public libraries in the country. DELSIS [7] is based on BASISplus and handles not only the OPAC but also has the administrative tools for building up the union catalogues on BASISplus. It provides powerful and extensive facilities for online inquiries for books, serials, biographical details about the specialists and supports the cataloguing of books in Indian languages. The important features of DELSIS are as follows:

- DELSIS is a user friendly, menu driven package. It contains the modules for OPAC as well as modules for the creation of databases
- It supports Boolean, phrase and word searching facilities. It generates a dictionary of subject heading while retrieving a subject.
- It displays a record in AACR II format and printout options are also available
- It provides multi-lingual features like creation of the bibliographic records in any Indian languages and transliteration in any Indian language including roman scripts. Printout may be taken in any Indian language and queries may also be formulated in Indian languages.
- It supports import and export of records in ISO format

3.4: GRANTHALAYA

This CUI based (DOS & UNIX) modular LMS is developed on FoxPro by INSDOC for medium range libraries. It includes all the modules required for day-to-day library operations. The package is made of seven modules – Library administration; Query; Circulation; Acquisition; Serials control; Technical processing and Data administration. The salient features [8] of the LMS are

- Based on object oriented design
- Supports CCF and ISO 2709 for import & export
- Generates a dictionary for various data elements for easy searching
- Supports Boolean operators and range searching
- Provides online help through screen messages

3.5: LIBSYS

LIBSYS is a fully integrated multi-user library system based on client-server model and supports open system architecture, web-based access and GUI. This indigenous LMS is designed and developed by LibSys Corporation, New Delhi. LIBSYS has seven basic modules – Acquisition; Cataloguing; Circulation; Serials; OPAC; Web-OPAC and Article indexing. The major advantages of using LIBSYS [8,9] are as follows:

- Based on client-server model and TCP/IP for communication and networking
- Provides ANSI Z39.50 compliant web access for making the server accessible through Internet/Intranet
- Supports web OPAC for access of bibliographic databases through Internet/Intranet
- Supports standard bibliographic formats like USMARC, UKMARC, CCF, UNIMARC etc.
- Includes images and multimedia interfaces with LIBSYS search engine
- Supports barcode technology for membership card production and circulation
- Offers SDI, CAS, fine calculation, e mail reminders etc. utilities

3.6: SANJAY

This LMS is based on CDS/ISIS (Ver. 2.3). It has been developed by DESIDOC under a NISSAT project to meet the requirements of library management activities. It includes a set of 35 Pascal programs and 25 special menus. The features [10,19] of SANJAY are –

- More user friendly than CDS/ISIS for library house keeping operations
- Effective interlinking of databases (it is a great achievement because CDS/ISIS does not support relational databases)
- Interlinks book databases, member databases, vendor databases and budget databases
- Maintenance module restricts the access right to a limited set of users and thereby provides security measures
- User module helps library staff to carryout daily routine in circulation, acquisition and online catalogue

3.7: SOUL

The story of SOUL (Software for University Libraries) started with the development of ILMS (Integrated Library Management Software) by INFLIBNET in collaboration with DESIDOC. Two versions of ILMS (DOS & UNIX) were developed for university libraries in India. But with the introduction of GUI based system and other revolutionary changes in the field of computer software, INFLIBNET decided to develop a state-of-the art, user friendly, Window based system which will contain all the features/facilities available with other LMSs in the market. As a result INFLIBNET came out with a LMS [11] called 'SOUL'. The package was first demonstrated in February 1999 during CALIBER-99 at Nagpur.

