UNIT 3: LIBRARY AUTOMATION

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3.1 LEARNING OBJECTIVES

After going through this unit you will be able to

- Know about the different standard bibliographic formats
- Know about library automation
- Explain the need and purpose of library automation
- Know about the areas where computer can be applied in the library
- Know about OPAC and retrospective conversation

3.2 INTRODUCTION

Library is a growing organism that requires constant positive changes to meet the need of its user. The invention of computer has brought in a rapid change in the society. Therefore, automation has become the need of the hour. Library automation not only improves the image of the library staff but also provides additional services to the users with the existing staff. The impact of automation on the library is quite obvious; it creates new environment where each function redefines the traditional organizational structure and transforms it into new institutional entries. In this unit a brief overview is given about library automation.

3.3 LIBRARY AUTOMATION: DEFINITION AND HISTORY

Automation is defined as a technique, a process, or a system which operates automatically. According to the Encyclopaedia of Library and Information Science, "Automation is the technology concerned with a design and development of the process and systems that minimize the necessity of human intervention in their operation."

Swihart Stanley S and Hefley Beryl F have defined the term 'library automation' as "the processing of certain routine clerical function in the library with the assistance of computer or other mechanized or semi automatic equipment". It may also be defined as a process of mechanization of all the housekeeping operation of a library which is repetitive in nature. The housekeeping operation includes acquisition, cataloguing, circulation, serial control, references and administration work.

To go with the library automation, the willingness of the librarian and library committee is a must. The library should also have proper planning and adequate finance. The availability of hardware (server, UPS, scanner, printer, storage media, etc), software (operating system, system software, application software, library automation software, etc), and also trained manpower together form the prerequisite for the library automation.

The first computer network was perhaps the OCLC (Online Computer Library Centre). Although the microcomputer made its first

appearance in 1971 it was not before 1981 that they made an impact on libraries. The reason was limited storage capacity of the computer and scarcity of good software for library applications. The development of OPAC in 1980s is a remarkable addition to the field of library automation.

Among all the universities in India, Hyderabad University Library was the first to start its automation project by using Libsys software. It gets the software free of cost from the Lybsys Corporation (Now Libsys Ltd) as parts of its development programme. Now the library switches over to BTLS software package. In NE India, all the universities started their automation project. The work done by Tezpur University and NEHU University is quite commendable.

In terms of automation, the university libraries of India are lagging behind their counterparts in the developed countries. However, the libraries and the librarians are slowly adjusting with the changes by starting their automation phase. Many libraries have also started their computerized circulation desk and resource sharing.

3.4 NEED AND PURPOSE OF LIBRARY AUTOMATION

Since the computer can be used in performing the various activities of the library, library automation can serve as a remedy to all the existing ills of libraries. We can briefly note the following advantages of library automation.

a) **Self Survival in the New Environment:** The user of any library nowadays expects to use their computer literacy in the library environment. If the library does not go for automation it is felt that it will not be able to cope with this new generation of users. The application of computer in libraries thus hopes to make a positive change towards this end.

b) **Speeding up the Operation:** The use of computer almost invariably speeds up the flow of work within the system. New books, reports and other materials can therefore be released sooner to the waiting reader. It will help the inputting of data only for a single time as the integrated nature of software helps for its subsequent use for other purposes, and

reduces duplication of the efforts or work. The searching of information can also be performed speedily, which will save time of the library staff and the user.

c) **Accuracy and Reliability:** Automation significantly increases the accuracy of files and records. Processing rules may be standardized and given to the computer in the form of a program which can be used to verify the rules for the new data are being followed. If inputs are edited by a computer, errors can be deleted before the information is entered into the files and processed. Computers are also more reliable in the sense of breakdown, vacation etc, and can work longer than human beings.

d) **Budget Saving:** Computer equipment is cheaper. Again, in case of an automated library, the unit operating cost is less than that of a non automated library. The larger the number of transactions, the lower the unit cost of automated libraries. Automation will reduce the human action and save physical space and cost on the stationary items.

e) **Simultaneous and Decentralization Access:** In an automated environment multiple users can access the same information sources or database. A user, without consulting the library staff, can also check whether a book is out on loan or in reserve.

