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Library Automation Software Packages: A Comparative Study of Virtua, Alice for Windows, SOUL and LIBSYS

Hilal Ahmad Dr.
Higher Education Department, Govt. of Jammu & Kashmir, India, drhilal198@gmail.com

Samar I. Bakhshi Dr.
National Law University Delhi, New Delhi, India, samar26s@gmail.com

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Dr. Hilal Ahmad (drhilal198@gmail.com)
Librarian, Higher Education Department, Government of Jammu and Kashmir, India

Dr. Samar Iqbal Bakhshi (samariqbal.bakhshi@nludelhi.ac.in,samar26s@gmail.com)
Assistant University Librarian, National Law University Delhi, India

Abstract

The core purpose of present research effort is to discern a reasonable evaluation of the features of automation software packages to guide the librarians select a package that suits their requirements and enhance library services effectively. Of the several available software packages; Virtua, Alice for Windows, SOUL, and LIBSYS are chosen for conducting micro evaluation of selected software features. A checklist comprising several parameters like operating systems, integration of modules; compatibility with international standards; Web-OPAC facility, etc. were highlights of the study. Virtua, with 308 out of 328 rating points, figured atop of the table with most sophisticated features and facilities followed by Alice for Windows with 247 points, LibSys with 228 points, and SOUL with 175 points. Virtua has been found with most modern facilities and compatibility to global standards; however SOUL has observed most used software in Indian libraries followed by LibSys. Since the study has covered popularly used softwares; therefore, it is expected to serve as aiding tool for librarians to select the package with advanced features to fulfill the emerging demands of techno-savvy users effectively.

Keywords– Library automation; Indian Libraries; Library automation software packages; SOUL; LibSys; Virtua; Alice for Windows

Type- Research Paper

1. Library Automation: Introduction

Automation in libraries has always been welcoming subject in professional literature. It is said to have taken off in the 1930s when punch cards were invented by 'Herman Hollerith' of the US Census Bureau in circulation and acquisition sections. However, computers in libraries originally kick started by the advent of MARC project by the Library of Congress in 1966 which gave rise to the second era of library automation. The use of earlier punched cards did not ceased, but their role declined to a noticeable extent (Salmon, 1975). During this significant era, few University libraries and public libraries in the USA, UK, and Continental Europe started developing in-house library automation systems. This period envisioned library computerization ideas, not at the cost of human in place of technologies, nevertheless the ideal utilization of their togetherness to boost library operations and services (Heiliger and Henderson, 1971). This was followed by some substantial advances like OCLC's cataloging venture, which became operational in 1971, and another parallel project like University of Toronto Library Automation Systems (UTLAS). The OCLC's project was remarkable as it simplified technical processing. Down some years,

RLG popularly known as Research Libraries Group and a network famous in the name of RLIN were founded by Bibliographical Automation of Large Library Operations (BALLOTS). Another network in form of WLN came into being for serving the similar goal (Riggs, 1992).

By the end of the 1980s, OCLC, WLN, RLG, and UTLAS extended their use to thousands of North American libraries. Although few libraries retained in-house systems for specific functions, automated cataloging was evolved in different directions. During the beginning of the virtual setup of OCLC, the networking stayed as a cooperative undertaking of Ohio academic libraries. But some years later, OCLC's entered to 800 libraries (Research Libraries Group, 1978). The development of Integrated Library Systems like Total Library System (TLS), Bibliographic Access and Control System (BACS), Minnesota State University System Project for Automated Library System (MSUS/PALS), MELVYL, and Virtua library management system in the USA while Plessey circulation system, Automated Library System (ALS) and Olivetti computerized issue and return system in Britain were further noteworthy developments of this period (Herring and Mackenzie, 1986). These developments flourished Integrated Library Systems (ILS) in American and British libraries.