SOUL uses RDBMS on Windows NT operating system as backend to store & retrieve data. The SOUL has six modules – Acquisition; Cataloguing; Circulation; Serial Control; OPAC and Administration. The modules have further been divided into sub-modules to take care of various functions normally handled by the university libraries. The features [12] of SOUL are –

- Window based user friendly system with extensive help messages
- Client-server architecture based system allowing scalability to users
- Uses RDBMS to organize & query data
- Multi-user software with no limitation for simultaneous access
- Supports bibliographic standards like CCF & AACR II and ISO 2709 for export & import facility
- User friendly OPAC with web access facility
- Provides facility to create, view & print records in regional languages
- Supports LAN & WAN environment
- Affordable cost

3.8: SUCHIKA

This LMS is developed by DESIDOC for libraries/technical information centres of DRDO laboratories (around 42 Labs.). Presently two versions (DOS & UNIX) are available for small and big libraries respectively. The package supports CCF, AACR II, ISO 2709 and allows data conversion from CDS/ISIS. SUCHIKA has four modules – Acquisition; Circulation; OPAC & Serial control and also has in built facility for data validation and data duplication checking. SUCHIKA [8,13] has powerful retrieval facilities with the help of free text searching, Boolean searching and various indexes created automatically on searchable fields.

3.9: TLMS

TLMS (Total Library Management Service) is developed in Germany by TRANCE [14] group and marketed and distributed in India by OPAC Infosys Pvt. Ltd., Pune. It is SQL based client-server system with fully integrated library management systems. It supports CCF, USMARC and Indian UNIMARC (as recommended by Central Secretariat Library, New Delhi) and Z39.50. The package also provides various additional facilities like member card generation, email reports, virtual library, audio, video and scam management within the database and use of digital camera. The features of TLMS [15] include following supports –

- Printing of accession register; AACR II card generation; Article scan management; Authority files creation; Auto cataloguing from web sites; Auto export & import; Auto keyword generation; Automatic barcode generation; Letterhead creation; Dropdown matching etc.

- Barcode based issue & return and serial control; Auto status generation for progress of processing of documents; Bulletin board facility; Kardex generation for serial control; Complete Intranet support; Automatic claim generation for overdue & missing journal issues
- RTF, Dial-up networking, E mail and Printing of gatepass; GIST card facility; ID card generation; Arrival list generation; Multi-lingual support, Web access of OPAC; Power search facility; Fine calculation and receipt generation; Reservation of books; Retrospective data conversion; SDI service; Search refining; Security enhancement; Statistics & graphs; Stock verification
- UNIMARC input sheet generation; UNIMARC cataloguing; Virtual library creation; Z39.50 client & server; UNICODE support etc.

3.10: TRISHNA

TRISHNA [16] is developed by NISTADS, New Delhi by using CDS/ISIS (ver 2.3) under a NISSAT project. It supports data creation, storage and retrieval in Indian language scripts namely Assamese, Bengali, Gujrati, Devnagari, Kanada, Malayalam, Oriya, Punjabi, Tamil and Telegu. NISSAT provides this package at no cost with nominal charges for training and free technical support. The computer system must have a GIST card for the effective running of TRISHNA

4. Comparative study of selected LMSs

Now, we may go for a comparative study of ten selected LMSs on the basis of the discussion made in the sections 2 and 3. The comparative study may be done by taking into account five aspects – hardware requirements, intrinsic features of packages, available services & facilities, customer support service and price

4.1: Hardware and backend software requirement for LMSs

Any LMS is application software, which requires some system software and hardware support for proper functioning. Thus the selection of LMS should be done on the basis of careful analysis of the basic hardware and software requirements for the package. The essential backend softwares and minimum hardware requirements for the selected packages are given in the appendix II.

4.2: Intrinsic features of LMSs

The factors like data storage techniques, programming language(s) used in the development of software, database structure, file organization etc. must also be taken into consideration for the comparative study because these factors will determine very important issues of maintenance, upgradation and customization in future [17]. These features of the selected packages are available in appendix II (Column 2 and 3)

4.3: Services & facilities available with LMSs

The suitability and superiority of any LMS depends on the available services, facilities and coverage of library/information activities in various modules. The whole range of services available in selected LMSs may be divided into three groups – Core services, Enhanced services and Value added services.

