

LIBRARY AND INFORMATION SCIENCE

Class XI

Chapter-1

Library, Information and Society: Role and its implications

Unit 1

Library, Information and Society : Concepts

1.1. Introduction

The information and knowledge are the driving factors in the development of the society. The human is the most intelligent among all category of living world. It gathers the information and converts them into knowledge and further used it to improve the Living standard of the people. The need and desire are the two motivating factors for acquiring knowledge since the inception of the society. Initially, the knowledge used to be preserved and transferred through oral traditions. When the volume of knowledge grew, people invented the mechanism of recording them through writings. The organised set of such records called documents.

The society continued to develop and accordingly the volume of knowledge grew. Due to such developments, different civilizations emerged. With the advent of civilization different organizations as educational, political, administrative, cultural, religious, social, etc. were established. This organizational approach of the society increased the intellectual activities of the human being. The milestone was achieved in the history of preservation and dissemination of information and knowledge by the invention of printing technology. Because of all these developments, quest for knowledge and to disseminate as well as to preserve them for the next generation, the concept of library emerged and got institutionalized.

1.2. Definition of a Library

The word “Library” means in English “a collection of books gathered for study, research, reference and recreation”. It is being perceived that it has derived from a Latin word ‘liber’ which means ‘a book’. The definition of library has changed as its functions have

changed since its inception. Let's see some of the definitions provided by different reference sources and the scholars of Library and Information Science.

The Oxford Dictionary defines library as "a building or room containing collections of books, periodicals, and sometimes films and recorded music for using or borrowing by the public or the members of an institution".

The Merriam-Webster's Dictionary says that "a place in which literary, musical, artistic, or reference materials (as books, manuscripts, recordings, or films) are kept for use but not for sale".

The Oxford Companion to the English Language says that the "library is a collection of books, periodicals and/or other materials, primarily written and printed".

The Harold's Librarians' Glossary and Reference Book explains library as:

- (a) A collection of books and other literary material kept for reading, study and consultation.
- (b) A place, building, room or rooms set apart for the keeping and use of a collection of books, etc.
- (c) A number of books issued by one publisher under a comprehensive title as the 'Loeb Classical Library', and usually having some general characteristic, such as, subject, binding, or typography.
- (d) A collection of films, photographs and other non-book materials, plastic or metal tapes, disks and programs.

The observation of definitions, provided above make us understand a library as:

"A physical space such as a building, part of a building, room or rooms or such place having collection or collections of intellectual or literary output of a society such as manuscripts, books, periodicals, newspapers, pamphlets, written or

printed records, tape, artefacts or any literary and artistic materials for reading, reference, or lending purpose”.

Initially, library was considered as a storehouse of books. The main function of a library was to preserve the human thought and knowledge of the society. The ‘use’ and ‘utilization’ factors of those preserved knowledge was not evident from. But, as society advanced the use of the knowledge preserved in the library become more prominent. Hence, the definition given by S. R. Ranganathan, father of library science in India, is more appropriate from the perspective of use of the library materials and their preservation.

Ranganathan says “a library is a public institution or establishment charged with the care of collection of books and the duty of making them accessible to those who require to use them”. Here, the term ‘book’ symbolizes the library collection which may be book, periodicals, or any other material kept in a library.

1.3. Purpose of a Library

The definition of a library, given by Ranganathan, makes us to understand the status of a library in the society. He designates the library as a public institution. This status itself set goals and objectives for a library. Being public institution, it has the responsibility to serve the public without any reservation or biasness. Further, he says ‘care of collection of books’ which, refers to the organization, maintenance and preservation aspects of the library materials so, it can serve the society or community for a longer period. The final and the most important factor in his definition is ‘making them accessible’. This aspect of the definition of a library set agenda to provide service to the society. The collection of a library should be made available to the public for use or consultation who so ever and when ever required by them.

Hence, the purpose of a library is to serve the society through the records of human thoughts, ideas and expressions by making them available as and when required by the

member of the society, as well as preserve them for the coming generations, as those records are the intellectual wealth of the society.

1.4. Functions of a Library

As the society developed the responsibility of the library also grew. The functions of a library in the modern society falls in two categories, namely (i) preservation of the intellectual heritage of the society in the form of literary work which are being termed as information sources; and (ii) make these literary works accessible to the people of the society. On the parameters of these two categories, the functions of a library can be illustrated as to:

- (a) collect, maintain and make available the information sources to the people of the society to help them to make them aware of the available literature and to think and act independently;
- (b) foster and promote the dissemination of information, education and cultural heritage to promote enlightened citizenship and to enrich personal life;
- (c) provide opportunity and facility for formal and informal life-long self-education to the member of a community irrespective of age, caste, creed, colour, gender or any other human characteristics ;
- (d) preserve the intellectual, literary and cultural heritage of humanity for posterity as resources for research and development;
- (e) provide reliable information to all citizen without any bias and prejudice.
- (f) facilitate advancement of culture in the community.

The above mentioned functions of a library make it an important institution for the development of the society.

1.5. Role of Library in the development of Modern Society

Library and society is inter-linked and inter-dependable. This is the strong perception and realised truth that the development in the society is not possible without library. The society we live today has been termed as information society as maximum population is engaged in the profession where information and technologies are both raw as well as finished products of the human efforts. The present stage of the society is the result of the collective intellectual human endeavour for centuries.

The close observations of the socio-economic and cultural development of the society may give us an idea about the role of information, knowledge and library in shaping the modern society. The society has been segmented in three different phases on the development graph. This segmentation is based on the vocation and profession of the population of the society.

The first phase is known as 'agrarian society'. The main occupation was agriculture. Maximum population of the society was engaged in cultivation, fishing and mining using muscular energy. The Living standard of the mass was simple hence, their needs were also limited. Gradually, the population of the society grew accordingly their needs increased. By the time people started to accumulate knowledge and apply them in improving the human lives.

Then, the second phase is called 'industrial society' as maximum population of the society become occupationally dependant on industries. The invention of different technologies took place in the society because of the application of information and knowledge. These inventions produced machines and equipments which replaced muscular energy with mechanical energy. Now, the society started to produce the goods and products based on the raw materials produced by agrarian activity. This phenomenon brought the industrial revolution and changed the dynamics of the society.

Large number of the population got engaged in the production houses. People acquired information and used it as the resources in organising and improving the production lines which brought industries in existence. The society moved from the agricultural occupation to industry based occupation.

The third phase of the society is being termed as 'information society'. The human quest grew more and people put more efforts in research and development. The information became the centre of economic, political and cultural activities. Maximum population of the society got engaged in the occupation in which creation, distribution, use, integration and manipulation of information became significant and provided livelihood. The information became both raw as well as finished product of a large number of human activities.

By analysing the growth of the society from agrarian to information society, we find that the backbone of the growth are information and knowledge. In the process of development, many institutions took shape to support this growth. Out of those institutions the most important is the educational institutions. Initially, the educational institutions used to run in oral traditions where generation to generation knowledge used to transfer orally. As the volume of knowledge grew and the human activities were getting institutionalized, people invented recording mechanism through writing and further invented printing technology for preservation and dissemination of information and knowledge.

If we visualise the picture of the development of the society then we find that the whole process has revolved around the information and knowledge. When the society invented the writing mechanism, the library came in existence. After that, the library became the backbone of the development process.

In the changing context of the society, the role of library has also changed dynamically. The library in modern society is being considered a service agency. It organises and facilitates the use of information and knowledge for the development of an individual as

well as the society. Pierce Butler has stated in his *Introduction to Library Science* that “the basic elements of librarianship consist in the accumulation of knowledge by society and its continuous transmission to the living generation so far as these process are performed through the instrumentality of graphic records”. Here, the graphic records refer to the recorded information and knowledge as, books, periodicals, audio-visual records, etc. Here, the concept of “continuous transmission to the living generation” gives library the status of service agency.

1.6. Information and Library

Information has remained the changing force in the society from the foundation of civilization to the modern society. It has played defining role in the evolution process. People from different fields of studies; have tried to understand information with the background of their own area of expertise. Hence, there is no universal acceptability of meaning of information, but, it can be better understood when it would be discussed with its associated terms which are data, information, knowledge and wisdom in sequence. Let's discuss the concept of data, information, knowledge and wisdom, their association as well as their independent existence.

In the modern society, information is being considered a vital economic resources and backbone of growth and development. People in different subject area require information on various subjects in different forms and with different emphasis, approaches and explanations. It applies in various ways in day-to-day usage as well as in research and studies. For researchers, it can be considered as a thing, resource or a commodity that can be produced, purchased, replicated, distributed and communicated. Ultimately, it becomes factors or attributes in creating knowledge.

Information is a related concept. It gets created through processing and/or analyzing data and further creates knowledge. Hence data creates information, information creates knowledge and knowledge creates wisdom

We may define Information as “the factual data, ideas and other knowledge emanating from any segment of society that are identified as being of value, sometimes gathered on a regular basis, organized in some fashion, transmitted to others and used in some meaningful manner”. In other words we can say that information is a core value or entity; gathered on a regular basis and collected in organized manner, have some accurate value and a part of distribution or transmission of the values. These values can be used for decision making.

Information gets generated as a result of processing data of various human or cosmic activities, events or incidents taking place purposefully or naturally. Human factors involve both, individuals and corporate bodies. The Knowledge is an organized statement of facts or ideas, presenting a reasoned judgement or an experimental result, which is transmitted to others through communication in some systematic form. Information becomes knowledge when it is assimilated and shared with others. As we have studied above, data as raw facts and figures; information assimilates the data and organized in a meaningful manner and when this information widespread, distributed or shared among the people through communication becomes knowledge.

Knowledge can be viewed in different ways and can be categorised broadly as personal and public knowledge. The personal knowledge is the knowledge of an individual which may be communicated to others, through that individual only. The public knowledge is possessed collectively by the society. It is available for all in the society in the form of information products and services.

Michael Polanyi has given two categories of knowledge as tacit and explicit knowledge. Tacit knowledge is the knowledge of an individual which may or may not be expressed or shared while, explicit knowledge is that which is expressed to others orally, in a recorded form or through any communication channels.

Wisdom is the highest form of knowledge which can be acquired but not transferred. It is an individual trait or expertise acquired through the application of sound knowledge,

ability to see far ahead in future and capability of selecting right things from the alternatives and taking right decision.

After analysis of Data, information, knowledge and wisdom, we can say that these concepts have well established relationship. In this series the data possess least value while the wisdom the highest one.

1.7. Role of Library in Society

Over the centuries, library has also developed different models to serve the society. Presently, we have different types of libraries to cater wide range of the informational need of the society. Broadly, we have three models of libraries namely (a) Academic (b) Public and (c) Special library. Apart from these three models or types of library, we have one unique type that is National Library. We will discuss these types of libraries in detail in Chapter-2. But, all together, the libraries play a vital role in socio-economic, political and cultural development of a community and society.

1.7.1. Role of Library in Education

Library and educational institutions are two faces of the same coin, one cannot survive without other. The meaning and purpose of education is completely supported by library. Library is often called as hub of educational activities and heart of educational institution with which it is attached. The main objectives of education are imparting knowledge, inculcation of values and creation of vocational skills. These three aims are being achieved by different models of education. In modern society, there are three models of education as: a) Formal education b) Non Formal education and c) Informal education

(a) Formal Education

The formal education system is such a system in which education is imparted through the contact of teacher and student in school, college and university. In such system the

student are to be educated or trained on the basis of certain curriculum for a certain period of time . After completion of the program, within stipulated time, students are assessed and accordingly a degree or diploma is being awarded .In the system of education the institution are supported with the library to acquire the knowledge on the subject as well as related subjects of the student choice . in this context library is playing the following roles:-

- (i) Library supports the teaching and learning process at all levels of education(school, college , universities ,technical or professional)
- (ii) Inculcate reading habits and acquires knowledge in the subjects of pursuits.
- (iii) Developing critical and analytical thinking and creating skills of self studies
- (iv) Intellectual development of a student to make one research from a simple reader.

(b) Non-formal Education

Non formal education is such a system in which a person gets educated without the help of teacher or formal classes. In this system student get enrol with an academic institution for certain educational program and complete it through self studies.The library plays a major role in supporting educational pursuit such student who is getting education through this model. The public libraryplaysa major role in supporting non formal education system and provides the access of required sources as books, periodicals, etc. Anyone of society has the right of accessing the library services provided by public library. Hence, a student of non formal education completes his/her study easily with the help of a public library. Sometimes, the institutions, providing non-formal education also provide library services to support the students enrolled for such educational programmes.

A library plays following roles in non-formal education:

- (i) Supports the educational program in which the student is involved.

- (ii) Provide informational requirement needs for educational program.
- (iii) Bridge the gap of the absence of the teacher
- (iv) Help in self learning and create a researcher for student

These days almost all the institutions of higher studies offer distance educational programmes. In such programmes, a library plays the role of both teachers as well as information resources. In this direction public library is more important in this mode of education. Hence the library system itself becomes teacher, guide and mentor to the student, getting education through non-formal mode of education.

(c) Informal Education

Informal education system is such a mode of education in which a person get information and knowledge as per his/her requirements it doesn't have a course curriculum or structure education programme as offered in informal and non formal education .The informal education system could be for anything as an illiterate learns the reading-writing skills and become literate. Another example may be taken as a professional gets knowledge and skills to complete their work from any other professionals who have such knowledge. Hence, informal education is having a wide range of coverage. The library satisfies the knowledge quest of an individual for professional, spiritual or recreational. It provides the opportunity of lifelong self learning to the member of the society.

The role of library in the informal education can be listed as:

- (i) Satisfy the knowledge requirement of an individual needed for personal, professional and educational development, etc.;
- (ii) Creating reading habit among semi illiterate or illiterate;
- (iii) To creating responsible citizen;
- (iv) Keep semi illiterate or illiterate person educated through library services.

1.7.2. Role of Library in Research and Development

The human activities in the modern society is based on creating and utilizing information and further convert them into economic resources. Hundreds and thousands of individual, corporate houses, government institutions are conducting researches on science and technology as well as in social science and humanities. All these researchers need in to obtain effective and fruitful results. Hence, the library provides support to the research and development work of an individual as well as institutions.

The role of a library in research and development may be listed as:-

- (i) Keep the researchers up to date with the latest development in their field of research.
- (ii) Helps in selecting the research topic and assisting in completion of result
- (iii) Organises programmes on the process and procedure of research and research methodology.
- (iv) Provide information to avoid duplication of research.
- (v) Provide bibliographical service for collecting and selecting study material.
- (vi) Convey rational outlook and scientific knowledge to researchers
- (vii) Bridge the gap between the researchers and experts of the field research.

The library attached to the institution, which are conducting research programmes are well equipped and stuffed with information resources needed for research programmes of the institution.

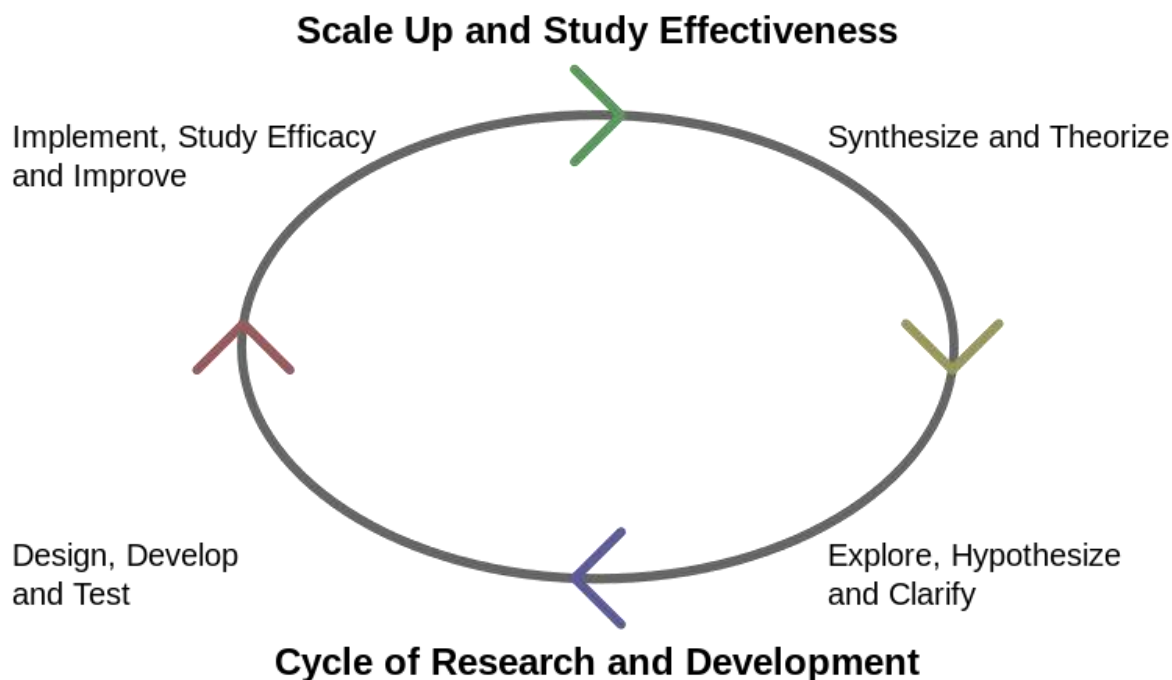


Figure 1.1: Role of Library in Research and Development (Source: <http://upload.wikimedia.org/> accessed on 19.02.2014 at 23.10hrs IST)

1.7.3. Role of library in Information Dissemination

Every individual of the society approaches a library for satisfying his/her informational need. For this purpose the library collect the information materials required by the various section of the society. With the help of library services the library disseminates the information among the individual of the society. Apart from this, the library organizes seminar, workshop, exhibition and a lot of other programs which helps people in acquiring the knowledge and skills. With the help of formal and informal library services, the library disseminate information in the society either store in the library in the form of book, journal, Periodicals etc. or by organizing program with the help of expert of different field. The library does not disseminate information in the present society but,

also preserve them to be disseminated in the future.

Diagram 2. Horizontal information dissemination by level

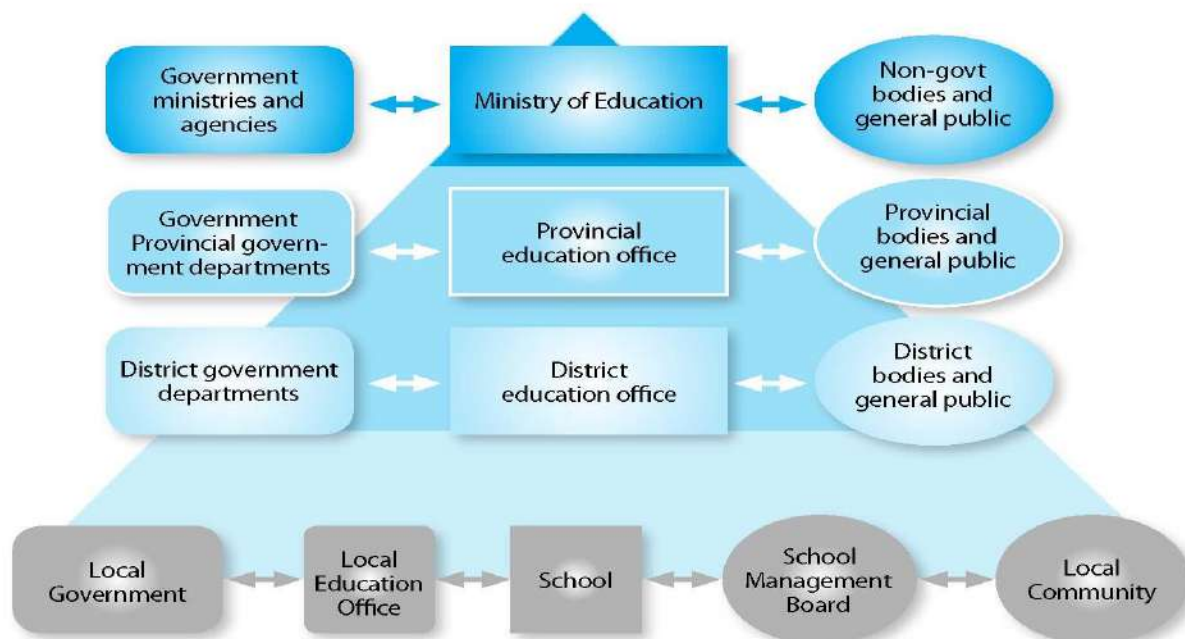


Figure 1.2: Role of Library in Information Dissemination (Source: <http://www.unescobkk.org/> accessed on 19.02.2014 at 23:15hrs IST)

1.7.4. Role of Library in Promotion and Development of Culture

The library is one of the institutions which has responsibility to preserve the cultural heritage of the society. It also preserve the art facts, traditions, customs and history of the society and knowledge about own as well as other culture.

Role of a library in promotion and development of culture may be listed as:

- (i) Reading and thinking, that widens the intellectual horizons and develops creativity of an individual
- (ii) The library enriches the cultural of society through its activity, lecture, seminars, workshop, cultural programs, exhibition etc.
- (iii) Preserve the cultural heritage of a nation, state, city, town even village or panchyat.
- (iv) Educate people about local history as well as tradition

- (v) Organizing different cultural programs as exhibitions, dance, drama, concerts of different type of competition to save the cultural values and traditions. For ex. Activities like puppet show, poetry show, exhibition of craft and art helps in promoting the tradition and culture of the society.

1.7.5. Role of Library in Recreation and Leisure

The library provides opportunity to the people of the society to utilize their leisure time in the positive manner and creative direction. If a person having leisure time without any positive work, it is possible that the person may go negative and destructive. Hence, the library has an important role to provide positive directions to such persons through, books, periodicals, and popular magazines as well as organizes programs to keep them in positive spirit. For this purpose, the library stocks fiction, novels, other form of literature, work of the art and other materials which have recreational values. The cultural program organized by the library also keeps engaged such people and make the society healthy.



Figure 1.3: Role of Library in Recreation and Leisure (Source: <http://www.the-club.com/facilities/recreationleisure/library> accessed on 19.02.2014 at 23:45hrs IST)

1.7.6. Role of Library in Moral, Ideological and Spiritual Development:-

On the basis of the contents of the book have been divided into three categories:-

- a. Inspiratory
- b. Informatory
- c. Recreatory

Books pertaining to religions, philosophy and related fields which lifts the human spirit, poetry, drama and fiction falls under the inspiratory category.

Books pertaining to biography, history, travel science useful arts and sociology falls under informatory category.

Books related to fiction, drama, poetry, humour, essay and light reading materials in various fields are considered recreatory books.

Hence, a library plays positive roles in shaping the moral values, ideology and spiritual value of an individual through inspiratory materials.



Figure1.4:Role of Library in Moral, Ideological and Spiritual Development (Source: <http://pjmedia.com/lifestyle/author/davidswindle/page/3/> accessed on 20.02.2014 at 24:45hrs IST)

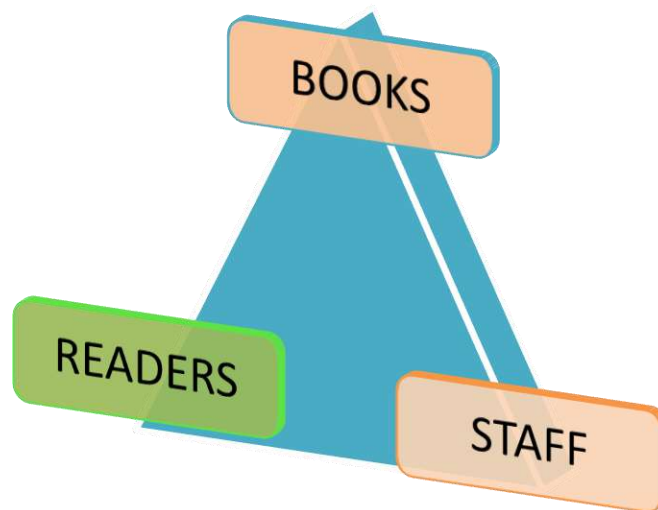
1.8. Concept of Trinity and Library

Ranganathan, the father of Library and Information Science in India, introduced the concept of “trinity in library”. He says that “a library is a trinity made up of books, reader and staff”. According to this concept, the library having three inter-dependent components which make it a social institution. Those components are books, reader

and staff. The 'book' is the representative of all the materials which provide information and knowledge to people. These materials may be a book, magazines, journals/periodicals, map, charts, art facts, audio-visual materials, etc.

