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CDS/ISIS: the second decade

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CDS/ISIS: the second decade

Despite earlier claims that CDS/ISIS was outdated, the software package has adapted successfully to developments in information technology and continues to enable less wealthy institutions around the world to join the information society.

Alan Hopkinson

INTRODUCTION

Ten years ago in *Information Development*, we published 'CDS/ISIS information: the first 10 years of the microcomputer version'.¹ This referenced an earlier article in the very first issue of *Information Development* by M. Pobukovsky entitled 'The UNESCO Computerized Documentation System'² which in turn had been based on a paper by UNESCO's Chief of the Computerized Documentation and Library System, Jacqueline Forestier.

The world of information technology has changed considerably since 1995. The Internet had existed in various forms for some years, but before that year, very few computer users outside of the major universities (which had been connected to the predecessors of the Internet) were able to have access to it. The World Wide Web, which is a set of protocols enabling browsers to access data on servers via the Internet, was very much in its infancy and again was used for communication between members of the academic community more than between anyone else.

Since 1995, CDS/ISIS has changed less than most other systems. A regular column, 'CDS/ISIS Information', has continued to appear in every issue of *Information Development* since Volume 5, no. 3, July 1989 and we have endeavoured to address the issues relating to CDS/ISIS in which readers are interested. Ten years ago, the only way of communicating internationally was by traditional mail or fax; telex was also available but never used for lengthy communication. Phone was possible but very expensive. Questions were asked by mail and answered in the column. Today communication is much easier; e-mails can be sent from most of the world via the Internet and questions can be answered interactively in a way that might have formerly taken months. Turnaround time using conventional mail would have been four or five weeks to a country like Nepal.

THE INTERNET

We maintain that the way in which CDS/ISIS has changed over the last ten years is partly due to the existence and use of the Internet. For example, in Nepal, ICIMOD, the International Centre for Integrated Mountain Development, which deals with problems of mountain economies, has used CDS/ISIS for many years. They have been using e-mail for almost ten years using an international .org address and have contributed widely to discussions on CDS/ISIS. Nepal is not considered to be amongst the most Internet-enabled countries, but because their remoteness has given them a poor postal service, some organizations in the country embraced Internet technology early. Occasionally we receive e-mails from countries with national e-mail addresses which we do not recognize but this does not happen very often; today nearly everywhere in the world has access to Internet e-mail.

Another effect of the Internet has been the ability of anyone to publish in a way that anyone in the world can read it. This has led to the need for software to enable CDS/ISIS databases to be mounted on the World Wide Web and published for all to see.

As a result of this need, UNESCO cooperated with BIREME (the Brazilian Centre for Information in Health Sciences), an institution in Brazil which acts as a centre for health information in Latin America and the Caribbean, to develop a version of ISIS, known as WWWISIS, for mounting ISIS databases on web servers. A standard database can be used, but the print formats must be adapted for Hypertext Markup Language (HTML). This software was adapted from C-ISIS, a version of ISIS written in the programming language C, but developed from the Pascal source code. Source code is the computer language in which programs are written by programmers. It can be adapted by other programmers to improve or add functionality to a computer program. After the programs are written they are compiled into a language which the computer reads which cannot be changed without going back to the source code and recompiling. This protects code from unauthorized change and theft. BIREME staff were permitted by UNESCO to use source code for the development of C-ISIS, and WWWISIS is based on that. WWWISIS

version 3 is made available free of charge and may be downloaded from BIREME's website. There have now been further versions which are available only under license. WWWISIS uses XML to generate its screens to be viewed on the Web; this is created on the fly from the CDS/ISIS database using CDS/ISIS print formats.