1.1 Indian Scenario:

Subsequent to phenomenal progress of American and British libraries, some Indian libraries also pooled their efforts for computerization to improve their functions. In this direction, a premier statistical institute in India in name of ISI, Kolkata, first used computer in 1955. However INSDOC New Delhi (now popularly known as NISCAIR-CSIR), is first known agency to have used computer in libraries to automate author and subject indexes of Indian Science Abstract (ISA) in 1965. Two years later, the same institute used computers for the 'Indian Scientific and Technical Translators' roster. But in 1973, the first union catalog entitled "regional union catalogue of scientific serials" Bombay-Poona was out for use. Further in 1978, INSDOC provided SDI service using CAN/SDI software of IIT Madras. During this decade, computerized databases were also prepared by some libraries. The appearance of library networks, i.e., CALIBNET; INFLIBNET, DELNET; NICNET PUNNET; INDONET, SIRNET, etc. (Sharma, 1995) also came into being. With the increasing enthusiasm among professionals, many institutes like NISCAIR, New Delhi; Documentation Research and Training Center (DRTC), Bangalore, and ISI, New Delhi, started library automation training through several sponsored, regular and refresher courses. However, the momentum of library automation picked up with the falling price of computer hardware and software. Though initially, it was slow, but with the adequate funds from UGC, automation increased manifold. This rising demand resulted in the readily availability of software packages. Of these packages, Software for University Libraries (SOUL), LibSys, Granthalaya, Suchika, Sanjay, Maitrayee, TULIPS, DELMS, Deldos, LIBRARIAN, LIBRIS, etc. are some famously used library softwares' in India. At the same time, Virtua, Alice for Windows, and CDS/ISIS were some famous international software that also proved their metal in Indian libraries.

2. Library Automation Software Packages

In India, library software packages began with the CDS/ISIS of UNESCO in the mid-eighties (Saxena and Srivastava, 1998). However, research and development centers were premiers in developing indigenous software, but most of their packages lacked upgrading and hence did not last long. As a result, some libraries switched over to international softwares. Though the list of available software packages is long; however, popularly used softwares by Indian libraries are discussed here.

2.1   Virtua

Virtua is notable international library automation software developed by VTLS Inc., a for-profit company. Currently, it is used by more than 1900 libraries in 44 countries. Being Integrated Library System, Virtua was acknowledged by 1800 reputed libraries in 42 countries across the globe by 2012 (Chachra, 2012). Virtua is based on the most up-to-date technologies deployed in library operations i.e., RDBMS for database management and handling; database warehousing; three-tier Client-Server architecture; rapid development tools; UNICODE compatibility and ATM network optimized applications and RFID technology (Chachra et al., 1993; VTLS, 2021). Virtua has seven robust modules Acquisition and Fund Accounting, Cataloguing, Circulation, Serials control, OPAC, Statistics and Reporting, and Chameleon Gateway. It has multilingual solid capabilities using UNICODE. It supports all formats and different versions of MARC besides MARC 21. It has Windows-based Client-Server architecture to choose from among different platforms like UNIX, LINUX, etc., with Windows as a Client. It uses Oracle Relational Database Management System (RDBMS) as its back-end. It is the first Unicode-compliant library automation software, with FRBR functionality and RDA implementation (VTLS, 2021) Virtua has solid features and is being used by libraries worldwide, but its expensive nature is the only pullback for Indian libraries to use this software. Nevertheless, about 40 Indian libraries, including Indian National Library in Kolkata; JNU New Delhi; CIIL Mysore; IIT Madras, etc., use Virtua to automate their functions and services.

2.2   Alice for Windows

Alice for Windows is also an assimilated library management system comprising ten modules Acquisition, Circulation, Management, Periodicals, Journal indexing, Multimedia, Multilingual, Subject authority, Web inquiry, Book hire, and user self-check. Alice for Windows supports USMARC format. It runs on its database. Therefore it doesn't require RDBMS. The extensive use of Alice for Windows is proved by the fact that it has 17000 installation base and 80 offices worldwide. In India itself, Alice for Windows has about 250 users, including the libraries of UPSC New Delhi, Institute of Chartered Accountants of India, Ministry of Railways, Larsen and Turbo, Dhirubhai Ambani International School, Indian Institute of Management (IIM) Ahmadabad, etc. (Softlink Asia, India Mart, 2021).

