KARNATAKA STATE OPEN UNIVERSITY
MUKTHAGANGOTRI, MYSORE –570 006

Master of Library and Information Science

M.Lib.I.Sc - 2

ORGANISATION OF INFORMATION RESOURCES

BLOCK - 3

BLOCK

3

INFORMATION RESOURCES ORGANIZATION

INSTRUCTIONAL DESIGN AND EDITORIAL COMMITTEE

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M.Lib.I.Sc - 2 : ORGANISATION OF INFORMATION RESOURCES
Block – 3 : INFORMATION RESOURCES ORGANIZATION

Block Introduction

Information Resources organization simply means systematic organization of information resources in Libraries, Information Centres, and in recent years it has encompassed the organization in electronic and/or web-based information environment. Two aspects of Information Organisation are considered; the organization information resources on the bases of their thought content or subject content of documents and second on the bases of the physical embodiment of thought content. Several standards, tools and techniques have been evolved in this context and they are Library Classification and Library Cataloguing. Due to the developments in Library and Information Science, there have changes and developments in these tools and techniques and in this Unit a study of these tools and techniques are discussed. First let us understand the Information Resources organization, then the related concepts like the Bibliographic description.

The first practical tool for organizing information in this context is the design of a Catalogue Code. The rules books for cataloguing are normally termed as "Catalogue Codes" or "Cataloguing Rules" which cover all aspects of the description of a bibliographic item like; the printed books, periodicals etc., and also non-book materials the cartographic items, microforms and so on. The history of catalogue codes is traced to period of Anthony Panizzi. The Catalogue code has remained the basic practical tool for cataloguing of all types of documents in libraries. The developments in cataloguing practices with the different forms of documents emerging the codes have also undergone continuous changes.

Some important named cods are Classified Catalogue Code of Dr. Ranganathan, the Anglo American Cataloguing Rules by ALA and Canadian Library Association, the Rules for Alphabetical Cataloguing and the Rules for Dictionary Catalogue by Cutter.

The impact of information technology on library and information science and in particular about the Bibliographic Description has been towards creating international standards for Bibliographic Record format. In this context the cooperation of several national and international organizations like IFLA and UNESCO is found. The first landmark in this context is the International Conference on Cataloguing Principles (ICCP) which was held in Paris in 1961. This resulted in the genesis of International Standard Bibliographic Description formats (ISBDs). The Library of Congress, for the purpose of automating centralized cataloguing and to print catalogue cards for distribution envisaged the Machine Readable Cataloguing which resulted into MARC Project. MARC Project was started by LC in 1966 as Pilot Project for a Machine Readable Catalogue data. MARC I was completed in 1968 followed by MAR II. Printed Catalogue Cards can be produced from MARC Magnetic Tape.

UNIMARC was developed in 1977 by IFLA as an International MARC Format. Sensing the lacunas in the MARC towards its acceptability universally. IFLA

Recommended it as international interchange of bibliographic data. UNIMARC uses a special Block structure in the place of areas. The structure consists of 8 Types of data and 8 Blocks. Out of the total of 143 fields of UNIMARC only few are required to meet the structural standards of ISO-2709. UNIMARC is maintained by IFLA/UBMCIM.

Later MARC to suit the ongoing developments in the 21st Century expanded its base to Electronic Resources, especially the Web-resources and to cope-up need for comprehensive bibliographic data elements for accessing web resources, MARC21 was created. It supplemented the use of available Metadata standards for Bibliographic records, for example the Dublin Core Metadata standards.

Unit-12 deals with an attempt are made to provide the rules/provisions that are available for cataloguing of Internet resources in AACR2, MARC 21 and Dublin Core. The cataloguing rules provided in AACR2 reviewed 2002 for different categories of electronic resources consists of data (information representing numbers, text graphics, images, maps, moving images, music, sounds, etc.), programs (instructions, etc., that process the data for use), or combinations of data and programs. Electronic resources often include components with characteristics found in multiple classes of materials.

Prof. A Y Asundi

MLISc- 2

ORGANISATION OF INFORMATION RESOURCES

Block – 3

Information Resources Organisation

Unit - 9

Introduction to Information Resources Organisation

Structure

9.0 OBJECTIVES

The Information Resources consist of variety of documents which vary in content and physical form. For example, the Book, the Print Media and Electronic Documents and so on. The Orgnisation of resources is one of the old techniques evolved by Library and information professionals over a long period of time. Since the physical forms of documents are in the process of continuous change since the time of early books, so the tools and techniques of organizing information resources are also changing. It is the main content of this and later Units.

The Objectives of this Unit are :

1. To give an understanding of the need for Organizing Information Resources.
2. To familiarize the students with different types of Information Resources.
3. To understand the need for bibliographic description
4. To know the techniques and tools of organizing Information Resources
5. To enlist different bibliographic description, Formats and Metadata Formats

9.1. INTRODUCTION

9.1.0 What is Information Resources Organisation ?

Information Resources organization simply means systematic organization of information resources in Libraries, Information Centres, and in recent years it has encompassed the organization in electronic and/or web-based information environment. Two aspects of Information Organisation are considered; the organization information resources on the bases of their thought content or subject content of documents and second on the bases of the physical embodiment of thought content. Several standards, tools and techniques have been evolved in this context and they are Library Classification and Library Cataloguing. Due to the developments in Library and Information Science, there have changes and developments in these tools and techniques and in this Unit a study of these tools and techniques are discussed. First let us understand the Information Resources organization, then the related concepts like the Bibliographic description.

9.1.1 Information Resources Organisation

The libraries, documentation centres and other information systems consist with an item of collection and need to be organized in a purposeful manner for their convenient use. The items may be traditional forms of printed materials like books, periodicals, serials, monographs, and non-book materials like the maps, music scores and so on. The libraries have seen a steady growth of new forms of materials, including designated non-books materials .Some materials called multimedia,

electronic documents and need to be treated differently. New forms of documents have been appearing and new terms and descriptions are used to describe them. Some progressive materials are such as Microforms, A.V. Materials, Cartographic materials and electronic documents etc.

According to Dr. Ranganathan documents are categories on the basis of different characteristics - on the basis of their physical embodiment, nature of presentation, publication characteristics, purpose, information content and level of treatment. A Document he conceived as an Embodiment of thought content (Embodied in a Physical Body/Media). The Embodied Thought is a Record of work on Paper, or on other material, for easy physical handling, transport across space and preservation through time. A wide array of physical forms of documents is created, used and over a period of time has been disappearing from their current use. New forms are being created to form the essential media for recording and storing information for present and future use. Further more the division would also be on the basis of nature of content and the form of presentation. All these characteristics form the basis for the bibliographic representation and bibliographic description.

9. 1.2 Bibliographic Description and its use

The Bibliographic description of a document is a collection of information elements which is intended to provide a unique and unambiguous reference that will enable Library staff as well user to identify and retrieve the document from the catalogue or a database. Bibliographic description is mainly consists of identification of elements of an item or a document in a library, to describe its format, content-

specifications, creator, accessibility, location and dissemination functions. It is in a way a surrogating a documents enabling its location and use. The Bibliographic description can be conceived in two different environments – finding a reference to a document in a Card catalogue and the second is to find a document reference in a bibliographic database, which is becoming more important and essential in recent years due to the growth of computerized libraries and library networks. In the latter context it is more important to provide more descriptions relating to author description, content description, and location description to enable the user for selection of appropriate item in a vast collection.

The bibliographic description in a computer readable file constits Records in a bibliographic database. These records facilitate rapid communication and exchange of information on scientific, technical, social science and other kinds of documents. It also facilitates processing of bibliographic records for the purpose of exchanging them with different types of libraries. It also helps in the preparation of national bibliography, union catalogue and in the Universal Bibliographic Control (UBC). It ensures consistency, uniformity and compatibility in the creation, exchange and utilization of the bibliographic databases in general and the bibliographic records in particular.

To make use of such a variety of collection, with variations in forms, content and descriptions, satisfactorily, it is essential to find out ways and means of understanding such collection and also to identify the tools and techniques to organize them. The tools and techniques required creating a bibliographic record, and that record will provide user to identify an item in the collection and seek it whenever he

needs it. It is therefore essential that the bibliographic record would contain the necessary and essential details to identify the item and also its derivations, such as new editions, translations, authorship change and the related elements.

In this Unit the Bibliographic description is discussed primarily relating to the Library Cataloguing practices, catalogue codes like AACR-2, national and international bibliographic standards like ISBDs, MARC Record formats and related developments such as MARC21, Metadata formats, Dublic Core etc. Library and Information professionals, bibliographers, computer science professionals and academicians have contributed to the development of codes, standards and tools for bibliographic description and continued changes happening time and again due to impact of technology.

9.1.3 Normative Principles and Bibliographic Description

The Bibliographic Description and Document cataloguing are synonymous and significant contribution has been made by Dr. Ranganathan in the form of Normative Principles of cataloguing. His Classified Catalogue Code is based on these principles and he also developed codes for bibliographic description for institutional, national and international purposes. He also laid the theoretical foundation for practical cataloguing on the basis of Canons. The laws, principles and canons provide a basic guidance to design, develop operational aspects of standards for bibliographic description. The following in brief are the Canons of Cataloguing as guidance in this context. These norms acted as good precursor for complete bibliographic description.

1. Canon of Ascertainity
2. Canon of Prepotence
3. Canon of Context
4. Canon of Sought Heading
5. Canon of Recall Value

9.1.4 Developments in the Bibliographic Description:

Since the time of Anthony Panizzi, the interest in development of Codes for bibliographic description has been an ongoing work. The contribution of American Library Association which laid the foundation for the present AACR, the contribution of Dr. Ranganathan in the development of Classified Catalogue Code, the unique role of Charles Ammi Cutter in the formulation of the first time the Rules for Dictionary Catalogue these are some of the early cataloguing developments. The earlier cataloguing rules later transformed into or related to the entire bibliographic record.

The development of ISBD and MARC are the turning points in regard to standardization of data elements for the machine readable bibliographic records. The ISBD contributed with the association of IFLA and UNESCO a universal standard in Bibliographic description and the internationalization of Bibliographic control in the form of Universal Bibliographic Control. (UBC).

9.1.5 Different Categories of Information Resources

As already mentioned with the progress in library and information science and in the related fields there is a metamorphosis in the type of documents created in the last three to four decades**.** According to the on going changes there were changes in the Rules for cataloguing different categories of information resources. Each of one of these formats have some common and many different elements and the rules for rendering them and for designating them are also to be framed. The varieties of new documentary forms are increasing retaining the traditional formats. Hence a systematic designations have to be evolved for the precise identification of them and also represent them particularly in computer readable files. The categories of information resources covered by AACR2R are as follows:

1. Books, pamphlets and printed sheets
2. Cartographic materials
3. Manuscripts (Including Manuscripts Collections)
4. Music
5. Sound Recordings
6. Motion Pictures and Video Recordings
7. Graphic Materials
8. Computer Files
9. Three dimensional Artifacts and Realia
10. Microforms
11. Serials

In fact the Bibliographic description elements for these were also changed. The ISBD created separate standards for Monographs, Serials, Cartographic Materials, Non-book Materials, Computer Files and Electronic Resources – viz ISBD(M), ISBD(S), ISBD(CM), ISBD(NBM), ISBD(CF) and ISBD(ER).

As already mentioned the material designations for formats are becoming more significant as the content will be identical. For example in a Printed book and an electronic document the content and its organisaton will be identical, but the physical embodiment is different and it is to be highlighted in the Cataloguing. The table below gives general material designations (GMD) to various types of materials and the GMDs are added to the description in Square Brackets immediately after the title proper.

Examples:

1. Scared straight [motion picture]
2. Gargoyles [video- recording] : guardian of the gate.

General material designations (GMDs) according to AACR2R. List 1 is used in British Libraries and List 2 is used in North American Libraries, particularly in LC.

List 1	List 2	List 2 (Contd.)

Braille	Activity Card	Microforms
Cartographic Material	Art Original	Microscope slide
Computer Files	Art Reproduction	Model
Graphics	Braille	Motion Picture
Manuscripts	Chart	Music
Microforms	Computer Files	Picture
Motion Picture	Diorama	Realia
Multimedia	Filmstrip	Slide
Music	Flash card	Sound Recording
Object	Game	Technical Drawing
Sound Recording	Globe	Text
Text	Kit	Toy
Video Recording	Manuscripts	Transparency
	Map	Video Recording

9.2 Rules for Cataloguing and Bibliographic Record

9.2.1 Development of Rules and Tools

One of the important aspect of Organisation of Information Resources is the formulation of Rules for Cataloguing in conventional practices and for the Bibliographic Record in the mechanized or computerized environment. However they

are not either different, but are complementary to each other. For example the Rule for Authorship is essential for both Catalogue entry as well as for a Bibliographic Record. In the latter is called a field and the related characteristics of a field have to be described and the same in a cataloguing practice is called an Entry Element and it has also rules for its rendering and location. In a bibliographic record for a computerized catalogue the location part and the mode or rendering are not very significant. Such rules are framed for every element of the Book, for example Title, Classification Number and others. The rules are normally consolidated and referred to as Catalogue Codes ore Cataloguing Rules. The catalogue codes and such rules for cataloguing have been in practice since several decades. With the addition of new forms of documents the new rules are being added. For example the addition of rules for General Material Description, rules for Electronic Resources etc.

The two well known examples of modern catalogue codes are the Classified Catalogue Code of Dr. Ranganthan and the Anglo American Cataloguing Rules, popularly called as AACR. The latter is being revised constantly and has become up-to-date by including rules for contemporary information resources. For instance the later edition of AACR included exclusive rules Cartographic Materials and Audio-Visual documents and other new forms of documents.

Yet no universally acceptable set of cataloguing rules exist, and to over come the gaps in the local and national cataloguing practices, Rules specific for a geographical area were are created. The Classified catalogue code is one such example, which suggest rules for rendering Indic Names. Similarly AACR was also created keeping in mind the requirements of cataloguing practices British and North American libraries. In order to evolve universal standards in cataloguing practice especially for Universal

Bibliographic Control, a set of general cataloguing principles were developed under the auspices of the International Federation of Library Associations and Institutions (IFLA). It is referred to in a document called "Statement of Principles adopted at the International Conference on Cataloguing Principles, Paris October 1961" which is in brief termed as Paris Principles. This event had a profound influence on formulation new cataloguing rules for International requirements and a step in the evolution of International Standards (ISBDs) for Bibliographic Description and their various formats. They are ISBD (M), ISBD(S), ISBD (NBM), ISBD (CM) ISBD (CF) and ISBD(ER). The later developments refer to the rules for the documents in machine readable form and digital environment and that has progressed toward evolving MARC Record formats and metadata standards.

9.3 Summary

Organisation of Information Resources is one of the age old practices of the Library and Information profession and has gradually developed with the emergence of Printed world. Organising information resources is in practice nothing but cataloguing of books and other kinds of documents in libraries. The libraries, documentation centres and other information systems consist with a items of collection and need to be organized in a purposeful manner for their convenient use. The items may be traditional forms of printed materials like books, periodicals, serials, monographs, and non-book materials like the maps, music scores and so on. The libraries have seen a steady growth of new forms of materials, like non-books materials, multimedia, electronic documents and so on and thus arose need for new rules for new forms of documents.

The two aspects of information resource organization are Bibliographic Representation and Bibliographic Description. The Bibliographic description part refers to the Cataloguing practices evolved over a period of time. The developments in the Bibliographic description have resulted in the formulation rules for cataloguing of different types of documents and they are created as Catalogue codes and later national and international standards like ISBD. With impact of computerization and digitalization of documents, the rules for machine readable cataloguing and for the Web based practices were are developed and they are MARC formats and Metadata Standards.

Self Check Exercises

1. What do you understand by Information Resources Organisation ?
2. Enumerate the Canons of Cataloguing as enunciated by Dr. Ranganathan.
3. Discuss in brief about Bibliographic description and related issues.
4. What are the tool that evolved rules for cataloguing and bibliographic record ?

9.4Answers to Self Check Exercises

1. Information Resources organization simply means systematic organization of information resources in Libraries, Information Centres. The information resources in the present context refer to the Print, Non-print and electronic media. Information Organisation consists of organization information resources on the bases of their

thought content and on the bases of the physical embodiment of thought content. The Library Classification and Library Cataloguing are the two standard tools and techniques in this context. The need for information resources organization is for the purpose their convenint use. The items may be traditional forms of printed materials like books, periodicals, serials, monographs, and non-book materials like the maps, music scores and including multimedia, electronic documents and so on. New forms of reading materials or documents have been appearing such as Microforms, A.V. Materials, Cartographic materials and electronic documents etc. So there is need for evolving new tools and techniques of information resources organization.A wide array of physical forms of documents are created, used and over a period of time have been disappearing from their current use. Two aspects of information resources organization as stated above are designated as bibliographic representation and bibliographic description.

2. Dr. Ranganathan enunciated Normative Principles of cataloguing. The theoretical foundation for practical cataloguing Classified Catalogue Code is based on these Canons and principles The following are the Canons of Cataloguing.

1. Canon of Ascertainity
2. Canon of Prepotence
3. Canon of Context
4. Canon of Sought Heading
5. Canon of Recall Value
6. The Law of Parameter

3. The Bibliographic description of a document is a collection of information elements to provide a unique and unambiguous reference that will enable Library staff as well user to identify and retrieve the document from the catalogue or a database. Bibliographic description is mainly consists of identification of elements of an item or a document in a library, to describe its format, content-specifications, creator, accessibility, location and dissemination functions.

The bibliographic description also refers to Records in a bibliographic database to facilitate rapid communication and exchange of information on scientific, technical, social science and other kinds of documents. It also helps in the preparation of national bibliography, union catalogue and so on It ensures consistency, uniformity and compatibility in the creation, exchange and utilization of the bibliographic databases in general and the bibliographic records in particular.

The Bibliographic description part in general relates to Library Cataloguing practices. Significant contribution has been also made by Dr. Ranganathan in the form of Normative Principles of cataloguing.

The developments in Bibliographic description resulted in AACR-2, national and international bibliographic standards like ISBDs, MARC Record format the MARC21, and Metadata are the turning points in regard. The ISBD contributed in association with IFLA and UNESCO. The Bibliographic description has internationalization of Bibliographic control in the form of Universal Bibliographic Control. (UBC).

4. One of the important aspects of Organisation of Information Resources is the formulation of Rules for Cataloguing in conventional practices and for the Bibliographic Record in the mechanized or computerized environment. Such rules are framed for every element of the Book, for example Title, Classification Number and others. The rules are normally consolidated and referred to as Catalogue Codes ore Cataloguing Rules. With the addition of new forms of documents the new rules are being added such as rules for General Material Description, rules for Electronic Resources etc.

The two well known examples of modern catalogue codes are the Classified Catalogue Code and the Anglo American Cataloguing Rules- AACR. For the purpose of universally acceptable set of cataloguing rules and for Universal Bibliographic Control, a set of general cataloguing principles were developed under the auspices of the International Federation of Library Associations and Institutions (IFLA). It is referred to in a document called "Statement of Principles adopted at the International Conference on Cataloguing Principles, Paris October 1961" which is in brief termed as Paris Principles. This event had a profound influence on formulation new cataloguing rules for International requirements and a step in the evolution of International Standards (ISBDs) for Bibliographic Description and their various formats. They are ISBD(M), ISBD(S), ISBD(NBM), ISBD(CM) ISBD(CF) and ISBD(ER). The later developments in machine readable form and digital environment are MARC and metadata standards.

9.5 Key Words

Bibliographic Description : The description of a printed and published work in the form of a book, or an Audio-Visual document like musical score or an electronic document. The description would include the particulars regarding, authorship or any other form of contributor – Editor, Translator, Compiler etc., and the particulars regarding, title, publisher, edition, date and place of publication, physical format, the physical description like pages, binding, etc.

Catalogue Code : A set of rules for guidance of cataloguers in the practice for the preparation of entries manually or in a computer environment. It also ensures uniformity in treatment of the elements. Catalogue codes being standard practices include rules for subject cataloguing and filing rules.

Paris Principles : A significant development in the standardisation of cataloguing for universal application. The Conference which was organized by IFLA in 1961

was intended to serve as a basis for international standardization of cataloguing The principles apply only to the choice and form of headings and entry words in catalogues of printed books, non-book materials, cartographic materials and now computer files and electronic resources. Thus it resulted into different formats of International Standards for Bibliographic Description designated as ISBDs.

9.6 References for Further Reading:

1. The Anglo American Cataloging Rules (1986) Ed2. Chicago,ALA,

2. Ranganathan, S.R. (1964). Classified Catalogue Code with Additional Rules for Dictionary Catalogue. Ed.5. Bangalore, SRELS.

Unit - 10

Theory and Practice of Organizing Information in all Types of Environments: Principles, Standards and Tools

Structure

10.0 Objectives

The objectives of this Unit are to identify the practical standards, tools and their theoretical basis. One of the basic practical tool in Cataloguing is the catalogue code. In order to meet changing needs of cataloguing in manual and electronic environment, it is also imperative to study the new tools, and the standards emerging from these developments. The main objectives of this Unit are:

1. To study the practical tools used in cataloguing
2. To study the salient features of AACR
3. To study the role of standardization in the Information Organisation
4. To study the Standards for Bibliographic Description and Record format

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10.1 Introduction

10.1.1 The Catalogue Code – Rules for Cataloguing

The first practical tool for organizing information in this context is the design of a Catalogue Code. The rules books for cataloguing are normally termed as "Catalogue Codes" or "Cataloguing Rules" which cover all aspects of the description of a bibliographic item like; the printed books, periodicals etc., and also non-book materials the cartographic items, microforms and so on. The history of catalogue codes is traced to period of Anthony Panizzi. The Catalogue code has remained the basic practical tool for

cataloguing of all types of documents in libraries. The developments in cataloguing practices with the different forms of documents emerging the codes have also undergone continuous changes.

A Code is a system in the true sense of the term. It consists of written logical statements of its essential components consisting of :

1. Working concepts their definitions which together with their interrelationships constitute the technical terminology of cataloguing
2. Principle to govern the formulation of rules of procedure
3. Rules for Cataloguing practice

The levels of Cataloguing code are :

1. Universal Cataloguing code
2. Embodiment- oriented (Document type) cataloguing code
3. Linguistic Cataloguing Code and;
4. Local Cataloguing code

Some important named cods are Classified Catalogue Code of Dr. Ranganathan, the Anglo American Cataloguing Rules by ALA and Canadian Library Association, the Rules for Alphabetical Cataloguing and the Rules for Dictionary Catalogue by Cutter.

10.1.2 Introduction to AACR and its Revisions

The origin of AACR is traced to the detailed set of standardized rules for cataloging various types of library materials in *Catalog Rules: Author and Title Entries*, published in 1908 under the auspices of the American Library Association and the Library Association (UK). The second in the series is The *A.L.A. Cataloging Rules for Author and Title Entries* (1949), with its companion volume *Rules for Descriptive Cataloging in the Library of Congress*. The Cooperation between the ALA, the Library Association, and the Canadian Library Association resumed with the joint publication in 1967 of *Anglo-American Cataloging Rules*, which is divided into two parts: rules for creating the bibliographic description of an item of any type and rules governing the choice and form of entry of headings (access points) in the catalog.