In addition other developers have made available their own programs. The Institute for Computer and Information Engineering (ICIE) of Poland, who have over the years been contracted to work for the Food and Agriculture Organization of the United Nations (FAO) on CDS/ISIS implementation, have made available a web-based catalogue system, WWW-ISIS, which has recently been incorporated into a fully fledged integrated library automation system, as we announced in June 2003.³

The Internet has succeeded in enabling information about CDS/ISIS and its usage to be broadcast around the developing world in a way that could never have been imagined when CDS/ISIS was first launched. Information is readily available on UNESCO's website. A host of bibliographies has been created (no doubt using CDS/ISIS itself for the purpose). One such is by Bakheet Beshtaway.⁴

CDS/ISIS FOR WINDOWS

As microcomputers developed in the 1980s, great efforts were made to develop user friendly interfaces. The most successful effort was undoubtedly Microsoft Windows, which has continued until today in its various versions (Windows, Windows 3.1, Windows 95, Windows 98, Windows NT, Windows 2000, Windows XP, etc.). CDS/ISIS was developed originally for mainframes, but it came into general use as a DOS program for microcomputers. In the 1990s there were many calls for CDS/ISIS to be adapted for Windows. Unable to wait for UNESCO, the Russian National Library for Science and Technology developed a version using their own Windows-like infrastructure called IRBIS which sat on top of the DOS operating system.

UNESCO's CDS/ISIS for Windows, commonly known as WinISIS, was formally released in December 1998. Its first public release was version 1.31. However, there had been such a strong call for a Windows version that UNESCO had released an early version in early 1995. The earlier versions of CDS/ISIS for Windows did not follow the usual standards for Windows programs, and it was not until version 1.31

that CDS/ISIS for Windows became what would be regarded as a standard Windows program. It was made available on two floppy disks to the network of distributors that had been set up by UNESCO and was intended for distribution via the Internet. However, this did not happen for some time because UNESCO staff had to investigate the legal safeguards necessary to distribute software in this way.

It is important to remember that the Windows version can access a database created in the DOS version. However, so many new features are available in Windows that a version created in Windows may not easily be viewed in DOS if it is using sophisticated print formats. However it could always be read if a simple print format is created.

Early versions of CDS/ISIS for Windows did not include all functions of the DOS version. For example, reinitializing databases and backing up databases has been only recently implemented in CDS/ISIS for Windows.

CDS/ISIS for Windows has continued to be developed. Usually new versions have been released for users to use at their own risk. Then versions have been released reasonably well tested. The latest is version 1.5 which was released in Summer 2004.

CDS/ISIS for DOS had three kinds of program exits: three different types of programs could be written by users to add on to the functionality. These programs had to be written in CDS/ISIS Pascal and a compiler was provided. There were menu exits which enabled the user to add extra functions on as menu options, display format exits which allow users to enhance the display formatting language and ordinary programs which can be run from the menu. CDS/ISIS for Windows, on the other hand, retained only format exits, which are compiled from an option on the menu. To add any more requires a knowledge of Visual Basic. BIREME, the organization that initially assisted UNESCO in developing CDS/ISIS for Windows, has developed ISISDLL which can be used to write programs which can extend the functionality of CDS/ISIS and which could be added to the Windows-style drop-down menus. Otherwise, there is only a minimum that can be done to change the menu: functions such as opening a DOS window can be added to the menu without knowledge of Visual Basic. When CDS/ISIS for DOS was at the height of its popularity, many programmers wrote programs to add additional functions to the basic package, such as global edit or data entry in a window instead of the basic line editor. These were included as standard features of the basic

CDS/ISIS for Windows program. Over the last ten years UNESCO has been receptive to requests for new functionality. Indexing was formerly restricted to terms of 30 characters; the latest version allows more, but interim versions could permit it with a special version which could be obtained from UNESCO. From the earliest generally released version of CDS/ISIS for Windows, it was possible to create a print format in HTML using a wizard (this is an alternative way of publishing on the World Wide Web, but it can be used only for producing bibliographies or catalogues). More recently, XML has been regarded as a new generation markup language with more facilities than HTML. Later versions of CDS/ISIS have therefore been able to produce an XML file from a CDS/ISIS record or records in a similar way, basing the tags on the data element definitions in the field definition table and giving various options to produce this, including an option to produce a file which is compatible with WWWISIS.

CDS/ISIS FOR DOS

The last ten years has been the decade of CDS/ISIS for Windows. But in the early years of the decade, developments were still being made to the DOS program because many developing countries were still extensively using computers which were not powerful enough to support Microsoft Windows. In 1995, for example, the Netherlands Library Development Project in Pakistan was circulating LAMP (Library Automation and Management Program) developed in conjunction with the Pakistan Library Association. This was a suite of programs which were developed in CDS/ISIS Pascal and used the facility for adding programs to the menus to tailor it to the needs of the users. The latest version of CDS/ISIS for DOS to be released was version 3.08, made available in 1998.