2.3   SOUL

Information and Library Network popularly known as INFLIBNET chiefly brought an indigenous software SOUL to help the College and University libraries in India to automate their operations and services. SOUL known for its user-friendliness is available in six modules viz Acquisition, Catalogue, Circulation, OPAC, Serials Control, and Administration. Designed primarily on Client-Server design with compatibility to global standards i.e., AACR 2 and MARC21 for bibliographic formats, CCF for networking, ISO 2709 for circulation protocols, the software coordinates multi-platforms for bibliographic databases like MY SQL, MS-SQL, or any known RDBMS. The current release of the software appeared as SOUL 3.0 in February 2021, for which the Operating System requirement is Windows 10 or higher versions and Windows server 2012/2016/2019 or higher versions. The attractiveness of SOUL has been found by the fact that presently it has more than 2000 libraries as its clientele, including universities, college, public and special libraries in India (INFLIBNET, 2021).

2.4   LibSys

Also an indigenous integrated library management package, LibSys was developed by LibSys Ltd. based in Gurgaon, India. It is a standard Integrated Library automation software package with cutting-edge technologies. LibSys, with its latest web-based and discovery solutions

version, is developed by the most advanced technologies for library operations. The Windows-based user-friendly Web OPAC is top-rated among clients. It manages both Indigenous and international languages due to its multilingual nature. The package has generated different versions including LSEase, LibSys7, LSPremia, LibSysX, Libsys10, LSDigital, LSDiscovery. The LSDiscovery version has primarily been developed to support digital libraries and e-resources. LibSys is perhaps the only indigenous software that is compatible to most of the international standards. It has six Modules Acquisition, Cataloguing, Circulation, Serials control, Article indexing, and OPAC. Known for running on its centralized bibliographic database on MARC format, the software is compatible to print as well as non-print resources. It is compatible with standards like CCF, USMARC, OCLC, MARC, and non-MARC formats. The indigenous nature of LibSys also support CCC.

Another advantage of LibSys is that it operates on a wide range of platforms like Windows NT, UNIX, Linux, and NOVELL operating systems. The availability is also possible on any preferred RDBMS like Oracle or SQL Server.

LibSys is widely used in Indian libraries with some international clientele also. The popularity of LibSys can easily be understood by the fact that 1000 Indian libraries, including major university libraries including IGNOU New Delhi, AMU, NLU Delhi, Madras University, Allahabad University, IIT Delhi etc. are its users (LibSys Corporation, 2021).

3. Literature Review

Several studies have been conducted to evaluate Library automation softwares; however, some worth mentioning among them have been pointed out here. The remarkable study of (Reynolds, 1985) discussed several automated library systems like MSUS/PALS, TLS, ILS, BACS, MELVYL and Virtua integrated library management software. These packages assimilated acquisition, circulation and online catalog in a single platform. A relative work of Plessey, Automated Library System (ALS), and Olivetti system was conducted by (Herring and Mackenzie, 1986) for automating issue and circulation operations. The investigators revealed staff training and inadequate finance as the major problems of implementing the automated system in the City Libraries of London. Another study by (Stahl, 1988) examined the generation of integrated software packages for computerizing major library functions with the help of a single integrated package. He suggested Virtua as the appropriate for implementing a well automated library system. The work carried out by (Harison and Summers, 1988) underlined the expansion of integrated softwares in Lancaster Library. Acquisition was the first operation to have been automated. Lancaster's automated system got wide recognition and success. The study of Saffady (1989) discussed several software packages like the NOTIS package, DOBIS/LIBIS program, TECHLIB/STATS implementation of the BASIS package, LIAS system, and PALS package. But, these were the prewritten circulation software packages. The libraries which skipped the first stage of automating issue and return operations, and straightly implemented integrated systems confronted many problems and unforeseen costs (Lynch, 1991). Though it is challenging to get qualitative software, most libraries get some vendor with suitable software appropriate for their collection and services.

In Indian context, (Dutta, 1993) critically evaluated several software packages. The study found that the easy availability of indigenous packages like TULIPS, Sanjay, Maitrayee, and LibSys made library functions very operative. However, inadequate finance, lack of desire, and vision were revealed as major challenges for library automation. Another study (Haravu, 1994) revealed that most of the Indian softwares could not prove successful. But, LibSys extended reputation