4.3.1: Core services

These are the basic services [18] necessary for day-to-day library activities and must be available with LMSs. These services may be tabulated for the comparative study as follows: -

Table 3: Core Services

SL. No.	Core Services	LMSs (1 represents presence and 0 indicates non-availability of services)									
		Alice for Windows	BASIS Plus & TECHLIB Plus	DELSIS	GRANTH-ALAYA	LIBSYS	SAN-JAY	SOUL	SUCHIKA	TLMS	TRISHNA
1	ACQUISITION	1	1	0	1	1	1	1	1	1	0
2	CATALOGUING	1	1	1	1	1	1	1	1	1	1
3	CIRCULATION	1	1	0	1	1	1	1	1	1	0
4	OPAC	1	1	1	1	1	1	1	1	1	1
5	SERIAL CONTROL	1	1	0	1	1	0	1	1	1	0
6	BIBLIOGRAPHIC FORMAT SUPPORT	1	1	1	1	1	1	1	1	1	1
7	DATA EXCHANGE FORMAT SUPPORT	1	1	1	1	1	1	1	1	1	1
8	ARTICLE INDEXING	1	1	1	0	1	1	1	0	1	1
9	RETROCONVERSION	1	1	1	1	1	1	1	1	1	1
10	STANDARD REPORT/ ADMINISTRATION	1	1	1	1	1	1	1	0	1	1
TOTAL NUMBER OF SUPPORTS		10	10	7	9	10	9	10	8	10	7

It is clear from the above table (table 3) that DELSIS and TRISHNA do not support all the basic requirements of library management activities. It is very much natural because these two packages were designed keeping in view the purposes different from the library management. DELSIS developed as library network support software and TRISHNA designed to facilitate database creation in Indian language scripts.

4.32: Enhanced services

These are the additional set of services [20] which will make the work of a librarian easy, smooth and seamless and at the same time these will help users in efficient information retrieval, cross-domain searching and easy navigation. A comparative table may be drawn as below: -

Table 4: Enhanced Services

SL. No.	Enhanced Services	LMSs (1 represents presence and 0 indicates non-availability of services)									
		Alice for Window	BASIS Plus & TECHLIB Plus	DELSIS	GRANTH-ALAYA	LIBSYS	SAN-JAY	SOUL	SUCHIKA	TLMS	TRISHNA
1	CUSTOMIZED REPORT GENERATION	1	1	0	0	0	1	1	0	1	0
2	GUI BASED USER INTERFACE AND COLOUR	1	1	1	0	1	0	1	0	1	0

3	RESERVATION FACILITY	1	1	0	0	1	0	0	0	1	0
4	INTERLIBRARY LOAN MODULE	1	0	1	0	0	0	0	0	1	0
5	MULTI-LINGUAL SUPPORT	1	0	1	0	0	0	1	0	1	1
6	UNION CATALOGUE	1	1	1	0	0	0	0	0	1	0
7	AUTHORITY FILE SUPPORT AND CONTROLLED VOABULARY	1	1	1	1	1	1	1	1	1	0
8	ONLINE HELP	1	0	0	1	0	0	1	0	1	0
9	ONLINE TUTORIAL	1	0	0	0	0	0	0	0	0	0
10	POWER SEARCH FACILITY	1	1	1	1	1	1	1	1	1	0
11	INTERNET SUPPORT	1	1	1	0	1	0	1	0	1	0
12	INTRANET SUPPORT	1	1	1	0	1	0	1	0	1	0
13	WEB ACCESS OPAC	1	1	1	0	1	0	1	0	1	0
14	MULTIMEDIA INTERFACE	1	1	1	0	1	0	1	0	1	0
15	BARCODE SUPPORT	1	1	0	0	1	0	0	0	1	0
16	BACKUP	1	1	1	0	1	1	1	0	1	0
TOTAL NUMBER OF SUPPORTS		16	12	11	3	10	4	11	2	15	1

Most of these services are features of the third generation LMSs. The table (table 4) shows that four packages namely GRANTHALAYA, SANJAY, SUCHIKA and TRISHNA provide very little support for enhanced services and obviously belong to the second generation LMSs. Alice for Windows topped the list with TLMS at the next position. SOUL performed well in this service area. It is the only Indian LMS from the government sector with third generation features and facilities.