f) **Storage, Retrieval and Protection of Information:** Libraries are a growing organization. So without the application of computer it may be very difficult to handle the space problem of a library. Automation helps in storing much information in reduced space with extensive provision of different access points. The retrieval information will be relevant, fast and specific. It will make the ease and economy of producing and distributing multiple copies of cataloguing files and, thus, will provide greater protection against the loss of the catalogue by fire, earthquake and other natural disasters.

g) **Exception Reporting and New Services:** Automated system automatically provides overdue notice, follow up notice, location of order, editing of cataloguing activity, etc. The use of computer will also help us to provide new services such as CAS / SDI, special purpose catalogue, new holding announcement service, etc.

h) **Automatic Statistics Generation:** The use of computer in libraries helps us to generate different kinds of statistics and reports within a minute itself. The statistics are automatically prepared by the computers and are more accurate and reliable than the manually generated one. It will improve the control over the whole system.

i) **OPAC:** The library catalogue forms the base of most of the library activities such as circulation, reference service, literature search, inter-library loan, etc. The introduction of library automation brings OPAC facility to the library. The library staff also gets relief from the cumbersome jobs of writing and preparing card catalogues and their subsequent filling.

j) **Stock Taking:** Stock taking is an inspection to check what is in the stock in relation to what it should be. In this process the current file is compared with the inventory file (the old list of documents possessed by the library) and the unmatched records in the inventory files are listed out. This list constitutes the untraceable or lost document. Automation helps in stock taking, which is otherwise a cumbersome business.

k) **Resource Sharing:** Resource sharing among libraries demands library automation as the minimum requirement.

3.5 AREAS OF COMPUTER APPLICATION IN LIBRARY

A modern library cannot be imagined without the application of computers. In the library and information centres computers can be used for performing efficiently all sorts of jobs from the procurement of the reading materials to their organization and use. So, it can serve as a remedy for all the existing problems of libraries and information centres. But, till now computers have been used successfully in the following areas of library activities.

A) **Library House Keeping Operation:** In case of library house keeping operation, the computer is used for acquisition of books and other reading materials, their classification, cataloguing, circulation and serial control.

   i) **Acquisition:** The selection of materials can be made by the computer. Any library which is a part of online computerized library system has access to catalogue entries and bibliographic data of all

the libraries in the system. These databases can be used as a selection tools to purchase new documents for the particular library in question. Other offline databases can also be used as selection tools for non current documents and sometimes out of print books. For other documents, conventional book selection methods may be used. The MARC bibliographic record service has opened up a new vista in both cataloguing and bibliographic database that can be used as a book selection tool.

The ordering and acquisition are the routine jobs in the library and for a single time ordering it requires repetitive operation by different sections. These repetitive operations and the requisite checking can very well be done by the application of the computer system. Both offline and online acquisition can be performed by the use of computers.

ii) **Classification:** A computer based classification system is being experimented at the Documentation Research and Training Centre, Bangalore. It is based on Colon Classification System.

iii) **Cataloguing:** The computerized cataloguing system operates with high speed for performing routine and repetitive jobs. Besides, in the cataloguing unit, computer can also be used in various other ways such as producing book plates, book pockets, book cards, spine labels, etc. It can also produce a variety of records, card catalogues in the book form, printed catalogue, etc as byproducts. The following uses of computer in cataloguing have already been able to draw the attention of the librarians.

The MARC project was started in November, 1965 by the Library of Congress, USA. The latest development in the system includes the CoMARC (Co-Operative Machine Readable Cataloguing). Computer Output Microfilm (COM) was developed in the USA by Stromberg Carlson Company. The Online Computer Library Center (OCLC), previously known as the Ohio College Library Centre was started in August 1970. All these have successfully used computers for cataloguing of documents.

iv) Serial Control: Serials are continuing publication having reasonably permanent titles and appearing usually at regular intervals. Their contents usually vary from issue to issue. An article as a single bibliographic unit may be published in more than one issue and even in more than one volume. Obviously, the users may be interested in an issue of a serial as a bibliographic unit, or an article spread over a number of issues as a bibliographic unit. So, serial control comprises complex operations of library activities because of the vary nature and characteristics of Serial as library material. Again, the conflict between the physical unit and the bibliographic unit makes Serial control a complex task.