amongst Indian libraries. The Study suggested that certified specialized associations and library science schools are required to pool-in their efforts for evaluating international library management packages that are suitable to Indian context to enhance the Indian library services. Indian librarians face several challenges in the process of computerization (Frances, 1998). Some mechanism/criteria may be thought out to comprehensively evaluate different software packages, which may meet these challenges continuously. The critically examined study of several Indian softwares by (Saxena and Srivastava, 1998) revealed that LibSys, Suchika, and Granthalaya are user-friendly, powerful, and versatile for automation in India. Yet another study on various softwares by (Thapa, 2007) revealed that some libraries still use the CDS/ISIS package. The user-friendly as well as standard software like LibSys or Alice for Windows may be acquired. However, an evaluative examination of available softwares' will help select suitable software. Similarly (Ghosh and Panda, 2011) revealed LibSys as the most popular among Indian libraries. Still, it falls short to some international standards, while Virtua is robust international software that is efficient to deal with all library activities. Yet another study carried out to assess the status of library automation in India reveals that SOUL has maximum installations followed by Libsys Virtua and Alice for Windows (Lakpathi, 2014). While comparing LibSys, SOUL, KOHA, and NewGenLib, Naik (2016) concluded that KOHA has more features and easy to use (Naik, 2016). The study conducted to present a comparison of LibSys and KOHA revealed that KOHA is more user-friendly and rich in features than LibSys (Joy, 2014). The investigators expect that this research work will fill the void in the existing works on library software packages at national level.

4. Scope and Limitation

Computerization transformed the entire structure and environment of Indian libraries. Presently, there are a number library software packages; but many of them are outdated and have limited client bases. Therefore, only those Indigenous packages with a considerable number of installations, excluding KOHA (due to its open-source nature) have been evaluated here. Correspondingly, popularly used foreign softwares' by Indian libraries have been covered under this work. Furthermore, this work is restricted to large Indian libraries only. However, an attempt to present a comprehensive study of the features of select software packages has been carried out in this research study.

5. Methodology Used

Since it is not justifiable to cover all the available softwares, as most of them have few users, therefore, only four packages, SOUL, LibSys, Virtua, and Alice for Windows, were selected for the study. An attempt has been made to find the most rated software with the help of a checklist comprising different parameters including options in choosing operating system; architecture; integration of modules; international standards compatibility; RFID, UNICODE, FRBR and RDA compliance; Web-OPAC facility; Number of clients; user-friendliness; the reputation of developing agency; etc. Additionally, a rating scale ranging from $0 - 4$ in which (0) signifies 'not at all', (1) signifies 'poor', (2) for 'Average', (3) for 'Good' and (4) for 'Excellent' was used to evaluate the different features and facilities of standard modules of these softwares. Moreover, a survey based on the dissemination of structured/unstructured questionnaires and interviews was also conducted. It is worthwhile to state that the investigators discussed leading foreign and Indian software packages with their developing agencies during the course of the study. Notably the investigators directly discussed with the director of VTLS Company, Virginia, USA,

responsible for developing Virtua, and the staff of LibSys Company for bringing out LibSys software for having sound and overall background of these packages.

6. Objectives
Several objectives were in the background while undertaking this study; however, noted among them include:

- To assess and critically evaluate the leading automation software used by Indian libraries
- To find out the most effective and reliable software after a critical comparison between leading international and indigenous packages
- To conduct a comparative analysis of features and facilities provided by the different modules of select packages
- To provide a guiding tool for librarians for selecting the software that suits their requirements in the current networked environment

7. Analysis and Discussion
About 100 libraries were visited during the course of study. These include National Library, university, college, special and public libraries across the country. Besides, the libraries attached with research and development centers namely NISCAIR, CSIR, DRDO, DESIDOC, etc. were also visited to have actual scene and scenario of Indian college and university libraries. After a critical analysis of a long list of available packages with their respective users in India, the investigators selected four packages comprising two leading international and two indigenous software packages as discussed elsewhere in the study. The parameters with their discussion to carry out a comprehensive study of these software packages are presented and tabulated in the following tables.