The 'reader' refer to the member of the community or society who are directly or indirectly dependant on a library for their quest knowledge. The reader group depends upon the nature of the community a library is serving. For example, the students, teachers, researches are the reader for an academic library. But for a public library reader may be any one of the society without any distinction or scrutiny. The researcher and scholar are the reader for a special library. Hence, for the library, reader is reader is the client for whom the library is meant for.

The staff of a library is the link between the users and the book. They play a decisive role in establishing contact between the information source and the reader. Without the effort of the staff, it is very difficult for the reader to get right information especially at



right time.

LIBRARY

Figure 1.5 :Concept of Trinity

1.9. Summary

Information and knowledge has been the driving force in the development of the society. Society has passed through three different phases namely agrarian, industrial and post-industrial/information society. Human being understood the power of knowledge hence, they invented the mechanism of writing to record and document the information and knowledge they acquired. Further, they invented paper and printing technology which proved mile stone in human history.

Growth in information and knowledge and birth of several institutions in the society created an institution called library. Initially, a library had the role of preserving the knowledge of the society but gradually it become a service agency and started to serve the society with its resources namely books, periodicals, etc. The role of library grew many fold as society developed educationally, socially, economically, culturally and politically. Library has become backbone of the modern society as it provides means to the development process in each and every segment of the society.

1.10. Exercise

Very Short Answer Type Questions

- (i) What are the driving factors for the development of society?
- (ii) How the information and knowledge were preserved and transmitted in the primitive society?
- (iii) What kinds of institutions were borne due to development of civilizations?
- (iv) Why the concept of library emerged?
- (v) Name the three different phases of society on the basis of its vocation.

Short Answer Type questions

- (vi) Define a library.
- (vii) What is the purpose of a library?
- (viii) Define the agrarian society.

- (ix) Define the industrial society.
- (x) Define post-industrial society or information society.
- (xi) Why did the library emerged?
- (xii) Define data.
- (xiii) Define information.
- (xiv) Define knowledge.
- (xv) Define wisdom.
- (xvi) What do you mean by tacit knowledge?
- (xvii) What do you mean by explicit knowledge?
- (xviii) How data, information and knowledge are inter-linked?
- (xix) What do you mean by inspiratory materials?
- (xx) What do you mean by informatory materials?
- (xxi) What do you mean by recreatory materials?
- (xxii) Define formal education?
- (xxiii) What do you mean by non-formal education?
- (xxiv) What do you mean by informal education?

Long Answer Type Questions

- (xxv) What are different functions of a library?
- (xxvi) How a library plays an important role in education?
- (xxvii) How a library shape the moral, ideological and spiritual aspect of a community?
- (xxviii) How a library disseminate information and knowledge in the society?
- (xxix) How a library plays an important role in research and development?
- (xxx) What do you mean by the theory of trinity? Elaborate its three components with suitable examples.
- (xxxi) How a library plays role in promotion and development of culture?

1.11. References:

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1.12. Glossary

Agrarian society: A society that depends on agriculture, fishing and mining as its primary means for support and sustenance.

Civilization: An advanced state of intellectual, cultural, and material development in human society, marked by progress in the arts and sciences, the extensive use of record-keeping, including writing, and the appearance of complex political and social institutions.

Industrial society: A society driven by the use of technology to enable mass production, supporting a large population with a high capacity for division of labour.

Information society: A society where the creation, distribution, use, integration and manipulation of information is a significant economic, political, and cultural activity.

Institution: An organization founded for a religious, educational, professional, or social purpose.

Intellectual heritage: Recorded and unrecorded skills, information and knowledge of the society.

Knowledge society: A society which generates, processes, shares knowledge and makes available to all members of the society that may be used to improve the human condition; or a knowledge society serves to transform information into resources that allow society to take effective action.

Literary work: Information and knowledge in written or recorded form for preservation and dissemination.

Organization: An organized group of people with a particular purpose, such as a business or government department.

Post-industrial Society: The stage of a society's development when the service sector generates more wealth than the manufacturing sector of the economy.

Preservation: Carefully maintain something for longer use or to be used in future.

Society: Group of people living together, sharing same socio, economic, political, cultural and geographical territory.

Unit 2A

Types of Libraries and their role

2.1. Introduction

Library is a combination of three compounds as told by Ranganathan in the theory of trinity. These three compounds are book, reader and staff. Books and readers are two different components which need to come in contact for which staff is needed. Here, books represent the information source of any form whether books, journals, periodicals, audio visual material, map, charts etc. In case of non documentary source the information and knowledge come from the experts of different fields such as academicians' researchers, scientists, doctors, engineers, artists etc.

The reader which uses the information sources of a library, represents all those persons who need information and knowledge for their individual, professional educational or any other purpose. Hence, different set of persons have different approaches towards the library. They need different types of information in wide range of area of study.

Over the year the society has created different institution for different purpose. For educational needs we have established educational institutions for different level of studies, to satisfy the educational need of the society. We have schools, colleges, universities and professional and technological institution. We have social and cultural organisation for the development of our society and culture. .

The present society is engaged in research and development, inventions and discovery. The research and development work in society is going to be undertaken by different organisations worldwide. These organisations are government supported organisations, corporate houses, educational institutions, autonomous bodies and many more.

2.2. Types of Libraries

In all human activities and in the day to day life people need information and knowledge. To provide information and knowledge we have library systems in the society. The informational needs of society differ from community to community and institutions to institutions. On the basis of the informational needs of the society as well as the purpose of providing library services to different user community, different models of library have been developed. These models of library are being studied under the topic of type of library.

Broadly library has been grouped in four categories on the basis of their objectives and functions in the society. Those categories are as follows:

1. National library.
2. Academic libraries
3. Special libraries
4. Public libraries

2.2.1. National Library

The national library is the apex library in the library system of any country. It is usually created a fresh or entrusted the responsibility of national library by the constitutional provision of the country. The national library of any country is the custodian of the intellectual heritage of the country. The intellectual heritage is the total information and knowledge wealth either produced within the nation; any where written by the nationals; and written by any one on that particular nation. For example, the National Library of India, Kolkata has the responsibility to preserve the written and published materials within India, published by the Indian Nationals anywhere in the world and published by any one about India.

2.2.1.1 Definition of a National Library

S. R. Ranganathan defines the national library as “the library having the duty of collecting and preserving for posterity, the literary products of that country. It is the central station for assembling and dissemination through energy”.

Further, the UNESCO defines the national library as “libraries which irrespective of their title are responsible for acquiring and preserving copies of all significant publications published in a country and functioning as a deposit library, either by law or under other arrangements.

2.2.1.2 Objectives a National Library

The main objective of a National Library are to:

- (i) procure all the literary output of that nation by the legal provision of the nation or other arrangements;
- (ii) acquire foreign literature about that nation;
- (iii) preserve the literary wealth of that nation for posterity
- (iv) disseminate procured and preserved information through different services and publications;
- (v) maintain the national bibliography and publish it;
- (vi) coordinate with other libraries of the country to develop national library system.

2.2.1.3 Functions of the national library

The comprehensive functions of a national library differ from country to country but minimum functions set by the UNESCO's General Conference (1970) are as follows:

- (i) produce a national bibliography;
- (ii) hold and keep up-to-date a large and representative collection of foreign literature including books about the country;
- (iii) act as a national bibliographic centre;

- (iv) compile union catalogue;
- (v) publish the retrospective national bibliography.

The UNESCO conference had recommended that the libraries which may called “National” but whose functions do not correspond to the above definitions should not be placed in the ‘national library category’.

Examples of a Few National libraries of the world are:

- (i) The National Library of India, Kolkata. It was given the status of the National Library of India with the enactment of the Imperial Library (Change of Name) Act, 1948, and opened for public as the National Library of India on 1 February 1953. Web address-<http://www.nationallibrary.gov.in/>
- (ii) The British National Library is known as British Museum Library, London, UK was established the act of British Parliament in 1970. Web address-<http://www.bl.uk/>
- (iii) The United States of America has not designated any libraries as National Library of USA by law but the Library of Congress, Washington DC is executing all the functions of the National Library of the USA. Web address-<http://www.loc.gov/index.html>

Like wise one can find about the national library of any nations from reference sources of on internet.

2.2.2. Academic Library

Education and library are the two faces of same coin. One cannot exist without other. Hence, an academic library is an integral part of any institution of formal education. It supports the teaching- learning process of the institution it is attached with. Academic library can be defined as “a library which associated or attached with any educational institution to support its educational programmes”.

Depending upon the nature of the institution and its academic programmes, the library collection is developed. The students, teachers, research scholars and administrative and other staff of the institution are the users of the academic library. The need of the users of all these categories dominate the collection of an academic library. The numbers, qualities and qualifications of the library staff of an academic library differs on the basis of the type of academic library and its users as well as services it provides.



Figure 2.3 Architecture of academic library (Source: <http://www.dewberry.com/architects/Libraries/Academic> accessed on 20.02.2014 at 01:20hrs IST)

2.2.2.1 Objectives of Academic Library

The academic library has the following objectives:

- (i) serve the needs of the academic community;
- (ii) collect and store all kinds of reading and reference material;
- (iii) provide all kinds informational materials to support their curricular requirements;
- (iv) provide supporting materials for extra curricular activities;
- (v) provide reading areas for users;
- (vi) render lending service appropriate to students, teachers and researchers;
- (vii) provide an active reference and information service.

2.2.2.2 Types of Academic Library

Broadly, there are three types of academic libraries. Those are:

- (a) School library
- (b) College library
- (c) University library

(a) School Library

The school library is a library attached or associated with a school to support the education system of the school. It caters to all the informational needs of the students, teachers and staff of the school. In India, there are four levels of school as primary, middle, secondary and senior secondary. The government and the agencies responsible for developing and supporting school education in India, having policy that the school of all level should be supported by a school library. Because of this, even primary schools are being supported by a library to serve the need of its students, teachers and other staff.



Figure 2.4: Students reading books in the Library (Source: accessed on 25.02.2014 at 01:20hrs IST)

Objectives of School Library

The objectives of a school library are to:

- (i) support the education programmes of the school;

- (ii) awaken and foster interest in reading book and create reading habit among students;
- (iii) nurture good moral values and principles among students to create refined citizen;
- (iv) develop self learning skills and interest in using library for solving problems;
- (v) provides information on further study and vocation;
- (vi) help teachers to improve their teaching skills;
- (vii) inculcate communication skills through extra curricular activities like story telling, viewing and discussions on audio/visual programmes workshops, etc.

The school libraries of all levels having all most same set of objectives as mentioned above.

Function of School Library

The school library of all levels should develop the collection to satisfy the objectives mentioned above. Apart from developing suitable collection of inspiratory, informatory and recreatory books and other materials, the academic library is supposed to perform following functions:

- Lending of books and other materials;
- Reading rooms with suitable furniture and lighting;
- Reference services;
- Guidance, counselling and advisory services.

(b) College Library

The library attached to college to cater the informational needs of the college community- students, teachers and staff of the college, duty towards the alumnus and must become a positive influence in society for expansion of knowledge and helping in satisfying the quest for knowledge.

The modern society having different types of colleges as:

- (i) Junior college;
- (ii) Degree college;
- (iii) Postgraduate college;
- (iv) Professional colleges and technical college.



Figure 2.5: A view of college library (**Source:** Cypress College Library accessed on 25.02.2014 at 01:40hrs IST)

Objectives of College Library

The college library of all categories of colleges having the following objectives:

- (i) give the student, a wider and deeper understanding of the various disciplines;
- (ii) helps in all the educational programmes of the college;
- (iii) provide guidance to students for higher studies and self-learning;
- (iv) prepare the students for shouldering higher responsibilities in government departments, civic organizations, commercial establishments, business and industries, etc;

- (v) prepare them for varied professions like law, medicine, engineering, technology, etc;
- (vi) train them to become more enlightened, knowledgeable and responsible citizens; and
- (vii) keep informed the teachers with latest up-dates in their respective subject area.

Functions of College Library

The functions of a college library can be listed as:

- (i) develop collection of textbooks, related books, books of general knowledge, reference materials and audio-visual materials to support educational and instructional programmes of the college;
- (ii) procure popular magazines, newspapers and scholarly journals to support students and teachers in acquiring deeper knowledge in the subject of studies and general knowledge about their surroundings;
- (iii) make the library resources accessible through proper classification, cataloguing and shelving;
- (iv) provide physical facilities such as functional building, furniture, equipment, reading rooms, etc. ;
- (v) preserve previous years' question papers to help the students in preparation for examinations and assessments;
- (vi) develop collection of inspiratory materials like fiction, poetry, biographies, travel-books, etc.;
- (vii) organize orientation programmes to new students to make them aware regarding the facilities and resources available with the library.

(c) University Library

The university library is an integral part of any university. The academic programmes of a university covers a wide range of disciplines and subjects. The modern

universities are offering a number of academic programme which are multi disciplinary in nature. Apart from the curricular academic programme, scholar of the universities undertake research project for both, for degrees as PHd, DLit, etc., and discovery and invention of new theories, principles, technology for the sake of society or solving the problems of the society. Hence, a library becomes an essential component of the university to support its academic and research activities.

Because of the responsibilities a university library shoulder, it is considered the heart of a university, around which teaching and research revolves. According to the Association of University Teachers, “the prime function of the university library is to provide facilities for study and research for the members of its own institution”.



Figure 2.6: A view of university library (Source: **Leipzig University Library** accessed on 28.02.2014 at 01:40hrs IST)

Objectives of a University Library

The objectives of a university library are to:

- (i) provide facilities for all teaching, learning, educational, and research programmes of the university;

- (ii) satisfy informational need of the students, teachers and researchers of the university;
- (iii) provide intellectual and managerial leadership among the professionals in various fields of government and industry and inculcate a sense of social responsibility in them;
- (iv) inspire the teachers and researchers of the university to undertake research works for generating new knowledge to improve quality of life of the people; and
- (v) provide latest knowledge to the teachers in their area of teaching and research; and
- (vi) conserve knowledge and ideas for posterity.

Functions of a University Library

The major functions of the university library to fulfil its objectives are to:

- (i) develop collections on wide range of subjects for learning, teaching, research, publication, etc.;
- (ii) organize and store the library collection with proper classification, cataloguing, shelving, etc to make the collection easily accessible to the users.
- (iii) acquire, materials as books, journals, periodical, newspapers, and others sources of information to provide latest information and knowledge on the concerned subjects;
- (iv) provide reference, information and documentation services to the university community to keep them up to date in their area of studies and research;
- (v) keep pace with the development in the library system management and applications of new technologies to provide better library services to the users.

2.2.3. Special Library

The special libraries are established to meet the informational requirements of the organisations to which they are attached. Such organizations are devoted to Research and Development (R&D) activities. The special library procures all types of information sources as handbooks, technical reports, state-of-the-art reports, bibliographies, current awareness bulletin, periodicals, indexes, abstracts, directories, etc., needed for the research projects of the organization.

2.2.3. 1. Definition of a Special Library

The American Library Association (ALA) Glossary of Library and Information Science defines Special Library as, “a library established, supported and administered by a business firm, private corporations, associations, government agency, or other special interested group or agency to meet the information need of its members or staff in pursuing the goals of the organization. Scope of services is limited to the subject interest of the host or parent organization”.

Harrod's Librarians' Glossary of Terms states that a, “Special library is a collection of books and other printed, graphic or recorded material dealing with a limited field of knowledge and provided by a learned society, research organization, industrial or commercial undertaking, government department or even an educational institution. It may also be a special branch of a public library serving certain interests or occupational groups such as a technical library or a special subject library, meeting the needs of all enquiries on that given subject such as music library”.

A special library serves specialist user, located within a single organization or group and is responsible for the collection, organization storage, retrieval and dissemination of information directly concerned and ancillary to, the work of the specialized institution with which it is attached.

2.2.3.2 Objectives of a Special Library

The objectives of a special library are to:

- (i) develop current as well as retrospective collection in core subjects based on the projects and programmes of the parent organization;
- (ii) provide promptly the latest information about the significant developments in the field whenever requested by the users;
- (iii) provides all types of academic, technical and documentary support to render and appropriate services to the specialists.

2.2.3.3. Functions and Services of a Special Library

The functions of a special library are to:

- (i) select, procure, organize, store and retrieve current information required by the researchers and other users of the library;
- (ii) analyses, synthesizes and evaluates available information in the area of concern;
- (iii) provides state-of-the-art-reports, critical reviews, monographs, research reports, etc, to support the study and research programmes of the organization;
- (iv) provides indexes, abstracts and extracts for critical analyses of literature, identify and procure relevant source of information;
- (v) provide reference service as Current Awareness Services (CAS), Selective Dissemination of Information (SDI), and Translation Services;
- (vi) provide document delivery service including lending and inter library loan service.

2.2.4. Public library

Public library is a social institution established for providing opportunities to each and every person of the society, irrespective of their caste, creed, religion, gender, social, economic and educational status, etc., to acquire knowledge through reading materials. It is established for general public and maintained chiefly by public fund. It is an integral part of the community, it serves.

The public library research group of U.K. states that the whole aim of a public library is “to contribute to sustain the quality of life in all its aspects- educational, economic, industrial, scientific and cultural and promote the concept of democratic society in which equal opportunity exist for all, to develop into true citizens, with whole and balanced personalities leading to an increase in the sum total of man’s happiness and aware of himself, his fellow men and his environment “.

Ranganathan says that “the public libraries generate material happiness, mental jobs, and spiritual delight: they are social institution charged with the duty of providing the means for the perpetual self education of one and all: and the contribution to the circulation of the idea , the harnessing of leisure, the demand of democracy , the spreads of literary and the success of commercial and industrial organisation”.

Hence, we can say that ‘the public library is a social institution with responsibility of providing library services to the community, without any bias and prejudice to cater informational and recreational needs. It provides equal opportunity to each and every member of the society to get success in life which ultimately contributes in development of the society. It promotes the democracy in true sense. Inspired by the definition of democracy ,given by Abraham Lincoln, the public library has also been defined as “a library, of the people, by the people, for the people.”



Figure 2.1: A view of public library (Source: <http://post.jagran.com/Public-libraries-to-get-a-facelift-1390896951> accessed on 20.02.2014 at 24:50hrs IST)

UNESCO's Public Library Manifesto

UNESCO's Public Library Manifesto was formulated for its members countries in 1949, to promote the public library system and provide access of knowledge to each and every member of the society. This manifesto was further revised in 1972 and in collaboration with International Federation of Library Associations and Institutes(IFLA), it revised in 1994. The final manifesto is widely accepted by the member countries of United Nations. The manifesto provides guidelines regarding objectives, activities and services of public library; its funding, legislation and networks; its operations, management and implementation of the Manifesto.

According to the manifesto, public Library is the local gateway of knowledge, provides basic conditions for lifelong learning, independent decision making and cultural development of the individual and social groups. This manifesto proclaims UNESCO's belief in the public library as a living force for education, culture and information and as an essential agent for the fostering of peace and spiritual welfare through the minds of men and women.

Unesco Public Library Manifesto

JEAN GATTÉGNO*

The 1972 UNESCO Manifesto for the Public library, although it was a great inducement for better public libraries, must be updated.

Firstly because the necessity for *truly pluralistic collections* must nowadays be emphasised, if only to fight new and subtle forms of censorship.

Secondly because the question of free access – i.e. *access free of charge* – should no longer be addressed in the universal way which many librarians regard as self-evident: in developed countries at least, a participation of library users to the budgetary efforts of the community is becoming the rule – and for good reason too.

The UNESCO manifesto undoubtedly represented a significant step forward for public libraries in that it offered librarians and all those concerned by the educational, entertainment and cultural functions of libraries an internationally recognised concept which they could use in opposing any attempts to reduce the latter's role.

Nevertheless, the existing version is too general as regards access to information, or rather possible obstacles to the free access that forms the very basis of the public library.

If we look at the text of the manifesto, the main passages on the subject are as follows:

1. "The public library is the principal means whereby the record of man's thoughts and ideas, and the expression of his creative imagination, are made

* Jean Gattégno works for the Council of Europe. Originally a professor of English literature, Jean Gattégno has worked from 1981 to 1989 as "Directeur du Livre et de la Lecture" at the French ministry for cultural affairs. He was then in charge of public libraries and was the official partner of French authors, publishers and booksellers at administrative level. From 1989 to 1992, he worked at the "Bibliothèque de France" as co-ordinator of the project itself in terms of librarianship. Since October 1993, he is responsible, in the Council of Europe in Strasbourg, for the programme dealing with "Archives, Books, Reading and Translation", with special emphasis on the needs of the new democracies from Central and Eastern Europe.

Figure 2.2: Unesco public library manifesto (Source: Libri. International Journal of Libraries and Information Services accessed on 20.02.2014 at 01:10hrs IST)

Mission of the Public Library

The UNESCO's Public Library Manifesto provides following key missions that relate to information, literacy, education and culture should be at the core of public library services:

- (i) creating and strengthening reading habits in children from an early age;
- (ii) supporting both individual and self conducted education as well as formal education at all levels;
- (iii) providing opportunities for personal creative development;
- (iv) stimulating the imagination and creativity of children and young people;
- (v) promoting awareness of cultural heritage, appreciation of the arts, scientific achievements and innovations;
- (vi) providing access to cultural expressions of all performing arts;
- (vii) fostering inter-cultural dialogue and favouring cultural diversity;
- (viii) supporting the oral tradition;

- (ix) ensuring access for citizens to all sorts of community information;
- (x) providing adequate information services to local enterprises, associations and interest groups;
- (xi) facilitating the development of information and computer literacy skills; and
- (xii) supporting and participating in literacy activities and programmes for all age groups, and initiating such activities, if necessary.

Funding, Legislation and Network

On the issue of funding, legislation and network, the Manifesto states that:

- (i) the public library shall in principle be free of charge. The public library is the responsibility of local and national authorities. It must be supported by specific legislation and financed by national and local governments. It has to be an essential component of any long-term strategy for culture, information provision, literacy and education.
- (ii) to ensure nationwide library coordination and cooperation, legislation and strategic plans must also define and promote a national library network based on agreed standards of service.
- (iii) the public network must be designed in relation to national, regional, research and specific libraries as well as libraries in schools, colleges and universities.

Operation and Management

The manifesto further provides guidelines on operation and management of public library as:

- (i) A clear policy must be formulated, defining objectives, priorities and services in relation to the local community needs. The public library has to be organized effectively and professional standards of operation must be maintained.