4.33: Value added services

These are the essential work and services [21] of library management and generally not included within the scope of a LMS. But with the development in hardware, software and connectivity, presently LMSs are trying to provide software solution for this type of work and services. The table 5 compares selected LMSs against such work and services.

Table 5: Value Added Services

SL. No.	Value Added Services	LMSs (1 represents presence and 0 indicates non-availability of services)									
		Alice for Window	BASIS Plus & TECHLIB Plus	DELSIS	GRANTHALAYA	LIBSYS	SANJAY	SOUL	SUCHIKA	TLMS	TRISHNA
1	PATRON SELF SERVICE (Self circulation, Self reservation etc.)	1	0	0	0	0	0	0	0	1	0
2	ONLINE USER TRAINING/ORIENTATION	1	0	0	0	0	0	0	0	1	0

3	STOCK VERIFICATION FACILITY	0	0	0	0	0	0	0	0	1	0
4	MEMBERS PHOTO ID CARD GENERATION	0	0	0	0	0	0	0	0	1	0
5	BARCODE GENERATION	1	1	0	0	1	0	0	0	1	0
6	FINE CALCULATION & RECEIPT GENERATION	0	0	0	0	1	0	1	0	1	0
7	GATEPASS GENERATION	0	0	0	0	1	0	0	0	1	0
8	BULLETIN BOARD SERVICES & E MAIL REPORTS	0	1	1	0	1	0	1	0	1	0
9	ELECTRONIC SDI, CAS & CAL SUPPORT	1	1	0	0	1	0	1	0	1	0
10	DIGITAL CAMERA SUPPORT	0	0	0	0	0	0	0	0	1	0
TOTAL NUMBER OF SUPPORTS		4	3	1	0	5	0	3	0	10	0

In this service sector, TLMS topped the list with a perfect 10 score. LIBSYS is the only LMS of Indian origin performed well against the checklist.

4.4: Customer support services

The support service from the software developers/agent at the right time and at the right place is a critical factor to be kept in mind at the time of selection of any LMS. The mode of support for selected LMSs may be compared from the table 6

Table 6: Customer Support Service

SL. No.	Customer Support Services	LMSs (1 represents presence and 0 indicates non-availability of services)									
		Alice for Window	BASIS Plus & TECHLIB Plus	DELSIS	GRANTH-ALAYA	LIBSYS	SAN-JAY	SOUL	SUCHIKA	TLMS	TRIS-HNA
1	ON CALL & ON SITE SUPPORT	1	1		0	1	0	0	0	1	0
2	CONTINUED R & D AND SOFTWARE UPDATION	1	1	1	1	1	1	1	1	1	0
3	LIVE INTERNET SUPPORT AND UPDATE	0	0	0	0	1	0	1	0	1	0
4	TRAINING	1	1	0	1	1	0	1	1	1	1
5	USER GROUP AND NEWSLETTER SERVICES	1	0	0	0	0	0	0	0	0	0
TOTAL NUMBER OF SUPPORTS		4	3	1	2	4	1	3	2	4	1

It is clear from the above table that support services from private agencies are better than the government organizations for obvious commercial reasons.