Table-1 Features of Software Packages

	Software packages	Agencies responsible for development	Design/ Architecture	Operating System		Standards	RDBMS	No. of client base
				Client Platform	Server Platform			
International	Virtua	VTLS Inc, 2001 Blacksburg USA	Client-Server	95 98 2000 NT XP Vista, Linux	LINUX UNIX SUSE LINUX, SOLARIS, IBM (AIX), SUN(SOLARIS)	USMARC; UKMARC; CANMARC; SEWMARC and MARC 21	ORACLE	Over 40 users in India with an increasing trend and 1900 large libraries across 40 countries.
	Alice for Windows	Softlink Australia 1983, however Softlink Asia promotes it in India.	Client-Server	Windows 98 second edition Windows NT 4.0	Windows XP Professional SP2, Windows Server 2003 SP2 (32 Bit) Windows Server 2000 SP4	USMARC	Does not require RDBMS but runs on its own database	Over 250 users in India and 17000 across the globe
Indigenous	SOUL	INFLIBNET, 2001 Ahmadabad.	Client-Server	98/2000/NT, Windows XP SP3, Windows Vista	Windows 2003, Windows 2008 Server	AACR 2; CCF; MARC21 and ISO 2709 standards	MS - SQL MY SQL, or any popular RDBMS	Over 2016 Clients in India with some in adjacent countries
	LibSys	LibSys Corporation, Gurgaon, India. 1992	Open system architecture to	Windows NT, UNIX,	NT/Unixware/ Novell,	CCF, USMARC,	any preferred	Over 1000

Client-Server	Linux and NOVELL	UNIX, LINUX Sun Sparc (SOLARIS)	OCLC, MARC and non MARC also CCC	RDBMS i.e. Oracle or SQL Server	installations in India with some in other countries

Table-2 Modules supported by the select software packages

	Software Packages	Modules								
International	Virtua	Acquisition Fund Accounting Module	Cataloguing Module	Circulation Module	Serials control Module	OPAC	Statistics and Reporting Module	Chameleon Gateway Module	-	-
	Alice for Windows	Alice for Windows, SOUL and LibSys have integrated Acquisition Module	Like acquisition, Circulation Module is also integrated in Alice for Windows, SOUL and LibSys	Management Module	Periodicals and Journal Indexing Module	Hypermedia/Multimedia	Multi-lingual	Subject authority	Web enquiry	Book hire and User self- check
Indigenous	SOUL			SOUL and LibSys also have integrated Circulation Module	Serials control Module Integrated in SOUL and LibSys	OPAC Module	Administration Module	-	-	-
	LibSys					Article indexing Module	OPAC	-	-	-

Checklist-1 Salient Features of Common Modules (Acquisition) of all selected packages

Checkpoints	Softwares with Status to Checkpoints			
	International		Indigenous	
	Virtua	Alice for Windows	SOUL	LibSys
Helps in faster pre-order duplicate checking	4	3	2	3
Facilitate easy preparation of purchase orders	4	4	3	3
Facilitates easy accessioning and invoice processing	4	3	3	3
Simplifies to purchase the books in demand and keep the remaining books in pending	3	3	0	2
Enable to keep up-to-date budget consumption account	4	3	2	3
Shows the status of budget before the order is placed	4	3	2	3
Follows the Goods Offices Committee (GOC) conversion rates	4	3	0	2
Allows modification in discount rates	4	4	2	3
Enables transferring of bibliographic data from CD-ROMS, world databases like LC, OCLC, RLIN, WLN, etc. or vendor delivered electronic catalogues	4	4	*1	3
Assists electronic ordering and easy book selection	4	3	2	3
Aids to send prompt notices and letters for order cancellation	4	3	2	3
Accepts the books in gift/exchange or gratis	3	3	2	3
Enables to keep up-to-date vendor database	4	3	3	3
Helps in preparation of vendor performance report	4	3	2	2
Facilitates prompt notification to users	4	4	3	4
Software allows the library staff to generate customized reports	4	3	2	2
Total obtained rating out of 64	**62**	**52**	**31**	**45**

* represents only in SOUL 2.0/3.0 version
0 represents 'Not at all', 1shows 'poor', 2 denotes 'Average', 3 signifies 'Good', 4 symbolizes 'Excellent'

