UNIT 9  INTRODUCTION TO CDS/ISIS AND WINISIS

Structure
9.0  Objectives
9.1  Introduction
9.2  Historical Developments
  9.2.1  The Beginnings
  9.2.2  Versions for Different Platforms
  9.2.3  Versions for Different Languages / Scripts
  9.2.4  Installations and Non-bibliographic Databases
  9.2.5  Integrated Database
9.3  Successive Improvements
9.4  Basic Features of WINISIS
9.5  System Restrictions
9.6  Summary
9.7  Answers to Self Check Exercises
9.8  Keywords
9.9  References and Further Reading

9.0  OBJECTIVES

In the Block 1, Unit 5, we have introduced you to a general purpose DBMS package – MS ACCESS. In this Unit, we will be introducing you to another DBMS package – CDS/ISIS which is suitable particularly for creation of bibliographic databases, though it has the capability of developing other types of databases.

After going through this Unit you able to:

- describe historical antecedents of ISIS, CDS-ISIS DOS and WINDOWS (WINISIS) versions;
- discuss general features and capabilities of CDS-ISIS for DOS and WINDOWS versions; and
- make comparative analysis to the features of its DOS and WINDOWS versions and their applications in the design and development of various types of information storage and retrieval systems.

9.1  INTRODUCTION

WINISIS is a Windows version of the CDS/ISIS system (Computerized Documentation Service/Integrated Set of Information System) which was originated at ILO during the early 1960’s and is maintained and developed by UNESCO since 1970’s. In 1985, the first microcomputer version of CDS/ISIS was launched and since then it has been disseminated to over 20,000 institutions in various countries throughout the world. The first Window version (WINISIS)
was distributed for testing in May 1995 and was officially launched in November 1998 as version 1.31.

This Unit briefly discusses the historical development of CDS-ISIS for DOS and for WINDOWS (WINISIS). The successive upgrading of the software and addition of several features over the past twenty years are also mentioned.

## 9.2 HISTORICAL DEVELOPMENTS

### 9.2.1 The Beginnings

**CDS/ISIS** (Computerized Documentation Service/Integrated Set of Information Systems) had its origin in ISIS which was developed by the UN International Labour Organisation (ILO) for IBM mainframe computers, in the early 1960s. ISIS was used for cataloguing and documentation in the ILO library. Subsequently, the software was given to the International Development Research Centre (IDRC), Ottawa, Canada, – an international organisation supporting socio-economic development projects in developing countries. IDRC’s Information Science Division, in collaboration with the Hewlett Packard computer company (HP), developed application versions of ISIS called MINISIS for HP3000 mini-computer series. The software was also made available to institutions and organisations in developing countries that received IDRC support for development projects. Successive versions (A to G) of MINISIS with improved features for documentation of bibliographic and similar types of materials have been developed with good manuals.

UNESCO, which received ISIS from IDRC, began developmental work on the software. Several upgraded versions of ISIS for IBM main frame computers were developed with increasingly more powerful indexing, retrieval and printing features.

By 1980s, relatively less expensive microcomputers being available in the market, International organisations, such as, UNESCO and IDRC which have Information Science and Communication as areas of assistance to developing countries, found it expedient to support computer applications for information storage and retrieval using mini, micro- computers in institutions in such countries. The acquisition and use of DBASE, INMAGIC, FOXPRO, etc. on microcomputers for database work received support from developmental aid organisations including IDRC.

UNESCO felt the need to develop a software similar to ISIS for bibliographical work using microcomputers. The Mini-microcomputer version of ISIS or CDS-ISIS was developed during the early 1980s, and version 1.0 for DOS was released for public use in December 1985 when a training session on the software was organised at UNESCO headquarters in Paris for participants from developing countries. Since then, apart from the training programmes at Unesco Headquarter in Paris, national and regional workshops and short training programmes on the use of CDS/ISIS are being organised in many developing countries.