In case of Serial, the current issues, the retrospective or immediate back issues and bound volumes under every year of publication is an ongoing process. In this case, the library should encounter the search problem because of the conflict between the title and the corporate body, the old titles and the changed titles, nature of irregularity in publication (more than one issue in a single publication and the like). These situations pose the problem of listing, acquisition, accessioning, cataloguing and creation of records in the desired format.

v) Circulation: The circulation activities are the life-stream of the library services. The library documents are for use and are intended for the users. At various points, documents are to be trapped for the users who have recorded their priority in using such documents. The circulation is a flow of document, but the flow should be controlled by library operations so as to serve the users in the best possible way with the available materials in the library.

B) Library Administrations: In case of library administration, the library automation helps in

a) Providing Access Right to Staff Members
b) Providing Access Right to Library Users
c) Exception Reporting
d) Generation of Library Statistics / Report

C) **Information Retrieval:** Today, Online Public Access Catalogue (OPAC) or sometimes Web OPAC facility provided by the library and information centres helps in easy retrieval of information. Computers are also used for searching Library Database: eg. International Nuclear Information System.

D) **Building Digital / Virtual Libraries Collection:** Computers can also be used to build digital or virtual collection or for institutional repository of the library.

E) **Resource Sharing:** In order to facilitate the provision of material request on inter library loan basis, the use of computers and other latest telecommunication devices is being put to use in almost all the countries of the world. The Online Union catalogue is also a product of computer application in library.

F) **Library Network:** INFLIBNET, Developing Library Network (DELNET) is the example of taking library automation as its first step or base structure.

G) **Information System:** World Science Information System (UNISIST), Medical Literature Analysis and Retrieval System (MEDLARS), illustrate the advanced stage of library automation.

H) **User Services:** The library automation also helps to provide Current Awareness Service (CAS), Selective Dissemination of Information (SDI) Services, Indexing and Abstracting Service, Web Based Translation Services, Computer Based Indexing and Abstracting Services, and so on.

3.6 ONLINE PUBLIC ACCESS CATALOG (OPAC)

An Online Public Access Catalog (OPAC) is a computerized online catalogue of the materials held in a library, or a library system. OPACs are often part of an integrated library management system or software. The library staff and the public can usually access it in computers within the library, or from home via the Internet. Since the mid-1980s, it has replaced the card catalog in most libraries. Since the mid-1990s, character-based

OPAC interfaces are being replaced by Web-based interfaces. Today more complex OPACs offer a variety of search capabilities on several indexes, integrate rich content (book covers, video clips, etc.), and offer interactive request and renewal functionality.

Most integrated library systems offer a browser-based OPAC module as a standard capability or optional feature. OPAC modules rely on pulldown menus, popup windows, dialog boxes, mouse operations, and other graphical user interface components to simplify the entry of search commands and formatting of retrieved information. Many libraries have their catalogues accessible via Internet; some of them can be queried using a simple browser, other using a special version of browser (with JavaScript and CSS features), and some others using Z39.50 clients. If one has few elements to identify a document, then he/ she can use a meta-searcher where he/she can fill the query form once and spread his/her query over many library catalogues.

The OPAC has many advantages over card catalogues. It can store entries; it can add new entries, withdraw entries and print out updated version of a catalogue in book, card or shelf form. It can also be used to search and produce catalogue in CD, DVD etc. It itself can be used as a catalogue cabinet with enhance features i.e information can be stored within the computer and kind of entries required can be easily got as and when required. It has also the facility to input the data from the point of origin and output data can be transmitted directly to the place where it is needed by using teleprocessing.

OPAC is more useful than the traditional card formats because:

i) The online catalogue does not need to be sorted statically. Here the user can choose the author, title, keyword, or systematic order dynamically.

ii) Most online catalogue offer search facility for any word of the title. The goal of the grammatical word order which is to provide an entry on the word that most users would look for is reached even better.

iii) Many online catalogues allow links between several variants of an author's name. So, authors can be found both under the original and the standardized name (if entered properly by the cataloguer).