Checklist-2 Cataloguing

Checkpoints	Softwares with Status to Checkpoints			
	International		Indigenous	
	Virtua	Alice for Windows	SOUL	LibSys
Helps in easy cataloguing	3	3	3	3
Facilitates data entry in multi-lingual scripts	4	0	*1	2
Supports easy and MARC based data entry	4	3	2	2
Empowers import and export of data in international formats like MARC /CCF/ MARC21	4	4	3	3
Gives full support for easy copy cataloguing like transferring catalogue records from bibliographic databases such as OCLC, LC, etc	4	3	*1	2
Generate and maintain authority files	4	3	2	3
Enables the maintenance of thesaurus and availability of dictionary for entering data and select terms	3	3	*2	2
Produces Spine and Bar code labels	4	3	3	3
Cataloguing module supports all international standards	4	3	2	3
Supports FRBR, RDA, RFID standards	4	2	*1	2
Compatible with full UNICODE support	4	0	*3	**3
Enables library staff in cataloguing module and users in OPAC to customize the output reports.	3	3	3	3
Total obtained rating out of 48	**45**	**30**	**26**	**31**

* represents solitary in SOUL 2.0/3.0 version, ** represents only in LibSys7/10 version

0 'Not at all', 1 shows 'poor', 2denotes 'Average', 3 embodies 'Good', 4 signifies 'Excellent'

Checklist-3 Circulation

Checkpoints	Softwares with Status to Checkpoints			
	International		Indigenous	
	Virtua	Alice for Windows	SOUL	LibSys
Generates different categories user database with diverse parameters	4	4	4	4
Helps to create user ID card with requisite dimensions of user picture and barcode number	4	4	4	4
Compatibility with bar code aided services	4	4	3	4
Convenient for librarians to process loans, returns and flow of books/resources	3	2	2	3
Expedites Inter - Library Loan with easy upkeep of both inward and outward loan records	4	3	2	3
Supports automatic generation of due date slip and generates automatic reminders for overdue items	4	3	1	2
Assists in integration with safe system that compliments the personalized issue/return, check-in and check–out provisions	4	4	*2	**3
Allows users to reserve and staff to remove the reservation if the reservation time is exceeded	4	1	2	3
Allows the reservation for same resource more than once	3	1	0	2
Generation of fines for different types of resources automatically	4	3	2	3
Supports grace period if needed and fine exemption facilities for the poor members	3	3	2	2
Provision to accept holidays while calculating fines	3	3	2	2
Enables users to know the circulation statistics of resources while searching	4	3	2	3
Facilitates to track the missing, lost, damaged, written off and weeded out materials	3	3	1	2
Helpful in stock verification	4	3	0	2
Prints various types of statistical reports	4	4	4	4
Total obtained rating out of 64	**59**	**48**	**33**	**46**

* represents only in SOUL 2.0/3.0 version, ** represents in LibSys7/10 Version
0 represents 'Not at all', 1 shows 'poor', 2 signifies 'Average', 3 denotes 'Good', 4 embodies 'Excellent'

Checklist-4 Serials Control

Checkpoints	Softwares with Status to Checkpoints			
	International		Indigenous	
	Virtua	Alice for Windows	SOUL	LibSys
Supports easy serials data entry for check-in	4	3	2	3
Facilitates easy payment of new journals started by the library and evades repetition	4	3	3	3
Enables easy accessioning of individual and multiple issues	3	3	3	3
Aids in easy bill processing for fresh and renewal payment	4	4	3	4
Helpful in efficient renewal and cancellation	4	4	3	4
Assists in upkeep of appropriate consumption of fund accounts for payment and binding	4	4	3	4
Provision to accept refunds from different vendors/suppliers and lets adjustment in the budgeting	4	3	2	3
Upholds binding file	4	3	3	3
Helps in production of barcode labels for bound as well loose issues	3	3	3	2
Supports generation of list of possessions with their position	4	3	3	3
Keeps record of missing issues	3	3	2	2
Facilitates to generate automatic reminders for absent issues	3	3	2	2
Empowers librarians for search and retrieval provision within the module	4	3	3	3
Total obtained rating out of 52	**48**	**42**	**35**	**39**

0 represents 'Not at all', 1 shows 'poor', 2 denotes 'Average', 3 signifies 'Good', 4 symbolizes 'Excellent'