ASSURED DEVELOPMENT

UNESCO is not a software house so, from time to time, it has often been difficult to support politically the resources used in the development of CDS/ISIS. UNESCO's programme is determined by its member states and fortunately many, though not all, have seen the value of CDS/ISIS.

Developing software has become faster and, up to a point, cheaper. Distributing it has become even cheaper since it can be sent over the network, particularly the distribution of a new version.

UNESCO has been supporting the Open Source movement which promotes making source code publicly available so that it can be extended and adapted to increase its functionality. Many concerns have been expressed that, were the source code of CDS/ISIS to be released, it could have serious repercussions as developers could adapt it in such a way that databases developed under the amended versions were not compatible and chaos would ensue in the community of users. Consequently, the source code has not generally been released. However, there have been developments in this area outside UNESCO. The OpenISIS Society was founded in October 2002 in Berlin to further the development and dissemination of open source information systems. Their stated aim is to support libraries, archives and other public organizations to manage and retrieve information in a high quality way according to bibliographic principles.⁵ After a number of years of development by volunteers, OpenISIS, a software package which is functionally compatible with CDS/ISIS, was released as a test preview in November 2004.

CDS/ISIS AND STANDARDS

The original reason for producing the microcomputer version of CDS/ISIS was to promote standards, since UNESCO's General Information Programme (the predecessor of the Information Society Division) was substantially concerned with the development and promotion of standards. The main standard which it promoted was the ISO 2709 standard, which is the record structure of the MARC formats. A number of efforts have been made over the years to implement these formats. Certain key features were not supported by the software. Some of these have been introduced gradually in different versions. ISIS originally used a special version which included character returns at the end of each line of 80 characters. Ends of fields and records were marked by the hash (#) sign. CDS/ISIS for Windows implemented these in a more standard form in early versions of the software. However, repeatable subfields have not been implemented. Therefore, in 2002, a new software package which creates MARC records, IsisMARC, was developed by Ernesto Spinak of Montevideo, Uruguay, with support from UNESCO and the Library of Congress. This package implements MARC in its entirety on a standard CDS/ISIS database: implementations have been developed for MARC21 and UNIMARC. As well as MARC, which leads to a

common record structure, work has progressed in the library community with a standard known as Z39.50. The aim of this standard is to enable cross-catalogue searching. To this end it defines protocols to enable systems to understand each others' commands and profiles to identify indexes so that a client system can determine the nature of an index on a target server and thereby select different kinds of searches. To be Z39.50 compatible, CDS/ISIS would need to have a client which could access a Z39.50 compatible database and have a facility, if placed on a server, to enable Z39.50 clients to access the database. Stanley Aung⁶ has developed ZISIS which is a utility package for searching CDS/ISIS databases over the Z39.50 protocol through the Center for Networked Information Discovery and Retrieval (CNIDR) Isite Integrated Internet Publishing System. ZISIS consists of two programs written in the C language by using the ISISDLL library for Linux developed by BIREME. One program converts queries into the CDS/ISIS format, searches CDS/ISIS databases and stores search results to be used by CNIDR Isite Search. The second program reads information passed from the Isite Search Application program Interface (SAPI), retrieves the CDS/ISIS records, formats the records into either USMARC or SUTRS (Simple Unstructured Text Record Syntax – a string of textual data which may be displayed as it is without any manipulation) basing it on the requested syntax and sends the records out to the client software.

Another standard which is awaiting implementation is UNICODE. In principle, UNICODE is a very important standard to implement since it is the core standard in multilingual and multiscript computing and CDS/ISIS has always aimed to implement these two concepts. Unfortunately, to implement UNICODE requires a rewriting of the database managing system since characters will occupy the space take up by two characters in a pre-UNICODE system. Oracle and SYBASE, the best-known relational database systems, have implemented UNICODE. Because CDS/ISIS does not use any other supplier's database or search engine, all the work to reorganize the database would have to be done specifically for CDS/ISIS. So far there is no UNICODE version. However, many scripts can be implemented using Microsoft fonts, though without UNICODE implementation it will not be easy to use many scripts in the same database. Though not UNICODE compatible, version 1.5 for Arabic was released in 2004; a special feature is that it can cope with the right to left direction of text in Arabic.

