CHAPTER SIX

LIBRARY SOFTWARE
Chapter 6
Library Software

6.1 Introduction
6.2 Software
   6.2.1 System Software
   6.2.2 Application Software
6.3 Nature and Types of Software Packages
6.4 Basic Software
   6.4.1 Word Processing Software
   6.4.2 Database Management System
   6.4.3 Text Retrieval Packages
6.5 Software for Searching Online Retrieval Systems
6.6 Criteria for Software Selection
6.7 Library and Information Storage and Retrieval Software
6.8 CDS/ISIS
6.9 SOUL
6.10 Koha
6.11 History of software in Iraq
6.12 Reality of Software system in Iraq
Chapter 6
Library Software

6.1 Introduction

Software is the means by which a general purpose computer system is made to perform specific tasks. It contains a complete and clear description of each task in terms of available operations of the computer. In other words, software may be conceived as a set of programs for a computer. Each program is a complete specification of the processing to be performed on the data supplied to the computer.

The importance of software cannot be over emphasized because it is the software which supplies power of the computer to the user’s problems. It has been stated that the rapid increase in the capabilities of computer systems has not been matched by corresponding increases in availability and quality of software. Hence, there appears to be a software ‘backlog’. This may be due to the fact that computers demand completeness and precision in their instructions. Computers do only what they are told to and therefore, their orders cannot contain any ambiguity. Writing software involves a firm understanding of the application domain and also knowledge of the technology domain such as of computer system and programming language; also an ability to communicate and observe; and talent for innovation and integration. Software development requires many skills and varieties of knowledge. These might perhaps be the reasons for the existence of software ‘backlog’. Software is generally grouped into two categories: (a) systems
software (b) applications software. (a) System software is generally looking after by hardware, so we are not concern with this.

6.2 Software

- According to dictionary of new information technology, by A.J. Meadows, Software the information, programs of suits of programs which are used to direct the operations of a computer or other hardware.
- According to computer dictionary & handbook by Charles J. Sippl,
  - “Software the internal programmes of routines professionally prepared to simplify programming and computer operations. These routines permit the programmer to use his own language (English) or mathematical (Algebra) in communicating with the computer.
  - Various programming aids that are frequently supplied by the manufacturers to facilitate the purchaser’s efficient operation of the equipment. Such software items include various assemblers, generators, subroutine libraries, computers, operating systems and industry, application programmes.

Basically there are two types of software, System software and application software. Both are essential before any useful work can be obtained
6.2.1 System Software

System software means of these programmes, which enable a computer to function and control its operation. They are routines residing in the computer’s memory, which facilitate the use of the hardware and help the computer system run quickly and efficiently. A family of software is represented as figure

A Family of Software

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Operating System & Utility

Compilers/Assemblers

Application Programs

Single-user System

Multi-user System

Machine language

Assembly language

Higher language

Special purpose Programs

Standard Application Programs

Software

CP/M for 8 bit Computer

CP/M for 16 32 bit Computers

Pc-DOS MS-DOS

For IBM or IBM Compatible PCs

UNIX for 16/32 Bit computers

RSX-11 for PDP-11 range computers

Plan Auto coder etc.

Basic COBOL

FORTRAN etc.

dbase 11

Lotus1,2,3PC-Word Star

CDS/ISIS etc.
System software is further divided into three categories

- Operating system and utility programme
- Compilers / Interpreters (Translator)
- Application programmes-Data Base Management Systems (DBMS)

- Operating Systems (OS): It serves as an interface between the user and the computer, OS is a large and complex program that determines how a particular computer's CPU accepts incoming signals, transmits ongoing signals, allocates storage space to individual use and program, controls peripheral devices, permits access to various files of data. Purpose of the O.S. is to manage computer hardware so that it is used as efficiently as possible system.

- Utility Programme: Utility programmes are routine programmes of general nature which are often required to be used during the processing of the application system and testing of the programmes. Utility programmes may be obtained from computer equipment manufacturers or companies specializing in software development or may be developed by local programmers.

- Compilers and Interpreters: Compilers translate the complete programme, written in a high level language into equivalent machine level programme before the programme is actually executed by the computer.

- Interpreter: translates each instructions separately, as the computer needs it in order to process a given task. Like assemble, both compilers and interpreters equipment manufacturers.
Application programs- Data Base Management systems: This refers to shared collection of data, which is used by many application programmes. The software, which handles all access to such a database is known as data base management (DBMS). Tedd with references to kvitsand describes the components of DBMS as under

- Provides a way of describing the structure of data.
- Enables existing data to be incorporated into the new database.
- Provides facilities for the manipulation of data from application programmes.
- Enables the database be maintained and updated as and when necessary.