Checklist-5 OPAC

Checkpoints	Softwares with Status to Checkpoints			
	International		Indigenous	
	Virtua	Alice for Windows	SOUL	LibSys
Supports easy and user-friendly OPAC	3	3	4	3
Supports basic and advance search facilities with Boolean Operators i.e. AND, NOT, OR.	4	4	4	4
Facilitates truncation(left & right), proximity, wild cards and various limiting search options	4	4	3	3
Allows access to patron information, account balances and details of circulation activity	4	3	2	3
Helps searching by search options like ISBN, ISSN, Call No, Accession No. etc.	4	3	3	3
Shows search history i.e. previous, next search, etc. for re-executing them at next log in	4	4	0	3
Supports retrieval of records in Indian scripts	4	0	1	2
Displays the list of new arrivals	4	3	2	3
Displays the list of accessible databases	4	4	2	4
Provides multiple database searching facility simultaneously	4	3	*2	3
Helps in orderly browsing and marking the required resources in the collection	4	4	4	4
Helps to provide CAS and SDI service	4	3	2	3
Facilitate users to make a word file for saving the records of their interest	2	2	*2	1
Allows the users to reserve the resources of their interest via OPAC	4	3	2	3
Maintain Thesaurus in OPAC	3	2	0	2
Supports both LAN and WAN	4	4	2	3
Provides access to internet and e-mail facility to bonafide users through OPAC	4	3	*2	2
Allows online renewals of checked out material	4	3	*2	3
Supports Web-OPAC facility	4	4	*2	2
Provides access to multimedia through OPAC	4	3	*2	2
Suggestion for recommending the books through OPAC	4	2	0	2
Keeps the record of OPAC usage	3	2	0	2
Customization of output reports is possible	4	3	3	3
Censors non-academic or uncultured websites	4	3	2	3
Creates management information reports of all modules as and when required	3	3	2	2
Total obtained rating out of 100	**94**	**75**	**50**	**68**

* represents only in SOUL 2.0/3.0 version, ** represents only in LibSys7/10 Version

After analysing the acquisition system of select packages, Virtua has been comparatively found most advanced with 62 rating points out of 64 while Alice for Windows got 52, LibSys 45 followed by 31 points by SOUL.

The features of the cataloguing module as depicted in the Checklist-2 reveal that LibSys (31 rating points out of 48) has got a slight edge over Alice for Windows with (30 points). However, Virtua (45 points) has again been found atop of the table, while SOUL has 26 points in this direction.

Like acquisition and cataloguing modules, the features and facilities in circulation system of Virtua with 59 out of 64 rating points has been found outstanding, while LibSys with 46 rating points figures at second followed by Alice for Windows with 48 points. The circulation system of SOUL on the other hand lags with only 33 points.

The features and facilities available in the serials control modules of LibSys (with 39 rating points) and SOUL (with 35 rating points) packages have shown improvement as that of previous module, however both packages lag behind Virtua (48 out of 52 points) and Alice for Windows (42 points).

In the case of OPAC, Virtua is again outstanding with 94 points out of 100, while Alice for Windows got 75 points. On the contrary, SOUL and LibSys got respectively 50 and 68 points.

The analysis part of this study has found that Virtua, with 308 out of 328 rating points, possesses the most sophisticated features and facilities than any other select package. Alice for Windows follows with 247 points, LibSys with 228 points, and SOUL with 175 points. However in contrary to the above findings, the study found SOUL popularly used package in Indian libraries with more than 2000 libraries presently its clientele.

8. Findings and Suggestions

The indigenous packages owing to their lesser price have been found most ranked softwares in Indian libraries, while Alice for Windows has more users than Virtua. Although costly, however, the trend towards Virtua due to its robust features, including compatibility to all international standards, is gaining ground in Indian libraries. Following are some of the findings deduced from the analysis of the data:

- LibSys, Alice for Windows, and Virtua have several options for operating systems, whereas these facilities are limited in SOUL (except 2.0/3.0 version) software.
- Withstanding the reputation of being developed by the world's premier automation industry VTLS, USA, Virtua has taken a clear-cut lead over Alice for Windows. At the same time, Indian packages fall short of supporting some international standards.
- All the select packages support various modules, however some of the indigenous packages are compatible with the modular-wise or package-wise installation.
- Except for SOUL, all the select packages facilitate downloading bibliographic data from CD-ROMS, international databases like LC, OCLC, RLIN, WLN, etc. However, the upgraded versions SOUL 2.0/3.0 have leveraged this shortfall.
- The major setback of Alice for Windows (except the latest version) is that it does not support the UNICODE feature and so does not SOUL; however, SOUL 2.0 supports this standard to some extent.
- RFID compatibility, FRBR, and RDA standards are other shortfalls of SOUL and LibSys. But, SOUL 2.0 and LibSys7, as well as LibSys10, support RFID technology.
- Stock verification and integration with a security system that compliments the self-issue, self-check-in/ check–out features is yet another shortcoming of SOUL. In contrast, the

latest version of LibSys has excellent features. However, Alice for Windows and Virtua support this feature.