Online cataloguing has greatly enhanced the usability of catalogues, and its origin from the effort of MAchine Readable Cataloging (MARC) standards in the 1960s. The rules governing the creation of catalogue MARC records include not only formal cataloging rules like AACR2 but also the special rules specific to MARC, available from the Library of Congress and also OCLC.

3.7 RETROSPECTIVE CONVERSION

Retrospective conversion is the process of turning a library's existing paper catalog record into a machine readable form. Retrospective conversion usually entails using catalog cards (with a minimum of data like call number, author, title, ISBN and / or LCCN information) to find or create bibliographic record in a database of machine readable record such as OCLC (World Cat) and brining those records into the existing local database. Usually retrospective conversion is done to obtain the full MARC records on each item. A full MARC record contains valuable information such as summary information that can be key-worded and searched using the electronic catalogue. MARC records are a standard format that allows exchange of data between various sites or systems. The local database then allows electronic access to the catalogue and automated circulation using patron and item bar codes.

a) **History:** In 1968, with the financial support of the council on library resources, the Library of Congress conducted a study by a task force for retrospective conversion of the library holding. It was known as Retrospective Conversion (RECON). The report of the task force was published in 1969. In August 1969, the RECON pilot project was initiated. The pilot project of RECON continued for two years and approximately 58,000 records were converted during the pilot project and the work is still continuing. The retrospective catalogue conversion made by the British Library is held in the BNB/LASER file. It was built up by the British National Bibliography (BNB) and the London and South Eastern Library Region (LASER).

b) Problem in Retrospective Conversion: Retrospective conversion solves the problem of entering the data on each item in the library into a computer system. But though it has many advantages, it has also some limitations. Some of the disadvantages are mentioned bellow:

i) Lack of standardization among the national MARC format in assigning content designators to elements of information in the machine readable record.

ii) Diverse functions of bibliographic agencies;

iii) Lack of an internationally accepted cataloguing code for machine readable cataloguing record.

iv) Lack of agreement among different bibliographical communities in organizing data contents in machine readable record.

v) Lack of agreement as to the function of content designators.

vi) Lack of money by a small library creates problem in retrospective conversion.

vii) Lack of expertise required to meet the standard for retrospective conversion.

viii) Retrospective conversion always demands standardization of bibliographic content and machine format.

ix) Incomplete or incorrect bibliographic information makes it impossible to match the shelf list cards with the correct MARC records. The result is the addition of an incorrect record to the database or the need to return the title to you for additional information.

3.8 SELECTION OF HARDWARE AND SOFTWARE

The mechanical and electronic devices of a computer system that can be seen and touched are known as hardware. It is the physical component of the computer system. The hardware consists of transistors, capacitors, resistors, diodes, printed circuit, integrated circuit, main and auxiliary storage system, various types of magnetic media, communication media for carrying and transformation of data, coded instruction, equipment for computing function, etc.

a) Steps in the Selection of Hardware: During the course of hardware selection the following steps may be useful:

i) Identification of the function / activities of the library which is to be automated;

ii) Compute the hardware requirement for each of the activities. The hardware requirements depend upon the number of terminal required for data entry, word processing, OPAC searching, internet searching and browsing, etc.;

iii) Tabulation of the total hardware requirements which are essential for libraries and for networking;

iv) Procuring the latest version of the hardware.

b) Essential Qualities of a Good Hardware: Some of the essential qualities of a good hardware are

i) Minimum hardware redundancy;

ii) Provision for a clear upgrade path for the phased implementation strategy;

iii) Scope for accommodating additional terminal;

iv) High computing facility;

v) Capacity to be compatible with the best available software on library automation and networking;

vi) Be functional with mini and micro computer to suit all types of libraries.

In the selection of the software for library, different factors should be considered. We will not deal with this part here in this unit. We will discuss each and every part of software selection in the next unit.

3.9 STANDARD BIBLIOGRAPHIC FORMAT

Standardization is the process of formulating and applying rules for an orderly approach to a specific activity for the benefit of all taking due account of the functional conditions and safety requirements.