6.2.2 Application Software

A Computer application software is a user program. It is set of instructions, which tells the computer how to execute a specific task on the particular set of data provided. Application software for libraries contains a sequence of instructions designed book order, list of journals received and numerous other specific task done in library operation. Application software can be categorized in number of ways. These can be broadly presented as below:

- Organizational information processing (data processing and MIS).
- Mathematical, statistical and modeling.
- Information retrieval
- Computer assisted instructions.
- Data communication.
- Process control
They can be developed by individuals or they can be purchased from software forms under the class of (a) User application programmes (b) Application packages.

6.3 Nature and Types of Software Packages

Software packages are commercially supplied products which typically provide solutions to a particular range of software development or applications problems. Since they are developed for commercial sale in a competitive market for use by a variety of customers, a great amount of skills and effort is put into their development. Therefore, they are reliable, easy to use and in many instances, well documented. Ready-made ‘Package’ software is not becoming available for an increasing range of applications such as Office Automation Systems and Library Automation and Information Retrieval Operations.

Library and Information personnel are primarily concerned with software packages for text or information retrieval. In addition to special purpose retrieval packages, there are also a number of general purpose packages which offer some information retrieval functions. The different types of software can be identified as: (i) basic software, (ii) word processing software, (iii) database management systems (DBMS), (iv) text-retrieval packages, (v) software associated with online retrieval systems, and (vi) in house keeping.

A brief description of each of the above mentioned types of software is furnished in the following paragraphs.
6.4 Basic Software

The basic software is also referred to as utilities. Basic software packages are available for performing operations such as data entry and validations, sorting and merging files and editing data. A data entry and validation software typically allows the users to define a format to be displayed on a screen (VDU) and by using other prompts enables data to be entered in the specific format defined by the user. Some simple checks on the data entered are also possible with this software, for instance, ensuring that there are no alphabetic characters in a numerical data field, etc. File sorting and file merging facilities are provided in such package. Some sophisticated packages offer editing capabilities of certain specific lines in the text or even full screen editing facilities as well as automatic input and output.

6.4.1 Word Processing Software

Word processing is one of most widespread applications software types in use today. Developed as a successor to primitive text-editors that were only possible on mainframe computers, word processing program allows interactive editing of documents, enabling easy redrafting and merging of chunks of existing documents, without the need for extensive retyping. Most of the popular programs contain features such as spell checks, outlining, choice of fonts, line drawing and page layout facilities. Word processing software permits the user to manipulate the text. This is a very handy feature when laying out tables or columns of the text.
6.4.2 Database Management Systems

These are essentially programming frameworks, and can offer good storage and retrieval systems. They are mainly intended for programmers to interact with and need a programmer in order to make them usable to libraries. This is specially applicable in case of network and hierarchical models. DBMS in general terms, have many attractions for the librarian wishing to implement automation of microcomputers.

There are three types of DBMS available to a micro-computer. They are: file or data management systems, relational DBMS and network and hierarchical DBMS. Of these, the first two types are easy to comprehend and do not call for intense knowledge in programming for developing library applications using them.

6.4.3 Text Retrieval Packages

Text retrieval comprises storage and subsequent retrieval of records, essentially textual rather than numerical, tabular or graphical. Although, each of the earlier mentioned software can be used for text retrieval purposes to some extent, there are special purpose packages which are written specially for the type of retrieval functions related to libraries and information centers. The characteristic features of such software packages are: (a) the software is normally self-contained and can be set up with a minimum involvement of a computer specialist staff; (b) the records in this software are independent, of variable length and are composed mostly of natural language texts; (c) access to data is by content rather than by structural position; (d) primary access is through inverted file of text terms drawn from the records as they
are placed on the database. Thus, an important feature of the package is user interfaces, which allows a non-programmer to understand and use them directly. Search and indexing facilities are the most important features of this type of software.

6.5 Software for Searching Online Retrieval Systems

Each of the major online systems has its own software which supports its activities on a host computer. Many of these hosts have begun to offer private facilities with the help of which end-users can exploit the sophisticated software developed by supporting large databases with many searches. If the user is familiar with the command language of the host, then a private file on that system avoids the need for familiarization with a further software package.

Private file facilities are expensive since a telecommunication charge is incurred each time the host computer is used. The second type of software generated in association with online searching of external databases, enables more economical access to host systems. There are a number of packages, mainly for use on micros, which support online interaction with an external database and permit the development and editing of search profiles and search outputs locally.

6.5.1 Library Housekeeping Software

The market is flooded with a variety of packages specially designed to support library housekeeping operations such as acquisitions, cataloguing, circulation control, serials control, etc. Some of these are integrated packages covering many functions, while others concentrate on individual routines like cataloguing, etc.
6.6 Criteria for Software Selection

6.6.1 General

- User Experiences: A well tested package that is established in the marketplace, with several applications, is generally to be preferred. Such a package will be less likely to have bugs and should have adequate support. Other people’s experiences are useful in indicating the potential and problems of a software package.