The Anglo-American Cataloguing Rules (AACR) are widely used in English speaking countries and more or less adapted translations are in use in many other countries. The first edition published in 1967 is a composition of British and a North American (1968) text which were not completely identical. A case in point was the form of names of organizations as headings. A second revised edition was published in 1978. This time there was only one text and among the stated objectives of this edition may be mentioned. The Code has the following features.

1. A closer conformity to the Paris principles
2. Particular attention to developments in the machine processing of records
3. Adherence to the principles embodied in the International Standard Bibliographic

Descriptions (ISBDs) and in particular ISBD (G).

The gist of AACR editions is given below :

1. Anglo American Cataloguing Rules (AACR) – 1967.
2. AACR2 1978-81
3. AACR2R -1988
4. AACR2R98

AACR2 stands for the **Anglo-American Cataloguing Rules, Second Edition**. It is published jointly by the American Library Association, the Canadian Library Association, and the Chartered Institute of Library and Information Professionals (in the UK). AACR2 is designed for use in the construction of catalogues and other lists in general libraries of all sizes. The rules cover the description of, and the provision of access points for, all library materials commonly collected at the present time. . It has also been adopted in full or in part by 56 other countries around the world. Cataloguing rules are not static; they must respond to changing needs. A number of continuing issues affecting implementation of AACR have been compounded in recent years by the fast-moving pace of technological development and its impact on publishing patterns. AACR is developed and maintained by the Joint Steering Committee for the Revision of AACR (JSC) of which the British Library is a full and active member. JSC has responsibility for the ongoing process of rule revision.

The second edition of the rules is based on a reconciliation of the British and North American texts of the 1967 edition. This extends to style, which is generally in accordance with the *Chicago Manual of Style*, and to spellings, which are those of *Webster's New International Dictionary*.

Part I deals with the provision of information describing the item being catalogued, and **Part II** deals with the determination and establishment of headings (access points) under which the descriptive information is to be presented to catalogue users, and with the making of references to those headings. In both parts the rules proceed from the general to the specific.

As well as occasional minor amendments, a broader revision is under way with a view to a new edition in which the rules are more consistent and coherent, informed by the Functional Requirements for Bibliographic Records. This 'AACR3' has the working title 'Resource Description and Access'.

10.1.3 AACR Coverage of Library Materials

The definition on Library materials can be given as; All the items purchased by a library or library system to satisfy the information needs of its users, including books, newspapers and periodicals, reference materials, music scores, maps, microforms, and nonprint media, as distinct from equipment and supplies. Some libraries include subscriptions to electronic resources in the materials budget; others fund them separately. Except for gifts and special endowments, the acquisition of library materials is normally

funded through the operating budget. The rapid escalation of journal subscription prices over the past decade has forced many academic libraries to cancel periodical subscriptions to maintain balance between expenditures for books and serials.

AACR2R Covers the following materials:

1. Books, pamphlets and printed sheets
2. Cartographic materials
3. Manuscripts (Including Manuscripts Collections)
4. Music
5. Sound Recordings
6. Motion Pictures and Videorecordings
7. Graphic Materials
8. Computer Files
9. Three dimensional Artifacts and Realia
10. Microforms
11. Serials

Areas of Description in Cataloguing as per AACR2R

1. Title and Statement of Responsibility Area
2. Edition Area
3. Material (or type of publication) specific details area

4. Publication, distribution etc…, area
5. Physical Description Area
6. Series Area
7. Note Area
8. Standard Number and terms of availability area

Chief Source of information for various categories of Materials

1. Printed Monographs (Books) the Title page and back of the title page.
2. Manuscript – the Manuscript itself
3. Atlases. The title page and the Cartographic item itself for other Cartographic materials.

4. Published Music – List title page, cover or caption, whichever furnishes the fullest information.

General Material Designations:

General material designations (GMDs) according to AACR2R. List 1 is used in British Libraries and List 2 is used in North American Libraries, particularly in LC.

List 1	List 2	List 2 (Contd.)

Braille	Activity Card	Microforms
Cartographic Material	Art Original	Microscope slide
Computer Files	Art Reproduction	Model
Graphics	Braille	Motion Picture
Manuscripts	Chart	Music
Microforms	Computer Files	Picture
Motion Picture	Diorama	Realia
Multimedia	Filmstrip	Slide
Music	Flash card	Sound Recording
Object	Game	Technical Drawing
Sound Recording	Globe	Text
Text	Kit	Toy
Video Recording	Manuscripts	Transparency
	Map	Video Recording

The GMDs are added to the description in Square Brackets immediately after the title proper. See Examples below.

Scared straight [motion picture]

Gargoyles[videorecording] : guardian of the gate.

When the item is reproduction the GMD of the Reproduction is given.

10.1.4 Practical Cataloguing : Rules for Various Areas

1. Specimen example only given is a motion picture.

1. Title Proper:

Scared straight [motion picture]

1.1 Parallel title

La montoneige au Quebec = Snowmobiling in Quebec

1.2 Other title information

From Poussin to Matisse : the Russian taste for French painting : a loan exhibition from the USSR

2. Statement of Responsibility.

And then there's always the possibility of disappearing altogether [motion picture]/Pegarty Long.

3. Edition Area/version

Export/import traffic management & forwarding/ by Alfred Murr.—3rd ed.,rev. and enl.

Science citation index [computer file]. – Compact disc ed.

4. Material (Or Type of Publication) Specific Details Area

Viewpoint [microform]. – Vol.1 (1976)-

5. Publication, Distribution, etc…. Area

Hans in luck [motion picture].— Santa Monica, Calif.

Carrier Air Wing [videorecording].—Seattle:Pool & Crew Communications, 1987.

6. Physical Description Area.

Spy.—Oct.1986- .—New York, N.Y.: Spy Pub. Partners. C1986.

v.:ill.:28 cm.

7. Series Area

Spy.—Oct.1986- .—New York, N.Y.: Spy Pub. Partners. C1986.

v.:ill.:28 cm. – (The Chester woodwind series.)

8. Note Area.

Spy.—Oct.1986- .—New York, N.Y.: Spy Pub. Partners. C1986.

v.:ill.:28 cm. – (The Chester woodwind series.)

Rev. and expanded ed. Of Star wars. Rev. ed. Birmingham, Ala.

Southern University Press, 1968.

9. Standard Number and Terms of Availability Area

Example of an AACR2R Entry for a Sound Recording

Fig. 4.52. *AACR2R* description of the sound recording shown in figures 4.17–4.18.

The four seasons [sound recording] / Antonio Vivaldi. —
Djursholm, Sweden : BIS, p1985.
1 sound disc (ca. 40 min.) : digital, stereo. ; 4¾ in. + 1 booklet
([10] p. ; 12 cm.)

BIS: CD-275.
Compact disc.
Nils Erik Sparf, baroque violin ; Drottningholm Baroque Ensemble.
Program notes in Swedish by Stig Jacobsson with English, French,
and German translations inserted in container.
Recorded June 7 and Sept. 11, 1984, in the Petrus Church, Stocksund,
Sweden.

10.1.5 Resource Description and Access (RDA)

Resource Description and Access (RDA) is the working title for the new edition of the Anglo-American Cataloguing Rules.Although the content of the new edition will be built on AACR2, and records resulting from use of the new edition will be compatible with those created in the past, what is being developed is in effect a new standard for resource description and access, designed for the digital world.

The Joint Steering Committee for Anglo-American Cataloguing Rules has agreed that there needs to be increased consultation with stakeholders, in parallel with the revision process. Major stakeholders for the new edition include not only the JSC constituencies who have traditionally had a role in defining the content of AACR, but also library administrators, system developers, metadata communities, MARC format developers, and international programs such as the Program for Cooperative Cataloging, the ISSN International Centre, and IFLA.

Built on foundations established by the *Anglo-American Cataloguing Rules* (AACR), RDA will provide a comprehensive set of guidelines and instructions on resource description and access covering all types of content and media. The new standard is being developed for use primarily in libraries, but consultations are being undertaken with other communities (archives, museums, publishers, etc.) in an effort to

attain an effective level of alignment between RDA and the metadata standards used in those communities.

10.1.3.1 A New Approach

Digital technologies have significantly changed the environment in which libraries, archives, museums, and other information management organizations build and maintain the databases that describe and provide access to resources in their collections. The resources represented in those databases include a rapidly growing number that have been produced and disseminated using state-of-the-art digital technologies. RDA is being designed to provide a flexible and extensible framework for both the technical and content description of such resources while serving the needs of libraries organizing traditional resources as well.

Database technologies are also undergoing significant change, and an increasing number of information management organizations are migrating the data that describe and provide access to their resources to new platforms. RDA is being developed to provide a better fit with emerging database technologies, and to take advantage of the efficiencies and flexibility that such technologies offer with respect to data capture, storage, retrieval, and display.

A key element in the design of RDA is its alignment with the conceptual models for bibliographic and authority data developed by the International Federation of Library Associations and Institutions (IFLA). The FRBR[1] and FRAD[2] models provide RDA with an underlying framework that has the scope needed to support comprehensive

coverage of all types of content and media, the flexibility and extensibility needed to accommodate newly emerging resource characteristics, and the adaptability needed for the data produced to function within a wide range of technological environments.

A second key element in the design of RDA is that it establishes a clear line of separation between the recording of data and the presentation of data. The major focus of RDA will be on providing guidelines and instructions on recording data to reflect attributes and relationships associated with the entities defined in the FRBR and FRAD models. The aim is to provide a set of instructions for recording data that can be applied independently of any particular structure or syntax for data storage or display. Guidelines and instructions on formatting data elements for purposes of presentation according to specifications set out in standards such as the ISBD(G)[3] and GARR[4] will be provided separately in appendices.

RDA is being designed for ease and efficiency of use. The guidelines and instructions in RDA will be structured to facilitate application to a wide variety of resources, ranging from those that can be described in a relatively simple and straightforward way to those for which more detailed guidance is required. General instructions covering basic aspects of resource description and access that are applicable to all types of resources will be formulated in clear, concise, simple terms. In cases where further guidance may be needed to describe specific characteristics exhibited by a resource, RDA will provide more detailed instructions applicable to particular types of content, media, and modes of issuance. As a means of further supplementing those detailed instructions, RDA will provide references to other standards for resource

description and access such as those developed by the archival and museum communities. For those who are creating less detailed descriptions, the structure and layout of RDA will also make it easier to identify basic instructions and to "mask out" those that may be required only for a more detailed level of description.

Notwithstanding its new approach, the need to integrate data produced using RDA into existing files (particularly those developed using AACR and related standards) is recognized as a key factor in the design of RDA. The reworking of instructions derived from AACR to produce a standard that will be easier to use, more adaptable, and more cost-efficient in its application, will be guided by recognition of the equally important need to minimize the need for retrospective adjustments when integrating data produced using the RDA.

10.1.6 Anglo-American Cataloguing for Cartographic Materials

The group responsible for developing and maintaining the *Anglo-American Cataloguing Rules* pertaining to cartographic materials. Composed of institutions and associations that deal with the collection and description of cartographic materials by libraries, its members include the British Library, the Library of Congress, the Library and Archives Canada, the National Library of Australia, the National Library of New Zealand, and cartographic associations from the five countries. Representatives of the member institutions and associations are recognized experts on the bibliographic control of cartographic materials. The Committee prepared *Cartographic Materials: A Manual of*

Interpretation for AACR2, 2002 Revision. Second Edition, published in 2003 by ALA Editions.

10.1.7 Cataloguing Rules for Non-print Materials

The outcome of the combined growth of information coupled with technology is the growth and importance of Non-print Materials (NPM).There are varieties of formats with different physical properties and media. They are as listed below.

a. Magnetic Media comprising – Magnetic tape, Magnetic Disc
b. Optical/Laser Disc – Compact and Digital Versatile Discs.
c. Film or Plastic Media – Microforms
d. Audio and Video Tapes and Cassettes

Besides the above even paintings, charts, graphic materials can also included. The library in fact have been acquiring a large number of Multimedia products too. In addition to print media the libraries are also procuring non-paper media such as floppies, hard discs, Compact discs, Audio and Video cassettes which are also sources of useful information. There is also a growing strength users who find them suitable for use to supplement or to complement the print media. So there is need for answering the following questions in the context of use of non-print media.

a) What types of NPM documents are available in the libraries ?
b) What facilities the libraries provide for their use ?

c) How accessibility and search of these materials can be achieved ?

In order to suitably answer them there is need for identification of methods of organizing the NPM and there should be separate rules relevant to their Bibliographic description. In case of NPM there is need to describe the contents of the document in full for enabling the user for accessing via Online Public Access catalogue or in any other computer based search system.

The AACR2 (Revised Second Edition) provides rules for cataloguing of NPM. The Chapter I discusses the general rules for description as a basis to discuss the physical description of NPM. The important rule in this context is the General Material Designation applied to various types of non-print materials as mentioned in the section

In assigning physical description to NPM following points should be considered.

1. The physical description of any item should be based on the first instance on the chapter dealing with the class of materials to which that item belongs.
2. It is likely that only a bibliographic agency will record all the elements described in the areas, i.e. 'third level of description;. Other bodies will choose either the first or second level of description
3. Give all the elements that are required to describe NPM; assign an order to these elements; prescribes punctuation for the elements.

The structure of NPM descriptions imply that the problems peculiar to NPMs are the physical structures and access modes. Thus, a document can be filed by Author, Title, Form or its Subject.

The source of Bibliographic description for the NPMs would be:

1. The material itself, including the NPM which forms the integral part of the item, for example motion film, Video Cassette and so on.
2. The accompanying print-on –paper text describing the contents, of audio-disc, video cassette etc.
3. Other sources which act as referral guides for information.

In the case of ISBDs the following elements of description for NPM are prescribed.

1. Title and statement of responsibility area
2. Responsibility for the creations of the item
3. Physical Description of the materials.

10.2 Other Rules of Bibliographic Description

The other available practical rules for bibliographic description are :

1. The UNISIST Reference Manual for Machine Readable Bibliographic Description.

2. Guidelines for processing of documentary literature.
3. Guidelines for descriptive cataloguing of Reports (COSATI Rules)
4. Rules for Bibliographic References.

Among the above only the Rules for Bibliographic References as a National and International is in current use. Bibliographic references which appear in bibliographies, in lists and footnotes in books and other published and unpublished documents are usually made by authors and editors of publications. They only contain only a bare minimum bibliographic elements in order to identify and locate the source and do not contain all the bibliographic elements as found in the descriptive cataloguing practice.

The method of rendering bibliographic references has been evolved as a standard by national and international standardization bodies like, Bureau of Indian Standards, American National Standards Institution and the International Organization for Standardization.

The National and International Standards available in this regard are:

1. ISO:690-1975. Documentation – Bibliographic References – Essential and Supplementary Elements.

2. ANSI:239.9-1977. American National Standard fro Bibliographic References.

3. IS:2381-1963. Recommendations for Bibliographic Reference.

10.3 Summary

In the theory and practice of organizing all types of information resources and in different types of libraries efforts are made to create Rules of cataloguing which are called as Catalogue Codes. Since 19th Century efforts were made to create catalogue codes. The well known codes are the Anglo American Cataloguing Rules, which was first brought in 1908 and underwent several revisions to match the ongoing developments in the form and formats of information resources. The latest development in this regard is the Resource Description and Access, which is regarded as the AACR3. The second well known code is the Classified Catalogue Code devised and presented by Dr. Ranganathan. But it has remained historical document now and no further revisions after the 5th Edition are mdae.

Several editions of AACR have been published with contemporary developments in library materials, from Print Media to Non-print Materials, Cartographic Materials and also the Rules for Audio-Visual Materials. The List of library materials covered by and the General Material Designations assigned to various Library Materials are also given. The AACR has been one of the progressive and developing catalogue code and is practiced in well over 56 Countries and is also available in several translations.

Besides the AACR several Rules for cataloguing were are created which are rather national codes like the a) Rules for Alphabetical Cataloguing and the b) The User

Cataloguing Code for the library materials from Russia and in other countries.

The Rules for Bibliographic References are another set of rules for the bibliographic description, and among which included are the National and International Standards, from Bureau of Indian Standards, American National Standards Institution and the International Organisation for Standardisation.

Self Check Exercises

1. Define a Catalogue code, and levels of cataloguing code.
2. What do you understand by General Material Description
3. State the important stages of developments of AACR.
4. What is RDA and highlight its new approach ?
5. Highlight the rules for cataloguing of Cartographic Materials and the NPM.

10.4 Answers to Self Check Exercises

1**.** The first practical tool for organizing information in this context is the design of a Catalogue Code. The rules books for cataloguing are normally termed as “Catalogue Codes” or “Cataloguing Rules” which cover all aspects of the description of a bibliographic item like; the printed books, periodicals etc., and also non-book materials the cartographic items, microforms and so on. A Code is a system in the true sense of the term. The levels of Cataloguing code are :

1 . Universal Cataloguing code

2. Embodiment- oriented (Document type) cataloguing code

3. Linguistic Cataloguing Code and;

4. Local Cataloguing code

Some important named cods are Classified Catalogue Code of Dr. Ranganathan, the Anglo American Cataloguing Rules by ALA and Canadian Library Association.

2. General material designations (GMDs) according to AACR2R are the types of materials especially non-print materials for which material codes are assigned at the time of cataloguing. . According to AACR2R. there are two categories of GMD which are different and are found in use in British Libraries and used in North American Libraries, particularly in LC.

The GMDs are added to the description in Square Brackets immediately after the title proper. See Examples below.

Scared straight [motion picture]

Gargoyles [videorecording] : guardian of the gate.

When the item is reproduction the GMD of the Reproduction is given.

3. The origin of AACR is traced to the *Catalog Rules: Author and Title Entries*, published in 1908 by the American Library Association and the Library Association (UK). The second in the series is The *A.L.A. Cataloging Rules for Author and Title Entries* (1949), with its companion volume *Rules for Descriptive Cataloging in the Library of Congress*. The of *Anglo-American Cataloging Rules*, 1967 was first published in collaboration with ALA, LA and the Canadian Library Association.

The first edition (1967) is a composition of British and a North American (1968) text which were not completely identical. A second revised edition was published in 1978. This time there was only one text.

The gist of AACR editions is given below :

1. Anglo American Cataloguing Rules (AACR) – 1967.
5. AACR2 1978-81
6. AACR2R -1988
7. AACR2R98

The rules cover the description of, and the provision of access points for, all library materials commonly collected at the present time. . It has also been adopted in full or in part by 56 other countries around the world. AACR is developed and maintained by the Joint Steering Committee for the Revision of AACR (JSC) of which the British Library is a full and active member. JSC has responsibility for the ongoing process of rule revision.

As well as occasional minor amendments, a broader revision is under way with a view to a new edition in which the rules are more consistent and coherent, informed by the Functional Requirements for Bibliographic Records. This 'AACR3' has the working title 'Resource Description and Access'.

4. Resource Description and Access (RDA) is the working title for the new edition of the Anglo-American Cataloguing Rules. The new edition will be built on AACR2, and it will be compatible with those created in the past, with a new standard for resource description and access, for the digital world.

The Joint Steering Committee for Anglo-American Cataloguing Rules has agreed that there needs to be increased consultation with stakeholders, like the library administrators, system developers, metadata communities, MARC format developers, and international programs Program for Cooperative Cataloging, the ISSN International Centre, and IFLA.

The new approach of RDA is on Digital technology environment covering libraries, archives, museums, and other information management organizations who build and maintain the databases that describe and provide access to resources in their collections. The resources in those databases include a rapidly growing number that have been produced and disseminated using state-of-the-art digital technologies. RDA is being designed to provide a flexible and extensible framework for both the technical and content description of such resources while serving the needs of libraries organizing traditional resources as well.

A key element in the design of RDA is its alignment with the conceptual models for bibliographic and authority data developed by the International Federation of Library Associations and Institutions (IFLA). The FRBR and FRAD models provide RDA with an underlying framework that has the scope needed to support comprehensive coverage of all types of content and media, the flexibility and extensibility needed to accommodate newly emerging resource characteristics, and the adaptability needed for the data produced to function within a wide range of technological environments.

A second key element in the design of RDA is that it establishes a clear line of separation between the recording of data and the presentation of data. The major focus of RDA will be on providing guidelines and instructions on recording data to reflect attributes and relationships associated with the entities defined in the FRBR and FRAD models. RDA is being designed for ease and efficiency of use.

Notwithstanding its new approach, the need to integrate data produced using RDA into existing files (particularly those developed using AACR and related standards) is recognized as a key factor in the design of RDA.

5. The group responsible for developing and maintaining the *Anglo-American Cataloguing Rules* pertaining to cartographic materials is composed of institutions and associations that deal with the collection and description of cartographic materials. The Committee prepared *Cartographic Materials: A Manual of Interpretation for AACR2, 2002 Revision. Second Edition*, published in 2003 by ALA Editions.

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1. The physical description of any item should be based on the first instance on the chapter dealing with the class of materials to which that item belongs.
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In the case of ISBDs the following elements of description for NPM are prescribed.

1. Title and statement of responsibility area
2. Responsibility for the creations of the item
3. Physical Description of the materials.

10.5 Key Words

Anglo American Cataloguing Rules : A cataloguing code devised jointly by the ALA, LA and the Canadian Library Association for the purpose of cataloguing of all types of materials. It has also developed separate Rules for Cartographic Materials, Non-print Materials and for which it has also devised General material descriptions. The Code has undergone several revisions since 1967 and the latest being the RDA.

General Material Descriptions : These are the list of non-book materials and the designations to be assigned in cataloguing as per AACR. There are two lists – list for British Libraries and for use in Library of Congress.

Resource Description and Access(RDA) : It would be a latest version of AACR and would be focusing on Digital world and in particular database resources built by libraries, archives and information management organizations and institutions.

10.6 References for further Reading :

1. Anglo-American Cataloguing Rules, edition 2 (1998). Chicago, ALA.

2. IGNOU Course Material. MLIS-03, Block-2 , Units 5-7.

Unit - 11
Standards for Bibliographic Records

Structure

11.0 OBJECTIVES

In this Unit 7 and Unit 8 we have studied on Cataloguing codes and their use in practical cataloguing. To universalize cataloguing practices due to concept of Universal Bibliographic Control (UBC) international efforts were made like the Paris Conference.

This led to standardization of Cataloguing practice and it resulted into ISBD, MARC and some tools for coding like CCF and so on. Hence the objectives of this Unit are:

1. To understand the meaning of UBC and Bibliographic Record format.
2. Trace the development of Standardising record format
3. Understand the ISBD, MARC and CCF

11.1 INTRODUCTION

The impact of information technology on library and information science and in particular about the Bibliographic Description has been towards creating international standards for Bibliographic Record format. In this context the cooperation of several national and international organizations like IFLA and UNESCO is found. The first landmark in this context is the International Conference on Cataloguing Principles (ICCP) which was held in Paris in 1961. This resulted in the genesis of International Standard Bibliographic Description formats (ISBDs). The Library of Congress, for the purpose of automating centralized cataloguing and to print catalogue cards for distribution envisaged the Machine Readable Cataloguing which resulted into MARC Project. MARC Project was started by LC in 1966 as Pilot Project for a Machine Readable Catalogue data. MARC I was completed in 1968 followed by MAR II. Printed Catalogue Cards can be produced from MARC Magnetic Tape.