4.5: Price

Lastly but not leastly, we have to take the price of the packages into active consideration for cost-benefit analysis of available services in the selected LMSs. This factor plays an important role in our country because financial crunch is a regular feature in Indian libraries and information centres. As a general trend, commercial LMSs are costlier than the packages developed by government organizations. The price of the software rises with the number of value-added services and enhanced services incorporated in the software. In general, the pricing model of commercial LMSs may be divided into three options – Basic ver. (Price range: Rs. 30,000/- to 80,000/-), Standard ver. (Price range: Rs. 1,25,000/- to 2,20,000/-) and Full ver. (Price range: Rs. 2,90,000/- to 3,50,000/-). The basic version supports limited collection size and does not have networking features. The standard version supports unlimited collection size and limited number of network users. The full version supports unlimited collection size and unlimited users. Moreover, commercial LMS designers also claim additional charges for customization, onsite training, data conversion (from other DBMS), software updates (after warranty period) and post warranty annual maintenance charges. But LMSs developed by government organizations are cheaper and sometimes available only against some registration charges (e.g. SANJAY). The Indian LMS SOUL, which includes most of the third generation features, is available at the cost of Rs. 50,000/- [12] only i.e., at much cheaper rate than other similar commercial LMSs.

5: Conclusion

This study is based on author's experience of using some of the LMSs mentioned above, technical literature/brochure of packages, comments and advises of professional colleagues having working experiences of using the LMSs and attending demonstration of LMSs arranged by the agencies. It is clear from the above study that LMSs has got enough maturity to provide software solution to most of the problems of library management activities. Packages are also becoming more and more user friendly through incorporating various features like easy and integrated access interface, cross-domain searching and self service facilities.

The selection of right LMS is always a difficult task for library managers. The present need, long term requirements, hardware & software requirements, financial resources of the library and customer support from software developers must be kept in view at the time of selection of any LMS. The LMSs designed and developed by the commercial software houses are costlier than packages developed by government organizations such as INSDOC, DESIDOC, INFLIBNET etc. Moreover after the warranty period, the services like software updating, trouble-shootings and annual maintenance etc. are also highly priced and naturally place heavy recurring financial burden on the already strained library budget.

Indian libraries need a LMS with all the third generation features at affordable cost, backed by strong customer support services. The present study indicates that the SOUL developed by the INFLIBNET has most of the features of a third generation LMS. Although looking at the name of the software, one may think that it meant for university libraries only, but in fact, it is flexible enough to be used for automating any type or size of library. It is available at an affordable price and much cheaper in compare with other similar commercial LMSs. The customer support service is not comprehensive enough but this difficulty may overcome by forming user group and discussion forum for the mutual benefit of each user. The forum may approach INFLIBNET for active support, guidance and advise. Moreover, SOUL is supported by continued R & D from INFLIBNET [11,12] ensuring release of newer versions of SOUL incorporating exciting features e.g. the efforts are already underway at INFLIBNET to create next version of SOUL on Linux platform.

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APPENDIX I: LIBRARY MANAGEMENT SOFTWARES AVAILABLE IN INDIA

SL. No.	LMS	Software Developing Group	Availability Status	Marketing & Distribution agent in India
1	Alice for Windows	Softlink International, Australia	C	Softlink Asia Pvt. Ltd., New Delhi
2	Archives (1,2,3)	Microfax Electronic Systems, Mumbai	C	Direct
3	BASISplus & TECHLIBplus	Information Dimension Inc., USA	C	Natioanl Informatics Centre, New Delhi
4	CATMAN	INSDOC, New Delhi	C	Direct
5	DLMS(Defence Library Management System)	DESIDOC, New Delhi	F	Direct
6	DELSIS	DELNET Society, New Delhi	C	Direct
7	Golden Libra	Golden Age Software Technologies , Mumbai	C	Direct
8	GRANTHALAYA	INSDOC, New Delhi	C	Direct
9	Krvger Library Manager	Blitz Audio Visuals, Pune	C	Direct
10	Libman	Datapro Consultancy Service, Pune	C	Direct
11	Libra	Ivy Systems Ltd., New Delhi	C	Direct
12	Librarian	Soft-Aid, Pune	C	Direct
13	Library Management	Raychan Sysmatics, Bangalore	C	Direct
14	Library Manager	System Data Control Pvt. Ltd., Mumbai	C	Direct
15	Libris	Frontier Information Technology	C	Direct
16	Lib Soft	ET & T Corp., New Delhi	C	Direct
17	LIBSYS	Softlink Asia Pvt. Ltd., New Delhi	C	Direct
18	ListPlus	Computer systems, Bangalore	C	Direct
19	Loan Soft	Computek Computer Systems, Hyderabad	C	Direct
20	Maitrayee	CMC Kolkata in collaboration with CALIBNET	NA	NA
21	MECSYS	MECON, Ranchi	C	Direct
22	NILIS	Asmita Consultants, Mumbi	C	Direct
23	Nirmals	Nirmal Institute of Computer	C	Direct
24	Salim	Expertise, Tiruchirapalli Uptron India Ltd., New Delhi	C	Direct
25	SANJAY	DESIDOC in collaboration with NISSAT	F	Direct
26	Slim	Algoorythms, Mumbai	C	Direct
27	SOUL	INFLIBNET	C	Direct
28	SUCHIKA	Direct	M	Direct
29	TRISHNA	NISTADS, New Delhi in collaboration with NISSAT	F	Direct
30	TLMS	TRANCE Group, Germany	C	OPAC Infosys Pvt. Ltd., Pune
31	TULIPS	Tata Unisys Ltd., Mumbai	C	Direct
32	ULYSIS	WIPRO Information Technology Ltd., Seccunderbad	C	Direct
33	WILISYS	Wipro India, Bangalore	C	Direct