- (ii) Cooperation with relevant partners - for example, user groups and other professionals at local, regional, national as well as international level - has to be ensured.
- (iii) Services have to be physically accessible to all members of the community. This requires well situated library buildings, good reading and study facilities, as well as relevant technologies and sufficient opening hours convenient to the users. It equally implies outreach services for those unable to visit the library.
- (iv) The library services must be adapted to the different needs of communities in rural and urban areas.
- (v) The librarian is an active intermediary between users and resources. Professional and continuing education of the librarian is indispensable to ensure adequate services.
- (vi) Outreach and user education programmes have to be provided to help users benefit from all the resources.

Objectives of Public Library:

S. R. Ranganathan, in his book “Library Manual”, lays down the following objectives of the public library:

- (i) it should help the life-long self-education of one and all;
- (ii) it should furnish up-to-date facts and information on all subjects to one and all;
- (iii) it should distribute in an unbiased and balanced way, all shades recorded views and thoughts to one and all, as a help in discharge of their political functions in respect of local, national and international affairs;
- (iv) it should contribute the productivity drive by informing top management of the latest trends in diverse enterprises, by ploughing back into the minds researchers, designers, and technologists every piece of relevant new thought, promptly and pin-pointedly;
- (v) it should provide one and all a harmless and elevating use of leisure;

- (vi) it should preserve the literary remains of humanity for posterity, as vehicles of culture and as source materials for antiquarian research; and in general,
- (vii) it should work for continued social well-being, as the agency in charge of all socialized recorded thoughts.

Hence, as per model functions listed by Ranganathan, a public library has , educational, informational, political, economic, industrial, cultural and antiquarian objectives.

Function of Public Library

The public library performs different functions to achieve its objectives. Those functions can be listed as:

- (i) **Supporting Education:** The public library provides all kinds information resources to the member of the community it serves. It helps people in educational endeavour whether formal, informal or non-formal education. Especially, it is boon for the people who acquire knowledge through non-formal and informal education system. Its services to the community supports Adult Education and Social Education which ultimately demolish illiteracy from the society. Because of this function, the public library is considered people's university as it provides the sources of knowledge whether printed, non-printed or any other form, to develop professional, intellectual, moral and spiritual capabilities of an individual member of the society.
- (ii) **Knowledge Preservation and Dissemination:** The public library preserves the socio-cultural, historical, geographical and other categories of knowledge either produced or needed by the community it serves. It disseminate these preserved knowledge in the community to make people aware about community, its professions and vocations, culture, customs, lifestyle, etc.
- (iii) **Creating Reading Habits and Love for Knowledge:** The public library provides all kinds of reading materials as books, periodicals, popular magazines, etc,

which creates reading habits among the people of the community which has positive effects on creating refined citizens.

Apart from the functions discussed above, providing needed information and knowledge to the member of the community it serves is the prime function of the public library.

2.3. Summary

The changing agent in society is information and knowledge. The need of information and knowledge has grown many folds since the inception of civilization. Different communities needs different types of information for their wide range of activities and further create wealth of knowledge for the betterment of the society. to serves the information and knowledge needs of the society and further preserve them for future generation, different types of library came in existence.

On the basis of the objectives and services rendered by the libraries, they have been grouped in four categories. Those categories are (i) Public Library (ii) Academic Library (iii) Special Library, and (iv) National Library.

The public library is to serve to all members of the community irrespective of their caste, creed, colour, nationality, gender, etc. It has the objective to satisfy the information and knowledge needs of the community members for whatever purposes they wish to study. Beyond this the public library has important roles to play in the society to make the people, knowledgeable and responsible citizen.

The academic library is the part and partial of academic institutions. The academic community of any Institutions needs information and knowledge to supporting its curricular programmes, careers and character building and research and development work. Hence, an academic library has objectives to satisfy the quest of knowledge of the community of the academic institution, the library is attached with.

The modern society has wide range of organisation which are engaged in specialized study and research activities. The researchers of such organizations have need intensive information and knowledge in their area of study. Hence, such organizations have their own library system to cater the information and knowledge need for its activities. Hence the special library is always attached to an organization of research and development and completely owned, funded and managed by that specific organization.

The national library is being considered the apex library of any nation having the responsibility to preserve intellectual wealth of the nation and disseminate among the nationals as well as international community. The national library is usually created by the legal provisions of a particular nation and has the responsibility to acquire the information and knowledge created in the nation, by the nationals and on the nation by other nationals. It has the responsibility to create, maintain and publish national bibliography. Sometimes, a particular nation has not created such library by the legal provisions of that nation but a particular library executes the responsibilities of a national library can also be designated as National Library of that particular nation, as Library of Congress, USA.

2.4. Exercise

Very short answer type questions

- a. What is the theory of trinity?
- b. Who brings the reader and the book in contact?
- c. What does a book represents in the theory of trinity?
- d. Who all are the user of a library?
- e. Name different types of libraries.
- f. What are different types of academic library?
- g. Define a public library.
- h. Define an academic library.
- i. Define a special library.
- j. Define a national library.
- k. Define digital library.
- l. Define virtual library.

Short answer type questions

1. What are different guidelines for funding, legislation and network of a public library in the UNESCO's Public Library Manifesto?
2. What are different objectives of academic library?
3. What are different objectives of a school library?
4. What are different objectives of a college library?
5. What are different objectives of a special library?
6. What are the objectives of the national library?
7. What are the functions of the national library?
8. Write down the characteristics of a digital library?
9. Write down the characteristics of a virtual library?
10. What are different functions of a university library?

Long answer type questions

1. What is the mission of the public library discussed in UNESCO's Manifesto?
2. What are different objectives for a public library have been laid down by S. R. Ranganathan?
3. Discuss three main functions of a public library.

4. What are different functions of a college library?
5. What are different functions of a special library?

2.5. References:

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2.6. Glossary

UNESCO: United Nations Educational Scientific and Cultural Organization- an agency of the United Nations which promotes education, scientific communication, the arts and culture.

Unit 2B

Changing formats of Libraries : Digital, Virtual and Hybrid

2.B.1. Digital Library

The implications of computer and digital technologies changed the forms of information sources their storage and retrieval approaches. The 1980's decade can be considered the transforming decade in the field of information publication industries. The information started to be published and distributed in electronic form. Initially , the storage media for transferring the information content were floppy disk or CD-ROM and likewise other storage devices. The content of these media were accessible with the help of computer and the special software provided by the publisher.

Further the improvement in the storage capacities of the storage media and the becoming internet accessible to the people in 1990's the delivery of content through internet to the institutions of individual become easy.

The publication of information sources become most popular 1990's onwards as the access device like computer, laptop, book reader and now smart phones become cheaper and affordable to the mass. Hence, the concept of digital library came in existence.

Definition of a Digital Library

The scholars have tried to define the digital library differently but the central theme of those definitions are same. Witten and Bainbridge(2002) define the digital library as “an organized and focused collection of digital objects, including text, images, video and audio, with the methods of access and retrieval and for the selection, creation, organization, maintenance and sharing of collection”.

The partner institutions in the Digital Library Federation (DLF) defines it as “Digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of, and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities”.

Characteristics of a Digital Library

The digital library is a library which select, collect, store, retrieve and disseminate electronic information. Main characteristic of a digital library is to build library collection of information sources in electronic or digital form and provide services to its members using such resources. Hence, the library services are there but only the form of information sources has changed from print to electronic. The digital library uses digital technology for storing, retrieving and dissemination information.

Example:

(i) Digital Library of India: <http://www.dli.gov.in/>

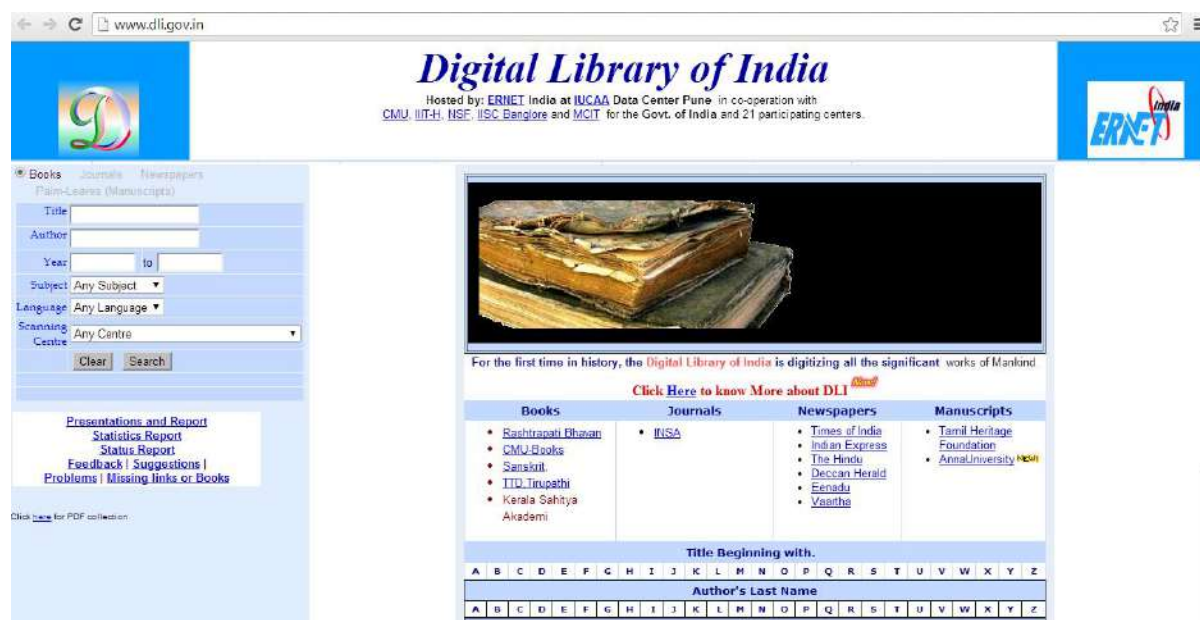


Figure 2.7: Indian Digital Library (Source: <http://www.dli.gov.in/> accessed at on 19.02.2014 at 22:10hrs IST)

- (ii) J. R. D. Tata Memorial Library, Indian Institute of Science, Bangalore:
<http://www.library.iisc.ernet.in/>



Figure 2.8: J. R. D. Tata Memorial Library (Source <http://www.library.iisc.ernet.in/>, accessed at on 19.02.2014 at 22:47hrs IST)

2.B.2. Virtual Library

Virtual library is a library without wall. With the application information and communication technology, the information become accessible from the remote. This accessibility power created the environment for such library which can stores information in digital form anywhere in the world and give access to its members through a numbers of electronic devices which are capable of accessing information through network. Those devices are computer, laptop, smart phone, etc. The member of the library uses these electronic devices for accessing information from the library portal through internet.

Definition of a Virtual Library

Gapen (1993) defines virtual library as “ the concept of remote access to the content and services of libraries and other information resources, combining and on-site collection of current and heavily used materials in both print and electronic form, with an electronic network which provides access to, and delivery from, external worldwide library and commercial information and knowledge sources”.

Hence virtual library has changed the concept of physical form of library with physical space and building. The approaches towards the access of knowledge by the users and managing the knowledge by the staff has completely changed in this environment. The library staff need to store and makes knowledge content of the library searchable and accessible through the computer and telecommunication network i.e. internet. Now, instead of visiting the library by the users for knowledge, the library itself reach to the users place demolishing physical barriers of time and space.

Characteristic of a Virtual Library

The main characteristic of a virtual library is that is demolish the time and space barriers and is available 24 hours of a day and 365 days of a year. As the library is maintained virtually, hence providing library services to the users and management of the such libraries by staff are done remotely.

Examples of Virtual Library

- (i) Indian Virtual Library: <http://www.southasianist.info/india/>



Figure 2.9: Indian Virtual Library(Source: <http://www.southasianist.info/india/> accessed on 19.02.2014 at 23:15 hrs IST)

- (ii) The www virtual library: <http://vlib.org/> provides a list of virtual libraries in different subjects or streams

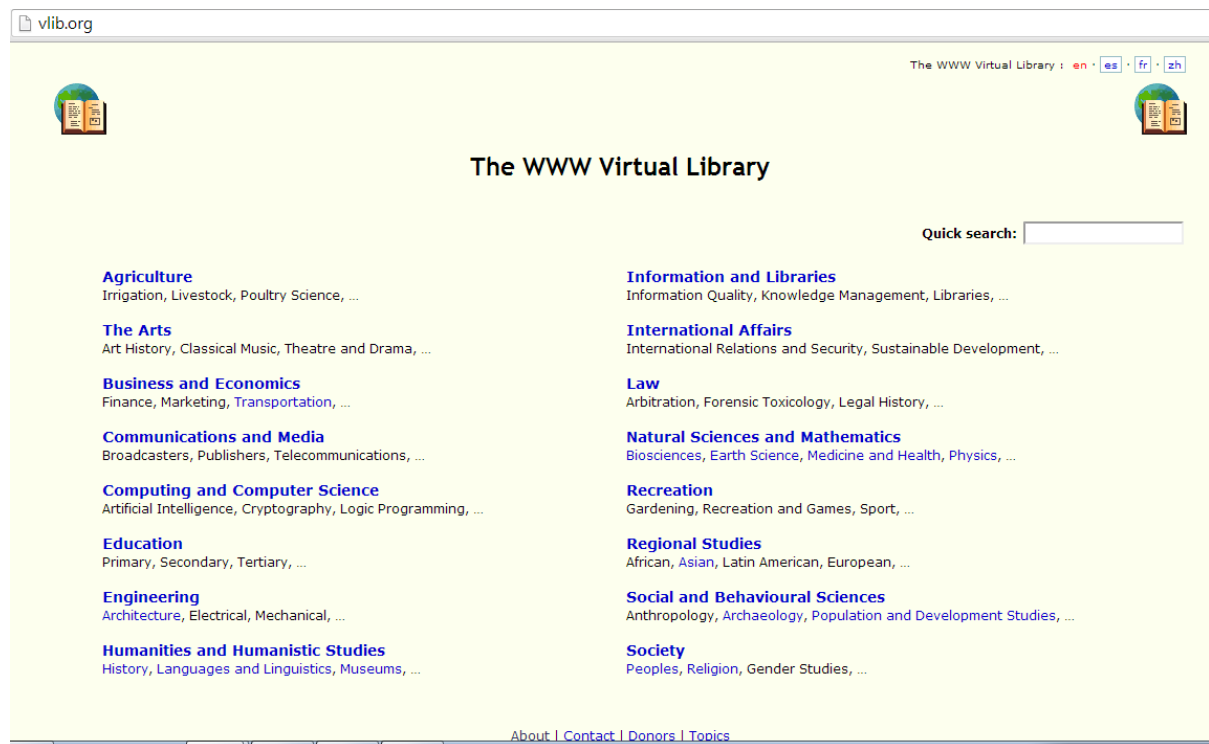


Figure 2.10: The www Virtual Library (source: <http://vlib.org/> accessed on 19.02.2014 at 23:35hrs IST)

2.B.3. Hybrid Library :

2.B.4. Summary

The information and communication technology has also changed the forms and format of information sources and the methods of dissemination. Due to the application of technology, specially computer and networking technologies, new breeds of libraries have emerged. Before the invention of computer, the information sources used to be in printed form. Now, the information sources are available in electronic form which is processed, stored, retrieved and disseminated using computer or other electronic devices and communication technology. Such libraries which has the collection of information sources in electronic form serving the community is called electronic library. The electronic information sources is being called digital information sources also as it uses digital technology for storing, retrieving, disseminating the information.

The digital information sources and application of computer and telecommunication networks has changed the model of the libraries also. Now, the concept of virtual library has emerged with the application of these technologies. The library without any physical existence, providing the library services to the community with the help of internet, telecommunications networks and electronic devices like computer, laptop, tablets, smart phones, book readers, etc, can be called virtual library.

The basic categories of libraries are same as public, academic, special and national but if they are using the technologies to reach the members of the community then they may also fall in the category of electronic (digital) or virtual library depending upon the model they adopt.

Unit 3

Five Laws of Library Science and their implications

3.1 Introduction

The laws of Library Science govern various disciplines within the field library science and are normally invoked when two or more commons lead to any conflicting. S. R. Ranganathan formulated five laws of Library Science in 1928 and published them in 1931 under the title “Five Laws of Library Science”. According to these five laws of Library Science, books are for use and user is the king whose time must be saved.

The five laws of Library Science are:

1. Books are for use
2. Every reader his/her books
3. Every Books its reader
4. Save the time of the user
5. Library is a growing organism

3.2 First Law: Books are for use

The first law of Library Science is ‘Books are for use’. No one will question the correctness of this law but the story in actual practice is different. Historically in 15th and 16th century in Europe, books were chained with the selves. In those days libraries were meant for storage rather than for use. At a later stage, books were made available to those persons who pay a fee but now the book lending is free for all. Modern libraries are attractive, comfortable and a number of special services are introduced to ensure optimum utilisation of the book. A modern librarian is happy when the readers make his shelves constantly empty. He is worried and depressed on seeing those volumes which stay at home-library. Librarians have taken some initiatives to make the library as the centre of intellectual achievements by maximum use of books.

3.2.1 Implications

In order to satisfy the first law of library science, libraries have to look into a number of factors. The most prominent factors are as follows:

3.2.1.1 Library Location: The resources of the library are to be fully exploited. Library has to play its vital role among intellectual users. It must be located at the central location of its user's community. If it is academic libraries, it should be situated in the middle of the academic institution or at a distance of few minutes' walk from the teaching departments or hostels. If it is a public library, it must be located in the heart of the city. A centrally located library will most helpful in increasing the use of the books and become the soul of the institution or city for intellectual achievements.

3.2.1.2 Library hours: Before the advent of this law, the library was more often closed than open. Even when opened, it was mainly to perform dusting books and chasing out the book worms. Fortunately in countries where the law "Books are for use" is implemented, it has changed the public mind and normally the libraries are kept open for 18 hours a day. Majority of universities in USA and Europe, the library is kept open round the clock.

In libraries, the opening hours of the library would be according to the convenience of library users. In academic library, libraries are kept open during the institution's working hours. Most of the libraries are kept open in morning to evening. In case of public library, most of the users are workers, businessman, professionals etc, so such libraries are kept open according to the off/free timing of these users. Now a day's due to impact of the culture of western countries, majority of libraries are kept open round the clock.

3.2.1.3 Library Furniture: The impact of the first law 'Books are for use' on library furniture and internal equipment is really appreciable. In the old days when the books were stored for the preservation purpose, the focus was to keep maximum number of books in the least space at lowest cost. Hence the books were shelved up to the roof. The implementation of the first law motivates us to provide open access of books for library users, the shelves should not more than 7' high. The space between two rows of shelves should be sufficient enough so that the readers and staff can move comfortably.

The Reading room must be quite attractive with hangings flowers and pictures. The rooms are made vermin-proof, theft proof and air proof. The tables and chairs should be comfortable and suitable for continuous sitting for longer hours. Bureau of Indian standards established standards for designing tables and chairs of reading room of the library under the chairmanship of Dr. S. R. Ranganathan. The Library building should be functional in nature with spacious rooms. The first law has thus exercised tremendous influence on library building and its furniture.

3.2.1.3 Library Staff: In the older day's librarian was expected to protect the books from four enemies- fire, water, vermin and man. Librarian was supposed to be a care-taker. He was just a matriculate and his pay was less. The first law of library science directs us that the libraries must have well educated and qualified staff, so that they can provide better library services to their user.

Library professionals should not forget the noble cause of the service. Scholarship, training emoluments and status etc. are some essential issues for attracting qualified and sincere professionals. The staff of the library should ensure the maximum use of books by readers.

The library should try to keep balance between the retrospective holdings and latest information bearing documents in its collection. Staff of the library should express their pleasure while providing services and express their lovable attitude. They should work as a friend, guide and teacher to their users. The efficiency of service and the ultimate success of the modern library as an agency for diffusion of knowledge depend upon the performance of its staff.

3.2.1.4 Book Selection: The first law had a tremendous impact on book-selection procedure. The librarians should perform the primary work of selecting books while keeping the present and potential needs of users in mind. In order to maximize the use of books, the librarian should select the books in a suitable, informative, evaluative and inspiring way. In fact, the first law allows placing only those books on the shelves which are regularly read, enjoyed, understood and acted upon by users. Worn out and out of date books should be weeded out with rigidity.

In brief, the implications of the first law are profound, rich, useful and revolutionizing. This law has changed the concept of the old day's librarianship.

3.3 Second Law: Every Reader his/her Book

The second law of library science has established a new concept of libraries and has inculcated the culture of libraries. Every Reader his/her books means books for all. Books for all symbolises 'Education For all.' In the past education was not for all, it was only for the chosen few.

The Second law says that every reader of the library should get the book he wants. This law also advocates the generalisation and democratisation of library services. In earlier days, the access to libraries and their books were only available to few persons who were belonging to the aristocracy and the upper classes of the society. Hence the library services have become a basic right of all citizens without any distinction or discrimination. Thus the second law 'Every Reader his/her Books' obtained great importance in this age of democracy. The second law honestly maintain the principal of equality of opportunity for books and provides suitable environment to learn for all.

3.3.1 Implications:

Reader's requirements are varied for implementation of law 'Every Reader his/her books'. It is the obligation of the library to provide every reader his/her books. This law has contained obligations on the State, Library authority, Library staff and the Readers of the library.

3.3.1.1 Obligation of the State: It is the obligation of the state to provide sufficient support to its citizens for informal, continuous and self-education through the network of libraries. Public libraries provide academic and literary support to the cross section of the society- children, men, women, rich, poor, abnormal and so on to facilitate development and dissemination of knowledge.

The state maintains various library services through several provisions for library activities and organisation. Various levels of provisions for better functioning of libraries are as follows-

- State public library act.
- State library authority
- Local library authority
- Local library committee and village library committee
- State central library

- Finance, Accounts and Audit.

The functioning of the system will be well defined with regard to gradation of the authority, power and duties of the authority at various level, sources of income and permissible items of expenditure, selection and acquisition of books, co-operative storage, centralized and co-operative cataloguing and classification, cooperation in dissemination of information, inter-library loan etc. This can provide a balance, economic and uniform development of library services based on approved standards. The development of the planned programmes of library services to “All”, can only comes from the government of the state.

3.3.1.2 Obligation of the Library Authority: The library authority should monitor the functioning of libraries and the overall system. They should try to provide prompt and free service. A well-thought legislative and co-ordinated measure on the part of state ensuring an evergreen source of finance is essential, but not sufficient.

For the second law, obligation of library authorities is in respect of choice of books and the choice of the staff. These are two main functions of authorities in libraries.

To provide Every Reader his/her book, the second law requires the librarians to know (i) Subject (ii) Standard (iii) Language of the books used.

The second law indicates that a library should select books on all the major occupations of its actual and potential users. The people are also likely to demand biographies and travel books. The second law also desires that book selection should be closely connected with the exposition of language, style suited to all the intellectuals. The librarians should select and furnish books which satisfy the demands of the neo-literates as well as of the scholars.

Regarding the choice of staff, an adequate and competent team of staff is necessary for facilitating every reader his/her book. In the absence of the able support of competent staff, a reader will not be able to approach good number of books.

3.3.1.3 Obligation of the Staff- The library staff has a great role to play in the success of the second law. The first law stresses the need for a well-qualified ,trained and properly paid staff, the second law requests the library authority to provide for an adequate and devoted staff to show every reader how to use books as tools. To act as the canvassing agent for the books, the staff

must know the readers, must know the books and actively help every reader to find his or her work; this work is known as Reference service. Reference service is an effective means of ensuring that a reader gains access to books of possible interest to him.

Book selection is an important Job of the library staff. The staffs should build-up good collections of reference work in libraries and provide personalised service is needed. In conclusion we see that second law demands active help of the staff to the readers of the libraries in locating their required books.