UNIMARC was developed in 1977 by IFLA as an International MARC Format. Sensing the lacunas in the MARC towards its acceptability universally. IFLA Recommended it as international interchange of bibliographic data. UNIMARC uses a special Block structure in the place of areas. The structure consists of 8 Types of data and 8 Blocks. Out of the total of 143 fields of UNIMARC only few are required to meet the structural standards of ISO-2709. UNIMARC is maintained by IFLA/UBMCIM.

Later MARC to suit the ongoing developments in the 21st Century expanded its base to Electronic Resources, especially the Web-resources and to cope-up need for comprehensive bibliographic data elements for accessing web resources, MARC21 was created. It supplemented the use of available Metadata standards for Bibliographic records, for example the Dublin Core Metadata standards.

11.2 Standards for Record Format and the MARC

11.2.1 Efforts towards Standardization

Record Format in general sense refers to the arrangement of presentation of data in a record. In specific terms, it refers to the structure, content and coding of the record. It must be suited to machine processing, and coding for the digital representation. Standardisation of the record format implies the standardization of the above aspects. As already mentioned the first international effort towards the standardization of bibliographic description (record is part of it) was started in 1960s with the International Conference on Cataloguing Principles (ICCP) held in Paris in 1961. This conference was responsible for International Standard Bibliographic Description (ISBDs) and its various formats.

The next was the creation of machine readable standard for cataloguing by computer this was through MARC – Machine Readable Catalogue. The Library of Congress was responsible for the MARC Project and later it became an International standard as ISO-2709.

The MARC Records use Tagged Fields for information exchange and for creating of switching mechanism through Common Tags for all bibliographic elements, A project named CCF – Common Communication Format was undertaken. All these developments and efforts are towards creating standards for bibliographic records.

11.2.2 MARC Record Format : Its structure and design.

The MARC Records were assigned a unique three digit Tag and the MARC Records were thus the Tagged Fields. The structure of MARC record format consists of : ***LEADER, DIRECTORY, CONTROL FIELDS AND VARIABLE FIELDS***.

The **Leader** provides general information about the Record, it is a fixed field consisting of 24 Characters. They indicate length of the record, type of record, status and bibliographic level of the record.

The **Directory** is an index location of various fields, both control and variable length within the record. The number of fields in the directory will be equal to the number of fields in the record.

The **Control fields** which are data fields consisting of information such as LC Card Number, date of entry on the file, date of publication, language of the text, country of publication etc.

The **Variable data fields** are made of single as well as groups of data elements. Each variable data field consists of indicators, subfield codes, data elements and field terminator.

The **US MARC** and **UK MARC** are the variant formats of MARC and have been used with national/local requirements of record structure.

The **UNIMARC** was developed with the association of IFLA Working Group on Content Designators recommended in 1973 with the SUPERMARC as beginning in this direction. The UNIMARC uses a special block structure in a place of areas. Data in national formats may be carried in different position but UNIMARC can identify these data functionally and establish clearly designated areas for them as blocks. Out of total 143 fields of the UNIMARC only few are required to meet the structural Internationa standard ISO-2709.

11.3 MARC21

MARC21 the latest of MARC Record formats has resulted out of USMARC and CANMARC. MARC21 also deals with three elements : The Record Structure, the content designation and the data content of the record.

a) The structure of MARC21 records is an implementation of national and international standards. E.g. Information Interchange Format (ANSI Z39.2) and format for Information Exchange (ISO-2709).

b) Content designation the codes and conventions established to identify explicitly and characterize further the data elements within a record and to support the manipulation of those data.

c) The content of data of most data elements is defined by standard outside the formats. E.g. AACR and LCSH.

MARC21 has made provision for electronic resources. In case of online resources, the field is assigned. When it was defined in 1993, the URL was not accepted standard and the www was in the early stage of development. As institutions began to use the new

11.3.1 The MARC 21 formats

There are five MARC 21 formats in total, covering bibliographic, authority, holdings, classification, and community information respectively. They share the following core elements for creating MARC records:

- Record structure, being an implementation of the international *Format for information exchange* (ISO 2709) and the *US Standard for Information Interchange* (ANSI/NISO Z39.2).
- Content designation, being the codes and conventions (fields, indicators, subfields and coded values) that identify the data elements in records.
- Data content, as defined by cataloguing standards.

The MARC 21 formats are intended for use by cataloguers and others involved with record creation and by personnel responsible for the design and development of database systems. Concise versions of all formats, technical specifications and MARC code lists, which are listed below, can be found on the Library of Congress website.

1. The *MARC 21 Format for Bibliographic Data* is designed to be a carrier for bibliographic information about printed and manuscript textual materials, computer files, maps, music, serials, visual materials, and mixed materials. Bibliographic data commonly includes titles, names, subjects, notes, publication data, and information about the

physical description of an item. The bibliographic format contains data elements for the following types of material:

Books - textual material that is monographic in nature.

Serials - textual items with a recurring pattern of publication, e.g., periodicals, newspapers, yearbooks.

Computer files - used for computer software, numeric data, computer-oriented multimedia, online systems or services. Other classes of electronic resources are coded for their most significant aspect. Material may be monographic or serial in nature.

Maps - all types of cartographic materials, including sheet maps and globes in printed, manuscript, electronic, and microform.

Music - printed and manuscript notated music.

Sound recordings - nonmusical sound recordings, and musical sound recordings.

Visual materials - projected media, two-dimensional graphics, three-dimensional artifacts or naturally occurring objects, and kits. Used for archival visual materials when format or medium is being emphasized.

Mixed materials - primarily archival and manuscript collections of a mixture of forms of material. Material may be monographic or serial in nature.

2. *The MARC 21 Format for authority data* is for control of the authorised forms of name and subject headings and references used in constructing access points in records. Name data elements include uniform titles and combined name/title data.

3. *The MARC 21 Format for holdings data* is designed to be a carrier for holdings information for three types of bibliographic items (single-part, multi-part and serial items).

4 *The MARC 21 Format for classification data* is designed to be a carrier for information about classification numbers and the captions associated with them that are formulated according to a specified authoritative classification scheme, including Dewey, Library of Congress and other schemes.

5. *The MARC 21 Format for community information* is Designed to be a carrier for descriptions of non-bibliographic resources that fulfil the information needs of a community. Resources covered include programmes, services, events, organisations, individuals, etc.

11.3.2 Technical specifications and code lists

The MARC 21 formats are supported by technical specifications and by MARC code lists, which it is essential to use in conjunction with the format documents.

1. MARC 21 Specifications for record structure, character sets and exchange media

Describes the structure of MARC 21 records, the character repertoires and coded values, and the formatting of records for exchange by electronic file transfer (FTP), on computer disk (diskettes) and by magnetic tape or cartridges.

2 MARC code list for countries (2003)

This lists places and their associated two-or three-character lower case alphabetic codes used in MARC records. Included are individual codes for presently existing national entities, states of the United States, provinces, and territories of Canada, divisions of the United Kingdom, and internationally recognised dependencies.

3 MARC code list for geographic areas (2002)

This is a list of up-to-date geographic areas and their associated one- to seven-character codes used in MARC records. Includes separate codes for countries, first order political divisions of some countries, regions, and geographic features. An appendix lists all changes since the 2000 edition.

4 MARC code list for languages (2003)

This list of languages and their associated three-character alphabetic codes that allow for the designation of the language or languages in MARC records valid as of March 2003. An appendix lists changes since the 2000 edition.

5. MARC code list for organizations (2000)

This revision of the 1996 edition contains an up-to-date list of organisation codes that represent names of libraries and other kinds of organisations that are identified in the bibliographic environment (mainly in the US and, to a lesser extent, elsewhere).

6 MARC code lists for relators, sources, description conventions (2000)

This revision of the 1997 edition contains lists of codes for use in MARC 21 bibliographic, authority, classification and community information records. It is arranged in six parts, covering: relator codes (showing the relationship between a name and a work); subject categories; classification schemes (for government documents and other types of publications); sources of subject index terms; format sources; description convention codes (i.e. cataloguing rules).

11.4 International Standard Bibliographic Description

11.4.1 Genesis and growth of ISBD

ISBD – International Standard for Bibliographic Description is an internationally agreed bibliographic description format. In 1961, an International Conference on Cataloguing principles was held I Paris. Number of cataloguing problems were discussed in this conference and to study them the International Meeting of Cataloguing Experts was held in Copenhagen in 1969 to set up a Working Group. This working group published its final recommendations in 1971 under the title "International Standard Bibliographic Description". This is the genesis and development of ISBD. The Objectives of ISBD are three fold and the formats are:

ISBD (G) - General
ISBD (M)- Monographs
ISBD (S)- Serials
ISBD (CM) – Cartographic Materials
ISBD (NBM)- Non-book Materials
ISBD (CF) – Computer Files
ISBD (ER) – Electronic Resources

International Standard Bibliographic Description arose out of a resolution of the International Meeting of Cataloguing Experts, organized by the IFLA Committee on Cataloguing in Copenhagen in 1969, that a standardization of the form and content of bibliographic description be established. The International Standard Bibliographic Description for Monographic Publications was the first of the ISBDs pursuant to the mandate of 1969. The first text of the ISBD(M) was published in 1971 as a set of recommendations. By 1973 this text had been adopted by a number of national bibliographies and, with translations of the original English text into several other languages, had been taken into account by a number of cataloguing committees in redrafting national rules for description. By this time it had also been noted that the

printed word is only one of the means of documentary transmission through which the communication needs of individuals and institutions are served, and that a standardized descriptive structure for documentary materials other than books should be addressed by IFLA's programme for International Standard Bibliographic Description. Consequently, the ***ISBD(NBM) International Standard Bibliographic Description for Non-Book Materials*** was produced and published in a first edition in 1977.

11.4.2 Purpose

The primary purpose of the ISBDs is to provide the stipulations for compatible descriptive cataloguing worldwide in order to aid the international exchange of bibliographic records between national bibliographic agencies and throughout the international library and information community. By specifying the elements which comprise a bibliographic description and by prescribing the order in which those elements should be presented and the punctuation by which they should be demarcated, the ISBDs aim to (A) make records from different sources interchangeable, so that records produced in one country can be easily accepted in library catalogues or other bibliographic lists in any other country; (B) assist in the interpretation of records across language barriers, so that records produced for users of one language can be interpreted by users of other languages; and (C) assist in the conversion of bibliographic records to electronic form.

11.4.3 Use

The ISBDs provide stipulations to cover the maximum amount of descriptive information required in a range of different bibliographic activities, and therefore include elements which are essential to one or more of those activities but not necessarily to all. It is recommended that the national bibliographic agency in each country, in accepting the responsibility of creating the definitive record for each publication issued in that country, prepare the definitive description containing all the mandatory elements set out in the relevant ISBD insofar as the information is applicable to the item being described. Certain elements are designated as optional (expressed throughout the text by the use of

the word 'may') and information on these elements can be included or omitted at the discretion of the agency. Other cataloguing organizations have a wider choice as they are not providing the definitive record for international exchange. They can select ISBD elements, mandatory or optional, for inclusion in their own records, provided that the elements selected are given in the prescribed order and transcribed with the prescribed punctuation according to the relevant ISBD.

The ISBD description forms a part of a complete bibliographic record and is not normally used by itself. The other elements which make up a complete bibliographic record, such as headings, subject information, uniform titles, filing devices and tracings, are not included in the ISBD stipulations. The rules for such elements are normally given in cataloguing codes.

This ISBD contained provisions covering machine-readable data files. However, when the ISBD(NBM) was being reviewed, together with the ISBD(CM), ISBD(M), and ISBD(S), by the ISBD Review Committee formed by IFLA in 1981, it was decided that special consideration should be given to the rapidly increasing need for a separate ISBD for computer files. With the development of programs and data files for smaller computers, the nature of the medium became more complex; in addition, this change resulted in physical items roughly comparable to other library materials to be more widely added to library collections, with bibliographic control needed for them. As a result, the ISBD(CF) Working Group was established and met for the first time in March 1986. Preliminary drafts based on the revised ISBD(NBM) were gradually improved through comments by a wide variety of users of computer files; these and other efforts by the Working Group culminated in a final draft of the ISBD(CF) in late 1988. A key feature of this work was the harmonization of the text of the ISBD(CF) with revised texts of the four ISBDs mentioned above as published in 1987-1988.

11.4.4 ISBD for Electronic Resources

Electronic resources are products of a volatile technology that continues to generate changes at a very rapid pace. Specific among recent advances are the following:

emergence of interactive multimedia; development of optical technology; availability of remote electronic resources on the Internet and World Wide Web; and reproductions of electronic resources. As a result of these considerations and in recognition of the importance that ISBD(CF) should address the bibliographic implication of such developments, the IFLA Cataloguing Section's Standing Committee decided to initiate formal review and revision of the ISBD(CF), in collaboration with the Section on Information Technology. A Working Group was formed in late 1994 with participating and corresponding members from both sections. With IFLA sponsorship and additional funding from the Research Libraries Group, the Working Group met in April 1995 and laid the foundation for the preparation of the draft Second Edition. This draft was distributed for worldwide review in response to which more than 30 commentaries totalling more than 110 pages of text were received from individual readers, library associations and national libraries. As a result, many improvements have been realized, including recognition of the need for a new term by which to characterize the material under discussion: this term is "electronic resource" which is judged more appropriate than the term previously used "computer file", given the array of materials intended to be comprehended by this ISBD.

The ISBD(ER) includes an index and five appendices. Appendix A offers a prescription for the special technique of multi-level description. Appendix B provides a brief sketch of the way in which data should be transcribed when partly in a script reading from right to left and partly in a script reading from left to right. Appendix C lists the recommended general material designation, resource designations and specific material designations with their definitions. Appendix D gives recommended abbreviations for use in English-language records. Appendix E conveys the examples formulated to offer an illustration of the result of applying ISBD stipulations in all areas of a record.

The International Standard Bibliographic Description for Electronic Resources - referred to hereinafter as the ISBD(ER) -specifies the requirements for the description and identification of such items, assigns an order to the elements of the description, and specifies a system of punctuation for the description. Its provisions relate first to the

bibliographic records produced by national bibliographic agencies (in issues of the printed national bibliography, in other printed records, and associated computer-readable data resources) and second to bibliographic records of other cataloguing agencies, whether in electronic or printed form.

Electronic resources consist of materials that are computer-controlled, including materials that require the use of a peripheral (e.g. a CD-ROM player) attached to a computer; the items may or may not be used in the interactive mode. Included are two types of resources: data (information in the form of numbers, letters, graphics, images, and sound, or a combination thereof) and programs (instructions or routines for performing certain tasks including the processing of data). In addition, they may be combined to include electronic data and programs (e.g. online services, interactive multimedia).

For cataloguing purposes, electronic resources are treated in the ISBD(ER) in two ways depending on whether access is local or remote. Local access is understood to mean that a physical carrier can be described. Such a carrier (e.g. disk/disc, cassette, cartridge) must be inserted by the user into a computer or into a peripheral attached to a computer - typically a microcomputer. Remote access is understood to mean that no physical carrier can be handled by the user - typically, access can only be provided by use of an input-output device (e.g. a terminal) either connected to a computer system (e.g. a resource in a network) or by use of resources stored in a hard disk or other storage device.

This definition is taken as applying for the most part to resources, including interactive multimedia works, that are generally available, and includes those accessed by network or via telecommunications. Resources produced and/or generated for limited distribution, for fee on demand, or on a made-to-order basis are, however, included. A resource residing in permanent memory in a computer (ROM) is understood to be part of the device in which it is stored, and, if catalogued, would be treated as a resource requiring remote access. Programmed toys, calculators, and other programmed objects are considered to be outside the intended scope of the ISBD(ER).

ISBD(ER) is one of several published ISBDs. The others cover non-book materials (ISBD(NBM)), serials (ISBD(S)), monographic publications (ISBD(M)), cartographic materials (ISBD(CM)), pre-1801 monographs (ISBD(A)), and printed music (ISBD(PM)). Each ISBD is intended to embody a coherent set of provisions for its own type of publication, but there has been no attempt to make any ISBD exclusive.

In cases where electronic resources combine the characteristics described in other ISBDs (e.g. an electronic serial, digitised map), it is recommended that the bibliographic agency first make full use of the stipulations in the ISBD(ER) and apply provisions of other ISBDs as appropriate. Some bibliographic agencies, however, may prefer to describe such resources by applying another ISBD appropriate for the material supplemented with application of the ISBD(ER). All the ISBDs are based on the general ISBD (ISBD(G)).

The ISBD(ER) is primarily concerned with the current needs of national bibliographic agencies, libraries and resource centres. It therefore may require elaboration before being applied to obsolete categories of material.

At the same time, since the resources described in ISBD(ER) are products of volatile technologies, the specific stipulations of this ISBD, particularly in area 3 (Type and extent of resource) and area 5 (Physical description), will need to be amended as appropriate to handle properly the addition(s) of resource characteristics or newly developing forms of material.

11.4.5 General Introduction to ISBD (ER) Elements

Definitions of Various Materials in general and special sense are given. For example : Hard disk, WWW, Compact discs etc.

Outline of ISBD (ER)

1) Area
2) Prescribed Punctuation

3) Element

4) Physical description area **:** Specific material designation and extent of item

5) Sources of information

6) Language and script of the description

7) Abridgements and abbreviations

CD-I	Compact Disc-Interactive
CD-ROM	Compact Disc Read-Only Memory
cm	centimetre(s)
col.	colour
in.	inch(es)
mm	millimetre(s)
Photo CD	Photo Compact Disc
sd.	sound

11.4.6 ISBD (ER) Cataloguing Rules

1. Title and Statement of Responsibility Area

a) Punctuation pattern

b) Title proper

2. General material designation (optional)

3. Statements of responsibility/

4. Edition Area

5. Type And Extent Of Resource Area

Punctuation pattern

- Type and extent of resource area is preceded by a point, space, dash, space (. -).
- Each statement of extent is enclosed in one pair of parentheses (()).

  - Electronic data
  - Electronic journal
  - Electronic spreadsheet programs
  - Electronic utility programs (3 files)

- Electronic system programs (2 files : 1.2, 1.5 MB)

6. Publication, Distribution, etc., Area

Punctuation pattern

Place of publication, production and/or distribution

London [i.e. Maidenhead]
- Dublin **Note:** Known to be published in Belfast

Name of publisher, producer and/or distributor
- London : BPI Systems. Editorial comment: Publisher's name appears first.

Date of publication, production and/or distribution
- St. Paul (Minn.) : Quanta Press, 1995

7. Physical Description Area

- 1 electronic optical disc : sd., col. ; 12 cm
- 3 electronic disks : sd., col. ; 9 cm

7.1 Specific material designation and extent

- 1 electronic optical disc (CD-ROM)
- 2 electronic optical discs (Photo CD)
- 1 electronic optical disc (CD-I)

7.2 Dimensions
- 1 electronic disk : col. ; 14 cm
- 1 electronic optical disc ; 12 cm
- 1 electronic tape reel ; 26.7 cm

7.3 Accompanying material statement (optional)

8. Series Area

9. Note Area

9.1 Notes on the title and statement of responsibility area
Notes on the language of the work and on translation or adaptation

- In German

- Screen displays in French and English

Notes on the source of the title proper (mandatory)

- Title supplied by cataloguer
- Title from IFLANET home page

9.2 Notes on the nature, scope, artistic form or purpose of the item

- Interactive adventure game

9.3 Notes on the statements of responsibility

- Data collected in collaboration with Christiane Klapisch, École pratique des hautes études, Paris

9.4 Notes on the edition area and the bibliographic history of the item

- Updated weekly
- Continuously updated; Version 7 dated: May 5, 1997
- Based on: Health interview survey 1996
- New England sermons, 1802-1918

9.5 Notes relating to type and extent of resource area and other resource characteristics

- Maximum record size: 2800 bytes
- File structure: Hierarchical

9.6 Notes on the publication, distribution, etc., area

- Disk label has date: cop. 1992

9.7 Notes on system requirements and the physical description area

9.8 Notes on system requirements (mandatory for local access electronic resources)

- System requirements: Macintosh; at least 1MB; System 6.0.5 or later; HyperCard version 1.0 or later; hard disk drive; videodisc player (Pioneer 2200, 4200, 6000A, 6010A, 8000); RS232 cable connector (from Macintosh to videodisc player)
- System requirements: UNIX workstation with Mosaic software
- System requirements: Philips Interactive compact disc (CD-I) player with monitor

9.9 Notes relating to mode of access (mandatory for remote access electronic resources)

- Mode of access: Gopher://gopher.peabody.yale.edu
- Mode of access: Computer university network

9.10 Notes on the physical description

- Also issued for IBM PC and PC compatibles
- Available in ASCII and PostScript versions
- Container: 32 x 36 x 16 cm
- Sound cassette in stereo

9.11 Notes on the series area

9.12 Notes relating to the contents

- Contents: Cohort file 1. Mature men (45-59 yrs.) ; Cohort file 2. Mature women (45-59 yrs.) ; Cohort file 3. Young boys (14-24 yrs.) ; Cohort file 4.

9.13 Notes relating to availability

- 250 copies issued

9.14 Notes relating to the resource described

- Description based on home page dated: 09/06/96
- Description of resource as of: May 19, 1996

9.15 Notes providing a summary

- Gives information on higher civil servants in U.S. federal agencies, including personal characteristics, educational background, and occupational mobility

9.16 Notes relating to use/audience

- Intended for senior high school students with knowledge of algebra
- Resource closed until Jan. 2010
- For use by library staff only

9.17 Notes on numbers

- Additional no. on label: A-096

10. Standard Number (or Alternative) and Terms of Availability Area

11.5 Common Communication Format (CCF)

11.5.1Introduction to CCF

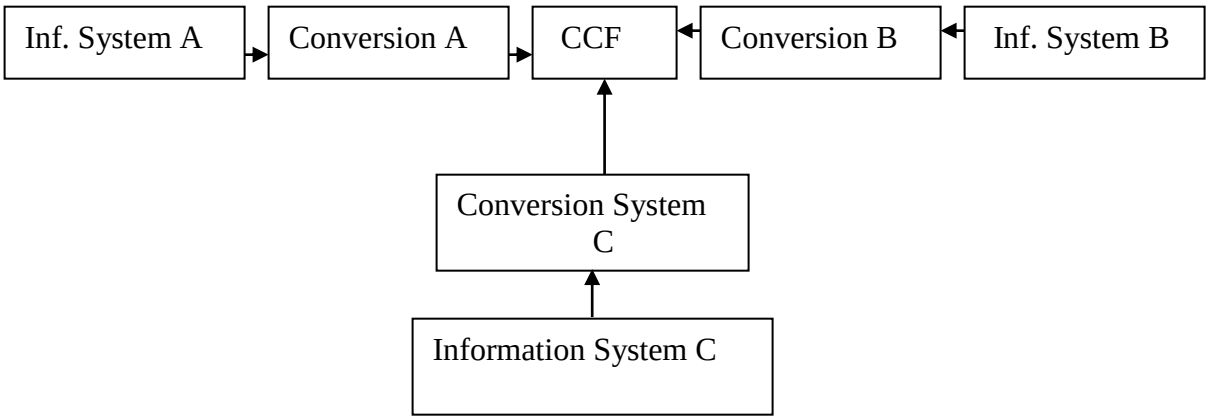
In an effort towards standardization of bibliographic record format, it was necessary to decide on a set of basic data elements for common communication format for the interchange of records was necessary. It was for the exchange of bibliographic records through one-to-one mapping of the special elements of one format into another

to be made applicable to all types of bibliographic information activities. The core record was augmented with optional data show relationship between bibliographic records and between elements within records were built up. ISBD is one of the major inter-change formats on which CCF is based.