GIAMPAOLO DEL BIGIO

CDS/ISIS was in its early days developed and maintained by Giampaolo Del Bigio who had worked earlier with the mainframe version of the software. Sadly he died after a year-long illness in 1997. He had held a senior post in UNESCO which had helped to ensure over the years that development work could continue. He was replaced by another staff member of Italian origin who had assisted him for some time, Davide Storti. At the Crimea Conference in 2000 a meeting was held in memory of Mr Del Bigio, who had himself attended the conference in previous years to talk about current CDS/ISIS developments.

USER GROUPS AND DISTRIBUTORS

A number of user groups were founded in the last decade. There was, for example, an International Association of CDS/ISIS Users later called The International Association of CDS/ISIS Systems and New Information Technologies Users and Developers Association (ISIS-NIT). The group held a meeting at the Crimea Conference in June 1996 to which they invited a number of CDS/ISIS specialists, including Mr Del Bigio. They held joint meetings with the UK CDS/ISIS User Group ISIS Plus in December 1995 and December 1996 in conjunction with the Online Information Meeting. User groups exist in other countries, there being very active groups in France and Argentina. To some extent the Internet has proved its value because communication is so effective by e-mail that it is less necessary to hold meetings than it was in the mid-1990s.

Additionally UNESCO has hosted European CDS/ISIS Distributors and Users Groups.

Distributors have continued to work to varying degrees in different countries. However, there has been a certain amount of concern amongst those distributors who do not have generous government support that their role may be reduced as software is increasingly being uploaded through the web. There is a certain amount of value in having a distributor to offer local support, but distributors are not likely to be willing to offer support free-of-charge services to organizations which have not obtained the software through them. Currently, national distributors may make a small charge to organizations to whom they distribute software to cover costs and to pay for support.

TRAINING

UNESCO staff provide training courses, but what they can do is only the tip of the iceberg. Other institutions have been involved in running training courses on CDS/ISIS or incorporating training into more general courses. One example of this is STIMULATE, a three-month long course which has taken place biennially or annually at the Free University in Brussels. The Institute of Development Studies, the UK distributor, has in the past conducted general courses on library automation which have included a substantial number of sessions on CDS/ISIS. Many courses are run in Latin America by institutions who are users and have the expertise, including BIREME, which supports UNESCO in many different ways. Sometimes courses are sponsored by institutions for the promotion of certain standards: IFLA sponsored a course which was held successively in New Delhi and Mumbai in the year 2002 which used CDS/ISIS as a model database for an electronic resources catalogue which could become the core of a digital library.⁷ The subject of standard exchange formats, MARC and UNIMARC, was also included and CDS/ISIS training included hints on the implementation of these formats in CDS/ISIS.

CD-ROM

Internet access is becoming faster, though in many developing countries bandwidth is not yet sufficient to support searching catalogues efficiently across the Internet. An alternative is CD-ROM. A CDS/ISIS for Windows or a WWWISIS database may be placed on a CD-ROM along with a version of CDS/ISIS as a search engine to enable searches to be made. This can be used as an off-line catalogue in organizations where the Internet may not be reliable or fast enough.

DOCUMENTATION

For a long time the only CDS/ISIS documentation was that made available by UNESCO for the DOS version. However, on the release of the Windows version other digitized documentation was released. Firstly, a Windows help feature has been implemented. Documents updating the latest version of the printed manual have been produced, along with a read.me file and a version changes file which records the latest situation of each version.