3.3.1.4 Obligation of the Reader: For the second law, there are certain duties/responsibilities of the reader of libraries also. The users of the library should cooperate with the library staff so that they can provide better library services. The users should have a sound knowledge of the rules and regulations of the library.

A Reader can get his/her book only if each realises that he is not the only one using the library. It is the obligation of every reader to get only the number of books he is entitled for and return them on due dates. The users should have basic knowledge of the scheme of classification used in the library and the art of using library catalogue. They should know about reference work, bibliographies, catalogues of other library services.

3.4 Third Law: Every Books its Reader

The third law is “Every book its reader”, it ensures maximum utilization of books by their readers. This law advocates for providing appropriate reader for each and every book. The first law is developed for satisfying the interest of library documents. While the second law is concerned with the task of finding appropriate book for every reader, the third law expects that an appropriate reader should be found for every book. The most prominent process used by the libraries for satisfying the third law is 'Open Access System', while the other prominent library activities which relate to the shelf-arrangement, catalogue entries, reference work, access of popular departments, publicity methods, Book selection and extension work also satisfy the third law of library science.

3.4.1 Implications:

3.4.1.1 Open Access: Open access system provides an opportunity to see and examine the book collection with as much freedom as one have in his own library. In open access library, the reader is permitted to enter the stack room and browse books at his/her own desire and pleasure for selecting the best to satisfy requirement.

Open access system increases the use of books. It provides opportunity to its readers for searching books which he never expected to have due to various reasons. With this specific support, less used books are that way put to use.

3.4.1.2 Self arrangement: Self-arrangement plays a vital role in providing easy and comfortable access of books by their appropriate readers. The third law emphasizes on the need of arrangement of books on shelves in classified order based on their content. Subject arrangement on selves, a special shelf for displaying recent arrivals and novelty in arrangement and display will attract the attention of the users.

3.4.1.3 Catalogue: It is the catalogue that caters useful bibliographic information about the library collection and helps in selection of sources. A well planned classified shelf arrangement is highly desirable but it is not self-sufficient in itself to attract needy reader unless it is supported by a well developed catalogue. The third law also expects from the technical staff for preparing analytical entries based on the contents of each document for the benefit of the readers.

3.4.1.4 Reference Work: The books cannot reach to the hands of readers until their thought content is interpreted by the reference staff. It is the duty of a reference librarian to act like a marriage match makers between books & readers. He should find a suitable reader for each and every book or vice versa. He should identify all those books which are of less use or no use. This is a kind of service that the third law expects from the reference staff.

3.4.1.5 Publicity: Publicity is a powerful tool to attract the readers of the library and thereby to increase the chances for every book to find its reader. Regular publicity is carried out though library bulletins, newspapers, magazines, printed catalogues, subject book lists, press notice, book fair, window displays, radio/TV talks, public lectures, exhibitions, demonstration tours,

library week, brochures and leaflets. The library should adopt all of the authorized methods for attracting library users.

3.4.1.6 Books Selection: The third law has an important role in book selection process. For satisfying the third law and fulfilling the user's demand, it is essential to examine the user's requirements and the objectives of the library. Book selection must be proper, timely and be based on the local demand, local history and local needs of the users. Thus the book selection process plays an important role in satisfying the third law of library science.

3.4.1.7 Extension Service: Extension service is a vital part of the implications of the third law. The purpose of providing extension services is to convert the library into a social centre for encouraging and inculcating reading habits and to turn non-reader into a regular reader.

To satisfying the demand of the third law, the librarians celebrate the local festivals and certain national days dedicated to national leaders or ideas and participate in local festivals. In India, where such celebrations attract huge crowds of people, this form of extension service is having great potential for satisfying the issues of the third law of library science.

3.5 Fourth Law: Save the Time of the Reader

The main concern of the first three laws of library science is to facilitate access of books by their appropriate reader and to optimise the usage of library collection. While the Fourth law is focusing towards the services for the readers. The Fourth law demands to save the time of the reader as well as staff. The Fourth law expects the library's reference staff to support a reader from the very instant he enters the library up to the moment he leaves it, critically examine each and every process he involves himself, with a care to save his time.

3.5.1 Implications

3.5.1.1 Open Access System: The fourth law strongly opposes the process of the Closed Access System as the time is an important constraint. In a closed access system there will be a sufficient loss of time while going through the library catalogues. In larger libraries, if the closed access system is followed, the unit processing time for getting the required book may be longer in comparison of the open access system. As the user after submitting the request, is bound to wait at the counter to get the required book and it may take a longer time if

the asked book is not available on shelf and the staff ask to give another related requirement (slip). In Open Access System, the user can go to the desired shelf and can browse several books and then finalise the best suited book.

3.5.1.2 Shelf Arrangement: The comfortable and useful method of shelf arrangement can save sufficient time of the user. Arrangement by subject has been found to be useful and easy to locate a desired book. But in some cases, the interest of the reader goes primarily by the author than by the subject. The method of shelf arrangement should be based on the convenience of the user.

3.5.1.3 Stack Room Guides: Proper guides in the stack room will save the time of the user. It may be quite useful to place them at the entrance of the stack room. It should include the complete plan of the stack room indicating the disposition of every row. Every book shelf must have a separate signal guide.

3.5.1.4 Catalogue: The fourth law is aware of the composite nature of the books. Some prominent aspects of a composite book can be highlighted only by cross-reference and analytical entries. The Fourth law advises the librarian to meet the diverse approaches of reader. To save the time of the reader, the library catalogue is generally in two parts as: Alphabetical part and Classified part. Some libraries also have an Author-Title catalogue and Subject catalogue, altogether it is known as divided catalogue.

Although the library catalogue enables a reader to locate the desired book without any loss of time, yet it becomes difficult to search a micro-document.

Further for saving the time of readers, the library must procure published Bibliographies of individual authors, Subject bibliographies, Cumulative indexes to periodicals, Topical bibliographies, National and Regional bibliographies, Union catalogues, Computerised databases etc.

3.5.1.5 Reference Services: Most of the readers require assistance of reference staff who know the hide and seek character of all kinds of catalogues and indexes and can easily handle them. They can bring books and readers together by providing both ready reference and long range reference services. Reference staff can also help in selection of books; documentation services like indexing, abstracting, translation, reprography; information services like CAS (Current

awareness services), Selective Dissemination of Information, Referral Service, Information Consolidation and Repackaging etc.

3.5.1.6 Issue/Return Methods: Circulation service is an important services of any library. If this service is well planned and equipped in any library, it saves the time of user and staff both. After a number of experiments, it is brought out that Browne charging system, Newark Charging system, Ranganathan Reader ticket-Book ticket method and Detroit self charging system are some of the economical, time saving charging systems. Two card systems is found to save the time of the readers over 'Day book' and 'Ledger system'. Automated circulation system is better than all other systems that save the time of the users.

3.5.1.7 Other Service: To save the time of reader, libraries provide some other services like Mobile library services, Library services for special classes etc.

3.6 Fifth Law: Library is a Growing Organism

The Fifth Law is 'Library is a growing organism'. This law enunciates a fundamental rule and principle which govern planning and organisation of libraries. The fifth law handles the library as an institution which holds all qualities of a growing organism. A growing organism has an inherent feature of natural growth, deterioration in old matters, change in size, development of new shapes and forms etc.

3.6.1 Implications:

3.6.1.1 Growth in size: Library is a growing organism, its growth depends on the count of reader, material and staff. According to Dr.Ranganathan there are two types of growth- Child growth and Adult growth. Here child growth is characterized by an overall growth in size and weight, while adult growth on the other hand is characterized by the absence of an overgrowth. The growth of library is very much similar to child growth in the respect of reading material and staff. It may possibly attain the adult growth but only in respect of the count of readers.

The main components of the library organism are books, readers and staff. A modern library is a trinity of all these factors. There must be a harmonious growth among all of these basic components.

3.6.1.2 Reading Materials: The quality of each and every library service is based on a live, well chosen, selective and growing collection of information and documents. Library should purchase new books, journals, audio-visuals materials and other informative documents to provide information support for teaching and research activities of the parent institution.

3.6.1.2.1 Library Building: Increasing size of the library collection is one of the important aspect for growth, this type of growth is reflected in the stack room of library. Its size, relative position, book racks, forming unit of which the stack is built, the parts of the book rack, the self-planks, label holders and all such things relating to housing of books will be examined in the light of inevitable growth in stack. In terms of the size of library building, the librarian should provide sufficient provisions not only for satisfying present needs but also for the future needs.

Library building must have a self sufficient system for adjusting books of fluctuating size. Being a service institution, a library may provide a number of user based services, the design of library building must be functional in nature for providing proper space to all of the services. The periodicals room also needs a careful design in the light of fifth law of library science. While designing the library building, new principal of architecture such as modular design and dry construction need to be seriously consider.

Catalogue Room is very important part of the Library building. Catalogue room is the room in which the catalogue cabinets are kept. A standard size of unit cabinet is 23”X28”. It can hold 48000 catalogue cards. It is observed that each book may have sufficient number of cards for its proper representation, so there must be some provision for its proper extension.

Fifth law also effects the physical form of library catalogue. If a library is a growing organism, the library catalogue will also have growth in its nature. If a library grows dynamically, librarian finds it exotic to administer its catalogue because of its limited identity, inflexibility, absoluteness and increasing cost. Another physical form of the catalogue is shelf catalogue, lose-leaf book catalogue and one leaf one entry catalogue but all of these are not competent enough to satisfy the fifth law of library science. Because of the simplicity, attractiveness, cost effective and less chance to error in use, Card catalogue is very useful for libraries. Card catalogue has an epoch making contribution in the library profession. It is quite valuable for

preparing bibliographies, indexes and union catalogues for ensuring interior qualities of up datedness and endless expansion.

3.6.1.3 Classification Scheme: Another important matter that needs to be examined in the light of the fifth law is the classification of books. As knowledge itself is growing with a very high speed, it is necessary that the classification scheme must be comprehensive, embracing all past and present issues, allowing places for any possible addition of knowledge. It means classification must be flexible, expansible and hospitable with the highest degree, so that it can accommodate the new subject without dislocating its predefined sequence.

The Reader is a part of trinity, he/she is an important part for any library organisation. The growth of libraries is measured in terms of continuity, eternity and perpetuity depends upon the growth in the count of readers. The growth of readers is examined in the light of the following factors:

- (a) The size of the reading Room
- (b) The use method
- (c) Certain Safeguards.

The growth of the reader requires that the reading room must be flexible to meet the growth of documents, furniture and accommodation for readers. The reading room should have well planned, attractive and comfortable seating arrangement for painless studies.

Issue Work: Increased count of readers leads to increase of issue and return works. The size and shape of the issue counter must, therefore be taken into consideration to meet the future growth. The issue system will also affect the size of the counter. The counter should be spacious enough to make the reader easy while getting their books issued and returned. Provision of property counter must be available, where the reader can deposit their luggage (belongings).

3.6.1.4 Open access: Open access system is only medium for facilitating the meeting of books and the readers through fifth law. In open access the readers themselves pick out books of their choice while in closed access system it is not possible.

3.6.1.5 Circulation system: The ledger system based circulation is not sufficient enough due to the growth of issue/return work as it involves a number of operations in completing the process

of issue/return of a volume. Browne Changing System and Newark changing system has achieved better success in heavy loaded environment.

On the other hand, Ranganathan proposed two card system known as Reader's ticket-book card charging system. It is useful and most economical charging system. These methods have solved the problem of identifying borrowers. Each reader is made responsible for the books drawn on his tickets and it is his business to keep the tickets in his personal custody and prevents their use by others.

3.6.1.6 Safe Guards: As the number of user increases, the problems of preventing unauthorised removal of books from the library becomes an acute problem in open access libraries. It necessitates some safeguards. Safeguards really secure that all the readers can leave the library through single door, on that door vigilance can be exercised. The safeguards consist of the following arrangements:

Entrance and exit to the library must be provided by one and only one gate. The gate should be normally in closed position. They should open it only if the counter assistant allows. The moment reader leaves it, it should automatically close/lock itself. The passage of the gate should be big/wide enough to allow one and only one reader to pass through it at a time. All other doorways and windows should be fitted with grill work, shutters, or weld-mesh shutters; whose meshes are too small for a book to allow replacing. The greatest disservice to the open access is its introduction without proper safeguards.

3.6.1.7 Staff: For providing quality support to the library users on various library services, library may require larger count of professionally trained staff. For facilitating this, the library decision maker provides the needed staff. To acquire the aim of library organization, the librarian must keep in view three behavioural requirements-

1. Brilliant trained persons must be inspired to join the library profession and to remain in it.
2. The person must aware with their task for which they have been appointed.
3. Working environments must be conducive for creative, spontaneous and innovative work.

3.6.1.8 Staff Council: Dr.Ranganathan suggests the formation of a staff council for helping the librarians to obtain maximum outcome of work in an efficient manner. In the constitution of the council, it should one representative from each section of the library. The prime function of the staff council is to advice librarian on various matters. Besides, the librarian should encourage the staff members through the sectional meetings.

3.6.1.9 Spirit of the hive: As a library remains open on all days for long hours, the organisation of the reference section and the direct dealing counters require the greatest skill and care while interaction. Further, library professionals in such areas should work hard with a natural quality of politeness. In other words, the members of staff should inculcate themselves a spirit of hives. It means that member of staff should be willing to co-operate with one another in every possible way.

3.7. Summary

The Five laws are the five commandments, embodying the rational for unifying the theory of library science with their formulation. Dr.Ranganathan infused a new life into librarianship and changed it into a scientific approach based library science.

3.8. Exercise

Short question

1. How library's location is important for popularising library?
2. Explain ideal opening time of the library.
3. Point out various features of library furniture.
4. Point out various obligations for satisfying second law of library science?
5. What are the obligations of library authority for providing quality services in the library?
6. How third law of library science can be satisfied?
7. What is the role of extension services in popularising library services?
8. How will you publicize library services?
9. Point out various library services for saving the time of users.
10. What do you mean by Guide? How is it useful for saving the time of users?

11. Which circulation method is the best for saving the time of users? Explain.
12. Discuss various types growth in a library.
13. What are the essential qualities of a library building in terms of the fifth law of library science?
14. Discuss various implications of fifth law of library science on technical processing based activities.

Long question

1. Discuss various issues for satisfying first law of library science.
2. Explain various obligations in the context of second law of library science.
3. What is the importance of Open Access System in terms of the third law of library science? Explain.
4. How a librarian can save the time of a library user? Explain.
5. Discuss various issues which establish the library as a growing organism.

3.9. Reference

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3.10. Glossary

Open Access System: In this system a user is allowed to go inside the library stack and browse document.

Close Access System: In this system a user search an entry of a document of his/her interest in the library catalogue, writes the description on the slip and hand that over to the stack assistant. The stack assistant goes inside the stack and searches the document of the slip and then hand over the document to the corresponding user.

Modular building design: In a modular building design, all of the services of the library are independent in nature. Any one of the services does not get effected due to functionality or non-functionality of any other service.

Chapter 2

Organisations of Library Resources: Basics

Unit 1

Library Classification Theory

4.1 Introduction

The word Classification comes from the Latin word “Classis”. The term Classification in one sense applies to the process of arranging individual objects or ideas into groups according to their degrees of likeness, and Combining these groups into larger groups. The term divisions refer to the reverse procedure. Here a single group is subdivided according to some quality possessed, not possessed or shared in varying degrees by some of the individuals it contains. The sub-groups thus obtained may be further sub-divided in the same way, until further divisions is impossible.

In general, both the above processes are referred to as classification, and it is said that classification is a separating as well as grouping process; it collect like things and separates unlike things.

Classification is a process of sorting; ideas or objects are collected into groups, and these groups stand for certain qualities which its members possess.

Classification not only assists the memory by arranging individuals into groups, but expresses the relationships of things and ideas to the discovery of their laws. Classification is essentially a mental process; we group or separate according to our concepts or ideas of the individuals. The mental process of separation or grouping is called abstraction. It is an aid to the memory and reasoning power. Nothing can be identified without it, in fact all thought and reasoning may be said to consist of classification. When we recognize “a little black dog”, we distinguish the dog as an animal from all other mammals and further identify it by recognizing size and colour.

Classification is primarily a mental operation. When we say we arrange things we mean that we place them in an order which corresponds with an idea or series of ideas in our minds; we could not arrange things in an order which did not thus exist in our thought. To do this, we have mental picture of things we are to arrange. That is ideal arrangement, indeed this mental process is the true meaning of Classification. Actual arrangement is the placing in order of objects that we can see or touch, such as mineral or botanical specimens or coins.

J. S. Jevons (Principles of Science, 1874, Vol. 2, P. 345) has assessed the relationship between Science and Classification in the following words: “ Science.... is the detection of identify, and classification is the placing together, either in thought or in actual proximity of space, those objects between which identify has been detected. Accordingly the value of classification is co-extensive with the value of science and general reasoning. Whenever we form a class we reduce multiplicity to unity and detect, as Plato said, the one in the many”. Classification not only

assists the memory by arranging individuals into groups, but expresses the relationships of things and ideas to the discovery of their laws.

The term 'Classification' is used in many senses. Ranganathan has recognized five senses. Thus this term is a homonym. The following three out of five senses have been taken from Ranganathan's *Prolegomena to Library Classification*, 1967.

Classification in Sense 1:

Division:

"Process of sorting the entities of a universe into sub aggregates on the basis of a preferred characteristic, or putting like entities into the same sub-aggregate and unlike entities into different sub- aggregates".

Classification in Sense 2:

Assortment:

"The process of the division of a universe into groups plus that of arranging the groups in a definite sequence - that is of ranking - that is, assigning a rank to each resulting group".

Classification in Sense 3:

Classification in Sense 2 plus representing each entity by an ordinal number taken out of a system of ordinal numbers, designed to mechanise the maintenance of the sequence,

- i. Either when an entity has to be replaced after having been taken out of its position;
- ii. Or when a new entity has to be interpolated or extrapolated in the correct place in the sequence.

4.2 Basis of Classification:

Basis of classification is based on two views. One view is that classification is based on "Type". The second view is that it is based on "Definition". 'Type' is the representative member of a class possessing the characteristics dominantly. But classification by 'Type' presupposes knowledge of classification itself, because a type is found only by the knowledge of the general attributes of a class.

According to J.S. Mill, classification is based on 'Definition' which states the essential attributes or features of a class. The classifier is supposed to find out common and essential characters of objects and then he should classify according to those characters. It is presumed that scientific classification is always based on 'Definition'. Since classification by 'Type' is called general classification, the classification by Definition may be called specific classification.

There is yet another basis of classification by series. This is applicable when different classes of entities possess a particular quality in common but in varying degrees. This means arrangement of classes of entities into a series, according to the varying degrees in which these classes possess a particular quality.

4.2.1 Difference between Classification and Division:

- i. Classification is the process of grouping individuals items into classes; or grouping classes into higher classes. However, Division is more or less a reverse process. It consists of dividing classes into sub-classes and sub-classes into further sub-classes and so on.
- ii. In classification we move from less general to more general or from minor extension to greater extension of classes. In division, we move from more general to less general or from greater extension to smaller extension. Therefore classification is inductive and division is deductive.
- iii. According to S.R. Ranganathan, division is putting entities into many groups on the basis of characteristics, and classification is division plus ranking the groups and arranging the groups in a definite sequence.

4.2.2 Kind of Classification:

There are two kinds of classification:

- i. Natural Classification and
- ii. Artificial Classification

A Natural Classification is supposed to be one that exhibits the inherent properties of things classified. It depends on homology, the likeness that resides in the structure and function of the entities classified. Artificial Classification is based on analogy, where things are classified by their external likeness and apparent purpose like color, shape, etc.

Differences between two:

Natural Classification	Artificial Classification
i. It is classification according to important and numerous points of similarity.	i. It is classification as per some un-important or less important points of resemblance.
ii. It is grouping of things according to nature's plan and order.	ii. It is grouping of things according to the purpose of the individual concerned.
iii. It is a more or less objective classification.	iii. It is more or less subjective classification.
iv. It is classification for general purpose.	iv. It is classification for specific purpose.

According to H. E. Bliss, “There are indeed two kinds of classification, on the one hand logical, natural and scientific, on the other hand the practical, the arbitrary, the purposive; but for library classification we should join these two hands; the two purposes should be combined”.

A natural classification may be defined as one which groups or separate a series of individuals according to the degree of their fundamental likeness or unlikeness. However, Artificial Classification is one which groups or separates a series of individuals according to some external or accidental likeness or unlikeness. It is the result of reasoning by analogy, i.e. the likeness between individuals having a similar function, appearance, or purpose.

4.2.3 Differences between Knowledge and Book Classification:

Knowledge Classification	Book Classification
i. It arranges knowledge itself, its substances tangible and intangible.	i. It arranges the expression of this knowledge in written or other form.
ii. A knowledge classification is abstract, for ideas only are arranged.	ii. Book classification is concrete and concerned with ideas in their written representation - a much more complex form.
iii. Knowledge classification is based on preconceived ideas, essentially superficial, which depend upon personal or current theories and which a new doctrine might upset. Books are actual indivisible objects and their form and purpose - recreational, educational, and literary - demand special treatment in any attempt to arrange them systematically on the shelves of the library.	iii. Have the practical aspect of the purpose of book classification comes to the fore; it becomes a method not only of arranging ideas in the mind, but more essentially of collecting together, so that they may be found easily, actual things that are used together.

4.3 Library Classification:

The Library Classification has been defined by various classificationists. The aim of library classification is to arrange the available documents in the library in the most helpful and permanent order.

According to **N. C. Berwick Sayers**, Classification is “the arrangement of books on shelves, or descriptions of them, in the manner which is most useful to those who read”. **Arthur Maltby** revises Sayers definition as “the systematic arrangement of books and other material on shelves or of catalogue and index entries in the manner which is most useful to those who read or who seek a definite piece of information”. **Margaret Mann** define the classification as “the arranging of things according to likeness and unlikeness. It is the sorting and grouping of things, but in addition, classification of books is a knowledge classification with adjustments made necessary by the physical form of books”.

According to **Ranganathan**, “it is the translation of the name of the subject of a book into the preferred artificial language of ordinal numbers, and the individualisation of several books dealing with the same specific subject by means of a further set of ordinal numbers which represent some features of the book other than their thought content”.

4.3.1 Need of Library Classification:

The problem of the arrangement of a collection of books first presents itself when specific works are likely to be sought by persons other than those who collected the books. The Librarian of a small library can lay his hand on any required title at will, and requires no systematic arrangement to help him. However, users of the library, on the other hand will need to scrutinize the bookshelves to find the particular book they want, and the larger the collection the larger the search. Therefore, the Librarian must use the principle of orderly arrangement to reduce the cumulative loss of time to successive readers. Any grouping is better than none, but some are better than others, if only because it breaks down the whole collection into two or more parts according to some criterion which one can apply mentally to the book one is seeking: e.g. which color group, which size group or which author group will contain it?

The foundation of the library is the book; the foundation of librarianship is classification, without classification no librarian can build up a systematic library; one, that is to say, which represents adequately the field of human learning as it is recorded in books.

Dr. Richardson has said, “The books are collected for use. They are administered for use. They are arranged for use; and it is use which is the motive of classification....”

Library exist to provide the “right book to the right user,” or, as Ranganathan puts it, “to every book its reader” with the greatest possible saving of time for both staff and reader. The classification of books should assist in the realization of this ideal.

Classification, thus perfected, has the obvious value of economizing time and energy.

4.3.2 Purpose and Importance of Classification:

The primary purpose of classification is the arrangement of books in some order convenient of both the reader and the librarian.