CCF – Common Communication Format is the Exchange format for records through one-to-one mapping of the special elements of one format into another to be made applicable to all types of Bibliographic information activities. CCF was sponsored by UNESCO under PGI. The format is evolved out of six formats. The first edition of CCF was published in 1984 and the second edition in 1988.

The objective of CCF was stated as to provide detailed and structured method for recording a number of mandatory and optional data elements in a computer readable bibliographic record for exchange purpose between two or more computer systems. Non-computerised systems also can use CCF data elements because it simplifies computerization at a later state.

CCF is not meant for the record of an institution for internal storage and processing purposes. Processing formats vary from Institution to institution and also within the same institution. It is specially designed for retrieval and output within an institution.



Systems and Interfaces Required in the Exchange using CCF

11.5.1Structure of CCF

Record label	Directory	Data Fields	Record Sequence

It is a specific implementation of IS0-2709. A CCF Record may contain descriptions of more thane one item, but the description of each item occupies a single record segment..

11.5.2CCF Tags with Data Elements

Given below are the some of the Examples of some important bibliographic data elements with CCF Tags.

031 – Language and Script of the Record
050 – Physical Medium
060 – Type of Material
100 – ISBN
200 – Title and associated statement
300 – Name of Persons
310 – Name of Corporate Body
400 – Place of publication and Publisher
440 – Date of Publication
460 – Physical Description
500 – Note
610 – Classification Scheme Notation
620 – Subject Descriptor

11.6 Summary

In this Unit a study on the process of prominent standardization on bibliographic record format is given. The concept of Universal Bibliographic Control has given an

impetus to evolve universal standards, as a result an International Conference was organized in Paris in 1961. Thus IFLA laid down the major foundation for the bibliographic standards that resulted into formation of International Standard Bibliographic Description (ISBD) and to cope with developments in the formats of Information resources, various formats of ISBDs were created.

Another important landmark in this direction is the project of LC on MARC. Today MARC has become an International Standard for machine readable bibliographic record format. MARC has also gone into various national and international formats like UKMARC, USMARC and the UNIMARC. MARC to incorporate current development of Web-based information resources and to augment bibliographic metadata elements created MARC21.

Growth of computerized databases and variant information system design it was necessary to interconnect them and also interchange bibliographic records. So UNESCO under its program PGI initiated a project on common communication format and that resulted into CCF.

Self Check Exercises

1. Mention the efforts towards standardization of bibliographic record format.
2. Write about the structure and development of MARC.
3. What are the features of MARC21 ?
4. ISBD and its formats
5. Write in brief on ISBD(ER)
6. Write about the importance of CCF.

11.7 Answers to Self Check Exercises

1. Bibliographic record format is the arrangement of bibliographic data elements in a record. Effort at national and international levels to standardize the Record format were undertaken. It refers to the arrangement of presentation of data in a record, the structure, content and coding of the record. Standardization of the record format implies

the standardization of the above aspects. The first international effort towards the standardization of bibliographic description (record is part of it) was the International Conference on Cataloguing Principles (ICCP) held in Paris in 1961. This conference was responsible for International Standard Bibliographic Description (ISBDs) and its various formats.

The project MARC- Machine Readable Catalogue a machine readable standard for cataloguing by computer by The Library of Congress was next and later it became an International standard as ISO-2709. A project named CCF – Common Communication Format was undertaken. All these developments and efforts are towards creating standards for bibliographic records.

2. MARC is a standard for Machine readable catalogue. The MARC Records were assigned a unique three digit Tag and the MARC Records were thus the Tagged Fields. The structure of MARC record format consists of : ***LEADER, DIRECTORY, CONTROL FIELDS AND VARIABLE FIELDS***.

The developments in MARC are first its record format became and international standard. Later various national and international versions were created to cater to the national and local needs thus came the **US MARC** and **UK MARC.** The **UNIMARC** was developed with the association of IFLA Working Group on Content Designators recommended in 1973. The UNIMARC uses a special block structure in a place of areas. Out of total 143 fields of the UNIMARC only few are required to meet the structural International standard ISO-2709.

3. MARC21 the latest of MARC Record formats has resulted out of USMARC and CANMARC. MARC21 also deals with three elements: The Record Structure, the content designation and the data content of the record.

a) The structure of MARC21 records is an implementation of national and international standards viz. ANSI Z39.2) and ISO-2709.

b) Content designation the codes and conventions established to identify explicitly and characterize further the data elements within a record and to support the

manipulation of those data.

c) The content of data of most data elements is defined by standard outside the formats. E.g. AACR and LCSH.

MARC21 has made provision for electronic resources. In case of online resources, the field is assigned.

There are five MARC 21 formats in total, covering bibliographic, authority, holdings, classification, and community information respectively. They share the following core elements for creating MARC records:

- Record structure, implents *Format for information exchange* (ISO 2709) and the *US Standard for Information Interchange* (ANSI/NISO Z39.2).
- Content designation, being the codes and conventions (fields, indicators, subfields and coded values) that identify the data elements in records.
- Data content, as defined by cataloguing standards.

The MARC 21 formats are intended for use by cataloguers and others involved with record creation and by personnel responsible for the design and development of database systems. The five formats and MARC code lists, are listed below. .

The formats

1. The *MARC 21 Format for Bibliographic Data*

2. The MARC 21 Format for authority data

3. *The MARC 21 Format for holdings data*

4 The MARC 21 Format for classification data

5. The MARC 21 Format for community information

The Code list:

1. MARC 21 Specifications for record structure, character sets and exchange media

2 MARC code list for countries (2003)

3 MARC code list for geographic areas (2002)

4 MARC code list for languages (2003)

5. MARC code list for organizations (2000)

6 MARC code lists for relaters, sources, description conventions (2000)

4. ISBD – International Standard for Bibliographic Description is an internationally agreed bibliographic description format. The formats are:

ISBD (G) - General
ISBD (M)- Monographs
ISBD (S)- Serials
ISBD (CM) – Cartographic Materials
ISBD (NBM)- Non-book Materials
ISBD (CF) – Computer Files
ISBD (ER) – Electronic Resources

International Standard Bibliographic Description arose out of a resolution of the International Meeting of Cataloguing Experts, organized by the IFLA Committee on Cataloguing in Copenhagen in 1969, that a standardization of the form and content of bibliographic description be established. The International Standard Bibliographic Description for Monographic Publications was the first of the ISBDs pursuant to the mandate of 1969. The first text of the ISBD(M) was published in 1971 as a set of recommendations. The ***ISBD(NBM) International Standard Bibliographic Description for Non-Book Materials*** was produced and published in a first edition in 1977.

The primary purpose of the ISBDs is to provide the stipulations for compatible descriptive cataloguing worldwide in order to aid the international exchange of bibliographic records between national bibliographic agencies and throughout the international library and information community.

The ISBDs provide stipulations to cover the maximum amount of descriptive information required in a range of different bibliographic activities, and therefore include

elements which are essential to one or more of those activities but not necessarily to all. The ISBD description forms a part of a complete bibliographic record and is not normally used by itself. The other elements which make up a complete bibliographic record, such as headings, subject information, uniform titles, filing devices and tracings, are not included in the ISBD stipulations. The rules for such elements are normally given in cataloguing codes.

5. Electronic resources are products information technology to generate changes at a very rapid pace. The first result being the creation of ISBD(CF) to address the bibliographic developments. IFLA Cataloguing Section's Standing Committee decided to initiate formal review and revision of the ISBD(CF), in collaboration with the Section on Information Technology. A Working Group was formed 1994 with IFLA sponsorship and additional funding from the Research Libraries Group. The Working Group after deliberations suggested many improvements and recognition of the need for a new term "electronic resource" .

The International Standard Bibliographic Description for Electronic Resources - the ISBD(ER) -specifies the requirements for the description and identification of such items, assigns an order to the elements of the description, and specifies a system of punctuation for the description. Electronic resources consist of materials that are computer-controlled, including materials that require the use of a peripheral (e.g. a CD-ROM player) attached to a computer; the items may or may not be used in the interactive mode.

For cataloguing purposes, electronic resources are treated in the ISBD(ER) in two ways depending on whether access is local or remote. Local access is understood to mean that a physical carrier can be described. Remote access is understood to mean that no physical carrier can be handled by the user - typically, access can only be provided by use of an input-output device (e.g. a terminal) either connected to a computer system (e.g. a resource in a network) or by use of resources stored in a hard disk or other storage device.

ISBD(ER) is one of several published ISBDs. The ISBD(ER) is primarily concerned with the current needs of national bibliographic agencies, libraries and resource centres.

At the same time, since the resources described in ISBD(ER) are products of volatile technologies, the specific stipulations of this ISBD, particularly in area 3 (Type and extent of resource) and area 5 (Physical description), will need to be amended as appropriate to handle properly the addition(s) of resource characteristics or newly developing forms of material.

Definitions of Various Materials in general and special sense are given. For example : Hard disk, WWW, Compact discs etc.

Outline of ISBD (ER)

1) Area
2) Prescribed Punctuation
3) Element
4) Physical description area **:** Specific material designation and extent of item
5) Sources of information
6) Language and script of the description
7) Abridgements and abbreviations

CD-I	Compact Disc-Interactive
CD-ROM	Compact Disc Read-Only Memory
cm	centimetre(s)
col.	colour
in.	inch(es)
mm	millimetre(s)
Photo CD	Photo Compact Disc
sd.	sound

6. CCF – Common Communication Format is the Exchange format for records. CCF was sponsored by UNESCO under PGI. The first edition of CCF was published in 1984

and the second edition in 1988. Its objective is to provide a detailed and structured method for recording number of mandatory and optional data elements in a computer readable bibliographic record for exchange purpose between two or more computerized systems. Non-computerised systems also can use CCF data elements because it simplifies computerization at a later state.

CCF is not meant for the record of an institution for internal storage and processing purposes. Processing formats vary from Institution to institution and also within the same institution. It is specially designed for retrieval and output within an institution.

The importance of CCF is that it provides a method for recording number of mandatory and optional data elements. CCF helps in exchange of records between two or more computerized systems. It also converts the data in its processing format into common format.

11.8 Key Words

Common Communication Format (CCF): It is the Exchange format for records. to provide a detailed and structured method for recording number of mandatory and optional data elements in a computer readable bibliographic record for exchange purpose between two or more computerized systems.

International Standard Bibliographic Description(ISBD): It is an internationally agreed bibliographic description format. There are 7 formats. The ISBDs provide the stipulations for compatible descriptive cataloguing to aid the international exchange of bibliographic records between national bibliographic agencies and the international library and information community.

Machine Readable Catalogue(MARC) : A Library of Congress project and is created for the purpose of communicating bibliographic information to a large number of libraries through computerized catalogue and initially using Magnetic Tape format.

11.9 References for further Reading

1. Simons, Peter and Hopkins, Alan, Eds. (1988)). CCF: The Common Communication Format. Ed2. Paris, UNESCO-PGI.

2.Dieriekx,H and Hopkins, Alan (1981): Reference manual for Machine Readable bibliographic description. Ed2. Paris, UNESCO.

Unit. 12
CATALOGUING OF INTERNET RESOURCES

Structure

Objectives

The objectives of this unit will be able to provide official standards and guidelines for cataloguing of Internet resources. This helps the students:

- To understand the concept of electronic (Internet) resources.
- To give extracts of rules from AACR2 for cataloguing of electronic resources.
- To learn how to adopt MARC 21 for cataloguing of electronic resources.
- To know the cataloguing of Internet resources using Dublin Core Metadata Standard (DCMS).

1. Introduction

The advent of the World Wide Web marks profound changes in how we use sources of information such as databases, indexes, and archives and how we use representations of knowledge such as maps, pictures, sounds, books, and journal articles. Nowadays the sources are changed from tangible to intangible media, from books and journals to services and databases. For librarians and those whom we serve, the most important changes in technology and society may be in how such sources of information

or representations of knowledge are created and used. These changes are profoundly affecting catalogers, catalogues, and catalogue users.

In this unit an attempt is made to provide the rules/provisions that are available for cataloguing of Internet resources in AACR2, MARC 21 and Dublin Core. The cataloguing rules provided in AACR2 reviewed 2002 for different categories of electronic resources consists of data (information representing numbers, text graphics, images, maps, moving images, music, sounds, etc.), programs (instructions, etc., that process the data for use), or combinations of data and programs. Electronic resources often include components with characteristics found in multiple classes of materials.

For cataloguing purposes, electronic resources may be treated in one of two ways depending on whether access is direct (local) or remote (networked). Direct access is understood to mean that a physical carrier can be described. Such a carrier (e.g., disc/disk, cassette, cartridge) must be inserted into a computerized device or into a peripheral attached to a computerized device. Remote access is understood to mean that no physical carrier can be handled. Remote access can only be provided by use of an input-output device (e.g., a terminal), either connected to a computer system (e.g., a resource in a network), or by use of resources stored in a hard disk or other storage device.

2. Definition of Electronic (Internet) Resource

All Internet resources are in electronic form so it is appropriate to use the term electronic resources instead of Internet resources. Electronic resources and Internet resources are used as synonymous words in this unit.

According to AACR2, 2005 Update, an electronic resource is: "Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet)." This

definition does not include electronic resources that do not require the use of a computer, for example, music compact discs and videodiscs.

The above definition is applicable throughout this unit.

3. Official Standards and Guidelines

There are many standards and guidelines available for cataloguing of Internet resources. Some of the important ones are as follows:

- AACR2, especially Chapters 9 and 12
- Marc 21 Standards
- Cataloguing Electronic Resources: OCLC-MARC Coding Guidelines
- Cataloguing Integrating Resources (OCLC)
- Guidelines for Coding Electronic Resources in Leader/06 (Library of Congress)
- CONSER Cataloguing Manual: Module 31: Remote Access Computer Files Serials
- Guidelines for the Use of Field 856 (MARC 21 Formats)

Let us see in brief the rules/provisions given in AACR 2, MARC 21 and Dublin Core Metadata Elements.

3.1 AACR2

AACR2 provides rules for cataloguing of electronic (including Internet) resources in Chapter 9 and 12. The following section gives extracts from AACR2 which are relevant for discussion of cataloguing of electronic resources.

3.1.1 Sources of Information:

The chief source of information for electronic resources is the resource itself. If the information required is not available from the resource itself, take it from the following sources (in this order of preference):

- Printed or online documentation or other accompanying material (e.g., publisher's letter, about" file, publisher's Web page about an electronic resource)
- Information printed on a contained issued by the published, distributor, etc.

If the information required is not available from the chief source or the sources listed above, take it from the following sources (in this order of preference):

- Other published descriptions of the resource
- Other sources (e.g., metadata records)

The prescribed source(s) **(**Rule 9.0b2**)** of information for each area of the description of electronic resources is set out below.

AREA	**PRESCRIVED SOURCE OF INFORMATION**
Title and statement of responsibility	Chief source of information, information issued by the publisher, creator, etc., container
Edition	Chief source of information, information issued by the publisher, creator, etc., container
Type and extent of resource	Any source
Publication, distribution, etc.	Chief source of information, information issued by the publisher, creator, etc., container
Physical description	Any source
Series	Chief source of information, information issued by the published, creator, etc., container
Note	Any source
Standard number and terms of availability	Any source

3.1.2 Title and Statement of Responsibility Area:

Title proper (9.1B): Rule 9.1B1 Transcribe the title proper exactly as to wording, order, and spelling, but not necessarily as to punctuation and capitalization. Give accentuation and other diacritical marks that are present in the chief source of information.

E.g.:

PageMaker

JAVA

Star office

Windows VISTA

Rule 9.1B3 says do not record a file name or a data set name as the title proper unless it is the only name given in the chief source. If desired, give a file name or data set name not used as the title proper in a note

Rule 9.1F1 says statements of responsibility relating to those persons or bodies credited with a major role in creating the content of the resource as instructed in 1.1F. See Block 8 and Unit 1 for examples.

3.1.3 Edition Area:

Edition statement (9.2B1): Transcribe the statement relating to an edition of an electronic resource that contains differences from other editions of that resource, or to a named reissue of a resource, as instructed in 1.2B.

E.g.:

Rev. ed.

3rd update

Version 5.20

Prelim. release 0.5

Interactive version

3.1.4 Type and Extent of Resource Area:

Type and extent of resource (9.3B) : Rules 9.3B1 indicate the type of electronic resource being catalogued. Use one of the following terms:

Electronic data

Electronic program(s)

Electronic data and program(s)

Extent of resource (9.3B2)*:* If the information is readily available, give the number or approximate number of files, records, etc., that make up the extent and/or these other details. If the resource is in a compressed form, omit the statement of extent.

a) **Data**. Give the number or approximate number of records (use records) and / or bytes (give the term in either abbreviated or full form).

Electronic data (1 file : 350 records)

Electronic data (550 records)

Electronic data (1 file : 600 records, 240,000 bytes)

Electronic data (1 file : 2.5 gb)
Electronic data (1file : 1.2 mb)

b) **Programs**. Give the number or approximate number of statements (use statements) and / or bytes (give the term in either abbreviated or full form).

Electronic program (1 file : 200 statements)

Electronic program (2150 statements)

c) **Multipart files**. Give the number or approximate number of records and / or bytes or statements and / or bytes, in each part according to a) or b) above.

Electronic data (3 files : 100, 460, 550 records)

Electronic programs (2 files : 4300, 1250 bytes)

Electronic data (2 files : ca. 330 records each)

Electronic data (2 files : 800, 1250 records) and programs

(3 files : 7260, 3490, 5076 bytes)

Electronic data (2 files : 3.5, 2 megabytes)

If such numbering cannot be given succinctly, omit the information from this area. If desired, give it in a note (see9.7B8).

3.1.5 Publications, Distribution, etc., Area:

Place of publication, distribution, etc (9.4C1):

Give the place of publication, distribution, etc., of a published electronic resource as instructed in 1.4C of AACR2.

3.1.6 Physical Description Area:

Extent of item (including specific material designation) (9.5B1):

Record the number of physical units of the carrier by giving the number of them in Arabic numerals and one of the following terms as appropriate:

Computer chip cartridge

Computer disk

Computer optical disc

Computer tape cartridge

Computer tape cassette

Computer tape reel

1 computer disk

2 computer tape cassettes

3 computer tape reel

4 computer optical disc

When new physical carriers are developed for which none of these terms is appropriate, give the specific name of the physical carrier as concisely as possible, preferably qualified by computer.

1 computer card

2 computer optical card

Optionally, use conventional terminology to record the specific format of the physical carrier.

1 CD-ROM

2 photo CDs

3 DVD

Other physical details (9.5C1):

If the resource is specified to have sound or is known to produce sound, give *sd*. If it is specified or known to display in two or more colours, give *col.*

1 computer chip cartridge : sd.

1 computer disk : col.

1 computer disk cartridge: sd., col.

Optionally (9.5C2), give other physical characteristics (e.g., recoding density, sectoring), if readily available and if they are considered to be important.

1 computer disk : sd., col., single sided, single density, soft sectored

2 computer tape reels : 6,250 bpi

3.1.7 Dimensions (9.5D1):

Give the dimensions of the physical carrier as instructed below.

a) Disc/Disk. Give the diameter of the disc or disk in inches, to the next ¼ inch up.

1 computer disk: col.; 51/4 in.

1 computer optical disc: col.; 43/4 in.

b) Cartridges. Give, in inches to the next ¼ inch up, the length of the side of the cartridge that is to be inserted into the machine.

1 computer chip cartridge; 31/2 in.

c) Cassettes. Give the length and height of the face of the cassette in inches, to the next 1/8-inch up.

1 computer tape cassette; 31/2 in.

Optionally, give the dimensions of the physical carriers described in a)-c) in centimeters to the next whole centimeter up.

d) Reel. Do not give dimensions for reels.

e) Other carriers. Give the appropriate dimensions of other physical carriers in inches or in centimeters, rounding up as appropriate.

1 computer card; 9X 6 cm.

Rule 9.5D2 says, if the item consists of more than one physical carrier and they differ in size; give the smallest or smaller and the largest or larger size, separated by a hyphen.

3 computer card ; 31/2-51/4 in.

or 3 computer disks ; 9-14 cm.

Accompanying Material (9.5E1):

Give the details of accompanying materials as instructed in 1.5E.

1 computer disk ; 51/4 in. + 1 user's guide

1 computer disk : col. ; 31/2 in. + 1 v. (51 p. : ill. ;20 cm.)

1 computer disk ; 51/4 in. + 1 user manual and addendum

(Accompanying material has title: User manual and addendum)

1 computer tape cassette : col. ; 37/8 X 21/2 in. + 1 sound cassette (20 min. : Analog, stereo.)

1 computer disk; 31/2 in. + 1 demonstration disk + 1 codebook

2 identical computer disks; 51/4 in.

1 computer tape cassette; 37/8 X 21/2 in. + 7 maps

Do not give a physical description for an electronic resource that is available only by remote access. See 9.7B1c and 9.7B10.

3.1.8 Series Area:

Series statements (9.6B1): Record each series statement as instructed in 1.6.
Eg: (Practicorp no-nonsense software)

(American national election study series; no.13)

(Series C. Machine-readable texts of Greek authors)

3.1.9 Note Area:

Rule 9.7A2: In making notes follow the instruction in 1.7A**.**

Rule *9.7B. Notes:* Make notes as set out in the following sub rules and in the order given there. However, give a particular note first when it has been decided that note is of primary importance.

Rule 9.7B1. Nature and scope, system requirements, mode of access

a) ***Nature and scope:*** Make notes on the nature or scope of the resource unless it is apparent from the rest of the description.

b) ***System requirements:*** Make a note on the system requirements of the resource if the information is readily available. Begin the note with system requirements:. Give the following characteristics in the order in which they are listed below. Precede each characteristic, other than the first, by a semicolon.

c) **Mode of access** : If a resource is available only by remote access, always specify the mode of access.

3.1.10.Standard Number and Terms of Availability Area:

Standard number (9.8B1): Give the International Standard Book Number (ISBN) or International Standard Serial Number (ISSN) assigned to a resource as instructed in 1.8B.

E.g.: ISBN 0-89138-111-2 (codebook)

3.2 MARC 21

Here you are going to learn how to adopt MARC 21 for cataloguing of electronic resources. A MARC record, as you are aware, is a **MA**chine–readable **C**ataloguing **R**ecord. "Machine– readable" suggests that a computer can read and interpret the data in the cataloging record. The following paragraphs will explain why this is important and how it is made possible. "Cataloging record" means any bibliographic record, containing information / data traditionally found in library catalogue cards, bibliographies, etc. A bibliographic record generally includes:

- A description of the item
- Main entry and added entry headings
- Subject headings
- The call number

In practice MARC records often contain much additional information. The description and headings for the main and added entries are provided using established standards.