- Cost: Cost is clearly a consideration, but since, in general you get what you pay for, cost should not be a primary consideration. Software cost may also be a small component of the costs of the entire system, and better software may significantly reduce operating cost. Annual maintenance cost and revised version of the package must be kept in mind at the time of cost consideration, so that it gives compatibility with present and future systems.

- Originator: The reputation of the systems house responsible for writing a software package is important to consider. Experience with other packages from the same originator may be useful in assessing a new package.

- Supplier: With specialist software the supplier is often the originator, but with standard business packages there is often an agent acting as supplier. The user may look to the supplier for support and needs to feel confident that this will be forthcoming. The supplier’s reputation and history should be considered. Supplier should provide training in the use of the program. Ease of availability of maintenance engineer should be kept in mind. Even though the software package is best, the system sometimes fails without timely and proper customers support in maintenance.
6.6.2 Technical Criteria for Software Selection

- **Language:** It is important that the language used permits the application to be run efficiently in terms of machine time and storage requirements. The programming language in which the software is written may be a high-level language or assembler or, often, a combination of both. If an application package is written in a particular language, a compiler or interpreter must be available on the system that is to run the package. Or application software language should be compatible with the compiler/interpreter available with the existing hardware system in library.

- **Technical consideration and compatibility:** The software must run under the operating system available in the hardware configuration to be used, and must also be available in a version that is compatible with the hardware. Compatibility is less of a problem that it was once, due to the move towards UNIX based system and extensive use of DOS in microcomputer systems. Multi-user environment is preferred software must be compatible with the hardware available for use and not visa-versa.

- **Ease of Use:** The quality of the human computer interface is important for any software package. One must observe how user friendly is the system? It is menu driven (file and functions on the screen for user to choose)? Are the commands and operations easily learned and handled by documentation Staff? Minimum key operations are preferred for change in menus. Software package must be in a position to cover all libraries in-house functions also few or no changes in library functions according to software are acceptable but not more or all. Similarly modifications or provisions must be available in the software for new functions or services to be started in future.
Support: Most suppliers or originators offer some support. Good, reliable manuals should be the norm. Other support may take the form of on-site training, off-site training, consultancy, assistance in setting up a system, and a help desk. Some software packages have associated user groups and user group membership may provide a valuable source of information on the package. Both the quality and the cost of these support events must be considered.

Supplied Format: the supplied format may be particularly important for microcomputer system. Software can be supplied on 3 ½ " or 5 ½ " size disks or tapes that can be run on the system and, if necessary, transferred to another medium such as hard disk.

Interface and Integration: Most software packages should be able to export and import data to and from the other packages, of the same kind. Such as between word processing packages and two database packages. Some software will also export data to other kind of packages as from, for instance, a database package to a word processing package e.g. Data from dBase files can be converted to LIBSYS format or database in CDS/ISIS can be converted into dBase format. Software package should support different activities such as word processing, database, graphics and spreadsheets. It is important to be able to reuse data in a system in different formats so a high level of flexibility should be sought.

Retrospective Conversion: Vendor should convert the existing database and should train librarians for import export function.

Documentation: It includes both printed documentation and online help systems. Any reasonable system should have both. Ideally, different kindly of documentation (manuals) should be available for different kinds of user.
It should include an introductory explanation of basic features, a full account of all features, a list of commands and an online help system.

- **Advice in setting up:** In addition to tutorial support, some assistance in implementing a software package is to be expected. With the larger systems, the contract for the purchase of the software will include a number of hours’ assistance from suppliers in order to help establish databases, input forms, report forms and other features.

- **Training:** It may be availed from the system supplier or from the training centers licensed by the system supplier. With the larger system, both on-site and off-site training is available. Different groups of staff should be suitably trained.

- **Maintenance:** The software package should be appropriately maintained by the supplier. Maintenance involves removing bugs or errors and improving the software so that it incorporates new facilities and concepts. Many software suppliers offer Annual Maintenance Contracts (AMC) at about 10% of the price of the original package and this entitles users to new releases of the software. Other suppliers offer special discounted rates for upgrades to existing users.

- **User Group:** Many of the larger and some smaller well-established software packages have user clubs or user groups. User clubs are groups of users of software packages that have two main functions: to share expertise and experience in the application of the package between different users; and to discuss and present a concerted front to software suppliers concerning problems and desirable improvements and developments.

All the above criteria are applicable to the selection of any software package for any application including library software package.
6.7 Library and Information Storage and Retrieval Software

IBM (International Business Machines Corporation) was one of the earliest to invest money to develop software packages intended for Information Storage and Retrieval.