From the beginning, UNESCO distributed the software free of charge to not-for-profit organisations especially in developing countries. In several countries national centres have been identified for distributing and organising training
programmes and workshops for promoting the use of the software. In India, these functions were performed by the National Information System for Science and Technology (NISSAT), Department of Scientific and Industrial Research (DSIR), Government of India, New Delhi. In recent years CDS-ISIS User Groups have been formed in some countries. Some of these groups now interact through Listservs. These training programmes and CDS-ISIS user group meetings and interactions have enabled not only the wider spread of the use of the software but also helped in obtaining feedback on its performance in practical applications. Based on the feedback and suggestions received, UNESCO released successive versions of the software with bugs eliminated with added features and new capabilities (Ver.2.3, 3.0+ especially). Ver.3.0 released in 1989 and its subsequent updates, can be configured for networking and for multi-user, multi-tasking functions.

9.2.2 Versions for Different Platforms

CDS-ISIS for MS Windows (called WINISIS) became available in 1996 and could be downloaded from the Internet. The beta test version 1.0 was made available in January 1999. As with the DOS version, bugs have been removed, and new features and capabilities have been built into the successive WINISIS releases. (1.1 – 1.3.1). Version 1.3 (January 1999) was the first formally released version. This course is based on WINISIS version 1.4 (build 19). Now, Unesco has come up with WINISIS version 1.5.

WWWISIS, JavaISIS, GENISIS are some other versions of CDS-ISIS which enable placing and accessing CDS-ISIS database on the web.

9.2.3 Versions for Different Languages / Scripts

UNESCO makes available the software in English, French, and Spanish language versions. Development of CDS-ISIS to handle non-Roman script (e.g. Arabic, Chinese, Thai, Vietnamese, Cyrillic), has generally been through collaboration between UNESCO and experts/professionals from the respective language groups (e.g. the Arab League Documentation Centre, for Arabic). A version for handling AMHARIC (language of Ethiopia) was developed at the School of Information Studies for Africa (SISA) of the Addis Ababa University. The GIST card developed by C-DAC (Centre for Development of Advanced Computing, India) provides a hardware solution to handle Indian language scripts by CDS-ISIS.

Self Check Exercise

1) a) Write a note on various versions of CDS-ISIS for Windows which were made available by Unesco.

   b) Which is the latest version of WINISIS?

   c) Is it downloadable from the internet?

Note: i) Write your answer in the space given below.

   ii) Check your answer with the answers given at the end of this Unit.
9.2.4 Installations and Non-bibliographic Databases

The number of installations of CDS-ISIS (many of them now changing over to WINISIS) in developing countries of the world may be over 50,000. Its usage ranges from preparing catalogue of books of small school libraries to large cooperative databases and services. For example, some of the regional Economic Commissions of the United Nations, the IDIN (International Development Information Network), OECD, Paris, (with inputs from its regional centres), the GATT (now WTO), the PADIS (Pan-African Development Information Service with the main database located at UNECA, Addis Ababa, Ethiopia) use the software. The centres involved in socio-economic developmental studies – e.g. at the University of Sussex, Mara Institute in Colombo, ADIPA in Kuala Lumpur use CDS-ISIS for preparing catalogue and documentation and indexing of other documents. The UN Food and Agricultural Organisation (FAO) uses the software in its various agricultural information services. Some of the international specialised agricultural research centres supported by the CGIAR (Consultative Group on International Agricultural Research) FAO, World Bank, UNDP use the software for their documentation work and services.

BIREME (Latin American and Caribbean Center for Health Science Information) in Brazil, provides a current awareness service distributed on CD-ROM (including to doctors in remote areas). This has resulted from the cooperation of over 55 health libraries, in 17 countries in Latin America. Current health literature is documented and indexed using CDS-ISIS. The CD also contains a union catalogue of periodicals in health sciences available in the libraries in Brazil, UNEP’s database, International Health Legislation information sources etc.

UNESCO Clearing House Centre publishes the UNESCO Databases in CD-ROM. Currently in its 8th edition, it uses WINISIS. It carries bibliographic references to all UNESCO documents and publications, worldwide specialised bibliographies on education, museums and sites, and the DARE directory of institutions in the social sciences, UNESCO sales catalogue, and the UNESCO - IBE (International Bureau of Education) Thesaurus.