Many libraries, especially in the English-Language speaking countries follow the rules in the recent edition of Anglo-American Cataloguing Rules (AACR2R) for the purpose.

3.2.1 Frequently Used MARC 21 Tags:

Following are the commonly or most frequently used MARC 21 tags for preparing bibliographical record for printed and electronic resources.

020 – International Standard Book Number (ISBN)
082 – Dewey Decimal Classification Number
100 – Main entry-Personal name (author)
110 – Main entry-Corporate name
245 – Title information (which includes the title, other title information, and the statement of responsibility)
250 – Edition statement
256 – Computer file characteristics
260 – Publication, distribution, etc.,
300 – Physical description (often referred to as the "collation" when describing books)
440 – Series statement/ added entry-title statement Personal
500 – General note
520 – Summary etc
650 – Subject heading entry – Topical name
700 – Added entry-personal name
710 – Added entry-corporate name
856 – Electronic location and access

Libraries in entering their own bibliographic records use the above-mentioned MARC 21 tags more frequently. For other full list of MARC 21 tags, indicators and subfield codes refer MARC 21 format for bibliographic data or MARC Manual. Field 856 is most relevant for cataloguing of electronic resources. So, a full description of the field is given below. It includes all changes made to the field through the midwinter ALA conference held in January 2003.

856 Electronic location and access (R)

Indicator 1:Access method

-- No information provided

0 – Email

1—FTP

2 – Remote login (Telnet)

3 – Dial-up

4 – HTTP

7 – Method specified in subfield $2

Indicator 2: Relationship

-- No information provide

0 – Resource

1—Version of resource

2 – Related resource

8 – no display constant generated

Subfield used most often:

$a – Host name (R)

$b – Access number(R)

$c – Compression information (R)

$d – Path (R)

$f – Electronic name (R)

$h – Processor of request (NR)

$i – Instruction (R)

$j – Bits per second (NR)

$k – Password (NR)

$l – Logon (NR)

$m – Contact for access assistance (R)

$n – Name of location of host (NR)

$o – Operating system (NR)

$p – Port (NR)

$q – electronic format type (NR)

$r – Settings (NR)

$s – File size (R)

$t – Terminal emulation (R)

$u – Uniform Resource Identifier (R)

$v – hours access method available (R)

$w – Record control number (R)

$x – Nonpublic note (R)

$y – Link text (R)

$z – Public note (R)

$2 – Access method (NR)

$3 – Materials specified (NR)

$6 – Linkage (NR)

$8 – Field link and sequence number (R)

Example: 856 2# **$a**anthrax.micro.umn.edu**$b**128.101.95.23

856 0# **$u**mailto:ejap@phil.Indiana.edu**$i**ejap subcription

856 7# **$3**b&w film neg.**$d**dag**$f**3d01926**$2**file

856 40 **$u** www.vidhyanidi.org

856 1# **$u**ftp://Harvarda.Harvard.edu**$k**guest

For other detail you may look at http://www.loc.gov/marc, and refer practical guide on the subject, 'Cataloguing and Organizing Digital Resources: A How-To-Do-It Manual for Librarians' by Anne M Mitchell and Brian E Surratt,. Neal-Schuman Publishers, May 2005, 236 p.

3.3 Dublin Core

Due to the rapid growth in number of digital resources, information professionals quickly understood the need for metadata schemes that could facilitate easier search and retrieval of the resources and whose application would be simpler than those schemes,

like **MARC21**, traditionally used to describe print resources. Let us deal with the cataloguing of Internet resources using Dublin Core Metadata Standard (DCMS)

The "Dublin" in the name refers to Dublin, Ohio, USA, where the work originated from an invitational workshop hosted in 1995 by OCLC, a library consortium that is based there. The "Core" refers to the fact that the metadata element set is a basic but expandable "core" list. One of these schemes, the internationally supported Dublin Core (DC) metadata standard, consisting of fifteen elements, was introduced in 1995, by the National center for Supercomputing Applications (NCSA) and the Online Computer Library Center (OCLC), and made Standard Z39.85 in 2001, by the National Information Standard Organization (NISO). The Dublin Core metadata element set is a standard for cross-domain information resource description. In other words, it provides a simple and standardised set of conventions for describing things online in ways that make them easier to find. Dublin Core is widely used to describe digital materials such as video, sound, image, text, and composite media like web pages. Implementations of Dublin Core typically make use of XML and are Resource Description Framework based. Dublin Core is defined by NISO Standard Z39.85-2001

The fifteen element "Dublin Core" described in this standard is part of a larger set of metadata vocabularies and technical specifications maintained by the Dublin Core Metadata Initiative (DCMI). The full set of vocabularies, DCMI Metadata Terms [DCMI-TERMS], also includes a set of resource classes, the DCMI Type Vocabulary [DCMI-TYPE]. The terms in DCMI vocabularies are intended to be used in combination with terms from other, compatible vocabularies in the context of application profiles and on the basis of the DCMI Abstract Model [DCAM].

All changes made to terms of the Dublin Core Metadata Element Set since 2001 have been reviewed by a DCMI Usage Board in the context of a DCMI Namespace Policy [DCMI-NAMESPACE]. The namespace policy describes how DCMI terms are assigned Uniform Resource Identifiers (URIs) and sets limits on the range of editorial

changes that may allowably be made to the labels, definitions, and usage comments associated with existing DCMI terms.

This document, an excerpt from the more comprehensive document "DCMI Metadata Terms" (http://dublincore.org/documents/dcmi-terms/), provides an abbreviated reference version of the fifteen element descriptions that have been formally endorsed in the following standards:

- ISO Standard 15836-2003 (February 2003): http://www.niso.org/international/SC4/n515.pdf
- [NISO Standard Z39.85-2001 (September 2001):

  http://www.niso.org/stadards/resources/Z39-85.pdf

3.3.1 Dublin Core Metadata Standard (DCMS):

The Dublin Core is one of the most well known metadata formats. It is considered to be an efficient and simple metadata system for describing resources. The application of the Dublin Core of elements has been designed to cover not only the types of resources housed in libraries, galleries, and other typical depositories of information, but also for use on the Web.

3.3.2 Dublin Core elements:

The following are the Simple Dublin Core elements:

1. Tile
2. Author or Creator
3. Subject and Keywords
4. Description
5. Publisher
6. Other Contributor
7. Date
8. Resource Type
9. Format

10. Resource Identifier
11. Source
12. Language
13. Relation
14. Coverage
15. Rights Management

Apart from the above Simple 15 Dublin Core elements, Working Groups of the Dublin Core Metadata Initiative (DCMI) recently identified and added 3 more elements. They are as follows:

1. Audience
2. Provenance
3. Rights Holder

4. Summary

In this Unit you have been introduced to the concept of cataloguing of electronic resources and significance of using AACR2-2R, 2002, MARC 21 format and Dublin Core for the purpose. The general rules given in AACR2 Chapter 1 of Part 1 provide basic rules for cataloging all types of material viz., print, non-print and electronic resources. This Unit, however, is restricted to discuss the rules for cataloguing of electronic resources given in Chapter 9 and 12 in AACR2-2R. It also provides basic knowledge to use the MARC format to design your bibliographic database and Dublin Core (DC) metadata standard, a standard for describing web resources. Dublin Core (DC) consists of fifteen elements and 3 extra elements that can be used to describe the content of the information resource itself and to identify who is responsible for creating the resource. These elements are optional, may be repeated, and may appear in any order. They can be embedded in HTML, XML or RDF.

Self Check Exercises

1. Define Electronic resources.
2. State the important official standards for cataloguing of electronic resources.

3. Discuss in detail the rules provided in AACR 2 for cataloguing of electronic resources.
4. Write an account on MARC 21.
5. Explain the Dublin Core elements.

Answer to Self Check Exercises

1. An electronic resource is "Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet)." This definition does not include electronic resources that do not require the use of a computer, for example, music compact discs and videodiscs.

2. Some of the important standards and guidelines available for cataloguing of Internet resources are as follows:

- AACR2, especially Chapters 9 and 12
- Marc 21 Standards
- Cataloguing Electronic Resources: OCLC-MARC Coding Guidelines
- Cataloguing Integrating Resources (OCLC)
- Guidelines for Coding Electronic Resources in Leader/06 (Library of Congress)
- CONSER Cataloguing Manual: Module 31: Remote Access Computer Files Serials
- Guidelines for the Use of Field 856 (MARC 21 Formats)

3. AACR2 provides rules for cataloguing of electronic (including Internet) resources in Chapter 9 and 12. The following section gives extracts from AACR2R, which are relevant for discussion of cataloguing of electronic resources.

- Title and statement of responsibility
- Edition area
- Type and extent of resource
- Publication, distribution, etc

- Physical description
- Series
- Note
- Standard number and terms of availability

4. A MARC record is a **MA**chine–readable **C**ataloguing **R**ecord. “Machine– readable” suggests that a computer can read and interpret the data in the cataloging record. The U.S. Library of Congress serves as the primary source of cataloging records for all American and international publications. When the Library of Congress began to use computer in the 1960s, it devised the LC MARC format, a system of using brief numbers, letters, and symbols within the cataloging record itself to mark different types of information. The original LC MARC format evolved into MARC 21 and has become the standard used by most library computer programs. The Library of Congress maintains the MARC 21 bibliographic record format, as well as all official MARC 21 documentation. For more detail you may look at http://www.loc.gov/marc.

5. The name "Dublin" is due to its origin at a 1995 invitational workshop in Dublin, Ohio; "core" because its elements are broad and generic, usable for describing a wide range of resources. The Dublin Core is one of the most well known metadata formats. It is considered to be an efficient and simple metadata system for describing resources. The application of the Dublin Core of elements has been designed to cover not only the types of resources housed in libraries, galleries, and other typical depositories of information, but also for use on the Web. The Dublin Core Metadata Element Set is a vocabulary of fifteen properties for use in resource description. The following are the Dublin Core 15 elements:

1. Tile
2. Author or Creator
3. Subject and Keywords
4. Description
5. Publisher
6. Other Contributor
7. Date
8. Resource Type
9. Format

10. Resource Identifier
11. Source
12. Language
13. Relation
14. Coverage
15. Rights Management

Keywords

ASCII: American Standard Code for Information Interchange. A standard character-to-number encoding scheme used widely in the computing industry. The term “ASCII” is also used to refer to electronic files that consist only of plain text.

Blog: A Web site (or section of a Web site) where users can post a chronological, up-to-date entry of their thoughts. Basically, it is an open forum communication tool that, depending on the Web site, is either very individualistic or performs a crucial function for a company.

Content designator: The codes and conventions established explicitly by MARC 21 to identify and further characterize the data elements within a record and to support the manipulation of the data

Data element: A defined unit of information.

Data element identifier: A one-character code used to identify individual data elements within a variable field. The data element may be any ASCII lowercase alphabetic, numeric, or graphic symbol except blank.

Data field: A variable field containing bibliographic or other data. Data fields are assigned tags beginnings with character other than two zeroes. Data fields contain data in any MARC 21 character set unless a field-specific restriction applies.

DCMES : Dublin Core Metadata Element Set.

Direct access (Computer files) : The use of computer files via carriers (e.g., disks, cassettes, cartridges) designed to be inserted into a computer or its auxiliary equipment by the user.

Eelement : An element is a property of a resource. As intended here, "properties" are attributes of resources -- characteristics of a resource, such as a Title, Publisher, or Subject. Elements are formally defined terms which are used to describe attributes and properties of a resource.

Electronic resource: Material (data and/or program(s)) encoded for manipulation by a computerized device. This material may require the use of a peripheral directly connected to a computerized device (e.g., CD-ROM drive) or a connection to a computer network (e.g., the Internet).

Email (electronic mail): A system whereby a computer user can exchange messages with other computer users (or groups of users) via a communications network utilizing a standardized protocol. Some electronic journals are available via electronic mail subscriptions, either through an electronic mailing list or by direct email from the distributor of the serial.

File (Electronic resources) A basic unit in which electronic resources are organized and stored. Electronic resources can contain one or more files. See also Electronic resource.

FTP (File Transfer Protocol) ; A protocol that defines how to transfer files from one computer to another; also the access method used to move files from a remote location to a local site for use. To retrieve files, the user initiates an FTP session by logging into a remote host computer, changing to the desired directory, and retrieving the files.

General Material Designation: A term indicating the broad class of material to which an item belongs (e.g., sound recording).

HTML (Hypertext Markup Language) : A subset of Standard Generalized Markup Language (SGML). The language in which World Wide Web documents are written about the document and/or determines how a document is displayed in a browser.

Hypertext Markup Language(HTML): The standard text-formatting language for documents on the World Wide Web. HTML text files contain content that is rendered on a computer screen and markup, or tags, that can be used to tell the computer how to format that content. HTML tags can also be used to encode metadata and to tell the computer how to respond to certain user actions, such as a mouse click.

Indicator: A data element associated with a data field that supplies additional information about the field. An indicator may be any ASCII lowercase alphabetic, numeric, or blank. Indicators are not used in control fields.

Internet: The world-wide “network of networks” that are connected to each other, using the IP protocol and other similar protocols. The Internet provides file transfer, remote login, electronic mail, news, and other services.

Leader: A fixed field that occurs at the beginning of each record and provides information for the processing of the record.

META tag: The HTML element used to demarcate metadata on a Web page. <META> </META>.

Qualifier :"Qualifiers" is the generic heading traditionally used for terms now usually referred to specifically as Element Refinements or Encoding Schemes. A qualifier must follow the Dumb-Down Principle. There are two broad categories of qualifiers: Encoding schema and Element refinement.

Record: A collection of data elements describing or identifying one or more units treated as one logical entity.

Remote access (electronic resources) : The use of electronic resources via computer networks.

SGML (Standard Generalized Markup Language): A standard for formatting textual documents so that they can be read by different document processing tools.

Tag: A three character strings used to identify or label as associated variable field. The tag may consist of ASCII numeric character (decimal integers 0-9) and/or ASCII alphabetic characters (uppercase or lowercase, but not both).

Telnet: The Internet protocol for remote terminal connection service. Telnet allows a user at one site to log in and interact with a system at another site just as if the user’s terminal were connected directly to the remote computer.

Uniform Resource Identifier (URI) : The syntax for all names/addresses that refer to resources on the World Wide Web.

Uniform Resource Locator (URL) :A technique for indicating the name and location of Internet resources. The URL specifies the name and type of the resource, as well as the computer, device and directory where the resource may be found. The URL for Dublin Core Metatdata Initiative is <http://dublincore.org/>.

URI (Uniform Resource Identifier): Provides a standard syntax for locating files using existing Internet protocols as in a Uniform Resource Locator (URL) or by resolution of a Uniform Resource Name (URN).

URN (Uniform Resource Name): A URI that has an institutional commitment to persistence, availability, etc. A particular scheme, identified by the initial string "urn:", that is intended to serve as a persistent, location-independent, resource identifier. (CCM)

World Wide Web (WWW): A hypertext-based system for locating and accessing Internet resources, which presents materials to the user in the form of interlinked documents (which can include text, images, and digitized sound).

XML: eXtensible Markup Language. XML is a pared-down version of SGML, designed especially for Web documents. It enables Web authors and Web developers to create their own customized tags to provide functionality not available with HTML.

References and Further Reading:

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7. http://dublincore.org/

8. http://loc.gov/marc/

9. http://www.oclc.org/oclc/man/9256cat/toc.html

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Master of Library and Information Science

M.Lib.I.Sc - 2

Organisation of Information Resources

BLOCK - 4

Block

4

PRESERVATION OF INFORMATION RESOURCES

M.Lib.I.Sc - 2: ORGANISATION OF INFORMATION RESOURCES
Block - 4 : PRESERVATION OF INFORMATION RESOURCES

Introduction

This Block comprises four units as detailed below:
Preservation and conservation of written records is an age old practice since the time of civilization of writing began. Over the period the formats of recorded media are changing and so the methods of preservation and conservation. In the early years attention was given for the conservation. The advent of palm leaf manuscripts Papyrus Rolls brought in newer methods of preservation and the advent of binding was once upon a time was a exquisite piece of art Binding is the longest surviving method of taking care of books and their preservation.

The concept of archives showed newer ways of preservation and became a specilised field of study. The advent of Archives was not only a store-house for Archival materials but place for training in preservation. Binding and archiving became the stable methods of preservation in libraries and archives..

In late 1960s the Microfilming came as a modern method of preservation of archives and for primary and specialized sources of information. Microfilm revolution brought in high storage capacity. Microfiche and Ultra-microfiche and remained for a very long time as the modern technique, not only as beneficial methods of preservation but also brought in several advantages with them.

The computer storage, in magnetic and optical media entering in 1980s, has totally changed the concept of preservation and conservation. The digital method of preservation surpassed the advantages of microforms and today digitization, and 'born digital' have come to be most stable, cost effective methods. However, the obsolescence of technology both in hardware and software have brought in newer issues, and there are some solutions in store now. However preservation and conservation continue to be the areas of interest of library and information professionals.

Dr. N. S Harinarayana

ORGANISATION OF INFORMATION RESOURCES

Block - 4

Preservation of Information Resources

Unit - 13

Concept of Archiving, Preservation and Conservation

Structure

13.0 OBJECTIVES :

Preservation and conservation of records of civilization is an age old vocation. The libraries since their early years were meant to 'preservation for posterity'. The concept of archiving became a candid method of preservation and conservation. During the last 100 years the concepts of archiving, methods of preservation and conservation of recorded media has changed with the changes in physical forms of documents. Sever methods are adopted and evolved. It is the objective of this unit to explore them and to come to the modern digital methods of archiving, preservation and conservation methods.

The objectives of this Unit are :

- To know the concept of archiving
- To know the methods of preservation and conservation
- To know the recent document management systems
- To know the concept of digital archiving

13.1 INTRODUCTION

One of the main objectives of libraries has been as the old adage states "preservation for posterity". It was revived with "Books are for use" the philosophy of five laws of Library Science enunciated by Dr.Ranganathan. The libraries later growing in size and dimension hence started thinking of reviving preservation and conservation. There was parallel growth of archival collection of handwritten and manuscripts documents and the libraries engaged in identifying newer methods of preservation and conservation. In 1960s and 1970s the revolution of microforms was seen as a viable method in this regard. The impact of IT and the digital revolution evolved in 1990s gave

brighter solutions to the consistent problems of preservation of ever growing print media. So this Unit would deal with them in systematic manner and introduce all these method in the preservation and conservation of information resources in the Libraries in particular, and in others in general. Today digitization has entered a new phase of development in document management systems and it is evolving into a specialized field of application with the mixture of different professionals.

13.2 CONCEPT OF ARCHIVING.

13.2.1 Meaning of Archiving:

The concept of archiving consists of a group of terms with distinct and clear meaning. According to Harrod's Glossary, the primary function of an archive depository is to provide adequate facilities for the care, protection and maintenance of archives of whatever kind. The specific individual and collective measures taken for the repair, restoration, protection and maintenance of archives.

The terms are Archive, Archives, Archiving, Archivist, Digital Archives, Archival Documentation and Archival Administration and so on. The meaning of each of these concepts taken from standard sources like Harrod's Glossary and other works is given here. They would be self explanatory to distinguish them from one another.

a) Archive :

The Dictionary meaning of Archive is repository, storage, museum or vault (a safe custody). It also means to state a building a facility or area that houses an archival

collection (the term repository is preferred by most archivists). Also to place documents in storage, usually to preserve them as a historical, informational, legal or evidential records, permanently or for a finite or infinite period of time.

b) Archives:

1. Public records or historical documents kept in a recognized repository.

2. Archives are often viewed as old, decaying and musty.

2. Documents which formed part of an official transaction and were preserved for official reference these include documents specially made for, and those included in, an official transactions.

3. A collection of original records assembled in the course of normal activity of a person or persons, or of a public or private organization, or such records from number of different sources kept together to ensure their preservation.

4. An organized collection of non-current records of the activities of a business, government, organization, institution or other corporate body or the personal papers of one or more individuals, families or groups, retained permanently by their originator or successor for their permanent historical, informational, evidential, legal, administrative or monetary value usually in a repository managed and maintained by a trained archivist.

5. Archives as an organisation in its meaning refers to 'the place where public records and historical documents are kept. As materials it is referred to the records and the documents themselves. In simple terms is a collection of historical records or

documents. The computer jargon of archive is “computer transfer (data) to a less frequently used storage medium.

6. The term is also now used in academia to refer to a depository of electronic reprints, working papers, and similar documents commonly called – e-print archives used in this sense that there is no implication of archival management which has caused some confusion. For example the broad purpose of Open Archives Initiative.

7. Archives are indicate an assembly of writings, papers, documents, sound recordings and so on. They are from a variety of unconnected sources but which together provide a body of evidence about an activity or way of life, which is either defunct or dying out and which for this reason have been purposefully brought together in order to preserve the information they contain for the future generations.

c) Archival Documents:

A document which it is expected will be kept permanently, as near as possible in its original form, for the evidence which it might afford both in itself and within its context.

d) Archival Administration:

The collection and conservation of archives their organization for use, and the theoretical and practical studies of such procedures.

e.) Digital Archive:

A system designed for locating, storing and providing access to digital materials over a long term. A digital archive may use a variety of preservation methods and ensure that materials remain usable as technological changes including emulation and migration.

The National Digital Information Infrastructure and Preservation Program of Library of Congress (NDIIPP) is an example of a program aimed at preserving digital content. Digital archives – archival material that have been converted to machine readable format usually for the sake of preservation or to make them more accessible to users. A prime example is “American Memory” a project undertaken by the Library of Congress to make digital collection of primary sources available via Internet. Also in electronic format preserved for its archival value.

Definitions of archive and archiving in different environments are hereunder.

1. An archive is a collection of documents, and in some senses, the building(s) it's kept in. These documents, which can be in any media, are normally unpublished records instead of books and periodical publications. Archives are sometimes personal but usually belong to large organizations such as firms and governments

2. There are two Internet-oriented definitions of archive. A group of files compressed into a single file, which then used for storage or transfer. Common archive types include Zip (.zip) and .tar internet sites that house files for its users to download.

3. An archive is a reserved location for a group of files with the intent to preserve the information in those files. Files that make up archives are often stored in what is called a “Zip” file. Zip archives are convenient for containing files that you want to preserve as backups or as a convenient way of sending multiple files to someone.

4. A consistent copy of a collection of data, usually taken for the purpose of maintaining a long-term durable record of a business or state. Archives are normally used for auditing or analysis rather than for application recovery.

13.2.2 History of Archives in India:

It is claimed that the Portuguese were the first to establish the archives in India. The Arquivo Geral e Historico da India Portuguesa with the initiao 1500 collect was started and they were of the Secretariate of the Government and later developed into a separate Directorate of Historical Archives. After independence of Goa its Portuguese name Arquio Historico do Estado da India was changed to Historical Archives of Goa.

The British established the Imperial Record Department in 1891. The history of Records Management both in England and India got a boost with the formation of First Royal Commission of Public Records in 1910 by the British Government in England, and it was a milestone in historical records management. The British issued number of instructions to the Indian Archives pertaining to methods of preservation and publication of records. The shifting of the capital from Calcutta to Delhi in 1911 marked the event of establishing the National Archives of India. This also paved the way for the formation of the Indian Historical Records Commission in 1919. This Commission urged both National and State Archives to encourage research by permitting bonafide research scholars to refer to archival records and it was conceded in 1930. After Independence the Imperial Records Record Department was named as National Archives of India. The

archival legislation has been enacted in India entitled " Public Records Act, 1953". This legislation offers the National and State archives an active role in record management, records appraisal, record transfer and preservation.