The well known package STAIRS (an acronym for Storage and Information Retrieval System) was developed to be used on IBM machines, that too mainframe series. STAIRS was a machine dependent program which was commercially made available for any one who could afford its cost. This package has been used by some organizations to manage bibliographic databases. It was a powerful text-retrieval system which enables string searching from any part of the record. Following the introduction of STAIRS, similar programs soon became available on mainframes as well as minicomputers. Packages like ISIS, MINISIS came into existence. But most of these packages were hardware dependent, and therefore could not be used on a wider scale due to lack of portability. Hence, need was felt to develop software packages which could be used for library and information storage and retrieval operations on a wider range of computers, especially microcomputer systems. Several attempts were made in this direction by commercial firms and international organizations like UNESCO, resulting in the proliferation of a number of microcomputer oriented software packages. Many of such packages are being commercially marketed, while a few packages like CDS/ISIS are supplied almost free of cost to educational and non-profit making institutions.

Today, there are a number of microcomputer oriented software package intended for automating library routines and information retrieval operations.
In recent years, the movement towards integrated modular software, which means that the librarian can spread the cost and effort of implementation without the risk of software incompatibility, has become common. There are packages such as ‘Bookshelf’ which contain programs for individual operations like acquisitions, cataloguing, serials control, etc. Each of these modules can be purchased separately, if necessary, and one can use the same set of records without the need to re-enter data each time.

6.7.1 Microcomputer Software Packages

There are a number of possibilities for using microcomputers in libraries and information centers. What the microcomputer can accomplish is limited by two main factors. The first one is the librarian’s imaginative outlook and his perception regarding the potentialities of this gadget, and the second one is the availability of suitable hardware and software. The point to be emphasised here is that the librarian need not be satisfied at the automation of mere library routines. He may try to examine and think of areas, where the application of microcomputer leads to improved performance. Some of the areas, where microcomputer might be used with advantage are:

i) compilation and maintenance of reference and fact files;

ii) compilation of current and retrospective bibliographies (both on demand and on a regular basis);

iii) compilation of catalogues;

iv) preparation of indexes to journal articles for special collection of material;

v) online searching from commercially available databases;

vi) provision of SDI services and many other services to the users.
It is essential to consider some important factors related to library and information storage and retrieval operations in order to make effective use of such software. Some of the factors are:

i) How large a record can the software program can handle?

ii) The maximum number of records in a file. That is to say the upper limit to the number of records that the software can manipulate at one time;

iii) Search facility will be the most vital part of any ISAR system;

iv) Whether the software can handle only fixed field or can it also process variable fields?

v) Rapid access to stored data in the file is yet another important feature to be looked into.

For example, inverted file techniques provide access to the file by a field other than key fields. This facility has a great impact on the response time.

6.7.2 Category of Library & Information Software

Computer software for library and information work can be categorized into the following groups:

- Library Management functions: Acquisition, cataloguing, circulation and serials control.
- Management support functions: Statistics, MIS, accounting and Budget control.
- DBMS & information retrieval functions: Database creation, database searching, generation of SDI, indexes and bibliographies, directory generation, etc.

6.7.3 Library Software Packages

A number of library software packages have been designed and developed indigenously and these are being used in various libraries and
information centers. Some of the library software packages are given in Table 1. Since there are many software packages and it may not be possible to discuss all the software packages in detail, only few selected software packages specialized nature designed for library operations including recently developed ones are discussed in br