Over the years, CDS-ISIS has been used to develop non-bibliographic factual databases as well. For example, even DOS versions 1.0, 2.3, 3.0+ have been used for developing factual databases containing records describing features of objects such as: Rocket launch vehicles; Forest Divisions in a State; Case Records of Hospital Patients; Profiles of specialists, institutions, and projects; International trade data; Land records, course programmes, technology profiles, market data, etc.

With the hypertext linking and other features of the WINDOWS version now available, records and files (full text, images, sound, and multimedia) created using other software can be linked and called.
9.2.5 Integrated Database

An integrated database holds records describing different types of entities. It may have only one data definition file and a single index for all of the records.

In database work in the early 1980s, it was noticed that many of the data elements were common to different types of entities, such as, profiles of persons, institutions, projects and description of documents. For example, name of person may occur as author in bibliographic records, as name of a biographer in the profile of experts, as name of head of institution in the profile of institutions, and as participant or leader of a project; similarly, with the name of corporate body, subject descriptor, dates, etc. Earlier, integrated databases were created using COBOL programming language. A single query, say by subject descriptor, could retrieve bibliographic records for documents as well as profiles of experts, projects, and institutions dealing with the subject. This enriched information retrieval for a single query, and the related savings in time, effort and computer space were seen to be an advantage. In the late 1980s such samples of integrated databases were created with CDS-ISIS 1.0 for DOS.

9.3 SUCCESSIVE IMPROVEMENTS

The present section is only a brief historical overview.

Integration of Programme Modules

CDS-ISIS for DOS Ver.1.0 (released in 1985 December) consisted of five programme modules that operated separately, but acted on the same database. One program included data entry and information retrieval and the remaining corresponded to the other options on the main menu of later DOS versions, Sorting and Printing, Data Base Definition, Masterfile Services, and System Utility Services.

Version 2.0 released in 1988 integrated the five separate programmes into a single programme. A facility for compiling and use of Pascal programmes was also added to the standard package to enable additional functions to be added to the basic package.

Following a few test versions, Version 2.3, made available for public use, included improvements in speed of indexing and the amount of space used by the indexes. The sorting of the index terms was made in two main phases – short terms (less than 10-character length) and long terms (more than 10 characters) respectively. Also, the database created by the software was made more robust and resilient by closing each record therein as soon as it is created or modified.

Syspar.par File

Further, a system parameter file, SYSPAR.PAR, was a feature added from version 2.3 onwards. The system offers default locations for the different files created. The program checks values in SYSPAR.PAR as soon as it is loaded. SYSPAR.PAR allows sets of files used by the program to be placed in different folders. The program can be set to open in any language for which a menu is available or to startup in any particular database. At the same time as syspar.par
was introduced, it became possible to set up a parameter file for each database so that the separate files which make up the database can be allocated to different folders, drives or devices.

One of the reasons for the introduction of the SYSPAR.PAR feature was to enable CDS-ISIS to be used as the search software for CD-ROM databases. CD-ROM is a read-only device and CDS/ISIS requires that certain files should be capable of being written to. These files have to be placed on the hard disk of the computer (they can be copied from a CD-ROM) whereas, the large files containing the data and indexes remain on the CD-ROM.

The syspar.par file also allowed CDS/ISIS to be run on a network, and version 3.0 was released in May 1992 as a ‘network sensitive’ version.

**Drag and Drop**

In a WINISIS database, with the worksheet for a record open, the related index can also be opened concurrently, and terms selected from the index (e.g. name of person, subject descriptors) can be dragged and dropped in the appropriate field(s). This secures certain amount of vocabulary control.

More than one database can be opened simultaneously and displayed using vertical tiling option. Index and records in each of the databases can be manipulated independently; but terms from the record or index of one database can be cut and pasted or dragged and dropped as the case may be into the worksheet of the selected record of the other database.

**CDS-ISIS DOS Pascal Utilities integrated into WINISIS Basic Package**

As CDS/ISIS was developed, new Pascal routines and functions were used in its compilation and were added to a Pascal programming library.

One important use of Pascal was for enhancing the print formatting language. This has been retained in ISIS for Windows. Users can develop their own Pascal programs to undertake functions which are not in the core program.