(C: Commercially available; F: Free against registration; M: Moderately priced; NA: Not available commercially)

APPENDIX II: HARDWARE & SOFTWARE REQUIREMENTS AND INTRINSIC FEATURES OF SELECTED LMSs

SL. No.	LMS	INTRINSIC FEATURES		SOFTWARE & HARDWARE REQUIREMENTS	
		Programming Language(s)	Data Storage Techniques	Software Requirement	Minimum Hardware Requirement
1	Alice for Windows	C++	Relational Model	WIN 95/98	Pentium I Processor 32 MB RAM 2.1 GB HD SVGA (640 X 480 X 256) CDROM Drive (48X) Sound Card
2	BASISplus TECHLIBplus DELSIS	Visual Basic	Realational Model	Server UNIX SVR 4.0 or UNIXWARE Client WIN 3.11 or above TCP/IP & PC-NFS (for network and shared file services)	Server Pentium II 16 MB RAM 170 MB HD 150 MB Cartridge Client Intel 80386 4 MB RAM (8 MB recommended) 20 MB HD
3	GRANTHALAYA	4 GL/FoxPro	Relational Model	MSDOS Ver. 6.0 & above SCO UNIX Ver. 5.32	PC-AT 486 8 MB RAM 540 MB HD
4	LIBSYS	C, Java	B-Tree and Inverted File	Server WIN NT/ SCO UNIX/ LINUX/ UNIXWARE Novell Client WIN 95/98/NT Or X-Windows	Server Pentium II 16 MB RAM 640MB HD Client PC-AT 486 8 MB RAM
5	SANJAY TRISHNA	PASCAL (CDS/ISIS)	Inverted File	MSDOS Ver 3.0 & above CDS/ISIS Ver.2.3 & above	PC-AT 640 KB RAM 540 MB HD GIST Card (for TRISHNA only)
6	SOUL	Java	Relational Model	Server WIN NT MSSQL Server (6.5) Client WIN 95	Server Pentium II 64 MB RAM 1.2 GB HD 32X CDROM Drive Ethernet Card (10/100 MBPS) Client Pentium I 32 MB RAM 1.2 GB HD Ethernet Card (10/100 MBPS)
7	SUCHIKA	C++	B-Tree	MSDOS 6.0 or higher Or UNIX (depending on the version of the package)	PC-AT 486 8 MB RAM 540 MB HD
8	TLMS	C++, Java	Relational Model	Server WIN NT Client WIN 98	Server Pentium III 64 MB RAM 6 GB HD Multimedia Kit & CDROM Drive Client Pentium Celeron 32 MB RAM 4 GB HD Multimedia Kit & CDROM Drive