**Table - 1**

*Some library software packages and their developing agencies*

<table>
<thead>
<tr>
<th>No</th>
<th>Software Package</th>
<th>Developing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Acquas, Ascat, Ascir, Asire, Seras</td>
<td>Ober Information System, Calcutta</td>
</tr>
<tr>
<td>2</td>
<td>Alice for windows</td>
<td>Softlink India, Softlink International, Australia</td>
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<tr>
<td>3</td>
<td>Archives (1,2,3)</td>
<td>Minifax Electronics (P) Ltd., Bombay</td>
</tr>
<tr>
<td>4</td>
<td>Basisplus &amp; Techlibplus</td>
<td>Information Dimension Inc. (IDI), USA (Marketed in India by NIC)</td>
</tr>
<tr>
<td>5</td>
<td>Catman</td>
<td>INSDOC, New Delhi</td>
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<td>7</td>
<td>CDS/ISIS</td>
<td>UNESCO</td>
</tr>
<tr>
<td>8</td>
<td>Defence Library Management System (DELSMS)</td>
<td>DESIDOC, New Delhi</td>
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<td>9</td>
<td>Golden Libra</td>
<td>Golden Age Software Technologies, Bombay</td>
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<tr>
<td>10</td>
<td>Granthalaya</td>
<td>INSDOC, New Delhi</td>
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<td>11</td>
<td>Grateful Med</td>
<td>National Library of Medicine, USA</td>
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<td>12</td>
<td>Inmagic Software</td>
<td>Warner-Eddison Associates in 1980</td>
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<tr>
<td>13</td>
<td>The IV + IV System Software</td>
<td>Institute for Machine Documentation (IMD) Graz, Australia</td>
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<td>14</td>
<td>Krvger Library Manager (KLM)</td>
<td>Blitz Audio Visuals, Pune</td>
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<td>15</td>
<td>Lamp</td>
<td>Information Systems, Bangalore</td>
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<td>16</td>
<td>Lib Data</td>
<td>Murphy Associates, Secunderabad</td>
</tr>
<tr>
<td>No.</td>
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<td>Developing Agency</td>
</tr>
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<tr>
<td>17.</td>
<td>Lib Info</td>
<td>M.N. Dastur &amp; Co., Madras</td>
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<td>18.</td>
<td>Libman</td>
<td>Datapro Consultancy Services, Pune</td>
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<td>18.</td>
<td>Libra</td>
<td>Ivy System Ltd., New Delhi</td>
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<td>20.</td>
<td>Librarian</td>
<td>Soft-Aid, Pune</td>
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<td>22.</td>
<td>Library Management</td>
<td>Raychan Sysmatics, Bangalore</td>
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<td>23.</td>
<td>Library Management System (LMS)</td>
<td>U &amp; I Software (P) Ltd., Bangalore</td>
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<td>24.</td>
<td>Library Manager</td>
<td>System Data Control Pvt. Ltd., Bombay</td>
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<td>25.</td>
<td>Libris</td>
<td>Frontier Information Technologies Pvt. Ltd.</td>
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<td>26.</td>
<td>Lib Soft</td>
<td>ET &amp; T Corp., New Delhi</td>
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<td>28.</td>
<td>ListPlus</td>
<td>Computer Systems, Bangalore</td>
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<td>29.</td>
<td>Loan Soft</td>
<td>Computek Computer Systems, Hyderabad</td>
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<td>30.</td>
<td>Maitrayee</td>
<td>CMC, Calcutta (for the CALIBNET Project)</td>
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<td>31.</td>
<td>MINISIS</td>
<td>International Development Research Centre, Canada</td>
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<td>32.</td>
<td>MECSYS</td>
<td>MECON, Ranchi</td>
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<td>33.</td>
<td>NILIS</td>
<td>Asmita Consultants, Bombay</td>
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<td>34.</td>
<td>Nirmals</td>
<td>Nirmal Institute of Computer</td>
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<td>35.</td>
<td>Salim</td>
<td>Expertise, Tiruchirapalli, Uptron India Ltd., New Delhi</td>
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<td>36.</td>
<td>Sanjay</td>
<td>DESIDOC, Delhi (under a NISSAT Project)</td>
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<td>37.</td>
<td>SCI – MATE</td>
<td>Institute for Scientific Information, Philadelphia</td>
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<td>38.</td>
<td>SDI Package</td>
<td>Rading Cybernetics (P) Ltd., Secunderabad</td>
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<td>39.</td>
<td>Searcher</td>
<td>INDATA, New Delhi</td>
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<td>40.</td>
<td>Serials PAC Software</td>
<td>Informatics India Pvt. Ltd., Bangalore</td>
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<td>41.</td>
<td>Slim 1.1</td>
<td>Algorythms, Bombay</td>
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<tr>
<td>42.</td>
<td>SOUL</td>
<td>INFLIBNET, Ahmedabad</td>
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<td>43.</td>
<td>Suchika</td>
<td>DESIDOC, Delhi</td>
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<tr>
<td>44.</td>
<td>Super Doc.</td>
<td>Thermodata Group, Grenoble, France</td>
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</table>
6.8 CDS/ISIS

Micro CDS/ISIS is an advanced non-numerical information storage and retrieval software package. It was developed by UNESCO in 1985 to meet the requirements of many institutions, especially in developing countries. It is meant to facilitate streamlining of the information processing activities in developing countries with the help of relatively inexpensive modern technologies. This software was originally based on the mainframe version of CDS/ISIS started in the ‘60s.

Main Features

The main features of CDS/ISIS software may briefly be summarized as follows:

- The handling of variable length records, fields and sub-fields, thus saving disk space and making it possible to store greater amounts of bibliographic information.
- It comprises a data base definition component which allows the user to define the data to be processed for a specific application;
- It has a data entry component which facilitates entering and modifying data through user-created database specific worksheets;
• Possesses an information retrieval component with a powerful search language providing for field level and proximity search operators, in addition to Boolean search techniques along with facilities for free-text searching;

• It has a powerful report generator facility allowing the user to create desired printed products such as catalogues, indexes, etc., according to required formats of the users.

• It has a data interchange application programming language (CDS/ISIS Pascal) which allows the user to tailor the software to specific needs;

• It functions helping the user to build pseudo-relational databases;

• The package also contains an interface between the micro CDS/ISIS and the IDAMS software for statistical analysis.