The needs for standardization of bibliographic description are as follows

i) To bring uniformity and order in the description of library materials of different kinds;

ii) For handling of data in an automated computer aided machine;

iii) To produce a centralized database;

iv) To exchange bibliographic information between and among different countries;

v) To overcome the problem of language barrier;

vi) To economise on time, space, effort, material, manpower and money.

3.9.1International Standard Bibliographic Description (ISBD)

In 1961, at the International Conference on Cataloguing Principles held in Paris, stress was laid on the need of standardization in bibliographic description. To solve the problem, International Meeting on Cataloguing Expert (ICME) was sponsored by IFLA and held in Copenhagen in 1969. The meeting formed a committee to study the problem of standardization in bibliographic description. The committee submitted its report at a meeting held in Liverpool in 1971 which is known as International Standard Bibliographic Description (Monograph) {ISBD (M)}. In course of its application many ambiguities and lack of details in some areas were discovered. To resolve the problem, IFLA conference was held in Grenoble in 1973. After the conference two documents- ISBD (M) and ISBD (S) were published. In 1975, the General International Standard Bibliographic Description [ISBD (G)] was developed. It serves as a single framework for the description of all types of publications in all types of media. The ISBD (G) was later on incorporated into AACR II as a general framework for bibliographic description.

The ISBD (G) acted just as some guiding principles. It was not intended for use as a working tool for the cataloguer. So, IFLA brought out the following ISBDs on the basis of ISBD (G) as working tool. Their names are:

ISBD (M): Monograph

ISBD (S): Serial

ISBD (CM): Cartographic Material

ISBD (AV): Audio Visual

ISBD (CF): Computer Files, etc.

As ISBD has so many numbers they are called ISBDs.

A) Elements of ISBD (M)

a) Title and Statement of Responsibility

i) Title proper

ii) Parallel title or alternative title

iii) Statement of authorship

b) Edition

i) Edition statement

ii) Statement of authorship related to edition

c) Imprint

i) Place of publication

ii) Name of publisher

iii) Date of publication

iv) Place of printing

v) Name of printer

d) Collation

i) Number of volumes and / or pages

ii) Illustration matter

iii) Size and accompanying material

e) Series

f) Notes

g) International Standard Book Number, binding, price

i) ISBD

ii) Binding

iii) Price

B) Punctuation: ISBD also suggested proper punctuation mark for each and every item for making machine readable format.

[] : If information is not available in the proper place;

() : To denote omission;

/ : Before the statement of author;

: : It proceed the name of publisher / sub title;

= : Parallel title;

- : Place of publication;

, : Year of publication, etc.

C) Capitalization and Abbreviation: The first letter of the first word in each area is given in capital.

s.l. (Sine Loco), used when place of publication is not known;

s.n.: (Sine Nomina), used when name of publisher is unknown;

ill.: Illustration;

cm.: Centimetre;

D) Information Sources for ISBD: Generally the maximum required information for ISBD is available in the title page of the document itself.

3.9.2 Machine Readable Cataloguing (MARC)

MARC format has become a generic term to all MARC formats including UKMARC, CANMARC, InterMARC etc which are used for the identification and arrangement of bibliographical data for handling by computer.

The first conference on Machine Readable Cataloguing was sponsored by the Library of Congress. The committee on Automation of the Association of Research Libraries (ARL) and Council of Library Resources (CLR) was met at the Library of Congress. This conference recommended that

i) MARC records should include additional information to be used as multipurpose records, in addition to information available on printed card;

ii) The element of MARC data should be standardized;

iii) MARC records should be produced and distributed to libraries which have automated system.

In the second conference held at the Library of Congress in November 1965, Library of Congress sought funds from CLR and in December 1965 it received a grant to conduct a pilot project.

In early January 1966 the planning for the pilot project began. The third conference was held in February 1966 at the Library of Congress which was considered the official opening of the pilot project for machine readable cataloguing data. The pilot project was called MARC I. In this way the MARC I format was set up in April 1966 which was restricted to books only. The distribution of regular weekly service of MARC tapes started from Nov. 1966. The MARC I format was based entirely on the structure of the Library of Congress catalogue card. So, BNB (with active collaboration with Library of Congress) made some operational changes to make it interchangeable record format. As a result, MARC II was developed. It is capable of containing bibliographic data of all forms of library material such as books, monographs, serial, map, music, etc. By subscribing to this service a library can acquire Magnetic tapes in machine readable form.