13.2.3 Examples of National and State Archives:

1. **National Archives of India (NAI):**

The central government records are preserved in National Archives of India. NAI has also procured a good number of microfilms of records from India Office Library. An important feature of NAI is that it has made available some old newspapers on microfilms. Its library has a very rich collection of rare books and newspapers, printed during 18th Century.

2. **Karnataka State Archives (KSA):**

The Karnataka State Archives is a repository of non-current records of the Government and holding them in trust for the use of Administrators and Scholars. Here "Archives" and "Records" are used as synonymously. Records are testimonies in writing of day-to-day transactions of individuals and institutions, and the Archives are the non-current records of enduring value permanently kept in proper custody for the use of scholars. Archives do not concern Government records alone. They include Ecclesiastical (Religious) Archives, Business Archives, Industrial Archives and other Private Archives.

The Karnataka State Archives is a treasure of historically important documents. It contains source material relating to the History of Mysore, i.e., establishment of the

British Rule in Mysore, French records relating to the correspondence between Hyder Ali - Tippu sultan and the French, and attempts made by the Indian National Congress to out the British from Princely State of Mysore, and Unification Movement, etc. In addition to the above Kannada -Marathi Modi records, and Gazettes from 1866 are available. Most of the records are in English, few are in French, Marathi Modi and in Kannada. Public/Scholars, officers and Officials of Government and Semi Government Organisations avail these records for reference

13.3 PRESERVATION AND CONSERVATION

13.3.1 Meaning of preservation and conservation:

Reading materials especially books represent a life long efforts and hard labour of research undertaken by philosophers, scientists, sages, litterateurs. It is rather a religious duty of Library and Information professionals to preserve and conserve this knowledge in an appropriate manner for the future.

The terms 'Preservation', 'Conservation' and 'Restoration' are often used as synonyms. But each of the terms has distinct and significance.

a) Preservation: Preservation is defined as "activities associated with maintaining library and archival materials for use either in their original physical form or in some other usable way".

As per IFLA professional report no. 8, 'Preservation' includes all the managerial, financial and technical considerations applied to retard deterioration and extend the useful life of the library materials to ensure their continued availability. These considerations include appropriate environmental conditions and storage, physical protection, exhibition and loan policies, proper handling procedures, emergency planning the use of surrogates and application of conservation treatment. It also includes accommodation provisions, staffing levels, policies, techniques and methods involved in preserving library and archival materials and the information contained in them.

One of the core functions of the Libraries and the archives is also to undertake preservation. The preservationists in the library and archives as specialist have developed number of tools, techniques and methodologies to the decrease the loss of traditional materials and to restore books and other documents, by adopting them to increase the longevity, life and usability of library materials. The purpose of preservation is to ensure protection of information of enduring value for access by present and future users.

b) Conservation: Intervention techniques applied to physical forms to archive chemical and physical stabilization for the purpose of extending the useful life of library materials to ensure their continued availability. Conservation denotes those specific policies and practices involved in protecting library and archival materials from deterioration, damages and decay including the methods and techniques of conservation devised by technical staff.

c) Restoration: It denotes those techniques and judgments used by technical staff engaged in restoring library and archival materials damaged by time, use and other factors. In other words, preservation has two aspects i.e. preventive preservation known as restoration.

13.4 CONCLUSION:

The archive, archives and preservation and conservation are age old concepts. The method of record keeping has different dimensions and the archives as institution are established to preserve them and put them into service of users for a long time to come. The traditional and modern technological methods are being adopted in this context and over period of time these have been practiced by Libraries, Archives and other similar institutions. Microfilming and digital preservation systems have emerged from this need.

The libraries since their early years were meant to 'preservation for posterity'. The concept of archiving became a candid method of preservation and conservation. During the last 100 years the concepts of archiving, methods of preservation and conservation of recorded media has changed with the changes in physical forms of documents. In 1960s and 1970s the revolution of microforms was seen as a viable method in this regard. The impact of IT and the digital revolution evolved in 1990s gave brighter solutions to the consistent problems of preservation of ever growing print media. Today digitization has entered a new phase of development in document management systems.

The terms are Archive, Archives, Archiving, Archivist, Digital Archives, Archival Documentation and Archival Administration are used in this context are clearly defined. It is claimed that the Portuguese were the first to establish the archives in India.

The British established the Imperial Record Department in 1891 and later it was named as National Archives of India.

It is rather a religious duty of Library and Information professionals to preserve and conserve this knowledge in an appropriate manner for the future. The terms 'Preservation', 'Conservation' and 'Restoration' are often used as synonyms. But each of the terms has distinct and significance. Preservation is defined as "activities associated with maintaining library and archival materials for use either in their original physical form or in some other usable way". Conservation denotes those specific policies and practices involved in protecting library and archival materials from deterioration, damages and decay including the methods and techniques of conservation devised by technical staff. In other words, preservation has two aspects i.e. preventive preservation known as restoration.

Self Check Exercises:

1. Define archive and the related concepts to distinguish their differences.

2. What are preservation, conservation and restoration?

Note:

i) Write your answers in the space give below.

ii) Check your answers with the answers given at the end of this Unit.

13.5 ANSWER TO SELF CHECK EXERCISES

1. An archive is a collection of documents, and in some senses, the building(s). These documents, which can be in any media, are normally unpublished records instead of books and periodical publications. Archives are sometimes personal but usually belong to large organizations such as firms and governments The concept of archiving consists of a group of terms with distinct and clear meaning. The terms used in the conceptual relation are Archive, Archives, Archiving, Archivist, Digital Archives, Archival Documentation and Archival Administration and so on.

The Dictionary meaning of Archive is repository, storage, museum or vault (a safe custody). It also means to state a building a facility or area that houses an archival collection Archives are often viewed as old, decaying and musty. A collection of original records assembled in the course of normal activity of a person or persons, or of a public or private organization, or such records from number of different sources kept together to ensure their preservation.

A document which it is expected will be kept permanently, as near as possible in its original form, for the evidence which it might afford both in itself and within its context. The collection and conservation of archives their organization for use, and the theoretical and practical studies of such procedures. A digital archive may use a variety of preservation methods and ensure that materials remain usable with changes including emulation and migration.

2. The books represent a vast collection in libraries all over the world and are the creation of philosophers, scientists, sages, litterateurs with their unstinted, life long efforts and hard labour. It is the duty of Library and Information professional to make them accessible to users. Hence 'Preservation', 'Conservation' and 'Restoration' are Librarians religious functions

Preservation is defined as "activities associated with maintaining library and archival materials for use either in their original physical form or in some other usable way". The IFLA professional report no. 8, states 'Preservation' includes all the managerial, financial and technical considerations applied to retard deterioration and extend the useful life of the library materials for their continued availability.

Conservation denotes those specific policies and practices involved in protecting library and archival materials from deterioration, damages and decay including the methods and techniques of conservation devised by technical staff.

Restoration means the techniques and judgments used by technical staff engaged in restoring library and archival materials damaged by time factors. In other words preventive preservation is known as restoration.

13.6 KEYWORDS

Archive : The Dictionary meaning of Archive is repository, storage, museum or vault (a safe custody).

Archives: 1. A collection of original records assembled in the course of normal activity of a person or persons, or of a public or private organization, or such records from number of different sources kept together to ensure their preservation. 2 Archives as an organisation in its meaning refers to 'the place where public records and historical documents are kept.

Archival Administration: The collection and conservation of archives their organization for use, and the theoretical and practical studies of such procedures.

Digital Archive: A system designed for locating, storing and providing access to digital materials over a long term.

13.7 References and Books for further reading:

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2. Harrod's Librians' glossary of terms used in Librarianship, documentation and book craft and Reference book. Ed5. Rev. and Updated by Ray Prytherch. Aldershot, Gower, Grafton Books, 1984.

3. Gates, Jean Kay: Guide to the use of books and libraries. Ed4. New York, McGraw-Hill, 1979.

MLISc -2

ORGANISATION OF INFORMATION RESOURCES

Block - 4

Preservation of Information Resources

Unit – 14

Needs for Preservation

Structure

14.0 OBJECTIVES :

Traditionally preservation and conservation of reading materials is a basic function of libraries and it begins with some simple but effective methods. For example in order to take care of books in libraries, it is necessary that books should not be shelved too loosely or too tightly. Libraries especially in tropical and subtropical countries must protect the books from the ravages of insects, rodents, micro-fungi, dampness, dust, desiccation, violent rain storms, and sand storms.

14.1 INTRODUCTION

The need of preservation and conservation is to provide and promote wider access to these materials to the users. The need for library conservation in particular is necessary in tropical and sub-tropical countries, because of climatic and environmental

conditions in these countries as the library materials are prone to be adversely affected or damaged too soon.

The preservation need is assessed by several in depth studies called Needs analysis. There are one or two ways of assessment of preservation needs. From different types of needs analysis following are considered as appropriate:

- Item by item approach to preservation and conservation needs.
- Preparation of a descriptive report.
- Simple base on the need for the preservation.

The key components of preservation needs are :

- Access
- Use
- Accommodation
- Conditions and usability
- Value importance
- Policy; and
- Condition assessment

14.2 TRENDS IN PRESERVATION AND CONSERVATION:

To effectively discharge the function of preservation and conservation of library materials it is also necessary to know the materials used in the preparation of the books. In fact paper, parchment, tracing cloth, leather, binding materials and the ink are

the main constituents of a book. In the last few decades, new methods of archiving and preservation like, Microfilming, A-V Materials and Computer readable sources of information in the form of Magnetic tapes/disks were employed. The advances in Information technology, especially the optical storage devices like CD-ROM and DVD and the widely accepted digital methods have also become the part of document archiving, preservation and conservation by the libraries. Apart from these library also contain some speicalised materials, like periodicals, newspapers, pamphlets, paper clipping, manuscripts, maps and globes. Now apart from publishers, enterprises in digital archiving are on the increase. For example the Gale Digital Collections by the Thomson Gale, who have released "The Times Digital Archive, 1785-1985' in 2002 and the JSTOR now famous for the Journal Archiving dating back as for as a Century, are now put into use. The trend of 1970s set in for the Microfilming of archives is now taken over by the digital archives and it is considered to be one of the widely accepted method of archiving, preservation and conservation of rare and classic documents and facilitating their global access through computer networks.

14.2.1 Electronic Records Management:

The decade of 1990s will be remembered as a period that witnessed an incredible diffusion of Information Technology through a massive and unanticipated spread in the use of Personal computers (PCs) and the :Local Area Networks, the maturing of Internet and the development of the World Wide Web and its enabling browser interface software. It was a decade that saw emergence of networking and wide spread sharing of

information resources. Electronic Records Management one such area which has caught up the IT developments and today digital library has become a buzz word spoken by all. The electronic Records Management is primarily of archival materials and selection of them is one of the chief areas of this subject.

14.2.2 Categories of Preservation:

1. Preservation of Intellectual Content :

   The intellectual content is preserved through reproduction – and common methods are – commercial, reprinting, microfilming and micropublishing.

2. Preservation of Artifact or Distinctive materials:

   Where a book Manuscript or related object has a value as an artifact for reasons of age, beauty, rarity and historical and bibliographical significance or lasting value or where it has physical features such as fine or colour photo, illustrations or foldout, maps and charts, the physical artifact must normally be preserved.

3. Mass preservation procedures:

   Preservation of both artifact and non-artifact materials – implications which are largely economical, with non-artifact materials, it seems possible that techniques can be devised which will make it cheaper to preserve the physical book than to copy or produce it. For artifacts mass methods may help to reduce the frighteningly high cost of physical treatment.

14.3PRESERVATION METHODS :

a) Environment Control:

- Environment takes toll of large number of printed materials. Temperature control one of the factors which regulates environment control.
- Relative humidity is an area which the preservation needs to be considered.
- Avoidance of direct sunlight is another precautionary measure.
- Provision for fire protection and adequate environment controls be incorporated into new library and archival facilities.

b) Handling and Storage Practices:

- Handling of books: Minimizing damages due to handling practices is use of common sense and attitudes of carefulness on the part of both staff and user. There are some specific book handling rules that should be observed – for example books should never be pulled off the shelf by the head caps.
- Shelving: Improper shelving practices are sources of damage to books. The shelves should be smooth, without sharp edges or abrasive finish. Books should be stored upright on the shelf – with books ends or supports.
- Photocopying: It is an example of two edged sword. On the one had it provides the possibility of preserving the intellectual content of brittle books and of reducing wear tear on valuable books to the extent that users can be persuaded to use copies rather than the originals. Copying is inherently somewhat stressful to books and potentially disastrous.
- Enclosures and protective coating materials. Use of plastics.

- Physical treatment methods such as paper treatment, Book binding, restoration of binding and other aspects.

Besides the above aspects in the preservation and storage methods, the other considerations are –preservation personnel, examining preservation literature to adopt newer methods, organization and management of preservation and the study of preservation standards. Microfilming and micropublishing in the decade 1970s was considered as a cooperative, regional and national preservation programme too.

14.3.1 Binding: Preservation and Conservation Method

The binding of books is both a craft and an art, even though the artistic aspect is of less important in age of electronic media. The binding process involves ; "Forwarding" as the first part and "Finishing " as its second part. Forwarding involves lettering and decoration, which requires high technical skills, good knowledge of materials and processes. Finishing is the actual work process and is carried out in stages.

Stages of Book-binding

1. Collation
2. Sewing
3. Attaching covers
4. Endpapers
5. Gilding

6 Headbands

7. Hollow Backs

8. Finishing

a) Collation:

Collation is the first task in the binding process. All the parts and the pages of a book have to be correctly sequenced. The periodicals collation is a very important step. Binding worn out, torn, soiled and damaged documents special care has to be taken at the time of collating. Collation is a difficult job in case of rare books, manuscripts and other printed books which are not generally paged.

b) Sewing

Sewing is a very important job in binding. The life of a binding actually depends upon the kind of sewing and the materials used for sewing. The thread used for binding should be superior, the life of binding depends completely on thread, the card or tapes than any other material, apart from the paper.

c) **Attaching Covers**

The board is then attached to the book, pressed and the glue is allowed to dry.

d) Endpapers

Sheets before and after the text of a book are called endpapers. They may or may not be decorated.

e) Gilding

Gilding or colouring edges may be done either at the time of trimming the edges or after cutting the boards. The **purpose** of gilding or colouring is primarily to protect the books.

f) Headbands

Headbands function is as decorative piece. The back is lined up using different methods of lining up.

g) Hollow Backs

Hollow backs help save the spine from cracking. This kind of back is achieved by marking a kind of ’tube’ with heavy wrapping paper. A paper three times the width of the spine is taken and one thickness is glued with the spine and two thicknesses apart from the spine.

The binding is covered either wholly or partially by leather, cloth or paper. All the above processes described so far are known as ‘forwarding’.

h) Finishing

Finishing is the final process of making the binding more artistic and attractive. This includes:

- Preparation of the leather covering
- Imaginative design for the cover
- Tooling i.e. fixing the title, call number of the book, etc.

On the spine or at any other place on the cover

- Decoration i.e. giving the final touches to get a finish

14.3.2 Different kinds of Library bindings:

a) Full leather Binding: Full leather binding means that whole of the card board is covered by leather. Books which are very expensive and are rare may need this kind of binding.

b) Half-leather Binding: This is a type of binding wherein half the board is covered with leather and the rest by cloth or buckram. The back and the corners are covered by leather as they are the portions which need protection.

c) Full Cloth Binding: The boards of books are covered completely with cloth in this type of binding. Generally this kind of binding is given to standard books and textbooks which are very heavily used.

d) Half cloth binding: The spine and corners of the board are covered by cloth and the rest of the cover board is covered by cheaper materials such as paper and other decorative materials.

e) Perfect Binding: The need to find a less expensive process for binding paperbacks led to the development of the 'perfect binding' – considered as the most imperfect. This substitutes an adhesive for sewing.

f) Plastic covering for Books: Librarian are always interested in attempts at preserving the freshness of new books for as long as possible, particularly those with artistic and decorative dust jackets. A colourful dust jacket attracts the patrons to the books. Various methods have been tried to prolong the life of these fragile papers, such as backing them, with different paper or attaching them to the books cover. However, the most effective method is to attach transparent plastic (PVC foil) covers to the book. These covers are reasonably priced and can be easily fitted. The book is also protected from the elements, thereby achieving the objectives of conservation. They are sometimes available in prepared 'sleeves' and the foil is available in rolls of various gauges of thickness.

14.3. 3 Binding Materials

The quality of binding depends on the type of binding material. One should be conversant with the types and quality of binding materials. They are:

a) **Covering Materials**: Include the boards and the materials used in covering these boards. The material includes Leather, Cloth and Paper.

b) **Sewing Material**: Sewing Materials are thread, thread gauze and tapes.

c) **Adhesives**: Adhesives like paste, glue and gum.

d) **Decoration Materials:** These include the dust cover and lettering material.

a) Covering Materials

i) Leather: Leather was the primary covering material used for books until the third decade of the 19th Century. It is later the commercial publishers began to use the Cloth as a covering material. Because of its pliability, strength and permanence leather is considered to be an ideal covering material for forwarding, finishing and tooling and lettering purposes. The Kinds of principal leather material used in bindings are:

a) **Morocco** made from goat skin of Persian, Niger and Levant varieties.

b) **Roan** is a kind of inferior skin is different from Persian Morocco and of cheaper variety.

c) **Pigskin** is the strongest leather of all, durable and used for heavy books.

d) **Sheep Skin:** It is very good in quality, attractive, brown in colour, soft and durable.

e) **Calf Leather:** Though not durable, it is smooth, delicate and beautiful.

f) **Imitation Leather:** High cost of natural leather, imitation leather and leather cloth are made.

ii) Cloth: Good binder's cloth is equally durable and less costly than leather. They make excellent covers for all types of library materials. The present technology has introduced water proof and oil resistant cloth with many varieties.

iii) Cloth Substitutes: A material made up of strong fibre like unlaundered paper is substituted for cloth. This substitute looks strong enough but weaker than cloth.

iv) Paper: The boards are covered with some colourful or cancy thicker paper, for giving a pleasing look and as well as protecting the cardboard. Many children's books and other popular books are bound in this manner. Wooden boards were used before paper boards were available but now a variety of paper boards is available. They are straw board, mill board, grey board, split boards.

v) Straw Boards: Made up of straw, they are cheaper, used for smaller and cheaper books.

vi) Mill Boards: Made up of old hump and other rags. They are strong, tough and hard wearing. Mill boards are good quality boards user for standard books.

vii) Grey Boards: They are medium quality boards, compact and hardwearing.

viii) Spilt Boards: Split boards are generally used for reinforced library binding. Thick black mill board is glued to thick straw board to get these split boards.

b) Sewing Materials

i) Thread: Sewing is the central operation in binding. The life of binding depends very much on the kind of sewing and the material used for sewing. Thickness of the thread must be appropriate to the thickness of the book. Thread used should be of superior

quality otherwise, binding may become undone causing wastage. Irrespective of the sewing method, sewing depends on the quality of thread. The varieties of thread include cotton, linen, silk, nylon and terylene. Linen thread is much stronger and cheaper than cotton. Silk thread is much stronger and cheaper than cotton. Modern synthetic fibres are much stronger and uniform. These are free from any tendency to rot in dampness and retain strength upon wetting.

c) Adhesives: Adhesives, though necessary for binding also damage the binding. There are varieties of adhesives and they are, starch paste, industrial paste, glues and gelatins etc.

d) Decoration Materials:

Decoration is one of the processes in ‘finishing’ which has already been explained in the earlier section of this unit. Generally leather, cloth and canvas have been used for the purpose of fine covering for the binding. Generally gold tooling or white lettering is used for decorative purposes.

14.4 Microforms and Digitization Methods

Libraries and Librarians are professionally and traditionally responsible for preserving historically and culturally valuable materials like books, periodicals and newspapers for posterity. As millions of books and newspapers are slowly crumbling due to the 'slow burn' of acid in their paper; inks fade while the paper yellows; film stock, phonograph disks, and photographic plates turn brittle or fall apart; mold and parasites

take their toll, the libraries are becoming very alert and active to use the modern digital preservation methods as traditional preservation methods, such as de-acidification, will be useful only to certain time period. Hence libraries all over the world were in the process of transferring the intellectual content of the object to a new medium, such as microfilm, acid free paper, fresh celluloid, or videotape and the digitization, obviously a new option among many, and that provide world wide access to these digitized documents via the Internet.

14.4.1 Microfilming and Micropublishing:

The use of microfilms for preservation and documentation was started as early as in 1929, with the League of Nations Committee of Library Experts suggested to adopt microfilm for documentation. In 1935 the US Government took the firm step of a massive microfilm programme with the filming of 3,00,000 pages of hearings of the National Recovery Administration and Agricultural Adjustment Agency to meet the demands for the copies of documents by the libraries. Thus began the process of using the Microfilms as one of the viable methods of document preservation.

The University Microfilms International used the Microfilm as the best method of preserving and distribution of Dissertations. Microforms thus have found the archival value since 1950 in large scale and were found to be best suited for security, preservation and protection of records in Libraries, Manuscript Libraries and in Archives. The

microforms it was considered has several years of life and have reduced the risk of mutilation, decay and loss.

The Micropublishing was adopted out of the ability to preserve rare, valuable and important records and documents for use and safety. There were several categories of documents which were generated out of the micropublishing. It is defined as the documents published in microforms and particularly the specialized documents. The types of documents subject to micropublishing were :

1. Original publishing of specialized documents for research and development requirements.
2. Parallel publishing - that is publishing both on paper and in microforms.
3. Republishing traditional micropublishing : Selected title of books,

   Library collection: Books, Serials and newspapers collections etc.

The Microfilming was used for the preservation of variety of documents in the Libraries, Archives and in Manuscript Libraries. However, especially microphotography found to damage the originals and found as a costly process and could be preservation for a few decades, hence digital technology came into use.

14.4.2 Digital Preservation Method:

The digital technologies have the advantage for viewing or executing digital content that has given rise to evolve need to preserve the documents in digital form. Preserving digital information in a useable form, could entail preserving an entire configuration of hardware and software.

Many resources of historical and cultural value – from print on paper and video cassettes to audio tapes and manuscripts deteriorating, crumbling or becoming unreadable for technical reasons are converted into digital form to preserve their content and also make them accessible easily. For example the Department of Preservation and Conservation at the Cornell University Library developed good methods of digitizing the documents of all categories. It is one of the excellent sources of technical advice on digital preservation. An extensive documentation on the hardware, software, metadata, and management issues involved in digitizing research materials is prepared. The Cornell method focuses on creating a high quality digital master good enough to meet both present and foreseeable future needs. The long-term value of a digital collection, they argue, should be defined not by short term technical considerations, but by its intellectual content. For example, projects should anticipate future improvements in optical character recognition technology (OCR) without necessarily using it yet. At the same time, there must be a balance between quality and costs. Projects should start simple, working on large quantities of material with few problems rather than on smaller quantities of material with difficult problems. It is easier to begin with materials that are out of copyright.