J.S. Mill said that the purpose of classification is primarily “to facilitate the operations of the mind in clearly conceiving and retaining in the memory the characters of the objects in question”.

A general classification sets out to cover the whole field of knowledge; a special classification to classify the branches of one section of knowledge.

The basic purpose of classification is to individualise each subject within its relevant class. This individualisation is only possible if each subject is given its own special name or number and

that no other subject shares this number. For individualising a subject in this manner, classification must be provided with an exhaustive scheme of notation.

The following features of classification shows the purpose of classification:

- i. When a reader asks for a book (document) which is in a library, it must be located immediately, even though the library may have miles of shelves of books.
- ii. When a book (documents) is returned to a library its correct place on the shelves must be easily determinable so that it can be replaced (and be ready) for the next user.
- iii. When a new book is added to a library it must find its proper (helpful) place among the other books on the same subject.
- iv. When the first book on a new subject arrives in a library, it must find a place among the books on such other already existing subjects which are related to it and in the degree of its relation to them.

Importance of library classification can be summarised as follows:

- i. Library Classification helps to arrange documents in a systematic order, which is most convenient to the reader and the library staff.
- ii. It helps to identify and locate a document on a given subject required by a user irrespective of size of the library collection.
- iii. It helps to retrieve the documents from and replace the documents to the original position.
- iv. It helps to identify the appropriate place of newly added documents among the other documents on the same subject.
- v. It helps in compilation of statistics on issue, which reflect the pattern of use and demand of documents on different subjects. The feedback helps in the allocation of funds to various subjects and guides the book selection policy of the library.
- vi. It assists user of the catalogue (through call number) to refer to the location of a document on the shelves.

Main Class:

Dr.Ranganathan defined Main class as “the fairly homogenous conventional regions of knowledge, which together form the first order array of classes which are mutually exclusive and totally exhaustive of the field of knowledge”.

The main classes in all the schemes of classification may not be the same. The classes which appear as the major divisions of the universe of knowledge are the main classes in that scheme. Once the knowledge is organized into a number of main classes, the next steps is to mark out for each main class the facets which are likely to be presented by subjects falling within it.

Facets of a Main Class

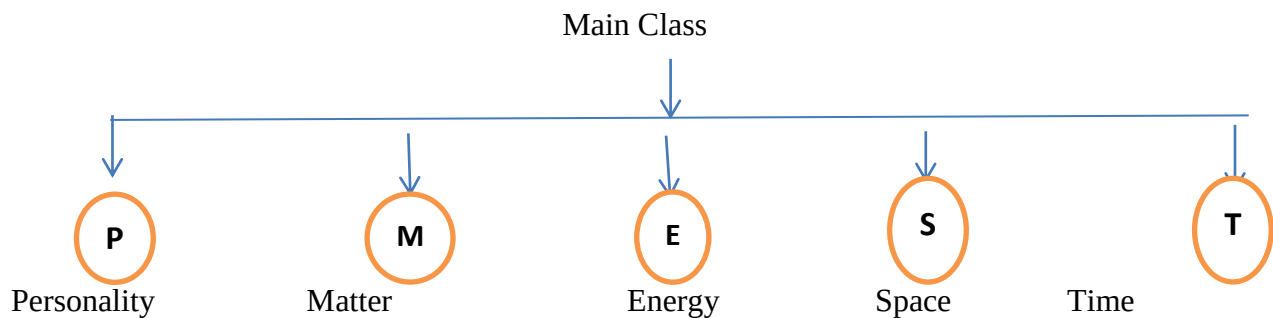
When we divide the universe of knowledge up to the stage of Main Classes, facets do not appear. But when we have to divide a Main Class, the concept of facets appears in the case of some main classes.

The purpose of facets is to divide a main class into its possible aspects. As a Main class contains a number of smaller units of ideas or entities within it, one method of their division is to group all of them only in one line.

Another possible method for division of a main class is to divide it first into its possible facets. The process can be termed as recognizing categories under a class. Therefore, any class enumerated in the first order array of a scheme of classification of the universe of knowledge is categorised as main class.

Concept of Fundamental Categories (PMEST)

There are five fundamental categories into which a subject or main class is divided. These are the five aspects of a subjects.



Dr.Ranganathan named the five fundamental categories as: Personality, Matter, Energy, Space and Time. A Subject may have a personality aspect, a Matter aspect, an Energy aspect, a space aspect and a time aspect.

Time: According to Mills, Fundamental category Time “is usually embodied in periods”. According to Dr.Ranganathan, “The fundamental category time occurs in every subject forming a local description of local history of any subject”. Time indicates that the entities under different subjects must go on changing in its structure, meaning, history development etc. with the progress of times.

Example: History of 18th century is different from 15th century

Space: According to Dr.Ranganathan “the surface of the earth is a manifestation of the category ‘Space’. It occurs in every subject forming a local description or local history of any subject.” Most of the Subjects if not all, get manifested in relation with continents, countries and their subdivisions.

In CC, we find a schedule of Geographical Divisions which can be attached to a subject. In DDC, we find the space facet applicable under the class History, and throughout the scheme the facet is available under the direction divide like 940-999.

Example: In following examples, the term denoting space is given in brackets.

- i. Agriculture in (India) brought up to 1990
- ii. History of education in (India)

Energy: According to Mills, the fundamental category Energy, “is a category of facets which characterize the exercise of energy – i.e. activities, operations, processes, problems, etc.” Palmer and Wells feel that Energy “usually presents itself as a problem to be solved, or a mode of work or approach.” Dr.Ranganathan, in his Colon Classification, call the facet based on the characteristic Energy, the problem facet. Thus, the fundamental Energy covers the problems, action including methods, functioning etc. aspects of a main class. Many main classes will have certain units which deal with the problems in the subject. These problems are generally applicable to all the organs of the class.

In class Agriculture, certain processes and actions like sowing and harvesting; in Botany, Zoology and Medicine units like physiology, and pathology are noticed which deal with functioning. Isolates which make the category Energy are generally important actions in the subject and commend a greater influence on the subject from two directions. One is when they are in general reference to the class and the second when they refer to the organs of the subject individually.

Dr.Ranganathan postulates that the energy aspect in a main class may manifest itself in different rounds of energy. 2E= second round of energy after 1E; 3E= third round of energy after 2E and so on. In Agriculture the energy focus ‘manuring needs to be followed by another energy facet consisting of foci such as collection, grading and application. Another example is from Medicine. Pathology or disease is a problem and therefore it is [1E] of the subject. Treatment and surgery, etc. are for actions on diseases themselves and therefore they are the [2E] of the subject.

Matter: Dr.Ranganathan postulates Matter as a fundamental category capable of manifesting itself as the ‘constituent of a whole’. Mills observes regarding Matter thus, “Matter is the category of facets which reflect substances, materials, etc; it is manifested clearly in most technologies, and in many of the natural science; it is generally absent from theoretical disciplines like Law, Economics, Literature, etc.” Vikery feels about matter as “Matter comprises constituent materials of all kinds.”

Matter facet is inherent in many subjects falling within main subjects. But those in which it is enumerated in CC are: Library Science, Engineering, Sculpture, Painting and Music. 7th edition of colon classification has given a very large scope to the Matter facet. There are three groups of “Matter” viz “Matter Material”, Matter Property and Matter Method”.

Example: In the Main class Library Science, Matter figures as reading material. In the class Painting, Matter figures as materials used for painting. In the class music, Matter figures as musical instruments. etc.

Dr.Ranganathan was convinced that the facet “Matter” should be expended into three groups and many isolates from the facet “Energy” be shunted to “Matter Property”. The three groups of Matter are:

1. Matter Property [MP]

Ex.	Main Subject	MP
	Biology	Morphology Physiology
	Education	Thinking Reasoning

2. Matter Method [MM]

Ex.	Main Subject	MP
	Chemistry	Physical Method Fluid Method

3. Matter Material [MM]

Ex.	Main Subject	MP
	Technology	Product
	Biology	Substance

Personality:

The fundamental category personality is most concrete and the category Time is the most abstract. According to Palmer and Wells ‘the term personality is used for the wholeness of any subject. Personality inheres in the subject itself and gives colour to the other fundamental concepts transforming them into concrete things.’

Personality facet is the category of first importance in many of the subjects belonging to any class and while being so, it is the most recognizable facet at least to the specialists of a class. Personality is the first facet in many subjects and it is often experienced that the other facets work as attributes of personality for its further subdivision. Matter, Energy, Space and Time are

often required in relation with personality facet, and it is comparatively in lesser degree that they are required in direct relation with the main class. Without Personality there can be no organ, constituent, attribute, action etc.

According to Dr.Ranganathan, the category Personality is only recognizable by elimination. After separating out the manifestation of Time, Space, Energy and Matter in the subject, the residue will often turn out to be personality. This may be called the method of Residue.

Within the “Personality” facet we find a number of levels into which the whole personality is spread. These are known as levels of personality facet, P1, P2, P3, P4 and so on. The different levels are arranged with the help of the principles of helpful sequence.

Ex.

	Personality facet			
Main class	P1	P2	P3	P4
	Literature	Language	Form	Author his work

Both in DDC and CC the fundamental category personality is enumerated for example:

Main class	Personality facet		DDC	CC
Psychology	Abnormal psychology	137	S6	
Zoology	Vertebrate		596	K9

The name of fundamental category and the connecting symbols, used to distinguish them in a class number are as indicated below:

Personality : The connecting symbol is comma (,)

Matter : The connecting symbol is Semi-colon (;)

Energy : The connecting symbol is colon (:)

Space : The connecting symbol is Dot (.)

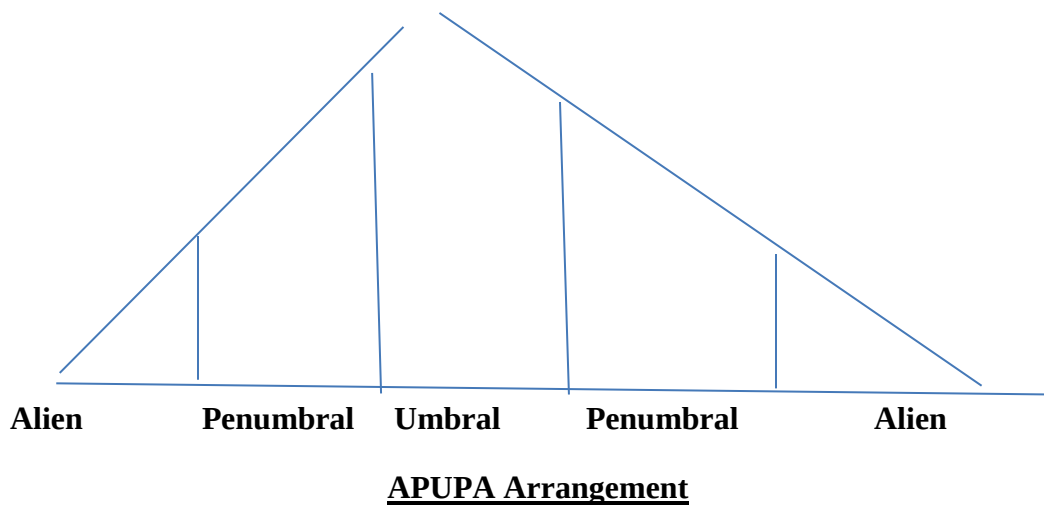
Time : The connecting symbol is inverted comma (‘)

APUPA Pattern

Dr. S. R. Ranganathan enunciated the APUPA pattern of helpful sequence. APUPA pattern is seen through Reader’s point. The focal point of his interest at the moment will be a particular subject. But we must remember that his interest will not be exhausted by that focal point. It will spread out from there in different directions in different dimension. The reader would really like to have the subject forming his focal point, and also certain other subjects with different degrees of immediate neighborhood Relation with it.

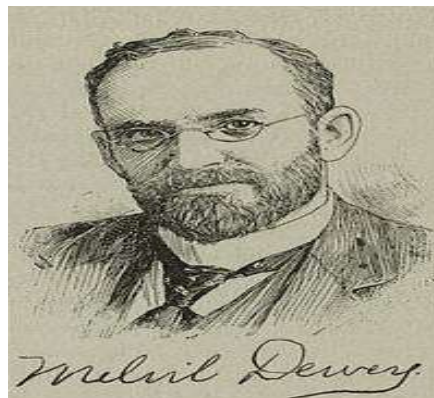
The focal point of his main interest is called Umbral Region. He would like to have fanned out on either side of the Umbral Region, the subjects partially relevant to the Umbral subject. The two regions on either side of the Umbral Region may be called his Penumbral Region; and the subjects in them are Penumbral Subject. The Penumbral Region will ultimately thin out into the Alien Region on either side. As he glances from one end to the other of his total Region, the reader will pass successively through the Alien, the Penumbral, the Umbral and again the Penumbral and the Alien Subjects. This is APUPA Arrangement.

This sequence puts the most relevant records in the centre. The records which are connected with it are placed before and after it; and those which are totally disconnected records are put at a distance from the Umbral. It is such an APUPA arrangement that will give that reader the greater satisfaction at the moment in full conformity to all the Five Laws of Library Science.



4.4 Main Schemes of library Classification:

4.4.1 Dewey Decimal Classification (DDC)

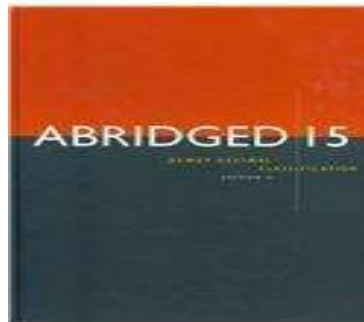


Melville Louis Kossuth Dewey (1851 – 1931)

The Dewey Decimal Classification (DDC) was formulated in 1873 by the late Melvil Dewey (1851-1931. **Melville Louis Kossuth (Melvil) Dewey** (December 10, 1851 – December 26, 1931) was an American librarian and educator. The first edition entitled “A classification and subject index for cataloguing and arranging the books and pamphlets of a library” was published in 1876. The first edition was consisted of 12 pages of preparatory matter, 12 pages of tables and 18 pages of index, a total of 42 pages. Edition after edition come out with additions and alterations till the 14th edition published in 1942. The 15th edition known as standard library edition came out in 1951. The 19th edition of 3361 pages came out in 1979. The 19th edition was in 3 volumes: Introduction, Table (Volume 1), schedules (Volume 2) and Relative index (volume 3). The 20th edition of 3383 pages came out in 1989. The 20th edition was in 4 volumes. The subsequent editions were also published in 4 volumes. It is now in its 23rd edition published in 2011.



Besides the editions of this scheme mentioned above, an abridged edition of the DDC was first published in 1894. At present, the abridged version is in its 15th edition published in 2012. This edition is meant primarily for use in schools and in small public libraries.



4.4.1.1 Main Outline:

Dewey divided the field of knowledge into ten main classes as given below:

- | | |
|-----|------------------------------------|
| 000 | Generalities |
| 100 | Philosophy and related disciplines |
| 200 | Religion |

300	Social Sciences
400	Language
500	Pure Sciences
600	Technology
700	Fine Arts
800	Literature
900	General Geography and history and their auxiliaries

The above main classes indicate that each main class represents either a major discipline or a group of related disciplines. However main class 000 includes varied subjects. Each main class has ten divisions. The divisions are “the second degree of subdivision in the classification (the first degree of subdivision of one of the ten main classes), represented by the second digit in the notation. There are 100 division”.

The ten division of the main class 100 are given below:

100	Philosophy
110	Meta Physics
120	Other Meta Physical topics
130	Mind and Body
140	Philosophical system and doctrines
150	Psychology
160	Logic, Dialectics
170	Ethics
180	Ancient, medieval, Oriental Philosophy
190	Modern Western Philosophy

Each division has ten sections. The digit representing section numbers are allocated third position in the notation. A section is “the third degree of subdivision in the classification (the second degree of subdivision of one of the ten main classes, and the first degree of subdivision of one of the 100 divisions), represented by the third digit in the notation. There are 1000 sections”.

Thus 170 represent Ethics in general. The ten sections of 170 are given below:

170	Ethics
171	Systems and doctrines
172	Political ethics
173	Ethics of family relationships
174	Economic, professional, occupational ethics
175	Ethics of recreation and leisure
176	Ethics of sex and reproduction
177	Ethics of social relations
178	Ethics of consumption
179	Other ethical norms



Classification Number(DDC)

DDC Class No assigned to a title.

4.4.1.2 Salient Features

DDC has following features:

- i. **Relative location:** According to Dewey's principle of relative location, subjects are ordered in a sequence, by assigning a notation to them and marked book not shelves, with this notation. By this, each book in a library secured a position relation to other books in the same subject.
- ii. **Subdivision of Classes:** Each main class has ten divisions; each division has ten sections, each of which may be further subdivided ten times and so on. Provision is thus made for an unlimited number of subjects. Wherever practicable, heads have been so arranged that each subject is preceded and followed by its most nearly allied subjects.
- iii. **Notation:** Dewey used Arabic numbers for the following reasons:
 - They are written more quickly and
 - With less danger of mistake
 - They are easier to remember than letter combinations.
 - It is difficult to catch the eye with such combination and they are more difficult to keep in mind.
 - Some combinations of letters are odd or ridiculous.

The notation is thus a pure one, consisting of Arabic figures used decimally. A "three-figure minimum" is used consistently. The notation is infinitely expandable. If there is no blank number available, any new topic is combined with the nearest allied head, or when important enough, a place can be made by the addition of another decimal.

Hospitality is achieved to a great extent by the character of the notation itself. Every one of main class number is divisible by 0/9 and this again by 0/9 and so on to any extent

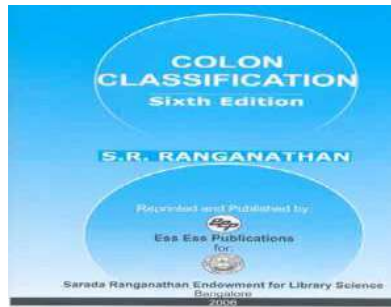
- iv. **Mnemonics:** The Decimal Classification is rich in systematic mnemonics. The systematic mnemonics reflect a constant order i.e. provision is made to get the same number wherever it may occur e.g. in literature class poetry is always 1, Drama 2; throughout the scheme India is always 54. These methods are called Form divisions and Geographic divisions.
- v. **Relative index:** The most important feature of the scheme is its index which is relative one. Arranged in alphabetical order, it aims to include all topics expressed or implied in the main tables together with every likely synonym. It is very elaborate also and is constructed with fair economy of the chain procedure. Dewey's scheme was truly modern in many respects. He anticipated many of today's developments including the principle of synthesis and facet structure, even though he did not recognize them explicitly.
In addition to the above mentioned features, DDC also contains other features. These are synthetic devices, add to device, special topics for general applicability, optional provisions and above all, efforts towards universality. These features are important because they have made DDC more synthetic, mnemonic, versatile and universal.

4.4.2 Colon Classification (CC)



Dr. Shiyali Ramamrita Ranganathan (1892-1972)

The Colon Classification was developed by Dr. S. R. Ranganathan. The Colon Classification was first published in 1933 with 127 pages of rules, 135 pages of schedules and an index of 106 pages. The 6th edition was published in 1960.



The 7th edition of the Colon Classification released in 1987. It brings many more changes than ever contained in any previous revision of this world famous classification system. The manifold increase in the number of basic subjects; recognition of the three varieties of the category matter; use of new notational symbols, and introduction of many new basic concepts, have all ushered in many complexities in the system.

It is the first scheme entirely based on analytico-synthetic principle. This aims at analysing first the subject field into constituent elements or facets and then constructing the class number by synthesis. Ranganathan said that in the Colon Classification, ready-made class numbers are not assigned to topics. The schedules in the Colon Classification may be said to consist of certain standard unit schedules. These standard unit schedules correspond to the standard pieces of meccano apparatus. Even a child knows that by combining these standard pieces in different objects/ways many different objects can be constructed. So also by combining the classes in the different unit schedules in assigned permutation and combinations, the class numbers for all possible topics can be constructed. In this scheme, the function of the colon (:) is like that of the bolts and nut in a Meccano set.

The rules of classification given at the beginning of the Colon Classification appear complex, until the construction of the scheme is understood, when they are seen to be concerned with explaining the difficulties likely to be encountered in each main class.

Ranganathan provides a set of independent tables for subjects, for relations, form and other classification factors. These tables like the parts of a Meccano set can be used for many constructions. The colon (:) acts as the nuts and bolts.

The purpose of adopting the synthetic method is to secure co-extensiveness of subject and class-mark, minuteness of classification in most of the subjects, individualization of every book in a library by assigning to each a specific class mark, infinite hospitality to new subjects and maximum autonomy for the classifier.

4.4.2.1 Fundamental Categories

According to Ranganathan, in any given subject, there may be a maximum of five fundamental categories. There can be less, but in no case more than five. To classify any

subject, it is required that the fundamental categories in a given subject may be identified. These are Personality (P), Matter (M), Energy (E), Space (S) and Time (T). In short it is PMEST. The detail of PMEST is given below:

- i. **Time (T):** This is primarily used for devoting period as it has been used in other schemes e.g. Economic Condition of India in **19th century**. Here, the 19th Century represents Time. The Connecting symbol in a single inverted comma(‘).
- ii. **Space (S):** This is also primarily used for devoting geographical characteristics e.g. Economic Condition of **India** in 19th century. Here, India represents Space. The Connecting symbol in a dot (.).
- iii. **Energy (E):**Ranganathan calls it a problem facet. It presents itself as a problem or a mode of work or approach. It is through the problems or approaches, one is to recognize the division of the Energy concept. e.g. **Teaching** of classification in the University of Delhi. Here, teaching represents Energy. The Connecting symbol is a colon (:).
- iv. **Matter (M):**This reflects the forms it takes in various subjects. If we were classifying books on the manufacture of paper we should required some divisions based on raw materials, these would relate to the concept matter. e.g. use of **esparto** in paper making. Here, esparto represents Matter. The Connecting symbol is a semicolon (;).
- v. **Personality (P):**Ranganathan found a way out to recognise personality by the method of residue, i.e. when it cannot be any other fundamental category it is assigned to personality. This is used for the wholeness of any subject. e.g. Human body in Medicine is the Personality.

4.4.2.2 Main Outline

The list of main classes recognized in CC 6th edition is given below:

Z	Generalia	△	Spiritual experience and mysticism
1.	Universe of knowledge		
2.	Library Science	MZ	Humanities and social science
3.	Book Science		
4.	Journalism	MZA	Humanities
A	Natural Science	N	Fine Arts
AZ	Mathematical Science	NZ	Literature and language
B	Mathematics	O	Literature
BZ	Physical Sciences	P	Linguistics
C	Physics	Q	Religion
D	Engineering	R	Philosophy
E	Chemistry	S	Psychology

F	Technology	Σ	Social Science
G	Biology	T	Education
H	Geology	U	Geography
HX	Mining	V	History
I	Botany	W	Political Science
J	Agriculture	X	Economics
K	Zoology	Y	Sociology
KX	Animal husbandry	YX	Social Work
L	Medicine	Z	Law
LX	Pharmacognosy		Illustrative
M	Useful Arts	(:g)	Criticism technique
		(p)	Conference technique
		(r)	Administration report technique
		(P)	Communication theory
		(X)	Management

Ranganathan divides knowledge into 26 branches.