Due to the differences between the British Library and the Library of Congress MARC II was later split into two formats - BNB MARC (later UK MARC) and US MARC. The USMARC format becomes the U. S. National Standard in 1971 (ANSI Z39.2) and an International Standard in 1973 (ISO 2709). The MARC II also influenced the other countries to develop their own standard format which followed the same structure but the tags were slightly different. As a result, certain amount of incompatibility exists among the different countries. To solve this problem IFLA launched a programme known as UNIMARC, but eventually it failed.

A) Structure of MARC Tapes

a) Leader: It provides information about ensuring such records as total length of the record, the type of record, etc. It is 24 characters (00-23) long.

b) Record Directory: It shows what variable fields are in the record and what their locations in the record are. It is of 12 characters long.

c) **Variable Field:** The variable fields are of two types- Variable Control Field (001-009) and Variable Data Field.

B) Advantages of Using MARC:

a) MARC tapes can be used by individual libraries for producing their conventional card catalogue / book form of catalogue, etc.

b) It helps in the creation of centrally prepared catalogue.

c) Distribution of MARC tapes to the receiving libraries avoid duplication of effort.

d) Uses of MARC tapes make different library softwares compatible to one another.

e) MARC tapes can be used for computerized SDI services.

f) MARC tapes perform sharing of bibliographical information.

3.9.3 Universal Machine Readable Catalogue (UNIMARC)

There emerged a number of standard bibliographic record formats such as UKMARC, INTERMARC, USMARC, etc whose paths diverged owing to different national cataloguing practices and requirements. Since the early 1970s, an extended family of more than 20 MARC formats has grown up. To greater or lesser degrees almost all formats are compatible but the differences in data content mean that editing is required before records are exchanged. Recognizing that there is a need for the establishment of international format for the exchange of bibliographic data, IFLA, the section on cataloguing and mechanization, took the initiative to develop international MARC format which would accept the record created in any MARC format. As a result, the first version of Universal Machine Readable Catalogue (UNIMARC) appeared for monograph and serial in 1977 to facilitate the international exchange of bibliographic data in machine readable form. UNIMARC follows the ISO communication format ISO-2709 (1981).

Besides MARC family of formats, there are other

formats, notable among them being AGRIS, International Nuclear Information System (INIS), UNISIST Reference Manual, UNESCO's CCF as a universal exchange format for bibliographical record.

Every national organization producing MARC records will produce them in the national standard for use within the country and will reformat them according to UNIMARC format for international exchange. So, after the development of UNIMARC each national agency would need to write only two programmes- one to convert into a UNIMARC and the other to convert from UNIMARC, instead of one programme for each other MARC format. Eg. INTERMARC to UKMARC, USMARC to UKMARC, and so on.

a) UNIMARC Format: The UNIMARC format like any other version of MARC involves three elements of the bibliographic record. These are

- **i) Record Structure:** The record structure is designed to control the representation of data by storing it in the form of strings of characters known as fields. By record structure various elements in a record structure are identified.
- **ii) Content Designation:** Certain conventions are followed in order to identify the data element within records. Such elements which include author, title and subject access are further characterized. This supports the manipulation of the data for a variety of purposes.
- **iii) Data Content**: The content is the data which is stored in the fields within the record. Data can be coded data or bibliographic data.

b) Functional Block of UNIMARC: The fields which are identified by three character numeric tags are arranged in functional blocks. These blocks organize the data according to its function in a traditional catalogue record. The data element and content of the record have been functionally divided into 10 different types of block. These are shown below:

