The Best Library Software for Developing Countries:

More than 30 Plus Points of Micro CDS/ISIS

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The article describes the features of a library automation application called Micro CDS/ISIS. The software produced by UNESCO is used by more than 15,000 institutions all over the world. It is free of cost and is readily available. Its technical features include minimum hardware requirements, large database capacity, variable length fields, repeatable fields, subfields, powerful indexing, and rapid searching. It follows international data exchange standards. Support features include extensive documentation and a worldwide user group. Training courses in CDS/ISIS are conducted throughout the world. Because of these characteristics, CDS/ISIS may be recommended as the best library software for developing countries.

Introduction

Computer technology is gaining rapid popularity in a wide range of libraries and information centers in developing countries. For various reasons, the selection of library software has always been a problem in these countries. Software normally developed in advanced countries does not fulfill the requirements of libraries in less developed countries. These packages are generally too expensive to be procured by libraries with a limited budget. Because of the lack of library automation experts and other resources, software development is difficult in developing countries. To achieve the goal of universal bibliographic control, the United Nations Educational, Scientific and Cultural Organization (UNESCO) took the initiative and decided to help the developing countries automate their libraries. In 1986 UNESCO released the first version of Micro CDS/ISIS.

Library Software for Developing Countries

Due to its many excellent characteristics, CDS/ISIS may be considered the best software for libraries in developing countries. The following sections describe the thirty-four major characteristics of CDS/ISIS that make it especially appropriate for these libraries.

1. Available without Cost

The lack of financial resources is a major hindrance when introducing information technology in developing countries. Due to meager budgets, poor libraries are hardly able to run their manual and routine operations. If they arrange hardware for automation, then the price of software is again a greater problem for them. Although CDS/ISIS is protected by copyright and is not shareware or public domain software, it is available free of cost for noncommercial use. The software, including three floppy diskettes and a comprehensive user's manual, can be procured without paying any money. The software can be used legally by license holders. This license is not as restrictive as some commercially produced software packages. The use of multiple copies of the system is permitted within each institution granted a software license.

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2. Easy Distribution

One can get the software in an easy way. UNESCO has appointed distributors throughout the world to assist in supplying the software to those who wish to use it. These distributors are in many cases national focal points for the UNESCO General Information Programme. Regional and national distributors totaled seventy-two in April 1995. There are also distributors for organizations in specific sectors. These are sixty-five distributors that cover such areas as agricultural information and energy information. To get the license, one has to fill in the form and send it to the distributor. The updated list of distributors and their addresses is available from UNESCO, Paris. In the absence of an available distributor, UNESCO can be contacted directly.

3. Multilingual Software

CDS/ISIS is multilingual library software. The standard software can manage English-, French-, and Spanish-language databases. Versions in other languages include Latin, German, Italian, Arabic, Hungarian, Thai, Tibetan, Hindi, and Chinese.

4. Specially Designed for Bibliographic Information

The CDS/ISIS package has been developed for information about bibliographic documents such as books, journal articles, or conference proceedings. Usually, each record in the database contains information about one document. Many features of CDS/ISIS differ from those in database management systems, which have been designed for general purposes.

5. A Reliable Organization of Support

A sound organizational support system is always a basic criterion for software selection or evaluation. CDS/ISIS is designed and developed by a well-established and stable organization, that is, UNESCO. This organization has worked on the software for a number of years. The mainframe version of CDS/ISIS was developed in 1975. UNESCO acquired a permanent, full-time staff for developing the software.

6. Available on Mainframe, Mini-, and Microcomputers

Although libraries in developing countries mostly use the microcomputer version of the software, CDS/ISIS is available on mainframe and minicomputers as well. The minicomputer version, MINISIS, was developed by International Development Research Centre (IDRC), Canada. An attractive feature of CDS/ISIS is that the databases created can also be converted to MINISIS and ISIS mainframe software.

7. Minimum Hardware Requirements

CDS/ISIS operates on simple computer hardware. It requires an IBM PC/XT/AT or compatible with only 512-KB RAM. The other requirements include one floppy disk drive, one hard drive, a monochrome or color monitor, and a printer. A special version is also available for WANG PCs working under the native MS-DOS operating system.

8. Larger Database Capacity

An unlimited number of databases can be designed for CDS/ISIS. The maximum number of records in a database is 16 million, which is sufficient for the needs of libraries in developing countries. The software can hold 8,000 characters in a record. 200 fields can be included in each database.

9. Variable Length Fields

In many database management packages, such as dBase or Foxpro, the fields are of fixed length. It is easier to design a system in which fields are fixed length—and for many applications that is no problem. The information can be abbreviated to fit the space available, or codes can be used. Bibliographic data tend to be treated differently from other kinds, with less recourse to abbreviation. Moreover, titles of books and other works that are contained in a bibliographic record may be of any length, from one word to many. To meet this need, CDS/ISIS provides variable length fields. In this case, only the space that has actual data in the field is consumed.