• It provides for CC & and I sorrow.

Since the beginning CDS/ISIS has been created as multi-lingual software, providing integrated facilities for development of different linguistic versions. UNESCO supplies the package in English, French, and Spanish Versions.

**Historic Perspective**

UNESCO developed version 1.0 of the software package in 1985. It was designed to run on IBM PC/XT with 256K RAM and hard disk capacity. Six different programs were required to execute the various functions. Version 1.0 was limited to databases containing 32,000 records. In the year 1989, version 2.0 of CDS/ISIS was developed by UNESCO with integration of all programs into one and the additional advantage of extending the capacity of the database to 16,000,000 records. The special feature of this version is the introduction of the CDS/ISIS Pascal programming language interface. The
CD-ROM version of the CDS/ISIS also came out in 1989. In 1993, Version 3.0 which supports Local Area Network (LAN) was developed. Also, in 1993 the development of UNIX version of CDS/ISIS became available. In 1991, Version of 1.0 of CDS/ISIS for Windows was developed. It may be stated that at present UNESCO maintains three fully compatible version of the software for different hardware/software platforms, which have been developed by UNESCO in response to user needs and/or to the technological developments which have taken place during recent years.

The three versions are:

- The MS-DOS Version, which supports the local area networks as version 3.0,
- The UNIX Version, initially developed to provide multi-user remote access especially through the Internet and,
- The Windows Version.

As a result of a strategic development policy enunciated by UNESCO, it was decided to completely rewrite the CDS/ISIS software in C++ in order to provide a common standardized language for all its versions. This effort resulted in reducing maintenance costs of different versions of CDS/ISIS. Also, this helps in the adoption of a multi-platform software development system in order to increase the level of portability to different hardware as well as operating systems. In other words the present change results in the portability level being increased to cover a range of hardware from stand alone PC’s to powerful mini-computers. This obviously leads to the implementation of a Client Server architecture using market standard interfaces.
6.9 SOUL

Software for University Libraries (SOUL) is state-of-the-art integrated library management software designed and developed by the INFLIBNET Centre based on requirements of college and university libraries. It is user-friendly software developed to work under client-server environment. The software is compliant to international standards for bibliographic formats, networking and circulation protocols. After a comprehensive study, discussions and deliberations with the senior professionals of the country, the software was designed to automate all house keeping operations in library. The software is suitable not only for the academic libraries, but also for all types and sizes of libraries, even school libraries. The first version of software i.e. SOUL 1.0 was released during CALIBER 2000. The database of the SOUL 1.0 is designed on MS-SQL and is compatible with MS SQL Server 7.0 or higher. The latest version of the software i.e. SOUL 2.0 will be released by the end of the year 2008. The database for new version of SOUL is designed for latest versions of MS-SQL and MySQL (or any other popular RDBMS). SOUL 2.0 is compliant to international standards such as MARC 21 bibliographic format, Unicode based Universal Character Sets for multilingual bibliographic records and NCIP 2.0 based protocols for electronic surveillance and control.

**Major Features and Functionalities**

Following are the strong features of SOUL 2.0:

- UNICODE based multilingual support for Indian and foreign languages;
- Compliant to International Standards such as MARC21, AACR-2, MARCXML;
- Compliant to NCIP 2.0 protocol for RFID and other related applications especially for electronic surveillance and self check-out & check-in;
- Client-server based architecture, user-friendly interface that does not require extensive training;
- Supports multi-platform for bibliographic database such as MySQL, MS-SQL or any other RDBMS;
- Supports cataloguing of electronic resources such as e-journals, e-books, virtually any type of material;
- Supports requirements of digital library and facilitate link to full-text articles and other digital objects;
- Support online copy cataloguing from MARC21 supported bibliographic database;
- Provides default templates for data entry of different type of documents. User can also customize their own data entry templates for different type of documents;
- Provides freedom to users for generating reports of their choice and format along with template and query parameters;
- Supports ground-level practical requirements of the libraries such as stock verification, book bank, vigorous maintenance functions, transaction level enhanced security, etc.;
- Provides facility to send reports through e-mail, allows users to save the reports in various formats such as Word, PDF, Excel, MARCXML, etc.;
- Highly versatile and user-friendly OPAC with simple and advanced search. OPAC users can export their search results in to PDF, MS Excel, and MARCXML format;
- Supports authority files of personal name, corporate body, subject headings and series name;
- Supports data exchange through ISO-2709 standard;
- Provides simple budgeting system and single window operation for all major circulation functions;
- Strong region-wise support for maintenance through regional coordinators. Strong online and offline support by e-mail, chat and through dedicated telephone line during office hours; and
- Available at an affordable cost with strong institutional support.