4.4.2.3 Salient features:

The Colon Classification has following features:

1. **Notation:** Colon classification uses a mixed notation. It consists of

- Arabic numerical (0 and 1 to 9)
- Roman Alphabets (26 capital)
- Roman Alphabets (24 small) except i & o
- Various symbol such as (Δ), (:), (-)

The notation of CC is distinguished by the following features:

- The notation is **faceted**. That means it takes cognisance of change of characteristics and separates the various facets of subjects.
- It uses **fraction principle** for both numbers and letters.
- It is **Expressive**. That means it reflects order of the subjects in their subordination and coordination i.e. expresses the hierarchy by making numbers for coordinate topics.
- It is **synthetic** in representing a subject by analyzing it into its fundamental constituent elements synthesising a class symbol for the subject out of the elements linked.

2. **Hospitality:** The most distinctive feature of CC is its hospitality. It is the only scheme to achieve this, because Ranganathan could use successfully the decimal fraction principle and faceted notation. CC has achieved hospitality both in array and chain.

Hospitality in array: It permits extrapolation and interpolation in an array. Ranganathan uses several devices to increase hospitality in array. These are as follows:

- **Octave Device:** According to this, when the classes of any array are numbered with Arabic numerals, only numbers 1 to 8 are to be used. 9 is not used ordinarily to individualize any class. The number next in order after 8 is 9 1 and not 9.
- **Subject Device:** it is used to form or sharpen a facet by adding to it (facet) another class number from elsewhere in the scheme. This device has been used in several main classes. The part of the number derived by the subject device should be enclosed in parenthesis (circular bracelets) ex: Medical College Library is 2, J3 (L).
- **Alphabetical Device:** It is used taking the first or the first two or three letters of the names of persons, or objects or products. The device can be used wherever warranted.
Ex: J,381 B – Basmati Rice. (J,381 is rice and B is for Basmati).
- **Chronological Device:** The purpose of this device is to sharpen a facet number. It can sharpen an isolate or form a new isolate. This is done by employing a chronological number from the schedule of time isolate. This device can be used wherever warranted. Ex. 2:51 M76 represents Dewey Decimal classification.
- **Geographical Device:** The purpose of all these devices is to form or to sharpen an isolate number in a schedule. Geographical number may be taken from the schedule of space isolate. Ex. Z 44, 2 Indian Law of property.

Hospitality in Chain: This may be defined as the quality of a notation which permits arrangement of classes in successive subordination, each one being subordinated to the preceding one. It permits simultaneous specification of all the facets of a subject if necessary and the ability to specify new facets in their correct sequence. The hospitality in chain is achieved by the following:

- **Decimal Fraction Notation:** Decimal fraction notation gives infinite extrapolation and interpolation. Similarly letters are also used as fraction. Any class can be divided indefinitely.
- **Faceted Notation:** Faceted notation provides for the complete exhaustion of each characteristics in turn and the marking off in the notation of each successive facet.

3. **Mnemonics:** Mnemonics are produced by using the following:

- Common Isolates: Anteriorising and Posteriorising isolates are indicated by using lower case letters. eg.
a bibliography
m periodical
v history. And etc.
- Geographical Divisions or space isolates are denoted by number eg.
44 India
441 Madras. etc.
- Language divisions or language isolates are for use mainly in the linguistics and literature class eg.
111 English
15 Sanskrit
157 Bangali
- Chronological division or Time isolates are specified as follows:
N 20th century (1900 to 1999AD)
N3 1930
N54 1954. Etc.

4. **Index:** The index of CC is the shortest index found in any classification consisting of only 45 pages. It is relative though the relative aspects of a subject are given in the form of class numbers. Some index of the schedules are shown under the schedule instead of enlisting them in index e.g. Botanical names after Botany class, Geographical schedules after Geography class and so on.
The index has been desired entirely for the classifier and not for the readers.

4.4.3 Comparison between DDC and CC:

1. **Main Outline:**

DDC: It has 10 main classes with 9 sub-classes and 9 sections of each subclass. That is to say beginning with most general subjects produced to more specific.

CC: Main classes are comprised of Generalia (1to 9) and twenty six main classes on both science and humanities. The first thirteen classes comprise the sciences and their applications, while the last thirteen comprise humanities.

2. **Notation:**

DDC:

- It uses Arabic numerals
- Three figure minimum notation has been used.
- Notation is expensive, but not in array.

CC:

- Notation is extremely mixed consisting of Arabic numerals, roman alphabet (both capital & small) and symbol & sign including colon.
- Notation is faceted.
- It is synthetic.
- It uses fraction principle for both numbers and letters.
- It achieves hospitality both in array and chin.

3. Form Divisions:

DDC:

- Used series of nine common form divisions.
- These with minor alternatives are used with the same meaning throughout the scheme.

CC:

- For common sub-divisions, used lower case letters.

4. Mnemonics:

DDC:

It makes full use of the mnemonic principle. The principal mnemonic features are:

- Form divisions
- Geographical divisions
- Language divisions.

CC:

The scheme is a faceted one, and enjoys a considerable mnemonic quality by the use of the same facets and common facets.

5. Index:

DDC:

- DDC has Relative index.

CC:

- Shortest index found in any classification scheme. The index to the scheme is entirely a tool for the classifier and not for the readers. Index of some subjects have been given under schedules instead of enlisting them in the index.

4.5 Summary:

The main aim of librarianship is to bring the user in contact with the document or information. Various techniques are adopted by a librarian to achieve the aim. Library classification is one such technique, which helps in the organization of documents and information so that the user can use sources of information efficiently. Therefore, library classification is a necessity in a service library. A classification scheme is designed for the arrangement of books or other material by subject or form or both or by any recognizable logical order. The Dewey decimal classification fulfills the criteria of a good classification scheme. Its inclusiveness and receptiveness to new subjects are well illustrated by the increased number of pages of tables and relative index. The notation is exceptionally simple, clear and expensive with excellent mnemonic feature. In the Colon Classification, the basic classification is logical in most of its divisions, scientific in its details and scholarly in its elaboration. The facet formula helped in securing helpful order in library classification, in individualizing every subject.

4.6 Exercise:

- i. Define classification by Dr. S.R. Ranganathan?
- ii. Differentiate between classification and Division.
- iii. Differentiate between Natural and Artificial Classification?
- iv. Differentiate between knowledge and book classification?
- v. Explain the need of library classification?
- vi. Write the purpose of Library Classification?
- vii. Write the salient features of DDC?
- viii. Write the salient features of CC?
- ix. Compare the DDC & CC scheme of Library classification?

4.7 References:

- i. Krishan Kumar (2013), Library Manual. 4th Revised ed. New Delhi: Vikash Publishing House, 2013, 386 P.
- ii. Dutta, D. N. (1962) – Library Classification: theory & practice. Nagpur: The western Book Depot, 1962. 320 p.
- iii. Phillips, W. Howard (1955). A Primer of Book Classification. London: Association of Assistant Librarians, 1955. 235P.
- iv. Sayers, W. C. Berwiek (1955). A manual of Classification for librarians and bibliographers. London: Crafton, 1955. 346 p.
- v. Raju, AAN (1984). Decimal. Universal Decimal & Colon Classification. Madras: Ajanta Publication, 1984. 270 P.

4.8 Glossary:

Dewey Decimal Classification (DDC): The Dewey decimal classification fulfills the criteria of a good classification scheme. Its inclusiveness and receptiveness to new subjects are well illustrated by the increased number of pages of tables and relative index.

Colon Classification (CC): the basic classification is logical in most of its divisions, scientific in its details and scholarly in its elaboration. The facet formula helped in securing helpful order in library classification, in individualizing every subject.

Unit 2

Library Cataloguing (Theory)

5.1 Introduction:

The term “Catalogue” has been formed from the Greek phrase, Katalogos. Kata means “according to” and “logos” means “order” or reason.

The library catalogue is a list of books and other reading materials in the holdings of a library or a group of libraries. The list contains details about the book and other reading material. Which are useful for the users of catalogue. The details are author, title, the person or body assisting in bringing out the book, edition, place of Publication, Publisher, Year of Publication, information regarding physical details like pages, size, illustrative materials etc. Besides these information, the catalogue also bears some location mark, usually in numerical form, by which documents can be located on the shelves. According to J. H. Shera (1956), “the library catalogue does not or should not exist as an end in itself. It is one part of the total bibliographic system and must be responsive to changes that take place in other parts of the system”.

Cataloguing denotes the various processes adopted in preparing the entries of the reading material in a catalogue and its maintenance. Library catalogues are different from the publishers’ catalogues, booksellers’ lists, bibliographies etc. Each of these reference tools is useful to build up the collections for a library book selection, but they do not do what a library catalogue does.

5.2 Definitions of Library catalogue:

The new English Dictionary defines a Catalogue as follows: ‘A Catalogue is usually distinguished from a mere list or enumeration by systematic or methodic arrangement, alphabetical or other order and often by the addition of brief particulars, descriptive or aiding identification, indicative of locality, position, data, price or the like’.

According to C A. Cutter, a catalogue is “a list of books which is arranged on some definite plan. As distinguished from a bibliography, it is a list of books in some library or collections”.

According to Margaret S. Taylor, “Bibliography is a list of books or manuscripts on a particular subject or subjects. A catalogue is also a list but its scope is limited to a particular collection”.

James Duff Brown in his Manual of Library Economy, has defined a catalogue as “an explanatory, logically arranged inventory and key to the books and their contents and it is confined to the books in a particular library”.

According to Dr. S.R. Ranganathan, “a library catalogue is methodically arranged record of information about its bibliographical resources”.

Therefore, a library catalogue:

- i. is a list of books and other reading materials available in a particular library;
- ii. contains entries prepared for all the documents according to rules prescribed in a catalogue code and organized in a systematic order;
- iii. gives bibliographical information of the documents such as author, title, edition, place of publication, publisher, date of publication in each entry in order to describe and identify the document; and
- iv. gives location number of the document, such as call number of the document in order to locate the document on the shelves of the library.

5.3 Need of a Library Catalogue:

A library acquires books, periodicals, serials, pamphlets, dissertations, manuscripts, maps, and other printed and non-printed materials to serve them to their users. If these documents are not organized properly then it is very difficult or impossible to locate the document. Even if they are organized on shelves properly, no persons either user or staff, will be able to know and remember what books are available in a library. It will also be difficult to ascertain, if a particular document as asked for by the user, is available in the library. Thus the very purpose for which the library has been established will get defeated.

It is, therefore, essential that each document is enlisted in the catalogue in a manner that users' approach is met with. The catalogue thus created serves as a key to the holdings of a library.

5.4 Objectives of a Library Catalogue:

Charles Ami Cutter described the objectives of a library Catalogue in 1876 in his book titled "Rules for a Dictionary catalogue".



According to him a catalogue should:

1. To enable a person to find a book of which either
 - a. the author, }

- b. the title, or is known
 - c. the subject
- 2. To show what the library has
 - a. by a given author
 - b. on a given subject, or
 - c. in a given kind of literature
- 3. To assist in the choice of a book
 - a. as to its edition (bibliographically)
 - b. as to its character (literary or topical)

The first objective of a library catalogue is to inform the availability of a particular document in the library. The readers may access the catalogue by the name of author or title or subject.

The second objective is to show what a library has. The catalogue helps in bringing together books by the same author and on the same subject or in a given kind of literature.

The third objective is known as descriptive cataloguing. The catalogue helps to identify a document from several similar documents.

Therefore, a library catalogue is an instrument equipped to deal with the several ways of enquiry, and of identification and retrieval of the books and other materials.

5.5 Purpose of the library catalogue:

The purpose of cataloging is to put order into a collection of books so that the volumes may be located and used for reference and circulation. The classifier makes it possible for the books to be arranged in an orderly manner on the shelves. The cataloger must supplement that work by listing books in the catalog under their author, title, or subjects to provide additional lines of approach for readers and staff members alike.

The main purpose of a library catalogue is to serve as a guide to the collection of the materials acquired for the library. Primarily the library catalogue reveals to users of a library, the document in a library and helps the person in finding out whether documents of the person's interest are available in the library or not. It also serves users as a retrieval tool.

5.6 Function of a Catalogue:

The main function of a library is to provide the required documents to the readers and it is the catalogue that performs this function by bringing the needs of the reader into the relation with the resources of the library.

According to Dr. S.R. Ranganathan, the function of a library catalogue is "to help the exploitation of resources of the library in conformity with laws of library science".

According to Shera and Egan, two important functions of a library catalogue are:

- Accurate and speedy determination of whether or not an item known by author or title is in the collection, and if no, where it may be found.
- What materials the library contains upon a given subject and where they may be found.

In addition to the above, the catalogue should provide the following functions:

- It guides the user in selection of a document of his interest;
- It can be used as a reference tool for answering many questions of users of documents;
- It saves the time of the reader;
- It provides other valuable information on documents besides bibliographical data for accessing and locating documents;
- It displays the library record before the reader;
- It gives the total account of the collection of a library, of an author, title and the subject; and etc.

5.7 Difference between Catalogue and the Bibliography:

A library catalogue and a bibliography are distinct from each other as they serve different purposes. The differences between them are given as below:

<u>Catalogue</u>	<u>Bibliography</u>
• It covers the reading material of particular library. • It's scope is limited to the collection of a library or a group of libraries. • There is a location symbol. • It is found on card. • There is sequence which is applied in uniformity.	• It is not limited to any one collection of books. • It's scope is unlimited. It may be limited to a library but also covers the whole universe on a particular collection of a country or the locality. • Location symbol need not be given. • It is found in book form. • There is sequence, but it may differ.

There is a definite distinction between bibliographies and catalogues but there is an equally definite link between them. Bibliographers need library catalogues to help them in their researches, and cataloguers use bibliographies for identification of publications and fact finding.

5.8 Catalogue Codes:

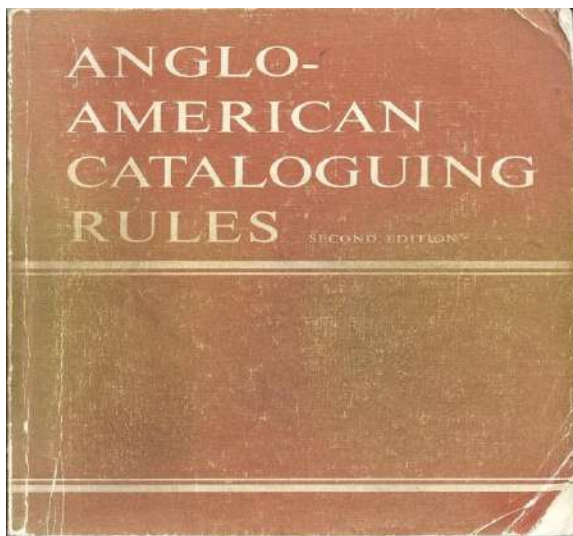
The catalogue must be constructed on a scientific basis. It must be founded on rules and regulations that insure uniformity and accuracy so that it will be a dependable tool. Therefore, a Library catalogue code is a set of rules for guidance of cataloguers in the preparation of entries in catalogues for documents so as to maintain uniformity.

Salient features of main Cataloguing Codes:

5.8.1. Anglo – American Cataloguing Rules – 2nd Ed.

The Anglo American Cataloguing rules was first appeared in 1967. The rules were given in two parts. Part 1 covered entry and heading consists of four chapters and part 2 covered description presented in 10 chapters.

Anglo – American Cataloguing Rules, second edition, i.e. AACR-II, has been jointly prepared by the American library Association, the British Library Association and the Canadian Library Association and the Library of Congress. It was published in 1978. There are two main parts and four appendices in the code. Part one deals with Description and Contains 13 Chapters. Part two is concerned with Headings, uniform Titles, and References and it Consists of 6 Chapters numbering 21-26. The Four appendices given at the end of the code deal with Capitalization, Abbreviations, Numerals and glossary. A Comprehensive index has also been provided at the end.



5.8.1.1 Features of AACR-II

- **Structure of the Rules:**

The rules for description is given in part one. The rules for the choice and rendering of various access points is given in part two. In both parts the arrangement of rules is from general to specific.

- **Contents of Part -1:**

The rules of part 1 contain instructions on the formulation of description of documents. The following types of documents have been included for the rules of their description in part 1:

- i. General Rules for Chapter 1 Description
- ii. Books, Pamphlets and Chapter 2 printed sheets
- iii. Chapter 3: Cartographic materials
- iv. Chapter 4: Manuscripts
- v. Chapter 5: Music
- vi. Chapter 6: Sound Recording
- vii. Chapter 7: Motion pictures and video Recordings
- viii. Chapter 8: Graphic Materials
- ix. Chapter 9: Machine Readable data files
- x. Chapter 10: Three Dimensional Artefacts and Radio
- xi. Chapter 11: Microforms
- xii. Chapter 12: Serials
- xiii. Chapter 13: Analysis

Chapter 14-20 of part 1 are left blank for future development.

Chapter 1 contains those rules that apply to all documents as it provides brief guidance. The Cataloguer will find specific treatment of certain elements in the appropriate specific chapter numbered in between chapter 2 to 13.

- **Contents of Part -2:**

Part 2 provides necessary rules for headings, uniform titles, and references. It consists of 6 chapters, as mentioned below:

- i. Chapter 21: Choice of Access points
- ii. Chapter 22: Headings for persons.
- iii. Chapter 23: Geographic names
- iv. Chapter 24: Headings for corporate Bodies
- v. Chapter 25: Uniform Titles
- vi. Chapter 26: References

The arrangements of the rules in part 2 is also from general to specific. If no specific provision exists in a particular case, the more general rules should be adhered to. The rules in this part are to be applied for all types of documents, irrespective of their physical feature.

Appendices:

Abbreviations, Capitalization and numerals are given in the appendices in the code. The code provides the instructions in the appendices as the rules contained in part 1 and 2.

Glossary:

A glossary of most of the technical, bibliographic and cataloguing terms, including those relating to the field of non-book materials has been given at the end of the code preceding the index. The terms contained in the Glossary have been defined in the context of the rules.

Examples:

It has been mentioned clearly that the examples used throughout the code are illustrative and not prescriptive. Therefore, neither the examples nor the form in which they are presented in the code should be taken as instructions unless the accompanying text specifically states that they should.

Index:

A comprehended index has been provided at the code. The index covers the rules and appendices, but examples have been excluded.

5.8.1.2 Organisation of AACR-II:

AACR 2 divides the description into the following areas:

- Title and Statement of responsibility area (Area1)
- Edition Area (Area 2)
- Material specific details area (Area 3)
- Publication, distribution etc. area (Area 4)
- Physical description area (Area 5)
- Series Area (Area6)
- Standard number and terms of availability area (Area7)

Precede each area, other than the first area or each occurrence of a note or standard number, etc. area by a full stop, space, dash, space(.-) unless the area begins a new paragraph.

5.8.2 Classified Catalogue Code (CCC):

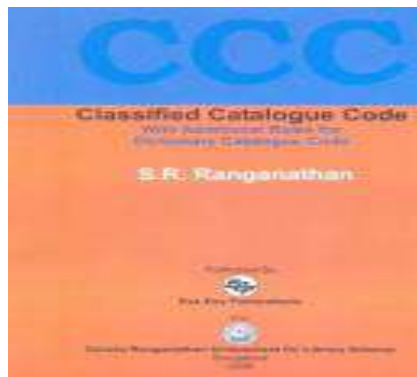
The Classified Catalogue Code (CCC) was developed by Dr. S. R. Ranganathan and first published in 1934. The 5th edition of the Catalogue code with additional rules for Dictionary Catalogue appeared in 1964. It is a code which can be used for the preparation of classified catalogue as well as dictionary catalogue.



Dr. Shiyali Ramamrita Ranganathan (1892-1972)

(Source: <https://www.google.co.in/#q=photo+of+sr+ranganathan>)

Classified Catalogue Code: With Additional Rules for Dictionary Catalogue Code



S. R. Ranganathan, A. Neelamegham

5.8.2.1 Features:

- The classified catalogue code is free from the restriction of language unlike the other codes in spite of their non-local nature. The CCC has achieved this by taking into account basic concepts: (a) Language of the Library, (b) Scale of languages, in which the language of the library comes first and the others come in the descending sequence of ferouredness.
- CCC is altogether a distinct Cataloguing code based on Canons and principles evolved by Dr. S. R. Ranganathan.
- There is special provision of rules for compilation of unions catalogues, periodical publications, National bibliographies, Indexing and abstracting periodicals.
- The chain procedure is the unique device in CCC which is a most important contribution of Dr. Ranganathan to the art of Cataloguing. This is a mechanical device to device the

subject headings from class number either for class index or for subject headings to be used for a dictionary catalogue.

- CCC attaches much importance to the title page and its overflow pages in order to get details to be incorporated in catalogue entries.
- Another feature of CCC is its economy. CCC does not allow the use of imprint and collation in the Catalogue entry which are considered to be part and facet of an entry for identification of the documents.
- The book number constructed in accordance with colon classification of Dr.Ranganathan indicates the years of publication of the document. An additional information to the title statement of the entry in CCC is the edition of the books.

5.8.2.2 Limitations:

- It lacks in providing complete bibliographical information which sometimes causes confusion and difficulties.
- No rules for cataloguing of non-book materials have been provided that are essential for cataloguing purposes of such materials.

CCC recognizes the following kinds of entries in a classified catalogue:

Main entry

Book index entry

Class index entry

Cross reference entry

Cross reference index entry

The main entry and cross reference entry are number entries. Therefore, these form part of the classified part.

Book index entry, class index entry and cross reference index entry are word entries.

Therefore, these are included in the alphabetical part.

A main entry in CCC consists of the following sections:

- Leading section;
- Heading section;
- Title section;
- Note section; if any
- Accession number; and
- Accession number; and
- Tracing section.

The Leading section consists of call number of the document and is always written in pencil.

The Heading section consists of authorship.

The Title section consists of title, edition and collaborators

Other information is provided in the note section, if required.

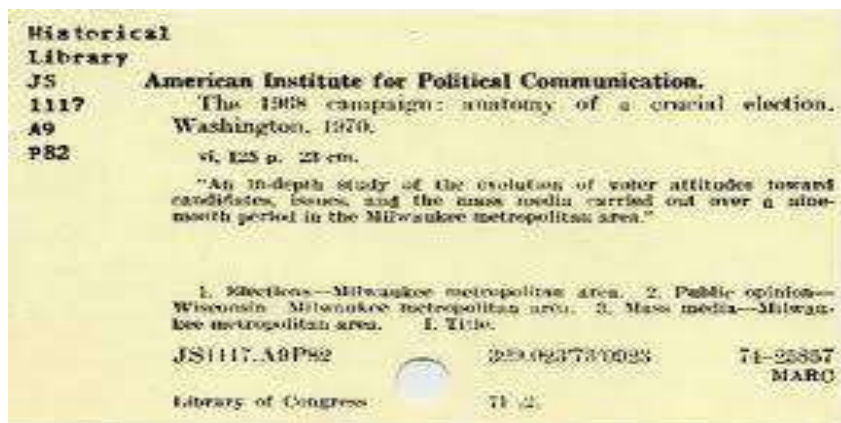
The tracing section is given on the book of the main entry. It indicates which entries in addition to the main entry have been prepared for the given book. The purpose is to enable the removal of catalogue cards related to a main entry at the time of the weeding of a book from a library.

5.9 Forms of Library Catalogue :

The first thing to consider in beginning a catalog is what form it is to take. The two most generally accepted are the card and the OPAC form.

5.9.1 Card Catalogue:

A catalog in card form is one in which each entry appears on a separate card; in other words, each entry is a unit which can be shifted, sorted and arranged in any way desired. The card catalogue is the most widely used form throughout the world. It has got the qualities of flexibility; ease of use and economy in production and maintenance. Another advantage with this form is that it is suited to unit entry cataloguing. The standard catalogue card measuring 12.5 cm X 7.5 cm (roughly 5"x3") is used in this form. The entries are prepared on these cards in desired quantity and they are then arranged in catalogue cabinet.