Block no	Field tag	Data Type	Example
0	000-099	Identification Block	Contains numbers that identify the record. Eg. 010 International Standard Book Number.
1	100-199	Coded Information Block	Contains fixed length data element describing various aspect of the record or data. Eg. 101 Language of the work
2	200-299	Heading Block	Contains the authority, reference or general explanatory heading for which records have been created. Eg. 205 Edition statement
3	300-399	Information Note Block	Contains note, intended for public display that explain the relationship between the record head ing and other heading.
4	400-499	See Reference Tracing Block	Contains variant heading from which a reference is to be made to see the heading of the record. Eg. 452 Edition in a differ ent medium
5	500-599	See Also Refere nce Tracing Block	Contains related uniform heading from which a reference is to be made to see also the heading of

			the record. Eg. 516 Spine title
6	600-699	Classification Number Block	Contains classification number that are related to the heading of the record. Eg. 676 Dewey Decimal Classification.
7	700-799	Linking Heading Block	Contains a form of the record heading in another language or script and links to another record in which that form is the heading. Eg. 700 Personal name
8	800-899	Source Information Block	Contains the source of the record and catalogues notes about the data not intended for public display. Eg. 801 Originating Source
9	900-999	National use Block	Contains data local to the originator of the record.

It is anticipated that each national bibliographic agency will be responsible for the conversion of authority record into UNIMARC / Authorities for transmission to other national agencies and will receive machine readable record in the UNIMARC / Authorities format from other national agencies. Despite much efforts of IFLA, UNIMARC failed to receive due consideration.

3.9.4 Common Communication Format (CCF)

CCF is a structure format for creating bibliographical records and for exchanging records between groups of information agency

and libraries. An international symposium in Taormina, Sicily conducted by UNESCO was held in April, 1978. On the recommendations of the symposium UNESCO / PGI formed the adhoc group on the establishment of a Common Communication Format (CCF). The first edition of CCF was published in 1984 under the editorship of Peter Simmons and Alan Hopkins and its second edition was published in 1988 in two volumes called CCF/B and CCF/F. Several countries have adopted this standard for exchange and creation of bibliographic records at national level.

A) Structure of CCF: The structure of CCF is the implementation of ISO-2709. It consists of the following-

a) Record Labels: Each CCF record begins with a fixed record label of 24 characters and consists of data element which contains the record. Each data element is identified by its relative character positioning the label.

b) Directory: The directory is a table containing a variable number of 14 characters entries i.e the length of each directory entry is of 14 characters terminated by a fixed separator character. Each directory entry corresponds to a specific variable. Data fields in the record are divided into four sub sections or parts, containing data for the following data element

i) Tab

ii) Length of the data field

iii) Starting character position

iv) Implementation defined section

c) Data Fields: In the CCF a data field is defined as consisting of

i) Indicator

ii) Sub Fields: A sub field consists of a subfield identifier followed by a data string which is terminated by either another sub field identifier or a field separator.

iii) Field Separator: The field separator is that character

which constitutes the final character of every data field except for the final data field in the record.

iv) **Record Separator:** The record separator is that character which makes the end of the final data field in the record and constitutes the final character of the record.

B) **Limitation of the CCF:** CCF is not designed to meet the requirement of all types of libraries and information organizations for local implementation. It is also not expected that institutes will use CCF record format for internal storage and processing purpose. The major limitations of CCF are

a) It is not sufficiently detailed in its definition and coverage of all data elements necessary for creating a bibliographical database for an individual library.

b) It does not include its cataloguing rules nor does it align itself with any particular cataloguing code or set of rules oriented towards a specific or fixed type of information output form.

c) Except for standard CCF fields CCF recommends the use of alphanumeric code for tags but it may not be possible to use alphanumeric code for tags in all cases (eg when library system uses CDS/ISIS, this recommendation cannot be implemented).

d) Though in CCF further addition of the new data elements and their respective content designator is possible, the unrestricted interpolation by different users can create complication for exchanging data among libraries. In such cases, the content designators of newly added data elements are likely to vary which may cause inconvenience for exchanging data from one database to another.