**Hypertext Linking**

A commendable feature added in WINISIS is hypertext linking of WINISIS records (which was not there earlier) – linking a field of a record to other field(s) in the same record; linking a record to other records in the same or other WINISIS databases; linking files (text, image, audio, multimedia) prepared with other software, located in the same computer, or in other computers in a network.

**Index and Retrieval**

A noteworthy feature of CDS-ISIS for DOS and WINDOWS is that practically every word (or even part of a word) in every field of a record can be indexed. There are five basic indexing techniques. In addition to the five basic indexing techniques (0, 1, 2, 3, 4) there are four more indexing techniques (5, 6, 7, 8). These indexing techniques (5-8) help in generating dictionary terms with prefixes (these have been discussed in unit 10). CDS-ISIS/WINISIS produces a single alphabetical list of the indexed terms. One and the same field can be indexed by more than one indexing technique. And terms extracted from different (related type) fields (e.g. Personal Author and Corporate Author; Title Words,
Words from the Abstract, and Subject Descriptors) can be placed in one field in the index. This may be useful in field specific searches.

The search and retrieval of records in CDS-ISIS/WINISIS databases can be (1) Index-based; (2) Free text search (not based on the index); or (3) a combination of (1) and (2). The index-based retrieval is very fast irrespective of the number of records in the database. Search expressions can be constructed using Boolean, and certain other operators to secure high relevancy of retrieved documents to the query. For Boolean and other operators refer to Block-1, Unit-3 of this course.

Record Structure and Exchange

The structure of records created by CDS-ISIS conform to the ISO 2709 format. Any database whose structure conforms to this format can be imported into a CDS-ISIS database and vice-versa. ISO 2709 is a standard format for machine readable cataloguing.

9.4 BASIC FEATURES OF WINISIS

Since 1989, when most new microcomputers were supplied with a new operating system called Microsoft Windows, it was inevitable that the users of CDS/ISIS would call for a Windows version, and UNESCO began to develop one in 1995.

Unlike the DOS version, ISIS for Windows is not written in Pascal but in a combination of languages, primarily C and C++. Following the philosophy of the DOS version, a program library is available of programs which can be utilised in the user’s own routines in a similar way to that in which Pascal was used in the DOS version.

Certain basic features of the Windows version of the CDS/ISIS system have been discussed in this section. The most obvious feature is the graphical user interface typical for all Windows applications. Other new features are database processing, data entry and searching, formatting language and user-friendliness of the package.

a) User friendliness

Various features make the WINISIS system more user friendly. These features include:

- Availability of various sets of system menus and possibility to change the current profile during the session;

- Numerous new system parameters; moreover, settings of the system parameters can be read and immediately applied by the system during the session; starting from version 1.3 WINISIS provides a user friendly interface that enables quick online modification of various system parameters;

- Presence of a help file (for the time being the help file in English is always used irrespective of the current language of conversation).
b) Database processing

WINISIS uses the same database structure as CDS/ISIS for DOS. Databases created by DOS versions of the CDS/ISIS system do not require any changes to be processed by the Windows version of this system. Moreover, a database created by the Windows version of the CDS/ISIS system can be processed by its DOS version.

The database processing features of WINISIS include:

- Opening of many databases simultaneously, in particular the same database can be opened several times; each of these databases is displayed in a separate window; if the same database was opened in various windows each of them can display another record (or the same record shown according to another display format);
- Easy access (from the pull-down menu) to databases used recently; users can be forced to select a database from the database list only (all users can have access to the same list or each of them can apply his/hers personalised database list);
- Maximum record size has been increased almost 4 times (30 KB in the Windows version as compared with 8 KB in the DOS versions) which greatly simplifies processing of full-text databases (however, a CDS/ISIS database containing records bigger than 8 KB cannot be processed any longer in the DOS environment);
- Global record processing operations (add a field, delete a field and replace text in a field contents) are available from the system utilities menu.
- The database definition wizard greatly simplifies creation of new databases and modification of existing ones. For new databases the print format assistant (component of database definition wizard) automatically creates a default format according to the selected format template. The dictionary assistant is another component of database definition wizard which automatically creates a very simple inverted file FST, for a new database.