Cards arranged in alphabetical or classified order are filed in a catalogue card tray, designed to hold at least 1400 cards in upright position which are housed in card cabinets. At the bottom of the cards there are punched holes through which passes a locking rod holding them secured together and in order they can be shifted to and fro along the rod for consultation. The card

cabinets are made of steel or wood containing any number of trays in accordance with the design. Generally, cabinets are based at a height of 3' or 3' 6" above the floor.



5.9.1.1 Merits:

- The greatest advantage of the card catalogue lies in the fact that it is far from growing obsolete or congestion except by carelessness or inadvertence.
- The arrangement allows flexibility and maximum ease of insertion of new entries and withdrawal of such entries of books as are lost or weeded out.
- The card is an absolutely single and self-contained unit, capable of infinite expansion and manipulation without any hindrance. Cards can easily be produced by a mechanical reproduction process or cards produced by a centralized service may be used.
- The card can be easily changed at any time by replacing new ones and the same cards can be arranged in any order.
- The card catalogue maintained in the card cabinets is easier to consult and handle, and many readers can use it at a time.
- It can be easily guided.

5.9.1.2 Limitations:

- The card cabinet occupies much space and as such it creates the problem of space. Thus the biggest disadvantage of the card catalogue is its bulk which can cause a serious accommodation problem as the catalogue grows.
- It is not portable and so it cannot be consulted like the book form, at every place.

- In a busy library when a single reader monopolizes the whole tray or section of the cabinet, he kills the time of other readers.
- The cards can be easily removed or distracted by errant readers who can create problems.
- Only one title can be located by the reader at a time and for others he has to see all entries. Thus, it is not economical in saving time and labour of the users.
- These days cards are too expensive.
- For a single book, many cards are needed to be prepared. Therefore, it is not economical in time, labour and money to the library staff.

5.9.2 Online Public Access Catalogue (OPAC):

An online Public Access catalogue is an online database of holdings of a library or group of libraries. Readers search OPAC to find the documents available in the Library. OPAC is accessible through Intranet and over Internet. The readers may search the bibliographic database and find specific information online. The search facility provides information about the status of each item available in the library.

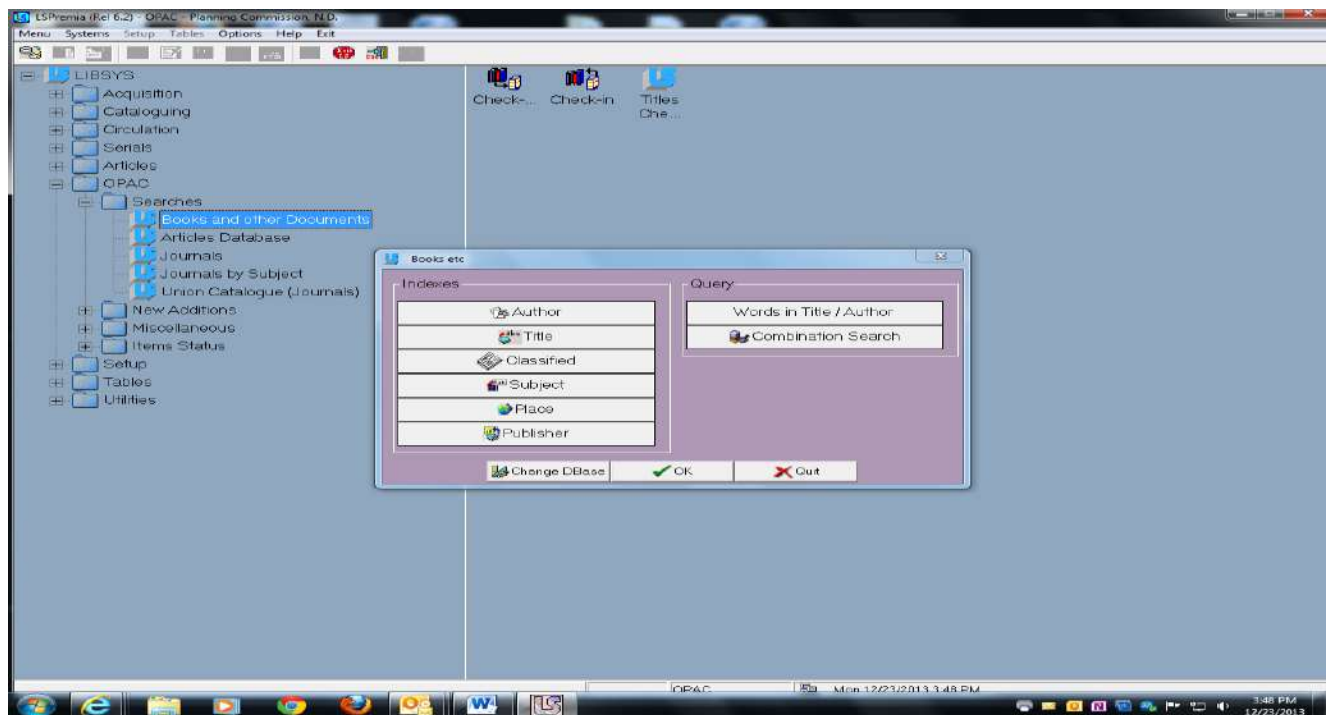
OPAC provides search results from the following search points:

- Title search point
- Author search point
- Subject search point
- Class number search point
- Publisher search point
- Place search point
- Keyword search point

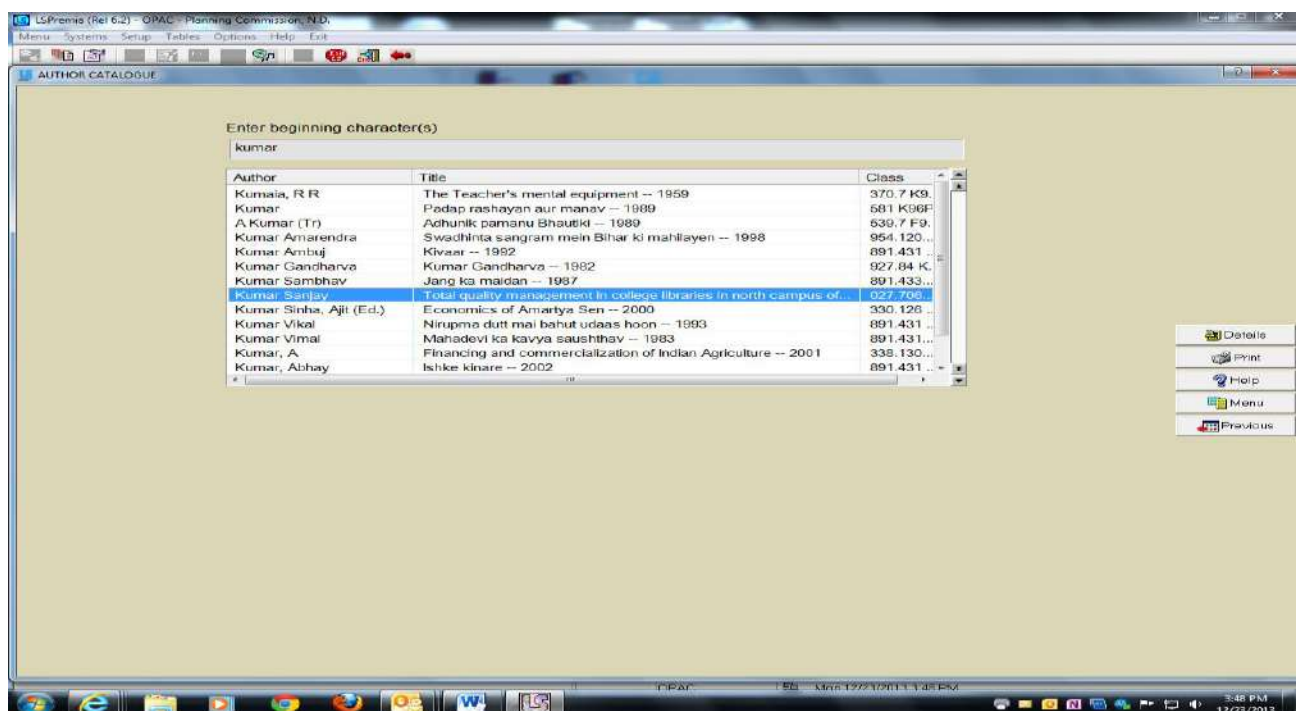
OPAC also provides the Boolean search facility in the combinational search. The Boolean search uses following logical connectors:

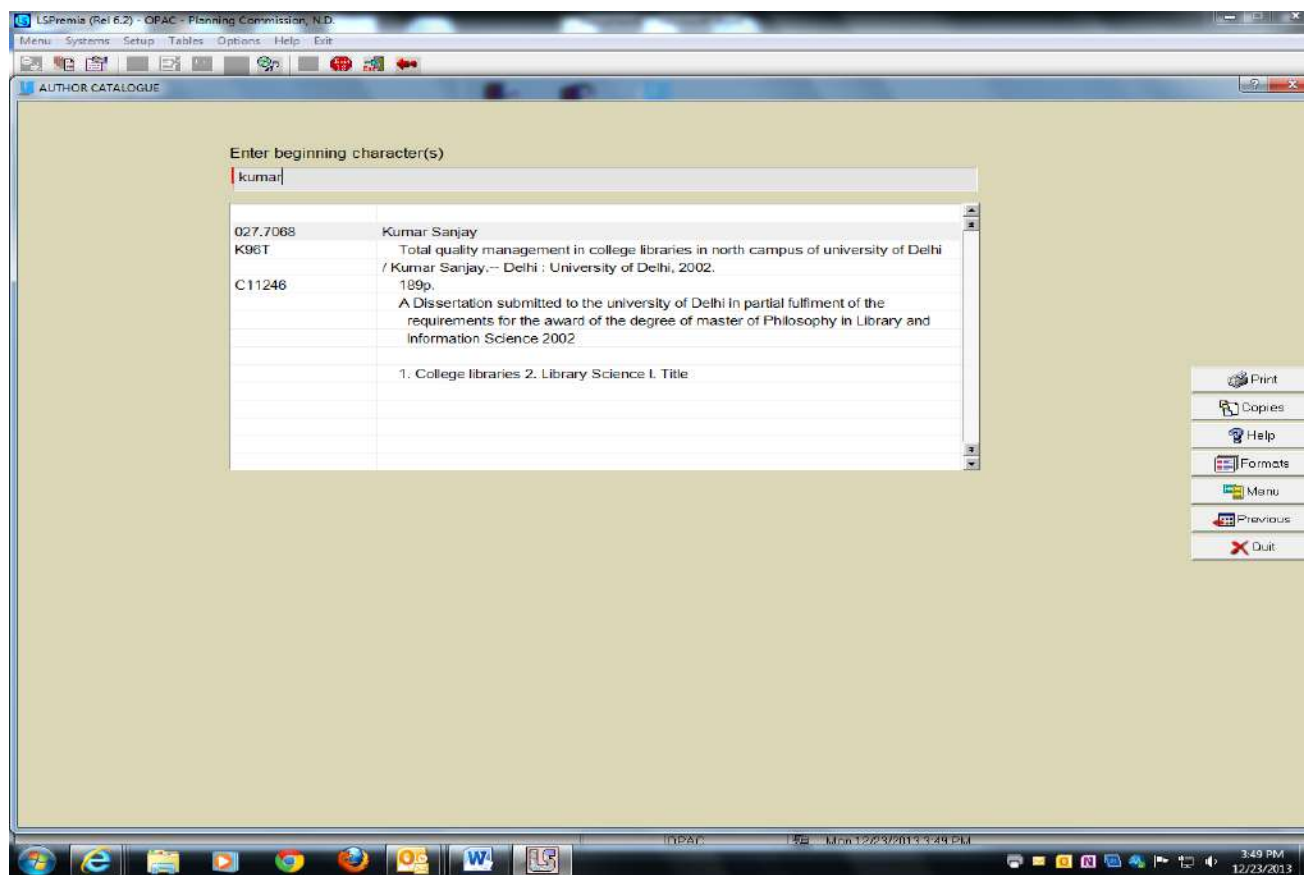
‘OR’, ‘AND’ and ‘NOT’

The following screen shows the OPAC dialog box through LS Premia software of Libsys in the Planning Commission Library, New Delhi.

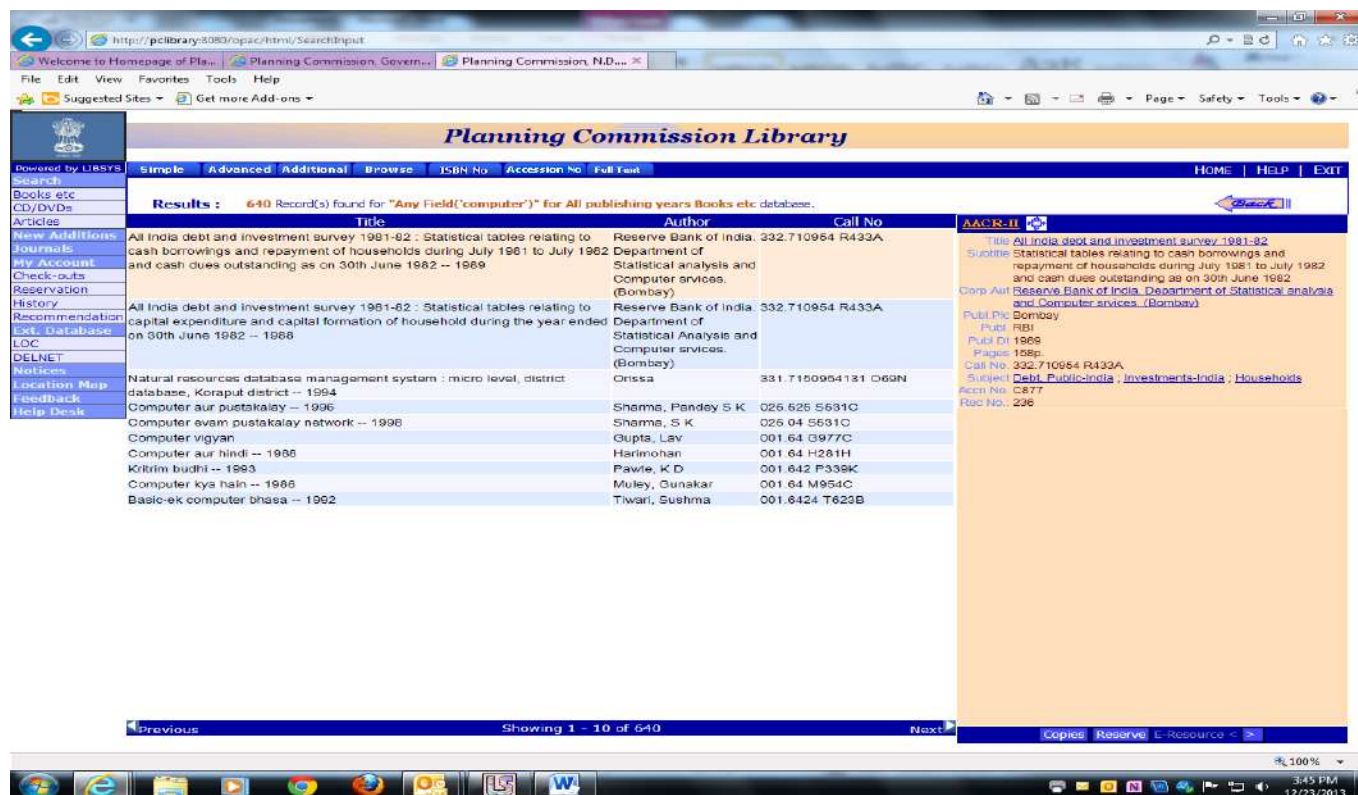


From the above, if we open the Author indexes and put the word 'Kumar' in search area and after selecting the author 'Kumar Sanjay' and click on the details we will get the following screen:

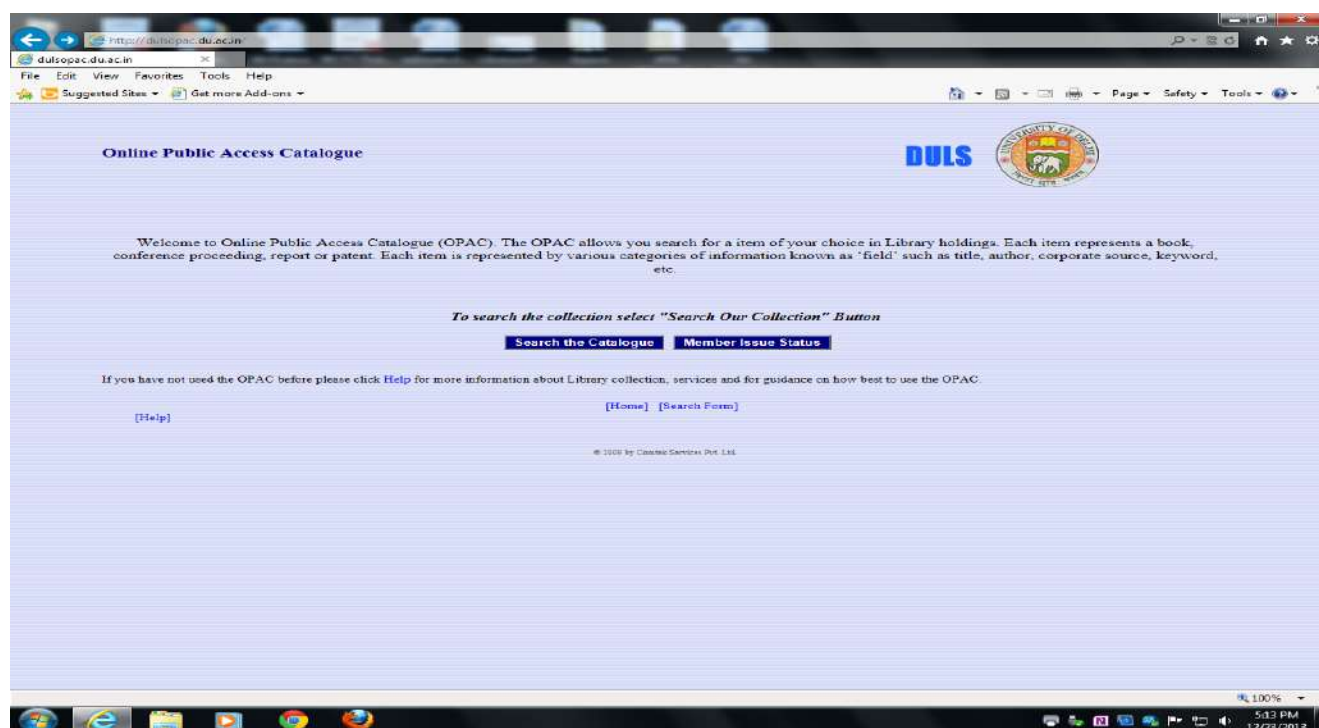




If we search the OPAC of Planning Commission Library on the Internet the following screen appears:



The OPAC screen of Delhi University System appears as follows (taken from the Delhi University Website):





5.10 Summary:

In this chapter, we have studied definition, objective/purpose, the different functions of a library catalogue. The difference between catalogue and bibliography is also explained. The salient features of two different cataloguing codes i.e. AACR2 (Anglo American cataloguing Rules-2) and CCC (Classified Catalogue Codes) are also explained. Two different forms of catalogue i.e. Card catalogue and OPAC (Online Public Access Catalogue) are also dealt with photographs.

5.11 Exercise :

1. Define a Library catalogue?
2. Enumerate the objective of a library catalogue as described by C A Cutter?
3. Discuss the need and purpose of a Library catalogue?
4. What are the different functions of a Library catalogue?
5. Differentiate between Catalogue and Bibliography?
6. Write the salient features of AACR2?
7. Write the salient features of CCC?
8. Write the limitations of CCC?
9. What are the different kinds of entries in CCC?
10. What are the different sections in the main entry of CCC?
11. Explain the card form of catalogue?
12. Write the merits and demerits of Catalogue card?

5.12 References:

1. Krishan Kumar (2013), Library Manual. 4th Revised ed. New Delhi: Vikash Publishing House, 2013, 386 P.
2. Gorman, Michael and Winkler, Paul W. (Ed.)(1978). Anglo-American Cataloguing Rules. 2nded. Chicago: American Library Association, 1978. 620p.
3. Mann, Margaret(1943). Introduction to cataloguing and the classification of books. 2nd ed. Chicago: American Library Association, 1943. 276p.

4. Shera, Jesse H. and Egan, Margaret E (1956). The classified catalog: basic principles and practices. Chicago: American Library Association, 1956. 130p.
5. Viswanathan, C G (1983). Cataloguing: theory and practice. 5thed. New Delhi: Today& Tomorrow's Printers and Publishers, 1983. 442p.
6. Tripathi, S M. (1978). Modern cataloguing: theory and practices. 2nd ed. Agra: Shiva LalAgarwala, 1978. 535p.
7. Ranganathan, S R and Neelameghan, A (1964). Classified Catalogue Code: With Additional Rules for Dictionary Catalogue Code. 5thed. New Delhi: EssEss Publications, 2006.

5.13 Glossary:

Online Public Access Catalogue (OPAC): An online Public Access catalogue is an online database of holdings of a library or group of libraries. Readers search OPAC to find the documents available in the Library.

Card Catalogue: A catalog in card form is one in which each entry appears on a separate card; in other words, each entry is a unit which can be shifted, sorted and arranged in any way desired. The card catalogue is the most widely used form throughout the world.

Chapter 3

Reference and Information Sources

Unit 1

Reference and Information Sources

1.0 Introduction

The source of information on any subject is the literature produced on it in any format. The term ‘literature’ was earlier defined as the published writings in a particular style on a particular subject. But the importance and quantum of unpublished sources produced in the area of science, technology and research has made the setting vaster. The literature is diverse, complex and multilingual in nature and becoming more interdisciplinary nowadays. The technologies to access information are also getting format and device independent.

Providing reference service to users is one of the prime objectives of any library. This is the most personalized service offered by a library, carried out with a carefully selected set of reference sources and trained reference library professionals. Dr. S. R. Ranganathan stated that ‘reference service is the process of establishing contact between a reader and his documents in a personal way’.

Reference process, as stated by William A. Kats, is the process of answering questions. He listed out three basic factors which affects the process as, (i) information (ii) the user and (iii) the reference librarian.

The importance of the effective use of reference sources through a planned reference service policy was dealt in detail in the guidelines brought out in 1990 by the Reference and Adult Services Division of the American Library Association. As per the guidelines, the library “should provide users with complete, accurate answers to their information queries regardless of the complexity of those queries.” And the library “should provide access to the most current reference sources available in order to assure the accuracy of information.”

In the last decade, the nature of reference services and resources has changed dramatically in response to the technological advancements and innovations. Today's user can access quality informational resources those are readily available outside the bounds of the library in numerous formats and through a number of devices. A reference librarian of today, as described by Meghan Harper, is often required to become an information mediator: evaluating information on the spot, selecting the best medium for information retrieval, and choosing among a host of informational resources.

This chapter deals with the definition, need, types, characteristics and evaluation of reference and information sources. It also presents some basic ideas about the development of a reference collection.

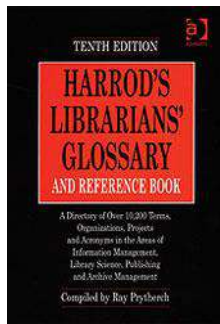
1.1 Reference Sources: Definition

Although, the materials in a reference collection vary in its format, to understand the concept historically, here we consider the definition of the term firstly with the most common format, i.e., a reference book.