10. Repeatable Fields

Bibliographic applications require repeatable fields. For example, one book may have a number of authors. Each author needs to be of equal status. Many bibliographic databases implemented on general database management systems have one field for "authors"; all authors are entered in one field, but only the first is searchable. In CDS/ISIS, each attribute that has more than one field is entered in its own field, and each field may be repeated up to 999 times.

11. Subfields

Bibliographic data may make extensive use of subfields. CDS/ISIS has implemented this facility. It is a very useful feature when a field is divided into different parts to be treated in different ways. An author's name may appear in an index as Smith or John, but sometimes it might be desirable to print it out as John Smith—for instance, when producing data in different reference styles. Subfields enable the different parts of the data to be separately manipulated.

12. System Menus and Worksheets

The software is completely menu driven. The main menu is displayed when the program is run, and from this menu other menus are reached by means of one keystroke. Some menus lead to worksheets on which necessary data are entered to carry out a particular function. All the menus and worksheets are designed in various languages. New menus and worksheets can be framed and modified as required.

13. Data Entry Screens

CDS/ISIS provides attractive data entry screens with a maximum of twenty pages. Fields can be designed in six different attributes, including normal reverse, bold, underline, blinking, and invisible. These attributes can be displayed in different color combinations. Attractive titles can also be created. A major advantage in data entry screens is scrolling fields, which increase the field length to the maximum, that is, 8,000 characters. Setting default values is also possible. More screens can be designed for one database.

14. Powerful Indexing

The indexing method of CDS/ISIS is very powerful. All 200 fields can be indexed in nine ways. Indexing of a particular field is possible with different indexing techniques at the same time, that is, the complete field, each individual subfield, or each word. Two indexing techniques index text enclosed by <. . . > or / . . . /. Terms can also be indexed with prefixes or suffixes as required. This flexibility is not normally found in other database management systems.

15. Terms Dictionary

CDS/ISIS maintains a list of all terms and words that have been indexed. This list is arranged alphabetically and is called a terms dictionary. One can choose the keywords from the terms dictionary, combine them with different operators, and then search them easily.

16. Accurate and Rapid Searching

CDS/ISIS provides an easy and convenient search language. The indexing method CDS/ISIS used assures fast searching. Boolean operators (AND, OR, NOT) may be used to broaden or narrow the scope of the search. Comparison operators (greater than, less than, equal to) may be used in numerical searches. One can search for records containing or lacking a particular field. Searches may be stored and later recalled or modified. CDS/ISIS offers output of search results on screen, to the printer, or to an ASCII file on disk. Fieldwise search is also available. Independent of indexed terms, free text searching is possible, but due to the sequential method of searching, it takes more time. To search for a related group of terms, ANY TERMS are introduced in the software.

17. Display and Print Format

Libraries generally need output report in more than one format from a database. In CDS/ISIS, this flexibility is achieved through a sophisticated algebralike formatting language. With a little understanding and practice, a user can make reports of his or her own requirements. For example, one can display cataloging data in ISBD format, and accession register style, or other bibliographic forms.

18. Printing and Sorting Facilities

CDS/ISIS includes several features for customized printing. Page layout and margin settings are easy. One can print directly to a printer or to an ASCII file for further manipulation or additional formatting with a word processor. Fieldwise sorting and subsorting are available. Four sorting keys are allowed. The printing of catalog cards and labels through CDS/ISIS has been successfully experienced in the libraries.

19. Stopword File

The concept of stopwords is not alien to information workers and librarians. This is a list of common, noninformative words that have no worth for searching, and one may want to prevent these words from being indexed. The examples of these words are articles, prepositions, and conjunctions. Within CDS/ISIS, up to 799 words can be specified as stopwords. This feature is not generally available in other database management systems.

20. Data Exchange

Records from one database can easily be transformed to others with the help of ISIS import/export services. The major advantage of CDS/ISIS is that it exports data in an international standard format, that is, ISO 2709. Thus the data are exchangeable between other software packages that use this standard. Programs have been developed to transfer data from dBase and others to CDS/ISIS. Records can also travel between two CDS/ISIS databases, even those of incompatible formats.

21. Password Protection

Passwords can be used to protect CDS/ISIS from unauthorized use. It is also possible to give different individuals or groups of users a password that will allow them to use different functions or see different databases.

22. Pascal Support for Advanced Programming

CDS/ISIS includes a Pascal compiler that can be accessed from the main menu. The software itself is written in Pascal and is built up from procedures written in Pascal. Many of these have been included in a library of procedures that can be accessed by the programmer. Anyone with knowledge of Pascal programming may write programs in the high-level Pascal programming language, compile them into the object code, and run them in CDS/ISIS. With this feature, one can go beyond the initial capabilities of CDS/ISIS.

23. Sample Databases and Programs

To facilitate users in learning the software, some sample databases and programs have been provided with standard CDS/ISIS. The databases include a catalog and a thesaurus database. The programs include a searching interface, a keyboard display, and a thesaurus program. Source codes of Pascal programs are also made available.