These two assistants use information on database fields stored in the field definition table. In consequence, a simple database can be quickly created by a novice having no prior knowledge of the WINISIS system. The database definition wizard facilitates also creation and maintenance of complex databases by the advanced users of the package.

c) Data entry and searching

The features available during data entry are:

- Data from some other windows (e.g. inverted file terms from the dictionary window or file names from the file manager window) can be easily entered into the record being currently edited by dragging and dropping on to the edit box;
- Record contents can be validated during data entry with creation of a database validation file. Various conditions to be met by particular fields and the whole record are specified in the database validation file and the record being edited can be saved only if its content fulfils these conditions.
The features available during **indexing** are:

- Dictionary assistant helps the user in the creation of a new FST table. This assistant enables automatic creation of a simple FST table by showing the list of all fields that have been defined in the FDT table. The user can check in this list the fields to be indexed. All these fields will be indexed using the indexing technique selected in the Technique box that shows the nine indexing techniques of WINISIS system.

- The dictionary assistant producing very simple FST tables is a useful component of the WINISIS database definition wizard, as it instantly generates an FST table defining the dictionary contents for a new database.

- Five basic indexing techniques (0,1,2,3,4) are provided. In addition to these indexing technique (5,6,7,8) are intended to generate search terms with prefixes.

- Every word (or even part of a word) in every field of a record can be indexed.

- One and the same field can be indexed by more than one indexing technique.

The features available during **searching** are:

- Apart from the standard search interface (called expert search, because it allows formulation of sophisticated queries, including free-text ones) the guided search interface is available for inexperienced users of the package;

- In dictionary window the whole dictionary or only inverted file terms taken from the specified field can be displayed;

- Retrieved terms can be highlighted in record contents during display;

- Retrieved records can be marked during browsing the search results and then only the marked records can be displayed or printed; size of all fonts used to display record contents can be increased or decreased proportionally (using the *Zoom in* or *Zoom out* functions from the *Browse* menu);

- Queries can be saved on a disk and recalled during the subsequent search sessions;

- Starting from version 1.4 only records from the specified MFN range can be searched by a free-text query.

The tabular mode of displaying search results is available starting from version 1.3 of WINISIS. In this mode one part of the screen shows briefly all records retrieved and the another part of the screen presents details of one record from this list. The user can easily move between these records, mark them and print records marked or all records retrieved.

These features are discussed in the later Units in detail.

d) **Formatting language**

Features of the formatting language are:

- Increased length of a format and its output;

- Access to separate occurrences of repeatable fields;
Availability of new numeric and string functions;

A new format can be built as concatenation of several existing formats;

In display and print formats new commands can be applied to specify type, name, size and colour of fonts used to output data as well as their properties (bold, italic, underlined);

Special commands can be applied to make output of other formatting commands more attractive by drawing colourful boxes around paragraphs, centering/justifying output texts and displaying pictures or graphics (stored as BMP or JPG files).

Starting from version 1.0 of WINISIS, the formatting language includes some commands typical for a high level programming language, like the the WHILE command, and the FOR command.

The most powerful innovation in the formatting language of WINISIS is availability of various hypertext commands that can be used to create interactive display formats. These commands are executed upon user’s request only and therefore operations of a display format that contains such commands are controlled by the user. Hypertext commands enable among others:

- to display the current record according to another format,
- to display another record,
- to display a picture or play a sound track or movie linked to the current record.

Availability of hypertext commands considerably increases functionality of display formats applied by WINISIS. Additionally, when a format name is provided as the parameter of a hypertext command it is possible to change contents of this format just before its execution. Such formats are called polymorphic formats. Use of these formats greatly facilitates creation of interactive display formats for complex WINISIS applications such as an application comprising several databases with logical links between their records.

**Self Check Exercise**

2) What are the various features which enhance the user friendliness of the WINISIS system?