14.5 CONCLUSION:

To conclude it can be said the preservation and conservation methods have always been essential in the Libraries. Over a period of change in the media, from Manuscripts to Optical Storage media, the preservation and conservation methods have also undergone

changes. Today the digital preservation is in practice and has been gradually replacing older methods like the binding and microfilming.

14.6 SUMMARY

The needs of preservation and conservation of reading materials are many and it is the basic function of libraries. There are various methods to fulfill these needs and it begins with some simple methods like shelving too.The need of preservation and conservation is to provide and promote wider access to these materials to the users. The need for library conservation in particular is necessary in tropical and sub-tropical countries, because of climatic and environmental conditions. The preservation need is assessed by several in depth studies called needs analysis. There are one or two ways of assessment of preservation needs.

It is also necessary to know the materials used in the preparation of the books like the paper, parchment, tracing cloth, leather etc. In the last few decades, new methods of archiving and preservation like, Microfilming and Computer readable sources of information in the form of Magnetic media were employed.

The 1990s saw emergence Electronic Records Management one such area which has caught up the IT developments and today digital library has become a buzz word spoken by all. There are several Categories of Preservation such as a) Environment

control b) Binding as Preservation and Conservation Method c) Microfilming and Digitisation and these methods are practiced contemporarily.

Self Check Exercises:

1. State the needs for preservation.
2. Enumerate different methods of preservation
3. What are the different types of bindings?

Note :

a) Write your answers in the space provided below.

b) Check your answers with the answers given at the end.

14.7 ANSWER TO SELF CHECK EXERCISES

1. The library materials are to be preserved for the longer need. The need and purpose of preservation is to provide extend the life of materials which are on road to deterioration, mutation and may be lost for ever. The other important needs are to promote wider access to these materials to the users. In tropical and sub-tropical countries, because of hot climatic conditions and other environmental factors there is need for library conservation, as the library materials likely to be affected or damaged too soon.

There are one or two ways of preservation needs as given below.

- Item by item approach to preservation and conservation needs.

- Preparation of a descriptive report.
- Simple base on the need for the preservation.

The key components of preservation needs are :

- Access
- Use
- Accommodation
- Conditions and usability
- Value importance
- Policy; and
- Condition assessment

2. Various preservation methods are :

a) Environment Control:

- Temperature control. l.
- Relative humidity.
- Avoidance of direct sunlight.

c) Handling and Storage Practices:

- Handling of books: Book never be pulled off the shelf by the head caps.
- Shelving: The shelves should be smooth, without sharp edges or abrasive finish. Books should be stored upright on the shelf – with books ends.

- Photocopying:
- Enclosures and protective coating materials. Use of plastics.
- Physical treatment methods.

d) Binding

e) Microfilming and Micropublishing:

f) Digital Preservation Method:

3. The Different kinds of Library bindings are:

a) Full leather Binding: Full leather binding means that whole of the card board is covered by leather.

b) Half-leather Binding: This is a type of binding wherein half the board is covered with leather and the rest by cloth or buckram.

c) Full Cloth Binding: The boards of books are covered completely with cloth in this type of binding.

d) Half cloth binding: The spine and corners of the board are covered by cloth and the rest of the cover board is covered paper and other decorative materials.

e) Perfect Binding: A less expensive process for binding paperbacks. .

f) Plastic covering for Books**: T**he most effective method is to fix transparent plastic (PVC foil) covers to the book. They are available either in prepared 'sleeves' or the foil is available in rolls of various gauges of thickness.

14. 8 KEYWORDS

Binding : The binding of books is both a craft and an art, of providing a protective cover to the books. It involves “forwarding” and “finishing”.

Digitization : Conversion of analog signals or code into digital signals or code.

Microform: A generic term for any format or film or paper with microimages.

Micropublishing : Marketing in new or reformatted information in microform.

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MLISc - 2

ORGANISATION OF INFORMATION RESOURCES

BLOCK – 4

Preservation of Information Resources

Unit- 15

Hazards to Library Materials and Preservation

Structure

15.0 OBJECTIVES :

Preservation is as much a management responsibility as binding. There are numerous hazards and hazardous materials that would damage and mutilate library materials. Librarians should be aware of such hazards and hazardous materials and also should be aware of use of preventive methods, for example, hazards due to fire and flood. In case of prevention and protection from fire sufficient number of fire extinguishing equipments should be installed in the Library and in strategic points. This Unit gives some details on the hazardous materials to library books and other reading materials and the prevention methods.

15.1 INTRODUCTION:

There are various hazardous materials that affect reading materials in the libraries. In fact binding is only one aspect of preservation. Preservation includes maintenance of objects in their original condition through retention, proper care and if it is damaged for restoration. A pre-requisite for successful preservation programme is the need for clear understanding of materials from which items to be stored are made. The reading materials in the Libraries consist of Paper based materials, photographs, slides, microforms, films, video tapes, sound recordings, video and computer tapes and disks.

Following are the three aspects of the problem which are faced in the preservation of reading materials, especially the printed materials.

1. Causes for paper deterioration.
2. Available methods for minimizing these causes.
3. Accepted methods of repairing the damaged records.

Robert Patterson has suggested the following steps for a successful preservation planning:

- Examine the environment in the library and the condition of the collection
- Prepare a disaster plan
- Examine current practices, (binding, handling, processing, repairing) recommend
- Changes and ascertain additional requirements to meet current standards
- Ascertain what professional conservation advice and expertise are available to the library
- Time when an item needs treatment beyond the facilities available in the library or needs
- To be withdrawn from circulation

15. 2 Five Enemies of Library materials

The causes for the damages to and deterioration of books are normally:

i) Insects – Cockroaches, black beetles, termites, white ants, Book worms, fungus, silver fish, firebrats, Brown House Moths, Mud Wasps, Book lice.

ii) Water

iii) Fire

iv) Enemies of Buildings : Dirt, Dust and Cobwebs

v) Human Beings

vi) Vermin ;Rodents, Rats and bats

The greatest enemies of books are dust and dirt. Though air-conditioning is the only final solution, regular dusting and routine cleaning would help avoid the damage. Dust and dirt should not be allowed to accumulate on open shelves as they would create long term problems to the books and other documents as well as to furniture and equipments in the Libraries.

Insects, pests can be disposed off by placing the book, with leaves opened, in a warm cupboard containing paradichlorobenzene crystals for about two weeks. Special attention should be given to old or rare books collection. Ancient bindings with metal bosses and corners and fine ornamental bindings need special care. These bindings have to be either protected by loose cloth covers or enclosed in carefully fitted boxes lined with some soft material to guard against friction. Apart from careful handling these materials should be supplemented by judicious application of leather preservative where appropriate. This fluid cleanses a great amount of dirt from the old bindings and also enhances the appearances of old leather as well as retarding deterioration, without harming the skin.

Control of Insect Pests:

In the control of pests the following questions be asked:

- What kinds of insects are injurious to books and archives?
- What part of the book is each species particularly fond of?
- What are the means of repelling and killing insects?

Based on this the following measure are suggested.

a) Anti-termite Measures – Chemical treatment of buildings especially
b) Fumigation to eradicate other insects
c) Insecticidal Book varnishes and lacquers

Other Measures include:

- For fungous damages the libraries must control the humidity in the library and use fungicides.
- Protections of buildings from fire and flood and termite control are the other measures which have to be carried out at different stages of construction and after construction.

Recommendations on Care and preservation library materials:

a) Prevent Insect attack:

i) Keep all insects out of buildings, as far as possible by rendering the buildings termite-proof and screening windows with mosquito-wire

ii) Lacquer window-sill, window frames, and rear, side and fore edges of bookshelves with insecta-lac.

iii) Brush wooden bookshelves with thick layers of Xylamon-BN-Clear, odour free, colourless & retains original color of the wood.

iv) Use Dieldrex 15 or sodium arsenite to eradicate termites. It is necessary to pump DDT or Gammexane smoke into termiteries that exist under or near

library buildings, it is best to use the services of firms of termite controller operate from different cities.

v) If it is desired to 'poison' the books themselves by application of a protective varnish.

b) To destroy Insects already present:

i) Xylamon –BN-Clear or Xylamon-LX-Natural may be brushed on woodwork and shelves. To destroy larvae already present in the books Fumigation is necessary. The methods of Fumigation are:

- Entire building fumigation
- Vacuum Fumigation
- Fumigation in carrel, cupboard etc.

c) To control Mildew the relative humidity is to be kept below 55 % by means of air-conditioning, Standard de-humidifiers, or home-made units.

d) To preserve book bindings Cire 212 be used for leather bindings. Cloth bindings may be preserved by application of the commercial lacquers and varnishes, and "poisonous' additives are mixed with the paste which will also repel the worms and silver fish.

15.3 **Binding**: Binding is another method of saving the reading materials from hazards and the same described in the previous Unit in detail.

15.7 FACTORS OF DETERIORATION

Deterioration is a change of original state of any material by interaction between the object and the factors of destruction. The different types of deterioration of the paper based materials are reflected in wear and tear, shrinkage, cracks, brittleness, warping, bioinfestation, discoloration, abrasion, hole, dust and dirt accumulation etc. Generally library materials are susceptible to deterioration by the following factors:-

1.Enviornmental (climatic Factors) factors like light, heat, humidity and moisture, dust and dirt, water.
2.Biological factors :- Microorganisms, insects and rodents.
3.Chemical factors
4.Human factors and
5.Disasters

15.7.1 ENVIROMENTAL FACTORS

a. Light :-

Whether natural light or artificial light paper gets deteriorated when it is exposed to light. Especially sun light, has a serious damaging effect on written or printed paper materials. The ultraviolet radiation of light are mainly responsible for photochemical degradation of paper which takes place rapidly when paper is exposed to sun light in presence of air (oxygen). When some portion of cellulose is oxidized to oxycellulose, the long cellulose chains are broken and the paper becomes weak and brittle. Fading of ink and dye of the coloured paper and yellowing of white paper also takes place due to the formation of oxycellulose. Artificial light like fluorescent tube light also radiates a high percentage of

ultraviolet rays which cause deterioration by yellowing the paper. However the amount of damage by light depends upon the following factors.

1)**Intensity of light-** as the intensity of light increases the rate of deterioration of the paper also increases.

2)**Duration of exposure-** the duration of exposure of paper to light is directly proportional to its deterioration.

3)**Distance from the source of light**- more the distance, less the damage.

b. Heat :

Usually the source of heat is high atmospheric temperature. Heat is measured in terms temperature either in Centigrade scale or Fahrenheit scale. High heat with low humidity causes dehydration of cellulose fibers and the paper becomes brittle. It loses its flexibility to the extent that it tends to crumble on touch. On the other hand, high temperature with high humidity creates the condition for the growth of moulds. If electric bulbs are used for lighting purpose, they increase room temperature as high powerful bulbs generate more heat. Besides extreme variation in temperature (say 50c in winterand 450c in summer) affects the physical condition of the library materials.

c. Humidity and Moisture: -

Humidity is the amount of moisture in the atmospheric air. The moisture is measured in terms of relative humidity. All organic objects absorbs water to a greater or lower extent and the water goes inside the object through surrounding air. Because of this absorbency property, the paper absorbs more moisture when there is high humidity. Certain amount of humidity is necessary for the flexibility of paper but in prolonged high humid condition, paper becomes soggy and the moisture weakens the fibers of paper. Moisture is the root cause of various types of physical, chemical and biological deterioration of library materials. It weakens the adhesive and makes the book binding loose. It also weakens the sizing elements of paper and causes spreading of ink.

Moisten pages of book often stuck together. It also accelerates various types of chemical

deterioration as a result of which paper becomes yellow and stained with spots. Moisture also promotes the growth of fungus, which cause damage to paper and book binding materials.

d. Dust and Dirt :-

Fine dry particles of any matter present in the air are known as dust. Dust, which is highly dangerous for the library and archival collection, composed of soil, tar, metallic substances, fungus spores and moisture among other things. Since dust is air borne it settles down on any surface of the object. Dust is hygroscopic in nature and when it is mixed with high humidity, it is transformed into dirt and if this dirt sticks to the surface of the books, it becomes difficult to remove. Dust and dirt are sources of both physical and chemical degradation of the library collection. Dust acts as a nucleus around which moisture collects and this moisture provides the necessary humidity for the growth of fungus and for chemical reaction, which lead to the formation of acids. Since dust and dirt are solid particles of varying size and hardness they exert
abrasion on the surface of the books.

e. Water :-

Water occurs in all the normal state of matter- solid, liquid and gas. It acts as a physical agent of deterioration by causing hygroscopic materials to undergo dimensional changes. Water, which is harmful for the library collection may come from sources like natural calamities, human negligence, from leaking roofs, defective plumbing and through open windows at the time of raining. Excessive water brings about biological attack on paper, which is usually manifested as the growth of fungus or mildew. The effects of water are stained paper, rotted leather, smeared ink, weaken adhesive, sustained fungi etc. Water also does injury to the steel furniture due to rusting.

2. BIOLOGICAL FACTORS :-

The deterioration caused by biological agents such as micro-organisms, insects and rodents is generally known as bio-deterioration. Almost all book components, be it paper,

leather, textiles or straw board used for binding are prone to attacks by these biological agents. The problem of bio-deterioration is a matter of considerable significance of tropical hot and humid climate like India. The climatic condition accelerates the growth and multiplication of living organisms. There is perhaps no library, which has not suffered the ravages of these agents of bio-deterioration. These biological agents can be subdivided into :-

(i)Micro-organisms- Fungus or moulds, bacteria etc.

(ii)Insects

(iii)Rodents

(i)Micro- organisms

A. Fungus-

Fungus are a large heterogenous group of plant organisms. The fungal spores are present in the earth, water and air and remain in a dormat state for long periods. These spores sprout and grow when they have the required moisture and heat. Generally fungi grow in a relative humidity range of 63-100% and temperature range of 15-35 0 c. In libraries fungal growth is known as mould or mildew and they appear as brown/black vegetative growth on paper, leather and textiles. Fungus consume cellulose and also thrive on nutrients in leather, glues, pastes, binding threads etc. they weaken and stain the paper and can cause discoloration.

B. Bacteria-

Besides fungus, bacteria also decompose cellulose in paper and binding textiles.

(ii)**Insects:** Even though there are thousands of insects, only certain insects badly damage the

archivo-library materials. They are silverfish, cockroaches, booklice, bookworms and termites.

A.Silverfish –

The main source of these insects are food materials like starch, glue and gelatin which are used in paper as sizing materials. Dust and dirt also attract this insects. They’re fond of

dark places and are active in nights only. Silverfish do not have wings and are silvery or pearl gray in colour and about 8 to 10 mm. in length. They eat the surface of the paper and also eat gum from postage stamps, envelopes etc. They grow holes in paper, prints, photographs, catalogue cards and cardboard boxes. The dark spaces on the library racks, catalogue cabinets, drawers are the places for their egg laying.

B. Cockroaches –

cockroaches are common all over the world which are brown or blackish brown in colour. They eat paper leaves, bookbinding, fabrics and other organic materials. They are frequently found in libraries, archives and museums and are very active during the night. They live in corners which are damp, cleavages in walls and floors, behind and beneath almirhas, shelves and in wooden cupboards. They excrete adark brown liquid, which leave stains on the paper and become difficult to remove.

C. Book worms or Book beetles-

Bookworms affect very much books and manuscripts. As the name itself suggests they feed on paper and damage the paper extensively. In libraries the bookworms lay their eggs on the edges of the books and on the surface of the bookbinding. They make tunnels in the pages and boards of the books.

D. Book lice: -

Dark dusty areas filled with unused books, dampness and warmth are essential requirements for the growth of booklice. They are gray or white in colour. They injure the bindings of books by eating paste and glue and also eat the fungus formed in between the edges of inner cover of the books.

E. Termites or White Ants –

In the tropical climate the damages to the library materials due to termites are much. Wet or damp conditions are most suitable places for termites. They eat wood and paper and can attack any type of material containing cellulose. If once they start destroying the books they can do irreparable damage in no time. They leave mud encrustation on the attacked materials.They are of two categories like earth dwelling termites and wood dwelling termites. Earth dwelling termites live in the soil and in the libraries their

presence can be noticed by their mud tunnels on the walls, book cases and furniture. Wood dwelling termites live above the ground and enter the building through cracks and openings.

(iii) Rodents

Rodents include mice, rats, squirrels and many other species. Mice and rats are mainly found in libraries and they find their way into buildings through dry drains and openings in doors and windows. In libraries they eat and destroy materials made up of paper, cloth, leather, glue, etc. These animals are very swift to move and hide in dark corners.

3.CHEMICAL FACTORS:-

In the manufacturing of paper sometimes fibers are used with low cellulose contents and some chemical compounds like alum, rosin etc. are used for sizing of paper which cause acidic effect and facilitate chemical deterioration of the paper with the passage of time. Besides, in the atmosphere among various constituents unwanted materials such as oxides of carbon, sulphur, nitrogen and hydrogen sulphides are also present. Because of the absorption of the chemicals by the moisture absorbed by the paper, the library materials get affected. The notable deleterious substances for the library materials are sulphur dioxides, oxides of nitrogen and ozone. Sulphur dioxide is a hazard to cellulose materials like paper and cloth. The most familiar effect in libraries is the brown and brittle edges of books caused by sulphur dioxide. Most of the nitrogen dioxide comes from automobile exhausts & when it combines with oxygen and water turns into nitric acid. This nitric acid has strong acidic effects and attacks the dyes in ink, cloth, paper and leather. Ozone acts as a powerful destroyer of organic materials. It makes the colours of fabric book covers fade and the book binding materials such as leather, gelatin, glue and paste are also susceptible to deterioration by ozone in humid atmosphere.

4. HUMAN FACTORS:-

Apart from physical and chemical factors, a serious cause of deterioration often is the casual attitude of the library staff as well as the users of the library towards books as

physical objects. Librarians in charge of the documentary heritage are directly responsible for the overall conservation and preservation of their collections. But they are not always aware how to handle, store and use collections carefully to minimize damage and help preservation. The standard of care and handling of books by their custodians and users is often pretty low. Improper storage, faulty repairment, rough handling, deliberate abuse, folding the fore-edges of pages as a mark of reading, marking by ball pen, mutilation, vandalism are all examples of deterioration of books by human beings.

5. DISASTERS

No library is exempted to the devastations that can occur as a result of natural or manmade disasters. In libraries, archives and museums there is a likely-hood of fire as the collections are mostly organic in nature. Once fire starts, it is difficult to save those materials which get fire. Items not directly engulfed in flames can be charred by soot and smoke. Heat emitted from fire causes bindings to shrink and warp and plastic base materials to melt. Water used for fighting fire can cause enormous damage. Besides fire, floods, high winds, cyclones, earth quakes are also agents of deterioration for the library collections. These will lead documents to absorb water, swell, warp and become extremely vulnerable to physical damage. Dyes and ink may bleed and book pages stick together. Leather bindings seriously warp and change shape. Effects of disasters on library collections are too obvious to comprehend.

IMPORTANCE OF PRESERVATION AND CONSERVATION

The processes of preservation, conservation and restoration are applied to safeguard the library materials from further decay and deterioration. Preservation is the process in which all actions are taken to check and retard deterioration where as conservation includes proper diagnosis of the decayed material, timely curative treatment and appropriate prevention from further decay. More over there are two aspects of preservation of library materials:

(i) the preventive measures which includes all forms of indirect actions aimed at increasing the life expectancy of undamaged or damaged elements of cultural property. It comprises all the methods of good house-keeping, caretaking, dusting, periodical supervision and prevention of any possibility of damage by physical, chemical, biological and other factors.

(ii) The Curative measures consists of all forms of direct actions aimed at increasing the life expectancy of undamaged or damaged elements of cultural property. It includes repairing, mending, fumigation, deacidification, lamination, and other jobs which are required considering the physical condition of the individual document. Preventive conservation plays a vital role and has assumed much importance in our country because a large number of institutions do not have proper conservation facilities. In fact if diagnosis in time is followed by proper preventive measures many problems can be solved. Here in this paper in accordance with the principles of preventive conservation some measures have been suggested to control the library materials from the effect of various deteriorating factors.

PREVENTIVE MEASURES FOR ENVIRONMENTAL FACTORS

Control of environmental factors partially begins from selection of site, the planning and the construction of the library building and also the soil on which it will be constructed because these elements have greater impact over the environmental control inside the library building. It is very important to choose the best architectural design for the library having cross ventilation facilities for free air circulation within the building. If there is a need to use wooden materials, the wood selected should be well seasoned and must be treated chemically to avoid insects. Growth of plants near the building must be avoided, as the roots will damage the building foundation. It is always better to construct the building away from traffic to avoid dust and dirt. Provision of adequate number of electric fans and few exhaust fans will facilitate air circulation inside the library. Sunlight

should be prevented from falling directly on papers because the sun is a great emitter of ultraviolet rays. The windows must be provided with colored curtains, which will prevent falling of direct light as well as absorb ultraviolet rays. Lemon yellow or green coloured glass panes should be fitted in window panes as these are more effective in blocking ultraviolet rays. It is extremely good to fit acrylic plastic sheet in the panes of window because it filters out UV rays to a greater extent than colored glass. The UV rays of fluorescent tubes should be filtered by covering the tubes. As high humidity and high temperature are more hazardous for library materials it is advisable to maintain ideal room temperature (20c) and relative humidity of (RH45- 55%) for preservation of documents. Air conditioning of the stack area round the clock is an ideal example of maintaining optimum temperature & humidity for the storage of documents. But it is practically not possible for all the libraries to afford for air conditioning for 24 hours. So it is useful to adopt local control measures like use of humidifiers in dry climate to increase required level of moisture content and dehumidifiers to remove moisture in wet seasons. These may be operated whenever necessary for which proper monitoring of relative humidity is highly essential. High humidity could also be minimized by the use of de-hydrating agents like silicagel. The requisite quantities of silica gel may be spread in dishes and kept in different places in the room. After the use for 3-4 hours the silica gel may get saturated and may need replacement with fresh gels, while the saturated gel can be reactivated for further use after heating it in open pans.

During the summer months when the temperature is high the windows should be kept closed. If the windows are to be kept open wet curtain should be used. High speed air circulators also be used for free air circulation. Floors can be cleaned by wet dusters. As accumulation of dust and dirt accelerate the physical damage of books, a cleaning schedule should be made considering the sequence of operations following daily and weekly routines. Specific instructions should be given to clean remote corners of the book shelves, behind cabinets, under desks, chairs, and all surfaces accumulating dust. The best way is to use a vacuum cleaner because it sucks the dust and cannot resettle on the surfaces.

PREVENTIVE MEASURES FOR BIOLOGICAL FACTORS:-

Since stagnant air, dampness, dark and dingy places in a library facilitate the growth of biological pests, good housekeeping and maintenance of optimum storage condition is necessary to control the propagation of the insects. Provision of cross windows, ventilators, exhaust fans ensures good circulation of air but at times it is necessary to circulate the air inside the room with electric fans. It is preferable to avoid contact of book racks with walls (at least 15 cm away from the walls) to eliminate dampness. Attending to cracks, crevices and loose joints in floors and walls eliminate the possibility of insect hiding in these places. Presence of edibles inside the library should not be allowed. Periodic use of insecticidal powder of solution like lindane at the

dark corner walls, beneath the racks and almirahs is a good precautionary measure to prevent insects. It is safe to use paradichloro-benzene as it acts both as an insect repellent and insecticide.