24. User Interfaces

To enhance CDS/ISIS's searching facilities, people have developed different user-friendly interfaces with the software. Advanced programs for circulation, selective dissemination of information (SDI), current awareness service (CAS), global change, creating new databases, facilitating data entry, and report creating have also been developed by the users of CDS/ISIS throughout the world.

25. Documentation

Although on-line help is not included with CDS/ISIS, a comprehensive reference manual of more than 300 pages has been prepared by UNESCO. The manual is properly elaborated and easy to understand. UNESCO keeps its users well informed with the latest developments through journals, bulletins, and newsletters issued for this purpose. A number of other periodicals include articles on CDS/ISIS. The following journals have started permanent columns for general discussion and for answering queries about CDS/ISIS: *Information Development* (United Kingdom), *Information Trends—News Magazine* (Botswana), *Program* (United Kingdom), *The ASTINFO Newsletter* (Philippines), and *UNISIST Newsletter* (France). A special journal focusing on CDS/ISIS has started publication from Argentina. It is a quarterly journal called *INFOISIS* and it publishes both English and Spanish editions. A bibliography compiled by Ernesto Spinak lists 39 books and monographs and 142 articles published in different languages throughout the world. This bibliography, last updated on April 18, 1996, is available on the Internet.

26. Network Support

Since version 3.0, CDS/ISIS includes features to allow it to function well in a multiuser environment. Full local area network (LAN) support is available. The main features that make the use of software by more users possible are record locking and database locking. Record locking prevents more than one user from accessing a record at a time to edit it. Database locking prevents a user from accessing a database when certain system functions such as inverting the file are being performed. However, data entry and searching may be performed by more than one user simultaneously.

27. Rapid Development

CDS/ISIS does not have such a long history. Its first version was released in 1986. Improved versions have been issued in 1987, 1988, 1991, and 1993. Now, version 3.07 is in the field. After receiving feedback from users all over the world, the experts and UNESCO quickly overcame the problems witnessed and inserted new facilities in the software. The new versions of CDS/ISIS will be written in the C++ programming language, which is more powerful than Pascal.

28. Unix and Windows Versions

UNESCO plans to produce versions of CDS/ISIS for other operating systems. A beta-test release of CDS/ISIS for UNIX has been issued to selected institutions. Although the DOS version can also be installed and run under Microsoft Windows, a version specifically designed to run under Windows is under development. A beta-test version of WINISIS has been released in which searching, data entry, and printing services have been much improved.

29. CD-ROM Version

UNESCO has produced a version of the package, called ISISCD, that allows read only and includes the facilities to search and retrieve and to sort and print from the database. This can be used on a multiuser system to prevent unauthorized editing of the database. On a single-user system, it should be used as the means of access for the people who are not permitted to make changes to the database.

30. Easy Customization

CDS/ISIS may easily be tailored to the particular local requirements of different developing countries and different institutions. New functions may be added to the menus by modifying them. System worksheets and help messages may be changed. System attributes and colors can be changed. New language versions may also be designed locally.

31. Versatile Applications

CDS/ISIS has been applied to various purposes throughout the world. Standard applications like MARC, CCF, and MIBIS have been prepared using CDS/ISIS. The national libraries of Portugal and Greece are using CDS/ISIS for producing national bibliographies in UNIMARC format. Directories have been produced with the help of CDS/ISIS. An application for on-line public access catalogs (OPAC) has also been written. Library housekeeping systems include SANJAY from India and LAMP from Pakistan. Using CDS/ISIS, a thesaurus in the field of economics named MACROTHESAURUS has been issued by the Organization of Economic Cooperation and Development (OECD), Paris.

32. Worldwide Use

More than 15,000 institutions use CDS/ISIS all over the world. The number of users in Latin America alone is about 7,000. The number of users in Asia is more than 2,500. There is a strong network of user groups throughout the world. An International Association of CDS/ISIS Systems and NEW Information Technologies Users and Developers (Association ISIS-NIT) holds international and regional conferences regarding new developments in CDS/ISIS. Many countries assemble their own national user groups. In Italy, a user group with 1,000 participants convened. Niger has a user group with 70 members. Thailand has an active user group with 200 institutions and about 200 individual members. The Dutch-speaking user group has about 100 members.

33. CDS/ISIS on the Internet

Since the summer of 1992, there has been a worldwide electronic user group on the Internet. In April 1994, the number of registered electronic subscribers was about 300, and the group archive was about 1 MB of interesting information. The discussion group is accessible to users connected to academic networks such as the Internet, JANET, or EARN, and to other networks such as GreenNet that have Internet connections. Users, mainly from Europe, Latin America, North America, and Australia, are exchanging information about the more complex areas of CDS/ISIS, such as the writing of Pascal programs and problems in the formatting language.

34. Training Facilities

Training facilities in CDS/ISIS are available all over the world. Training courses for beginners and potential users are arranged in various countries. In offering courses on CDS/ISIS, the National Information for Science and Technology (NISSAT), India; Asian Institute of Technology (AIT), Bangkok, Thailand; and Pakistan Library Association Computer Training Centers are eminent. Regular courses in library and information sciences at various universities also include training on CDS/ISIS.

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