**Note:**

i) Write your answer in the space given below.

ii) Check your answer with the answers given at the end of this Unit.
9.5 SYSTEM RESTRICTIONS

As discussed earlier, in successive versions the capabilities and facilities offered by CDS-ISIS for DOS and WINISIS have been enhanced. The current restrictions with respect to CDS-ISIS and WINISIS are as follows:

<table>
<thead>
<tr>
<th>Maximum number of dat</th>
<th>Maximum number of database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum record size</td>
<td>Maximum field size</td>
</tr>
<tr>
<td>Maximum number of fi</td>
<td></td>
</tr>
<tr>
<td>FDT)</td>
<td></td>
</tr>
</tbody>
</table>

9.6 SUMMARY

This Unit briefly discussed the historical development of CDS-ISIS for DOS and for WINDOWS (WINISIS), beginning with ISIS for IBM mainframe computers in the early 1960s at the UN International Labour Office. The successive upgrading of the software and addition of several features over the past fifteen years were mentioned. It is now a powerful information storage and retrieval software for use on microcomputer in standalone or networked mode. There are some 50,000 installations in the world, mostly in developing countries. The other Units deal in detail about the installation, features and application in database design.

9.7 ANSWERS TO SELF CHECK EXERCISES

1) a) Unesco released CDS-ISIS for MS Windows (called WINISIS) in 1996. The beta test version 1.0 was made available in January 1999. Bugs were removed from, and new features and capabilities were built into, the successive WINISIS releases. (1.1 – 1.3.1). Version 1.3 (January 1999) was the first formally released version.
b) Now Unesco has come up with WINISIS version 1.5 which is the latest version.

c) Yes

2) Various features which make the WINISIS system more user friendly are:
   - Availability of various sets of system menus and possibility to change the current profile during the session;
   - Numerous new system parameters; moreover, settings of the system parameters can be read and immediately applied by the system during the session, starting from version 1.3 WINISIS provides a user friendly interface that enables quick on-line modification of various system parameters;
   - Presence of a help file in English.

9.8 KEYWORDS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Test</td>
<td>A beta test is the second phase of software testing where a not-yet-final version of the software is made available to a limited number of users so that they can test the program and provide feedback.</td>
</tr>
<tr>
<td>Bug</td>
<td>A software or hardware error that causes the system to malfunction.</td>
</tr>
<tr>
<td>Concatenation</td>
<td>In its simplest meaning, concatenation refers to the combining of two or more data sequences to form a single data sequence(chain).</td>
</tr>
<tr>
<td>Data Definition</td>
<td>The process of describing databases and database objects such as tables, indexes, rules, default values, and other characteristics.</td>
</tr>
<tr>
<td>Data element</td>
<td>An elementary piece of information, which WINISIS can identify. A data element is stored in a field or a sub-field.</td>
</tr>
<tr>
<td>Default Format</td>
<td>The pattern into which data are systematically arranged for use on a computer.</td>
</tr>
<tr>
<td>Field Definition Table</td>
<td>A table defining the fields and the characteristics of its contents of records of a given database.</td>
</tr>
<tr>
<td>Field Select Table</td>
<td>A table defining the fields/sub-fields and the indexing technique, to be used for extracting one or more elements from a Master File record.</td>
</tr>
<tr>
<td>Format</td>
<td>A set of formatting commands separated by a comma or a space is called a Format.</td>
</tr>
</tbody>
</table>
The commands are specified according to CDS/ISIS Formatting Language. A Format used to display a record on the screen is called a Display Format and a Format used to print a record is called a Print Format. In fact, there is no difference between the two formats, they are named because of the functions they perform.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>The organisation of information according to preset specifications for computer processing.</td>
</tr>
<tr>
<td>Hypertext</td>
<td>Any text that contains links to other documents - words or phrases in the document that can be chosen by a reader and which cause another document to be retrieved and displayed.</td>
</tr>
<tr>
<td>Inverted File</td>
<td>A logical structure built automatically by CDS/ISIS to enable fast retrieval. It contains the dictionary of search terms and, for each term, a list of references to the Master File records from which the term was extracted. The Inverted File actually consists of six physical files.</td>
</tr>
<tr>
<td>Master File</td>
<td>A file containing the records of a given database.</td>
</tr>
<tr>
<td>MFN</td>
<td>Master File Number is a unique sequential number automatically assigned by CDS/ISIS to each record, when entered to a database, starting from 1.</td>
</tr>
<tr>
<td>Record</td>
<td>The set of fields containing all the data elements of one information unit stored in a database.</td>
</tr>
</tbody>
</table>

### 9.9 REFERENCES AND FURTHER READING