**Modules**

The SOUL 2.0 consists of the following modules. Each module has further been divided into sub modules to cater to its functional requirements:

- Acquisition
- Catalogue
- Circulation
- OPAC
- Serial Control
- Administration

The in-built network feature of the software will allow multiple libraries of the same university to function together as well as access to the distributed databases installed at various university libraries and union catalogue mounted at INFLIBNET using VSAT network.

**Acquisition**

The module enables library staff to handle all the major functions, such as

- Suggestions management;
- Order processing, cancellation and reminders;
• Receipt, Payment and budgetary control;
• Master files such as currency, vendors, publishers etc.; and
• Reports.

**Catalogue**

Catalogue module is used for retrospective conversion of library resources. It also facilitates library staff to process of the newly acquired library resources.

The strong features of catalogue module are:

• allows cataloguer to create their own templates for data entry of different library resources;
• different templates for leaders and fixed fields of MARC21;
• allows user-generated customized reports;
• facilitates authority database of person name, corporate body, subject headings and series name;
• supports copy cataloguing in MARC21 format by using ISO-2709 standard;
• master database of publishers;
• multi-lingual database by using Unicode Character set; and
• Supports full MARC 21 bibliographic format.

**Circulation**

This module takes care of all possible functions of circulation. Sufficient care has been taken in designing this module starting from membership management, maintenance and status of library items, transaction, ILL, overdue charges, renewals & reminders, search status and report generation according to the status of the items. The circulation module is fully compliant with the NISO Circulation and Interchange Protocol (NCIP) version 2.0 for
electronic surveillance and RFID based transaction of the items. Major functions of the circulation module:

- Membership;
- Transaction;
- Inter-library loan;
- Over due charges;
- Reminder;
- Search status;
- Maintenance of the items such as binding, lost, replace, missing, withdrawal, etc.; and
- Report generation based on the various requirements.

**On-line Public Access Catalogue (OPAC)**

One of the major attractions of SOUL is its robust On-line Public Access Catalogue (OPAC). The OPAC has simple and advanced search facility with the minimum information of the item by using author, title, corporate body, conference name, subject headings, keywords, class number, series name, accession number or combination of any of two or more information regarding the item. Major functions provided in the module are:

- Simple Search;
- Boolean Search;
- Advanced Boolean Search;
- Displaying and downloading of records in MS Excel, PDF or MARCXML; and
- Search support for the items that are in the acquisition process in the library.
Serial Control

Managing serials is the most complicated job for a library. The module keeps track of serials in the library effectively and efficiently. The serial control module is developed based on the KARDEX system and has following functions built into it:

- suggestions;
- master databases;
- subscriptions;
- check-in of individual issues of journals;
- payment, reminder, binding, and title history;
- export / import by using ISO 2709 bibliographic exchange format;
- article indexing of journal/book articles;
- cataloguing of electronic journals; and
- keeps track of the history changes of the journals.

Administration

In addition to the features available in the Administration Module of the SOUL 1.0, some more features have been added to the administration module of the SOUL 2.0. With the inputs from the various SOUL users and requirements of the library staff and their user rights. The module has been divided into three major sections for accommodating the new features; those are User management, System Parameters and Masters. The administration volume provides the following These Administration module include following features:

- grouping of users based on the policy;
• transactional rights over the systems;
• transaction level security to users;
• various configuration settings such as labels, e-mail and other parameters related to the software use; and
• Common master databases being used in modules.
6.10 Koha

Koha is an open source Integrated Library System (ILS), used world-wide by public, school and special libraries. It was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and the first installation went live in January 2000, so Koha is believed to be the first open source ILS in the world. The name *koha* comes from a Māori term for a gift or donation (see koha (custom)).

Features

Koha is web-based ILS, with a SQL database backend with cataloguing data stored in MARC and accessible via Z39.50. The user interface is very configurable and adaptable and has been translated into many languages. Koha has most of the features that would be expected in an ILS, including:

- Simple, clear interface for librarians and members (patrons)
- Various Web 2.0 facilities like tagging and RSS feeds
- Union catalog facility
- Customizable search
- Circulation and borrower management
- Full acquisitions system including budgets and pricing information (including supplier and currency conversion)
- Simple acquisitions system for the smaller library
- Ability to cope with any number of branches, patrons, patron categories, item categories, items, currencies and other data
- Serials system for magazines or newspapers
- Reading lists for members

History
Koha was created in 1999 by Katipo Communications for the Horowhenua Library Trust in New Zealand, and the first installation went live in January 2000.