3.9.5 Machine Readable Cataloguing 21 (MARC 21)

The MARC 21 is a standard format for the representation and communication of bibliographic and related information in machine readable form. The MARC 21 is a new name of

harmonization of CANMARC and USMARC in a single edition. In 1987, the Library of Congress issued the first edition of the document MARC 21. Subsequent editions were published in 1990, 1994 and 2000.

a) Necessity of MARC 21: Mark 21 is necessary because of the following factors:

i) Lack of standardization among different national MARC formats;

ii) Lack of internationally accepted cataloguing code to MARC record;

iii) Diverse functions of bibliographic agencies;

iv) Lack of agreement among different bibliographic communities.

b) Maintenance of MARC 21: The Library of Congress and the National Library of Canada serve as the maintenance agency for MARC 21. The MARC 21 format, documentation and reviewing and revision are done by the Machine Readable Bibliographic Information Committee (MARBI). MARBI is a committee of the ALA. MARBI meets in conjunction with MARC advisory committee at each American Library Association (ALA) conference.

c) Standard Used in MARC 21

i) Cataloguing Code: AACR II;

ii) Subject Heading: LCSH;

iii) Classification Scheme: DDC;

iv) ISO 2709 and ANSI/NISO Z39.2.

Till now, MARC 21 remains the standard one which is widely accepted in different library softwares and also in different countries



CHECK YOUR PROGRESS

Q 1 : Match the Following

a) CCF	i) Library of Congress
b) UNIMARC	ii) CANMARC + USMARC

c) RECON iii) UNESCO

d) MARC 21 iv) IFLA

Q 2 : Find out the True and False Sentences in the following:

a) The ISBD (G) incorporates into AACR II as a general framework for bibliographic description.

b) The USMARC format became the U. S. National Standard in 1971 (ANSI Z39.2) and an International Standard in 1973 (ISO 2709).

c) CCF and UNIMARC follow ISO-2709.



3.10 LET US SUM UP

The different bibliographic standards are helpful in maintaining uniformity in the data so that exchange and compilation can be done easily. The ISBD (G) serves as a single framework for the description of all types of publications in all types of media. Later on, IFLA brought out different ISBDs on the basis of ISBD (G). The ISBD (G) is incorporated into AACR II as a general framework for bibliographic description.

MARC format has become a generic term to all MARC formats including UKMARC, CANMARC, InterMARC and is used for the identification, arrangement of bibliographical data for handling by computer. The USMARC format became the U. S. National Standard in 1971 (ANSI Z39.2) and an International Standard in 1973 (ISO 2709). To solve the problem of incompatible nature among different countries, IFLA launched a programme known as UNIMARC. UNIMARC followed the ISO communication format ISO-2709 (1981), but it failed. The UNESCO also came up with CCF, which is the implementation of ISO-2709 to solve the problem of incompatibility. Several countries have adopted this standard for exchange and creation of bibliographic record at national level. The MARC 21 is a new name of harmonization of CANMARC and USMARC in a single edition. It uses the

standard AACR II, LCSH, DDC, ISO 2709 and ANSI/NISO Z39.2. Till now, MARC 21 remains the standard one which is widely accepted in different library softwares and also in different countries.

Today, the computers have entered each and every area of a library. The library automation is the application of modern technologies including the application of computer hardware and software, different storage medias, telecommunications, etc which help the mechanization of any activity in the library. To implement the computer in the library, the selection of proper hardware and software forms an essential part. If proper software is selected, it will automatically generate or create OPAC which will replace the traditional card catalogue of the library. The feature-rich software will also have the provision of retrospective conversion. It will help the library to enter minimum of details about the document in their collection in the database of some other libraries and will help in getting the full bibliographic record of the document that can be embedded in the local database.



3.11 FURTHER READINGS

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3.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1 :

a) CCF	i) UNESCO
b) UNIMARC	ii) IFLA
c) RECON	iv) Library of Congress
d) MARC 21	v) CANMARC + USMARC

Ans to Q No 2 :

a) True.

b) True.

c) True.



3.13 PROBABLE QUESTIONS

A) Short Answer Type Questions

a) Define library automation.

b) What are the needs and purpose of library automation?

c) What do you mean by retrospective conversation?

B) Write short notes on the following

a) Selection of hardware for automation.

b) ISBD c) CCF

d) MARC e) UNIMARC

f) OPAC

C) Essay Type Questions

a) Write a descriptive note on the areas of library automation.

b) Write a brief description of four standard bibliographic formats.

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