Nevertheless there has always been criticism that

the official documentation was not sufficiently user friendly: indeed that is a common criticism of system manuals. UNESCO had helped to sponsor the *CDS/ISIS handbook*⁸ in 1994. After the Windows version was developed, there were requests for the same to be produced for this version so the authors amended the text and produced the *CDS/ISIS for Windows handbook*. This was later translated into French, Russian and Spanish and all the texts are available on the UNESCO website.⁹

INFORMATION RETRIEVAL SYSTEM VERSUS INTEGRATED LIBRARY SYSTEM

It must be remembered that CDS/ISIS in all its forms is primarily an information retrieval system. Many add-on systems have been developed to deal with circulation and serials control but none has been particularly more widely adopted than any other. As time goes on, integrated library systems are being developed and made available around the world, with the result that many institutions prefer a ready-made solution to one which involves developing ISIS and at the same time lacks the kind of commercial support which is to be expected from a commercial package. However, the situation is different in Latin America: the Universidad Nacional de Entre Rios in Argentina has developed a library management software package called MarcoPolo which they have made Open Source at the request of the Argentine Association of Librarians. During the period we are covering, there have been no plans for UNESCO to develop any integrated library system. Currently many developments are taking place in the world of digital libraries. One of the best-known software packages for the storage and retrieval of full text information is the Greenstone Digital Library, which is also made available free-of-charge thanks to the donation of the software to UNESCO by its developer Ian Witten of Waikato University in New Zealand. A plug-in has been developed to enable the Digital Library to read CDS/ISIS databases and create bibliographies or catalogues from them.¹⁰

THE FUTURE

In a discussion of the last decade it is appropriate also to look forward to the next decade. Ten years ago, experts were saying that CDS/ISIS was an outdated package and were looking forward to the Windows version. ISIS in all its versions is closely based on the

MARC format. MARC itself has been decried as being outdated, but it survives. There are many users around the world, in industrialized and less developed countries, using CDS/ISIS in many cases because it is free-of-charge but in some cases out of choice, because it is a package that has been specially developed for bibliographic data. In October 2004, the UNESCO website reported that over the previous year many of the 500-plus librarians, records officers and IT managers in Zambia who use CDS/ISIS for Windows were trained by the Zambia Bureau of Standards (ZABS) and the Technological Development Advisory Unity (TDAU) department of the University of Zambia. Five hundred institutions used the package. To hazard a number of guesses, there will also be countries where CDS/ISIS is just the right package. After all it comes in DOS and Windows and has an interface for the World Wide Web. Additionally, all three are compatible with one another. The software will continue to be developed taking into account UNICODE and Z39.50. More utilities will be developed on the lines of Ernesto Spinak's SWK (Swiss Knife), which can assist in tidying up a database or counting the number of occurrences of a specific field.¹¹

CDS/ISIS deserves to survive since it enables less wealthy institutions in any part of the world to join the information society. Because of its architecture, encouraging add-ons in the ways that it does, it has also encouraged software developers from a similar spectrum of institutions to participate in developing the package for the benefit of all. The main developers, UNESCO and BIREME, look set to continue the work. They and other organizations will continue to provide the training that is essential if it is to be used successfully by the wide variety of organizations that currently use it.

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Abstract

Reviews the development of UNESCO's CDS/ISIS information retrieval software over the past ten years, including the impact of the Internet, the development of CDS/ISIS for Windows and CDS/ISIS for DOS, efforts to provide continuing support for the software and the implementation of international standards in CDS/ISIS. Refers to the work of the late Giampaolo Del Bigio in developing the software. Discusses the roles of CDS/ISIS User Groups and distributors and training programmes. Notes that CDS/ISIS on CD-ROM is still useful in organizations without adequate Internet access. Identifies the available software documentation and the relationship between CDS/ISIS and integrated library systems. Discusses the future of the software and concludes that 'CDS/ISIS deserves to survive since it enables less wealthy institutions in any part of the world to join the information society'.

Keywords: Information retrieval; Software; CDS/ISIS

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MORE ON CDS/ISIS**Development of an institutional database of citations using CDS-ISIS software.**

Sinnarkar, S.N. *Annals of Library and Information Studies*; 50 (4) Dec 2003, pp. 153–155.

A citation database of scientists belonging to National Environmental Engineering Research Institute has been developed in CDS-ISIS for the creation of an institutional database of citations. The study suggests that creation of such institutional databases can be a step towards the creation of an Indian Science Citation Index.

(From *Library and Information Science Abstracts*)