- The features and facilities of the serials control module of Alice for Windows, SOUL, and LibSys have not been found that dissimilar. However, Virtua has taken the lead in this context.
- Web OPAC facility has been the major challenge for most of the Indigenous packages, and so is with the SOUL; however, SOUL 2.0/3.0 Version and LibSys7/10 have solved this issue. On the contrary, the select foreign softwares support Web-OPAC facility.
- SOUL falls short of maintaining thesaurus, a record of OPAC usage, and recommending books through OPAC, while other select packages do so.

Based on the above findings, the investigators are of the opinion that the librarians should take a strong note of the features and facilities supported by the software packages before finalizing them for installation. A comprehensive survey conducted by Ansari et al. (2017) found that; of the eight major central university libraries in northern India, four are using LibSys software, and the other four libraries are using SOUL, KOHA, Virtua, and Troodan. He further noticed that due to many books in the non-English language, JNU New Delhi decided to switch to Virtua, as only Virtua has Unicode features (Ansari, Gautam & Fatima, 2017). The study conducted to analyse the situation of automated operations of Mumbai College libraries, found majority of the libraries using SOUL software followed by SLIM and KOHA (Zaveri & Salve, 2018). Madhusudan and Singh (2016) analysed the features of four library automation softwares comprehensively. They revealed that Virtua has the highest total score, followed by KOHA and LibSys whereas NewGenLib got the lowest scores (Madhusudan and Singh, 2016). It is also suggested that a comparative analysis based on certain definite parameters suited as per the need of the library must be undertaken before implementing an automated library system.

9. Conclusion

To date, many library softwares have been developed in India. However, most of them could not sustain for long as they lack upgrading and fall short with the emerging technologies and compatibility with international standards. Nevertheless, SOUL and LibSys have emerged as the most rated packages for college and university libraries in India, though they too lag to cope with international softwares. Owing to low cost and financial support from UGC, SOUL is used in over 2000 libraries across the country. However, it (except SOUL 2.0/3.0 versions) does not support the UNICODE feature and RFID technology and thus is unable to handle multilingual scripts. LibSys, on the other hand, is the most powerful indigenous integrated library management system that is compatible to most international standards. Notably, it is used by more than 1000 academic, special, and university libraries in India. LibSys supports RFID, and its latest version LibSys7 and LibSys10 have separate LSmart installations for using this technology. However, the latest versions of LibSys support the UNICODE features and multimedia files can also be integrated.

On the contrary, the incompatibility of Alice for Windows with the UNICODE feature is its most significant bottleneck in Indian context. Nevertheless, along with some noted libraries as also discussed earlier in this study, this is the third most rated software in Indian libraries. In comparison, Virtua is perhaps the first fully compatible software with all international standards and is most famous internationally. The full compliance to robust features like UNICODE, FRBR, RDA, RFID, and support to different versions of MARC are the beauty of Virtua. Nonetheless, because of the financial constraints of Indian libraries, this expensive software is

not as popular as the aforesaid software. However, it may be noted that about 40 libraries, including some libraries of national importance, are using this versatile integrated library management system. Many Indian libraries have been observed to have initiated implementation of KOHA library automation software because of its open-source code accessibility, but this too requires specifically trained technical staff or Third-party vendor support to deal with error handling and efficient working (Chauhan, 2018; Tripathy & Pandey, 2019; Lingam & Durake, 2019). KOHA is attaining popularity due to its reliability and community involvement (Oladokun and Kolawole, 2018). To conclude, onus lies in the competence and judgment of librarians' to choose the library management package that will suit their needs in the best possible way to serve the modern techno-savvy user.

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