A simple practice is to keep naphthalene bricks on the shelves as it repels the insects from coming to the book racks. Dry neem leaves, neem seed powder and camphor tablets tied in muslin bags should be kept inside the racks for keeping the pests away. The foundation of all the new library buildings should be given anti-insect treatment.

PREVENTIVE MEASURES FOR CHEMICAL FACTORS:

If the air pollution is controlled there will not be any external acidity in the paper materials. One of the best ways of controlling atmospheric pollutants is filtering of the air intake in to storage areas, which can be attained by air conditioning system operating for 24 hours throughout the year. Without this facility simple measures like wrapping the books and manuscripts in cloth or placing them in book containers reduces the effects of pollution to a great extent. The books kept inside cupboards are better protected than those which are kept outside. Documents kept inside folders are safer than those which are kept in the open. Proper care should be taken to save books and documents from dust. It is preferable to use vacuum cleaner and fine brushes for dusting of shelves and books.

No chemical formulations should be directly applied on to the book covers, since these may have an adverse effect on the books as well as users of the books and staff of the library. Wooden storage should be avoided as it gives off volatile acidic vapors. If it is to be used it must be covered with coats of acrylic emulsion paint. Besides, acid free paper, board and good quality materials should be used for repair and restoration of documents.

PREVENTIVE MESURES FOR HUMAN FACTORS

There are certain do's and don'ts which the library staff and the users should follow to increase the longevity of the library resources. These are among others: -

i. Important books and manuscripts should kept in specially prepared containers.
ii. For carrying a large number of books trolleys should be used. Utmost care should be taken while transporting rare, valuable and delicate books.
iii. Care should be taken while photocopying the books as at that time considerable stress is imposed on the material and the bindings suffer most and also the spine damages.
iv. Use bookends to support books when shelves are not full. Books should not be shelved too tightly or too loosely.
v. It must be always ensured while opening the books, pages are not torn or covers are not damaged. To turn a page lift the top corner and lightly slip the finger tips down the fore-edge supporting the page.
vi. Pages should never be folded otherwise creases will be formed and they may be torn at the folds. Corner of pages should not be folded to mark pages.
vii. Avoid licking of fingers as an aid to turn pages.
viii. Underlining must be avoided.
ix. Books should not be left open on the reading table, face downwards.
x. Leaning on an open book should be avoided since this can damage the spine and binding.
xi. Never allow a book to stand on its fore edge.

xii. When a book is displayed open, never use metal clips or pins to hold book pages open.

DISASTER PREPAREDNESS

Disasters are generally unexpected events with destructive consequences to a collection. Therefore it is vital for any library to take every possible precaution to prevent the occurrence of an unavoidable disaster. A disaster planning is an essential element of preventive conservation. It is also necessary to identify any external and internal threats that might cause problems for the collection and measures to meet those threats. Without an existing disaster preparedness plan or crisis management plan, the librarians will be unable to act quickly to organise salvage efforts. It should be mandatory for every library to have a written disaster preparedness and response plan containing description of emergency procedures, emergency supplies list, disaster response outline, conservation experts, list of staff volunteers, list of external contacts and names, addresses, home and work telephone numbers of personnel with emergency responsibilities. Besides libraries should be provided with fire and smoke detection system and automatic fire extinguishing system.

Use of match stick or open flame and smoking should strictly prohibited inside the library. Inflammable materials and chemicals should not be stored inside the stacks. The telephone number of the fire office should be visibly and clearly exhibited. Location of emergency gate must be clearly indicated. The electrical defects and faults should be set right in time.

15.4 CONCLUSION :

Preservation and conservation of library materials is an age old practice as they are constantly affected by several hazards such as fire, water and insect pests and even human beings. The change in formats from manuscripts to digital formats have not been

able to overcome this problem and newer methods and strategies are always in the offing. Hence the work of preservation of library materials is a never ending process.

There are various hazardous materials that affect reading materials in the libraries. A pre-requisite for successful preservation programme is the need for clear understanding of materials from which items to be stored are made. The reading materials in the Libraries consist of Paper based materials, photographs, slides, microforms, films, video tapes, sound recordings, video and computer based media. There are three aspects of the problem. Robert Patterson has suggested several steps for a successful preservation planning:

The Five Enemies of Library materials are Insects, water, fire, dust and dirt, human being and Rodents and rats. Among them The greatest enemies of books are dust and dirt. Insects, pests can be disposed off by placing the book, with leaves opened, in a warm cupboard containing paradichlorobenzene crystals for about two weeks. Special attention should be given to old or rare books collection. Human beings are also considered as greatest enemies of library materials who steal and smuggle them from the Library.

Self Check Exercises

1. Enumerate different causes for damages and deterioration of books in Libraries.

Note :

a) Write your answers in the space provided below.

b) Check your answers with the answers given at the end.

15.6 ANSWER TO SELF CHECK EXERCISES :

1. There are various hazardous materials that affect reading materials in the libraries. The three problems faced in the preservation of reading materials, especially the printed materials are:

1. Causes for paper deterioration.
2. Available methods for minimizing these causes.
3. Accepted methods of repairing the damaged records.

Besides the above the other Enemies of Library materials are:

i) Insects

ii) Water

iii) Fire

iv) Enemies of Buildings : Dirt, Dust and Cobwebs

v) Human Beings

vi) Vermin ;Rodents, Rats and bats

15.7 Suggested Further Reading

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MLISc -2

ORGANISATION OF INFORMATION RESOURCES

Block - 4

Preservation of Information Resources

Unit – 16

Preservation of Electronic Resources

Structure

16.0 OBJECTIVES :

The Preservation of electronic resources could be dichotomy. The concept of digital preservation encompasses two aspects; one the material begins its life in digital form called "born-digital" as well as material that is converted from traditional to digital format. It can be stated also as to convert the traditional documents in digital or in electronic form and maintain them. The other would be to preserve the electronic resources – the products already available in digital or electronic form. The second aspect can also be considered as management of electronic resources in a library.

The main objectives of this Unit are:

- To identify the electronic resources
- To know what are digital/electronic resources
- To know the preservation of 'born digital' resources

In this Unit the second aspect, the management of electronic or digital information sources is described rather than how to convert traditional material into digital form in order to preserve the original for future use if warranted. . However a mention to methods of digital preservation will be referred to wherever it is found essential.

16.1 INTRODUCTION:

Widespread transition of information resources from traditional print format to the electronic or digital formats has sought to look into the problems of their preservation. The problems have been further complicate due to technological changes and advancements, particularly the obsolescence of hardware and software. The continuous and seamless access to electronic or digital

information resources or the information contained in them necessarily involves copying or transforming digital documents to run on current media, software and hardware and the operating systems. "Digital materials are especially vulnerable to loss and destruction because they are stored on fragile magnetic and optical media that deteriorate rapidly and that can fail suddenly from exposure to heat, humidity, airborne contaminants, or faulty reading and writing devices."

The advent of electronic information introduces new preservation requirements. Medium preservation has been addressed in discussions on environmental and handling concerns for tapes, magnetic disks, optical disks, and the like. Greater attention should instead be directed to the obsolescence of technologies. It is a challenge to imagine not only how to technically preserve electronic records indefinitely, but also how to choose what to preserve and how to guarantee the electronic record's reliability and authenticity in the future. The combined problems of immense volume, unstable storage media, and obsolete hardware and software add up to some very tough problems, which have to be dealt with. Digital preservation is becoming a business. Not only are historians, librarians and archivists alarmed by the loss of cultural and government records due to a lack in digital preservation, but certain industries have also realised that they need to keep data longer and longer for regulatory or business reasons.

16. 2 Categories of Electronic Resources:

Unlike the print resources, the electronic resources are available in different formats and the content vary mere bibliographic references to the full text. Hence there are varieties of electronic resources available or stored on different media. The broad categories are:

1. CDROM Databases of Books, Journals – primary and secondary and of reference works. Multimedia Learning Resources.

2. DVD – Same as CDROM but with higher storage capacity.
3. Web or Internet Resources
4. Online Databases
5. Magnetic Media – Databases
6. Electronic Books and Journals
7. Archival Resources

16.2.1 What is digital preservation?

Libraries all over the world have to deal with fast growing numbers of digital materials that need to be safeguarded. Publications in digital form, online or on CD digitized images, and born-digital objects need to be preserved and kept accessible. In the national libraries, safeguarding the digital heritage is a major issue, because of their legal task to preserve the national heritage of a country.

Safe storage of the digital heritage and ensuring access for future use requires libraries to have a trusted digital repository system in place, and to have an ongoing R&D programme aimed at developing preservation strategies, such as migration and emulation.

According to the statement of Council on Library and Information Resources, “Digital preservation refers to the various methods of keeping digital materials alive into the future”. Digital preservation or digital archiving essentially aims at taking steps to ensure the longevity of electronic documents. It applies to documents that are“born digital”and stored online or on CD-ROM, or on magnetic media, or to the analog to digital conversion, if long term usage is required.

16.2.2 Problems of Preservation of Electronic Resources:

The preservation of electronic records is a well known and serious problem. The fundamental problem of preserving electronic resources in digital form comes from the fact that they are unlike the non-digital formats in the sense that are accessible only by computers**.**

More and more information is being created in digital form, either through converting existing materials to digital form or, increasingly,"born digital", where there is no other format but the digital original. There are increasing expectations in all spheres of life that the information we all need will be available on the Internet or at least in an offline digital format, such as CD-ROM. The increasing proliferation of digital information, combined with the considerable challenges, associated with ensuring continued access to digital information, means that it is imperative that there be concerted action to overcome these challenges.

Numbers of technical, operational, social and legal issues are also observed in the preservation of digital resources. Some of them are enumerated here.

1. Complexities of digital objects consisting of text, images and audio-video formats and their software dependency.
2. Document standards and formats.
3. long term access requirements
4. Copyright and/or Intellectual Property Rights; dealing with preservation and access, including downloading or copying.
5. unstable storage media; with changing life span
6. Lack of expertise or skilled manpower to look after electronic collection management.

16.2.3 Needs and Purpose of Preservation

The implications for preserving continued access to important digital materials is already being felt by libraries and archives, many of which have begun

to consider and take initial steps to meet their responsibility effectively. It is important that a document either in digital or otherwise need to be preserved for enabling its access in a usable form over a long period of time. Provision of seamless access to digital media is one of the issues of electronic resource management. In the context of digital media it is much more complex than the non-digital media, as there are already established practices and standards in the latter case, whereas new practices and standards have to be evolved for the former.

The main purpose of preserving the digital or electronically stored documents is to extract the individual elements of the document, such as the contents pages. In this case the whole document is not sequentially organized like a book. Digital objects are easily decomposed into separate and individual elements; hence more efforts have to be made to preserve them as a 'whole' and as a file only. Hence to a successful preservation of digital objects it is aimed at the following aspects.

1. Integrity of Object – the assembly of different objects into a whole.

2. Physical Preservation – to refer to a computer file in this case.

3. Content Preservation – to facilitate or ability to access the content.

4. Presentation Format - use of the approved formats like PDF etc.

5 Functionality – use of the multimedia content

6. Authenticity – security to access, but not allowing changes.

7. Location and Referencing – to maintain citations of digital objects.

8. Provenance – originality.

9. Preserve context – free from technical dependencies.

16.2.4 Issues of preserving digital materials

The Research Library Group has stated "Digital materials, regardless of whether they are created initially in digital form or converted to digital form, are threatened by technology obsolescence and physical deterioration. The challenges in maintaining access to digital resources over time has the following reasons.

i) Machine Dependency. Digital materials all require specific hardware and software in order to access them.

ii) The speed of changes in technology. Technology obsolescence is generally regarded as the greatest technical threat to ensuring continued access to digital material.

iii) Fragility of the media. The media on which digital materials are stored on is inherently unstable and without suitable storage conditions and management can deteriorate very quickly even though it may not appear to be damaged externally.

iv) Challenges associated with ensuring the continued integrity, authenticity, and history of digital materials.

v) A digital resource which is not selected for active preservation treatment at an early stage will very likely be lost or unusable in the near future.

vi) The nature of the technology requires a life-cycle management approach to be taken to its maintenance. A continual programme of active management is needed from the design and creation stage if preservation is to be successful.

Because of the nature of digital materials, the ability to preserve access to them well into the future depends upon the involvement of a wide range of stakeholders. Principal among these are the creators of digital content, whose involvement in their preservation might involve, for example, consideration of standards in terms of format and media, and ensuring enough documentation is available to enable their management by others. Another key stakeholder will be institutions which act as long-term repositories for digital materials.

All public institutions such as archives, libraries, and museums need to be involved in applying their professional skills and expertise to the long-term preservation of digital materials.

The above issues are all interconnected and mean that a radically different approach is required in managing digital materials

16.2 Methods of Preserving Electronic Resources:

Digital media are subject to destruction and deterioration in new ways, though unintended loss can be avoided if procedures are adapted to the needs of the technology. Precautions can be taken which will help significantly to reduce the danger of loss and include:

i) Storing in a stable, controlled environment.
ii) Implementing regular refreshment cycles to copy onto newer media.
iii) Making preservation copies (Assuming copyright permission)
iv) Implementing appropriate handling procedures.
v) Transferring to "standard" storage media.

However, while the media on which the information are stored may or may not fail, what is certain is that technology will change rapidly so that even if the media is retained in pristine condition, it may still not be possible to access the

information it contains but to deal with changes in technology should taken into consideration.

Because digital material is machine dependent, it is not possible to access the information unless there is appropriate hardware, and associated software which will make it intelligible. Technology advances even in the past decade illustrate this point. For example a) 5¼ inch floppy disks have been superseded by 3½ inch floppy disks and b) there have been several upgrades to Windows software since it was first introduced and it would now be very difficult to convert from earlier versions to the current versions and c) Thousands of software programs common in the early 1990s are now extinct and unavailable.

As quoted by the RLG survey technological obsolescence is the greatest threat to successful digital preservation. Precautions can, and should be taken, which will greatly reduce the risk of inadvertently losing access to a resource because of changes in technology. These include:

i) Using standard file and media format, recommended by reputable sources.

ii) Providing detailed documentation to enable both context to be determined and also to facilitate successful management and metadata and documentation are these measures.

16.3.1 Preservation Strategies

Several approaches and strategies to digital preservation have been developed:

i) Preserve the original software (and possible hardware) that was used to create and access the information. This is known as the technology preservation strategy. It also involves preserving both the original operating system and hardware on which to run it.

ii) Program future powerful computer systems to emulate older, obsolete computer platforms and operating systems as required. This is the technology **emulation strategy.**

iii) Ensure that the digital information is re-encoded in new formats before the old format becomes obsolete. This is the digital information **migration strategy**."

Strategies for some formats are well established and tested over time. For example, migration has been used for electronic text, image, and database applications by the computing industry and a number of data archives and centres for decades.

a) Emulation Strategy : This refers to creating new software that mimics the operation of older hardware or software in order to reproduce its performance. This not only preserves physical content but the digital objects are also displayed in original formats and functionality will be retained as in the older software. The third method, emulation, leaves the data in its original form and simply transfers it to new data carriers (or database systems). As soon as it has been deemed obsolete, the hard and software required for using the data needs to be replaced by new hard and software which is capable of emulating the functions required for accessing the data. This method has already been adopted in certain areas, however it is very costly in terms of technology and organisation, although this is compensated by there being no need to convert masses of outdated data on a regular basis. Large-scale use of emulation software is currently rendered impracticable, however, by the lack of standards specifying hard and software architectures and configurations.

b) Migration and transfer :Migration is the most common strategy adopted by many organizations to preserve digital objects. It involves, a range of activities to

periodically copy, convert or transfer digital information from one generation of technology to subsequent technology. Migration involves copying digital information from a media that is becoming obsolete (Floppy to CD) and converting from one format to another or moving documents from one platform to another. Migration certainly preserves the physical presence and the content of digital object. The migration involves regularly converting data which can no longer be read in its original form into new versions and, where necessary, transferring these to new data carriers (or database systems), thereby allowing them to be used with new hard and software. On account of the mass conversion processes required, this common procedure is, however, very labour intensive and carries a high risk of gradual data corruption as a result of the successive conversion processes.

In practice it seems likely that a mixture of migration and emulation will be the most practicable method. The other methods are:

c) Metadata Method :Some file formats make provision for the inclusion of metadata. This metadata may be generated automatically by the creating application, entered by the user, or a combination thereof. This metadata can have enormous value both during the subsequent active use of the data and for long-term preservation, where it can provide information on both the provenance and technical characteristics of the data. For example, a TIFF file may include metadata fields to record details such as the make and model of scanner, the software and operating system used, the name of the creator, and a description of the image. Similarly, Microsoft Word 2000 documents can include a range of metadata to support document workflow and version control, within the document properties. Metadata contains information about digital objects which is used to locate, manage and process them. A range of international standards exists for the coding of this metadata, but XML-based standards have come to dominate in the

last few years. These standards not only facilitate the exchange of data, they also permit its automatic processing in the repository. For this reason standards which are widely available and which also have an open format should be used for storing metadata, thereby allowing the storage of any new metadata types which may be added in the future.

d) Technology Museum Method : In the "technology museum" method the hard and software is archived along with the data carriers. This method is only practicable in exceptional cases and is completely unsuitable for extensive archiving tasks due to the ageing of the data carriers and the hardware and associated problems.

16.4 CONCLUSION :

Digital preservation is as much important as digitization process of archival materials to which digital technology is adopted to preserve and conserve rare and classic materials available in print and non-print media. Digital preservation is advented by the rapid technological changes and it has turned out to be an industry by itself. In this context several methods and strategies are evolved to preserved digital objects and texts.

16.5 SUMMARY

The Preservation of electronic resources encompasses two aspects; one the “born-digital” and material converted from traditional to digital format. This unit deals to preserve the electronic resources

The need for digital and/or electronic resources preservation is due to the obsolescence of hardware and software. "Digital materials are especially vulnerable to loss and destruction as they are stored on fragile magnetic and optical media. Digital preservation is becoming a business and historians,

librarians and archivists alarmed by the loss of cultural and government records have also realised that they need to keep data longer.

Unlike the print resources, the electronic resources are available in different formats and the content vary mere bibliographic references to the full text. In the national libraries, safeguarding the digital heritage is a major issue, because of their legal task to preserve the national heritage of a country. According to the statement of Council on Library and Information Resources, “Digital preservation refers to the various methods of keeping digital materials alive into the future”. Digital preservation or digital archiving essentially aims at taking steps to ensure the longevity of electronic documents. The fundamental problem of preserving electronic resources in digital form comes from the fact that they are unlike the non-digital formats in the sense that are accessible only by computers**.**

The main purpose of preserving the digital or electronically stored documents is to extract the individual elements of the document, such as the contents pages. And there are several issues involved in preserving digital and electronic materials and there are several methods of preserving the Electronic Resources . Some of the preservation strategies are:

i) emulation strategy.
ii) migration strategy."

In practice it seems likely that a mixture of migration and emulation will be the most practicable method. The other methods are:

iii) Metadata Method

iv) Technology Museum Method :

Self Check Exercises

1. What is the need for preserving electronic and digital resources ?

2. What are the issues involved in the preservation of digital resources ?

3. What are the different methods and strategies of digital preservation ?

Note :

Write your answers in the space provided

Check your answers with answers given at the end.

16.6 ANSWER TO SELF CHECK EXERCISES

1. The preservation of electronic records is a well known and serious problem. Hence there is need for their preservation.. Provision of seamless access to digital media is one of the issues of electronic resource management. In the context of digital media it is much more complex than the non-digital media, as there are already established practices and standards in the latter case, whereas new practices and standards have to be evolved for the former.

The need and purpose of preserving the digital or electronically stored documents is to extract the individual elements of the document, such as the contents pages. In this case the whole document is not sequentially organized like a book. Digital objects are easily decomposed into separate and individual elements; hence more efforts have to be made to preserve them as a 'whole' and as a file only. Hence to a successful preservation of digital objects it is aimed at the following aspects.

1. Integrity of Object – the assembly of different objects into a whole.

2. Physical Preservation – to refer to a computer file in this case.

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4. Presentation Format - use of the approved formats like PDF etc.

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6. Authenticity – security to access, but not allowing changes.

7. Location and Referencing – to maintain citations of digital objects.

8. Provenance – originality.

9. Preserve context – free from technical dependencies.

2. The Issues of preserving digital materials have been examined by the Research Library Group and it has noted that "Digital materials, regardless of whether they are created initially in digital form or converted to digital form, are threatened by technology obsolescence and physical deterioration. The challenges in maintaining access to digital resources over time has the following reasons.

i) Machine Dependency.
ii) The speed of changes in technology.
iii) Fragility of the media.
iv) Challenges associated with ensuring the continued integrity, authenticity, and history of digital materials.
v) A digital resource which is not selected for active preservation treatment at an early stage will very likely be lost or unusable in the near future.
vi) The nature of the technology requires a life-cycle management approach to be taken to its maintenance. A continual programme of active management is needed from the design and creation stage if preservation is to be successful.

Because of the nature of digital materials, the ability to preserve access to them well into the future depends upon the involvement of a wide range of stakeholders. Principal among these are the creators of digital content, whose involvement in their preservation might involve, for example, consideration of standards in terms of format and media, and ensuring enough documentation is available to enable their management by others. Another key stakeholder will be institutions which act as long-term repositories for digital materials.

All public institutions such as archives, libraries, and museums need to be involved in applying their professional skills and expertise to the long-term preservation of digital materials.

The above issues are all interconnected and mean that a radically different approach is required in managing digital materials

3. Methods of Preserving Electronic Resources to reduce the loss include:
   i) Storing in a stable, controlled environment.
   ii) Implementing regular refreshment cycles to copy onto newer media.
   iii) Making preservation copies (Assuming copyright permission)
   iv) Implementing appropriate handling procedures.
   v) Transferring to "standard" storage media.

As quoted by the RLG survey technological obsolescence is the greatest threat to successful digital preservation. Precautions can, and should be taken, which will greatly reduce the risk of inadvertently losing access to a resource because of changes in technology. These include:

i) Using standard file and media formats, as recommended by reputable sources.

ii) Providing detailed documentation to enable both context to be determined and also to facilitate successful management and metadata and documentation are these measures.

There are several approaches and strategies to digital preservation have been developed Strategies for some formats are well established and tested over time.

a) Emulation Strategy :

b) Migration and transfer :

c) Metadata Method :

d) Technology Museum Method :

16.7 KEYWORDS

Emulation Strategy : - The emulation, it to leave the data in its original form and simply transfers it to new data carriers (or database systems). As soon as it has been deemed obsolete, the hard and software required for using the data needs to be replaced by new hard and software which is capable of emulating the functions required for accessing the data.

Migration strategy : The migration is regularly converting data which can no longer be read in its original form into new versions and, where necessary, transferring these to new data carriers (or database systems), thereby allowing them to be used with new hard and software.

Metadata Method : The file formats are converted into the metadata formats especially in XML for the purpose of preservation This metadata may be generated automatically by the creating application, entered by the user, or a combination thereof.

Technology Museum Method : The method of archiving the hard and software along with the data carriers.

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