- From 2000, companies started providing commercial support for koha, building to more than 20 today.
- In 2001, Paul Poulain (of Marseille, France) began adding many new features to Koha, most significantly support for multiple languages.
- MARC and Z39.50 was added in 2002 and later sponsored by the http://www.mycapl.org/ Nelsonville Public Library.
- In 2005, an Ohio-based company, Metavore, Inc., trading as LibLime, was established to support Koha and added many new features, including support for Zebra sponsored by the Crawford County Federated Library System. Zebra support increased the speed of searches as well as improving scalability to support tens of millions of bibliographic records.
- Paul Poulain co-founded BibLibre in 2007.
- In 2009 a dispute arose between LibLime and other members of the Koha community. The dispute centred on LibLime's apparent reluctance to be inclusive with the content of the http://koha.org/ sites and the non-contribution of software patches back to the community. A number of participants declared that they believed that LibLime had forked the software and the community. A separate web presence, source code repository and community were established at
http://www.koha-community.org/. The fork continued after March 2010, when LibLime was purchased by PTFS.

- In 2010, LibLime was acquired by another vendor, PTFS.
- In the 2010 librarytechnology.org survey of ILS perception, independent Koha support and Koha support from ByWater Solutions outranked support from LibLime in every single question.
- By 2010, Koha has been translated from its original English into French, Chinese, Arabic and several other languages. Support for the cataloguing and search standards.

**Current status**

The latest release of the koha-community.org koha is koha-3.02.05. The latest release of the koha.org koha is Harley Koha is currently a very active project. According to ohloh, both branches have a very large, active development team and a mature, well-established code base but the PTFS fork has decreasing year-over-year development activity. The analysis of the size of the code base may be deceptive because koha stores user interface translations alongside actual source code and ohloh cannot always distinguish them.
6.11 History of software in Iraq

In the 1963 first time used software in Iraq, when used in the "Iraq Oil Company" in Kirkuk, a large computer type IBM 1401, and in 1968 used software in state institutions first time, by the following institutions:

- The railway Institution republic of Iraq - ICL In 24/1/1968
- Baghdad University / Engineering College -IBM In 1/4/1968
- National Electricity Institution -NCR In 1/5/1968

"National Center for Electronic Computers" founded in 1970 after many discussions during the first scientific conference's for Computers in Iraq. It discussed its significance and impact on the future of Iraq in Computerization. National center is responsible for the computer technology in Iraq.

The Ministry of Planning formed National Commission for Electronic Computers, In 2/12/1969, and its objectives, founding National center for Computers, and in 1971 attached to this Commission within the administrative the National Center for Consultations and management development.

The National Center for Electronic Computers was established in 20/8/1972 according to law No. 100 in 1972, the most important reasons for its establishment as follows:
To provide Electronic computational capacity in Iraq to assign the requirements of administrative work, the computational and engineering
To organization of investments
To provide services related to computers for various government agencies.

In 1975 the Center holding its first conference in the area of national plans for the use of computer in the developing countries. More than 50 developed and developing countries participated,

The Institute for research and training founded in 1979 to create a national advanced and specialized manpower in the use of computer, it was granted certificates of higher diploma and master’s in 1988, but it stopped granting this certificates by the Revolutionary Command Council resolution No. 137 and canceled the Institute in 1989 as the Revolutionary Command Council resolution No. 353, and founded “Research and Training Center “for training courses.

Linked the center with the Ministry of Higher Education and Scientific Research In 7/11/1994.The National Center for Electronic Computers established to provide the basic following activities as:

- To put the foundations, standards and controls on the use of computers
- Simplification of procedures for the completion of the tasks and duties of computers centers found in booklet included 52 standard.
To Provide advisory services on the types of computers, analysis and design systems, and software

- Designed 52 program for large computers
- Designed 113 program on the Main frame
- Construction exhibits of software, the first was in 1991, and in 1992 established a permanent exhibit to software
- Contributed to the provision of advisory services for some libraries, designed a system of libraries

6.12 Reality of Software system in Iraq

After declining numbers and left the work, began appearing actual for national experience in maintenance and sustainability, and established national companies, including "Aljeel company" within the state institutions, in addition to private offices that provide hardware and maintenance, as emerged national companies in the field of manufacturing and accumulating of the computers, as "salahddin company for electronic industry" so that increased design software by the national cadres and the support of the State, it has considered the industry and covered the law of "industrial development", thus increased offices and private companies to produce, manufacture and marketing of software,

In the early 1970s, six of foreign companies operating in Iraq, then rose to twelve at the beginning of the 1980s, it was doing the processing, maintenance and sustainability. Then founded "Babel Software Company", has been supported by the Ministry of Industry and Minerals to be a center for
the Manufacture of Software for the various agencies and authorities.

Iraq is the first of Arab countries in the Urbanization of software, computers & operating system including "Aan", which was the first system for Urbanization, founded by the Center of Electronic Computer, and the Ministry of Industry & Minerals, and the "AlAfik Office" for the Computer and software systems. The result of this expansion has spread national cadres in hardware and software, of graduates in scientific departments in the faculties of engineering and sciences in Iraqi universities, in addition to institutes and eligibility colleges.
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