The ALA Glossary of Library and Information Science (1983) offered the following definitions of a reference book.

- i. A book designed by the arrangement and treatment of its subject matter to be consulted for definite items of information rather than to be read consecutively.
- ii. A book whose use is restricted to the library building.

An all-inclusive definition was later given in the *Harrod's Librarians' Glossary and Reference Book* as "any material, published work, database, web site, etc. which is used to obtain authoritative information."



Harrod's Librarians' Glossary and Reference Book is a directory of over 10,200 terms, organizations, projects and acronyms in the areas of Information Management, Library Science, Publishing and Archive Management. The latest edition (10th) was published in 2005 by Ashgate Publisher, Yorkshire, and edited by Ray Prytherch. The book is considered as one of the most important sources of reference for the Library profession.

Source: <http://www.ashgate.com>

The reference materials organized in a library shall be supplemented by additional resources available in alternative or multiple formats and also available in free or open domains or on a virtual reference environment.

1.2 Information Sources: Definition

One of the earlier definitions for 'Information Source' was given in *the Great Soviet Encyclopedia, 3rd Edition (1970-1979)* as, "any system producing information or containing information intended for transmission; in information science, the conventional designation for scholarly documents or publications, which serve not only as important sources but also as the means of transmission of information in space and time."

According to Wikipedia, "an information source is a source of information for somebody, i.e. anything that might inform a person about something or provide knowledge about it. Different types of questions require different sources of information. Information sources may be observations, people, speeches, documents, pictures, organizations, websites, etc. They may be primary sources, secondary sources, tertiary sources and so on."

1.3 Reference and Information Sources: Need

We are living in an information society where the creation, distribution, uses, integration and manipulation of information is a significant economic, political, and cultural activity. The information becomes a resource as well as one of the most valuable commodities. Identification, gathering, organization, and utilization of the right information require the knowledge about the area of study and skills to process and retrieve it effectively. The users with varied information needs and those are not conversant with searching and retrieval techniques require proper guidance to find the accurate information stored in different information sources. The need of reference sources come in the picture at this point where the reference librarian or the user him/herself turns to the organized and authentic sources of information.

When we discuss the need of reference sources from the user's perspective, some notable requirements are,

- to obtain information quickly as possible for a specific reference query;
- due to the lack of knowledge about the newly generated information;
- the absence of skills to find, evaluate and use specific information from the vast pool of unverified information;
- because of user's specialization in some restricted subject areas which are not related to the reference query;
- to obtain copies of required material or the material itself in different formats; and
- the lack of knowledge about the criteria for evaluation and selection of reference materials.

Information need

A gap in a person's knowledge that, when experienced at the conscious level as a question, gives rise to a search for an answer. If the need is urgent, the search may be pursued with diligence until the desire is fulfilled. Persons with information needs often end up at the reference desk of a library where it is the responsibility of the reference librarian to determine the precise nature of the need, usually by conducting an informal

reference interview, as a basis for recommending relevant sources.

- ODLIS (Online Dictionary for Library and Information Science) by Joan

M. Reitz

Source: <http://www.abc-clio.com/ODLIS>

1.4 Information Sources: Types

Information sources are broadly divided into (i) Documentary sources and (ii) Non-documentary sources. Documentary sources include primary, secondary and tertiary sources which are basically ‘documentary’ in nature. Non-documentary sources include (i) formal and (ii) informal sources. Formal sources include research organizations, societies, universities, government departments, etc. Conversation with colleagues, visitors, attendance at professional meetings, etc. comes under the category of informal sources.

Based on the originality of the materials, information sources can be categorized into three. They are,

- i. Primary Sources
- ii. Secondary Sources and
- iii. Tertiary Sources

The definition of primary and secondary sources may vary depending upon the discipline or context.

As an introduction, examine the below given image, (Figure 1), where three manifestations of the same event are represented with the three types of sources of information, primary, secondary and tertiary.

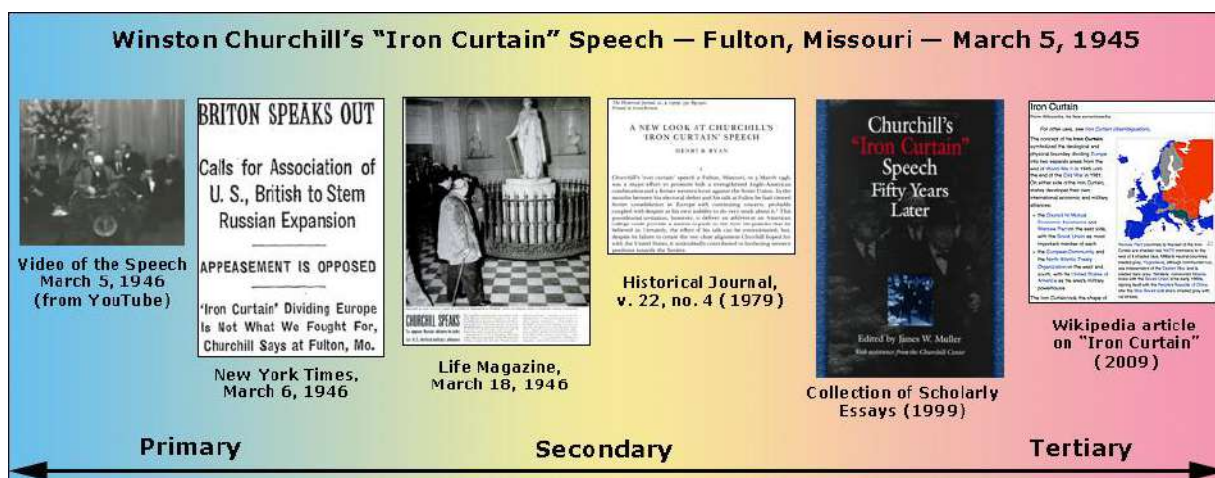


Figure 1: Flow from primary to secondary and tertiary resources: A time line

The characteristics of all three types of information resources are discussed with examples in the following sections.

i. Primary Sources

Primary Sources are original materials that were created first hand. This type of information is from the time period involved and has not been filtered through interpretation. They are usually the first formal appearance of results in physical, print or electronic format on which other research is based. They present original thinking, report a discovery, or share new information. Primary sources are unorganized sources, which are rather difficult to use by them.

Examples:

- a) Artifacts (e.g. coins, plant specimens, fossils, furniture, tools, clothing, all from the time under study);
- b) Audio recordings (e.g. radio programs)
- c) Diaries;
- d) Internet communications on email, list-servs;
- e) Interviews (e.g., oral histories, telephone, e-mail);
- f) Journal articles published in peer-reviewed publications;
- g) Letters;
- h) Newspaper articles written at the time;

- i) Oral history (i.e. records of interview, legal proceedings)
- j) Original Documents (i.e. birth certificate, will, marriage license, trial transcript);
- k) Patents;
- l) Photographs;
- m) Proceedings of Meetings, conferences and symposia;
- n) Records of organizations, government agencies (e.g. annual report, treaty, constitution, government document);
- o) Speeches;
- p) Survey Research (e.g., market surveys, public opinion polls);
- q) Video recordings (e.g. television programs);
- r) Works of art, architecture, literature, and music (e.g., paintings, sculptures, inscriptions on tombstones, musical scores, buildings, novels, poems).
- s) Ephemera (e.g. brochures, pamphlets, postcards, programs, advertisements)
- t) Web site.

ii) Secondary Sources

Secondary sources are interpretations and evaluations of primary sources. They are not evidence, but rather commentary on and discussion of evidence. These types of information are either compiled from or refer to primary sources of information. Generally, they are accounts written after the fact with the benefit of hindsight. These are the original sources having been modified, selected or reorganized (or repackaged) so as to serve a definite purpose or group of users. Secondary sources are easily and widely available than primary sources. These also serve as bibliographical keys to primary sources. The user may consult the secondary sources first which will lead him/her to specific primary sources.

Examples:

- a) Periodicals;
- b) Bibliographies;

- c) Indexing and abstracting periodicals;
- d) Biographical works;
- e) Commentaries, criticisms;
- f) Dictionaries, Encyclopedias, handbooks, tables, formularies;
- g) Histories;
- h) Journal articles;
- i) Magazine and newspaper articles (this distinction varies by discipline);
- j) Monographs, other than fiction and autobiography;
- k) Textbooks (also considered tertiary);

iii) Tertiary Sources

Tertiary sources consist of information which is a distillation and collection of primary and secondary sources. These will aid the user of information in the use of primary and secondary sources of information. Most of the tertiary sources do not contain subject knowledge. Out of various kinds of sources, tertiary sources are the last to appear.

Examples:

- a) Almanacs;
- b) Bibliography of Bibliographies;
- c) Chronologies;
- d) Directories;
- e) Fact books;
- f) Guidebooks;
- g) Indexes, abstracts, bibliographies used to locate primary and secondary sources;
- h) Manuals;

This following vector diagram shows the relationships between different sources of information and their association to a subject.

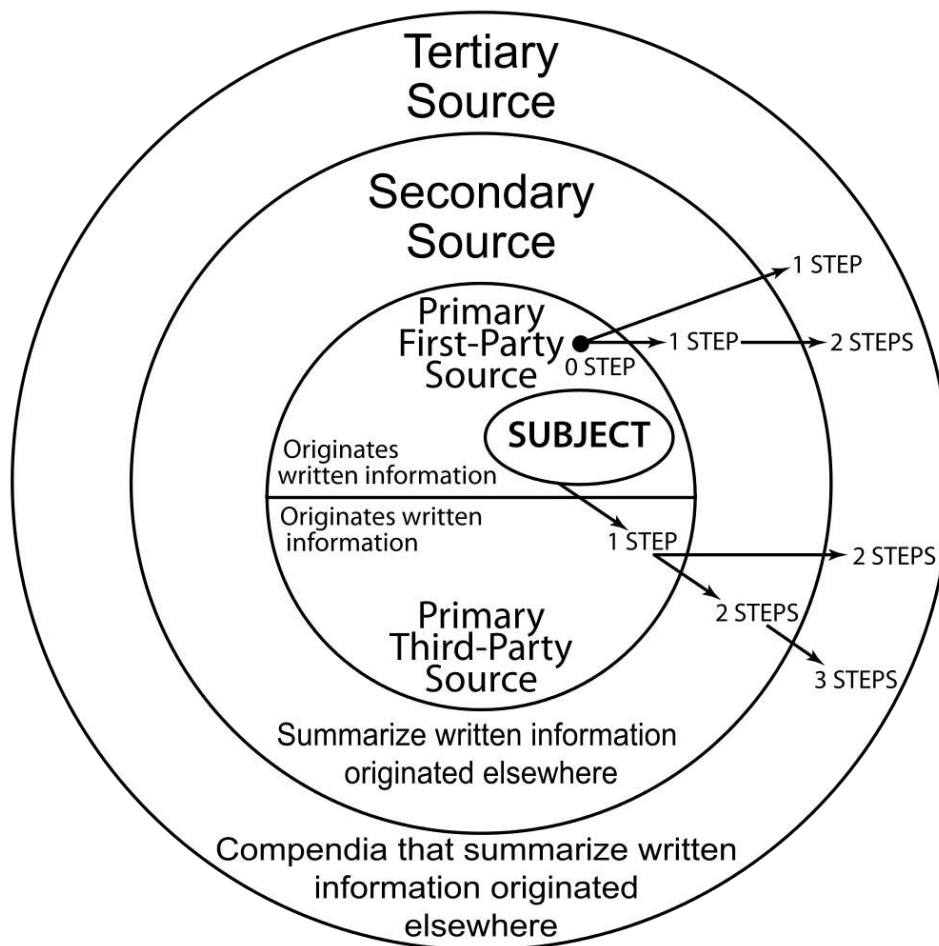


Figure 2: Relationships between different sources of information and their association to a subject

1.5 Comparison across Disciplines

As mentioned earlier, the definition of primary and secondary sources may vary depending upon the discipline or context. The concept is detailed in the table 1.

SUBJECT	PRIMARY	SECONDARY	TERTIARY
Art and Architecture	Painting by Picasso	Article critiquing art pieces	ArtStor Database
Chemistry/Life Sciences	Einstein's diary	Monograph on Einstein's life	Dictionary on theory of relativity
Engineering/Physical	Patent	NTIS Database	Manual on

Sciences			using invention
Humanities	Letters by Martin Luther King	Website on Kings' writings	Encyclopedia on Civil Rights Movement
Social Sciences	Notes taken by clinical psychologist	Magazine article about the psychological condition	Textbook on clinical psychology
Performing Arts	Movie filmed in 1942	Biography of the Director	Gide to the movie

Table 1: Comparison of information sources across disciplines

Source: University Libraries, University of Maryland,
<http://www.lib.umd.edu/ues/guides/primary-sources>

Exercise

1. Define reference sources.
2. Why do users require reference sources?
3. What are the types of information sources? Give examples.
4. Differentiate primary, secondary and tertiary sources of information
5. Compare the types of information sources across disciplines
6. What are the basic evaluation criteria for information sources?

1.8 References

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7. <http://www.ashgate.com/isbn/9780754640387> , retrieved on 10/02/2014
8. <http://encyclopedia2.thefreedictionary.com/information+source> , retrieved on 10/02/2014
9. http://en.wikipedia.org/wiki/Information_source , retrieved on 10/02/2014

Image Courtesy

Figure 1

Smith, Tim , Reference Librarian & Web Developer, Ohio University Libraries (<http://www.library.ohiou.edu/research/the-research-process/primary-secondary-sources/>).

Figure 2:

https://en.wikipedia.org/wiki/Wikipedia:Graphics_Lab/Illustration_workshop/Archive/Mar_2013

Table 1:

University Libraries, University of Maryland,

<http://www.lib.umd.edu/ues/guides/primary-sources>

Unit 2

Categories of References and Information Sources:

Description and Scope

1.0 Introduction

The quality of reference collection of a library determines the quality of reference service it provides. Selection and acquisition of reference materials depend upon the user needs and the overall objectives of the reference section or the library. A reference collection development policy has many elements. The ongoing process of maintaining the collection with proper updating or strengthening of the weaker areas, keeps the collection live and dynamic. Purpose and development of the reference collection is explained here which was followed by a brief description of important reference sources, those are normally acquired by the library to build the collection.

1.1 Purpose of the Reference Collection

Michael Buckland writes that a reference collection fulfills two needs:

- i. Looking up or verifying factual data, often referred to as “ready reference”; and
- ii. Establishing an initial outline and context for any topic efficiently and effectively, especially determining the what, where, when and who aspects of whatever is of interest.

The purpose of the collection will vary depend on the type and mission of the library, the needs of the clientele served, in addition to the philosophies and goals of the reference staff, library administration and the parent organization.

1.2 Development of a Reference Collection

The escalating cost of reference materials, growth in types of formats, emergence of new access technologies, and rigid licensing policies make the task of developing a collection of reference materials more difficult. Reference resources are available in a variety of formats and nowadays many are available in multi-formats (same content in print, online, e-book, audio book and video forms). Primary components of a core reference collection

include resources in print, microform, electronic and the resources over a network (internet).

1.2.1 Reference Collection Development Principles: The basic principles of reference collection development, as mentioned by Meghan Harper are,

- i. Reflect the library's mission
- ii. Knowing the user
- iii. Develop a budget plan
- iv. Maintain a balance of electronic and print resources
- v. Develop policies
- vi. Develop staff expertise
- vii. Solicit inputs from the user
- viii. Preview/Review reference materials
- ix. Evaluating the collection on a continuing and systematic basis

1.2.2 Reference Collection Development Policy: A collection development policy helps to streamline the process and to meet the specific objectives. Carol A. Singer states that, “a reference collection development policy serves as the basis for decision making by those who build and maintain the reference collection because it defines the purpose of the collection, and describes the content of the reference collection, both what should be included and - just as important – what should not be included”.

Singer outlines the components of a reference collection development policy which include:

- Purpose of the collection development policy
- Responsibility for collection development
- Purpose of the reference collection
- Target audience(s)
- Budgeting and funding
- Selection criteria
- Selection aids

- Preferred format
- Duplicates
- Preferred language(s)
- Circulation
- Treatment of specific resource groups
- Resource sharing
- Collection maintenance
- Weeding and reviewing the collection
- Policy revision

1.2.3 Collection Analysis: This is the process of gathering an overall picture of the age, number of items by topic, and often types of materials within a collection through the use of individual item records. Collection analysis helps the library to make good selection decisions and prioritizing collection development and evaluation.

1.2.4 Collection Planning: This is the identification, comparison and selection of quality reference resources with the help of analyzing user feedback and selection tools (publisher catalogues, professional journal reviews, etc.). The process includes gathering information to assist in the selection of new materials and the identification of weakness in the existing collection.

1.3 Evaluation of Reference Sources

Before including into the library's reference collection the quality of the individual sources must be evaluated. There are many criteria that should be considered when evaluating information sources. The general criteria devised by Bopp and Smith are,

- i. Format: print/microform/ electronic, physical makeup, illustrations
- ii. Scope: purpose, coverage, currency
- iii. Authority: authorship, publisher/sponsor, source of information
- iv. Treatment: accuracy, objectivity, style/ audience.
- v. Relation to similar works: uniqueness, new editions
- vi. Arrangement: sequence, indexing

- vii. Special features
- viii. Cost: price, licensing conditions

1.4 Classification of Reference Sources

William A. Kats categorizes reference source into two types.

- i. *Control Access Directional Type*: It itself does not contain the required information but directs the user to the documents which contain the information.
Example: Bibliographies, Catalogue, Indexes, Abstracts etc.
- ii. *Work of Sources Type*: It itself contains the information. Example:
Encyclopedia, Dictionaries, Yearbooks, etc.

1.5 Types of Reference Sources

Reference sources are designed to be consulted or referred to from time to time for a specific piece of information. Important reference sources are detailed in the following sections with their scope and main characteristics.

Encyclopaedia

An encyclopaedia is a compendium of knowledge. Knowledge is related to kinds of readership, which an encyclopaedia intends to serve. An encyclopaedia is regarded as one of the most reliable and used reference sources in a library. Creating a modern encyclopaedia is a he task involving a large team of persons including editors, consultants, contributors, etc. The Oxford English dictionary has defined an encyclopaedia as “a literary work containing extensive information on all branches of knowledge usually arranged in alphabetical order”. ALA Glossary of Library Terms defines encyclopaedia as “a work containing information articles on subject in every field of knowledge usually arranged in alphabetical order or a similar work limited to a special field of subject”.

Scope

The types of questions answered through the use of an encyclopaedia are (i) ready reference information (e.g., Who invented radio?) (ii) general background information

(e.g., How does photosynthesis work?) and (iii) ‘pre-research’ information, which helps to launch a research. Encyclopaedias provide a well-organized overview of selected topics of major importance written in an objective style.

Types and features

Basically, encyclopaedias can be divided into following types.

- i. *Encyclopaedias for adults*, containing informational articles/entries giving essential general information on subjects in various branches of knowledge, arranged alphabetically by subject and names. e.g., New Encyclopaedia Britannica, 32 vols. (2010, Chicago) Encyclopaedia Americana, 30 vols. (1984, New York), Colliers’ Encyclopaedia, 24 vols (1976-, New York)
- ii. *Encyclopedias for children and young adults* are written for young readers and tend to place more emphasis on formats, illustrations and pedagogical tools. e.g., World Book Encyclopaedia, 22 vols. (2010, Chicago), The Oxford American Children’s Encyclopedia, 9 vols. (1999, New York).
- iii. *Subject Encyclopaedias* have a broader scope and give in-depth coverage to a specific field of knowledge. E.g., McGraw Hill Encyclopaedia of Science and Technology, 20 vols, (1992, New York), Encyclopaedia Indica (1975, New Delhi)

Dictionaries

Dictionaries are used to define words; to verify spelling, syllabication, or pronunciation; to check on usage; or to determine the etymological history of a word. Around 1225 A. D, English Grammarian John of garland used the word ‘*dictionary*’ as the title of a collection of latin words arranged by subject for the use of learners.

Scope

A basic dictionary contains an alphabetical list of words with their definitions. This may be of a language or the terms of a subject or vocation arranged according to some definite order, usually alphabetical. Entries may also include inflected forms, run-on or derivative entries, etymologies or word histories, synonyms and antonyms, usage or status labels, usage notes, illustrative quotations and pictorial illustrations.

Types and features

Based on the approach of presentation, dictionaries can be of two types, (i) *descriptive*, recording how the language is actually used and (ii) *prescriptive*, advocating how it ought to be used.

The major categorization of dictionaries based on the content is as follows.

- i. *General (Unabridged) Dictionaries* are one that derived or condensed from a larger work, attempts to include all words in a language that are in use at the time the dictionary is compiled.
Examples: The Random House Webster's Unabridged Dictionary of the English Language (1997, New York)., Webster's Third New International Dictionary (1961, Springfield). Hindi Shabdasagar (1967-, Varanasi).
- ii. *Etymological Dictionaries* deals with origin and history of words and meanings in use. Example: Oxford English Dictionary (1928-, Oxford), Oxford English Dictionary in CD ROM appeared in 1992.
- iii. *Desk Dictionaries* are abridged, or desk-sized dictionary, a selective compilation, often based on a larger dictionary and prepared for a certain level of student use. Example: Marriam Webster's Collegiate Dictionary (2010, Mass.), The American heritage Dictionary of the English Language (2000, Boston), Comprehensive English-Hindi Dictionary (1962-, Varanasi), Practical Sanskrit-English Dictionary (1957- Poona), Bharatiyabyabaharkosha or Dictionary of sixteen Indian languages (1961, Bombay)
- iv. *Subject Dictionaries*, are confined to specialized subject fields, professions or occupations. Example: McGraw Hill Dictionary of scientific and technical terms, 3rd ed. (1984, New York), ALA Glossary of Library and Information Science (1983, Chicago).
- v. *Dictionaries of quotations* are used to identify or verify a given quotation or to select a quotation on a given topic or by a given author or for a special occasion. Examples: Barlett's Familiar Quotations (1855-, Cambridge), The oxford Dictionary of Quotations 5th ed.,(1999, Oxford).

- vi. *Thesauri (Dictionary of Synonyms and Antonyms)* are specialized dictionaries deals with synonyms and antonyms. Example: Roget's International Thesaurus, 5th ed., (1992- New York), Webster's new Dictionary of Synonyms (1968, Springfield).
- vii. Dictionaries of usage, contains definitions supplemented by discussions on how words should be used. Example: The New Fowler's Modern English Usage , 3rd ed., (2000, Oxford).
- viii. Abbreviations and Acronyms Dictionaries commonly used in every subject area. Example: Acronyms, Initialisms& Abbreviations Dictionary (1960- Farmington Hills).

Biographical Sources

Biographical sources contain data on people. Many biographical sources either focus on currently living persons or are retrospective, focusing on past historical figures.

Scope:

Biographical sources provide information about dates of birth and death, qualifications, the positions held, the contributions made and the address of the biographee. Some of these sources also provide portraits or images and with an index. These are ready reference sources which provide basic facts about the individual. The scope of a biographical source shall be broad or narrow depending on the comprehensiveness of the coverage.

Features and categories

The quality of a biographical source is determined by the accuracy and currency of the entries. There shall be a list of sources from which the information was obtained. The organization of the entries shall be with adequate access points, i.e., indexes and cross references.

Biographical sources can be divided into two,

- i. *direct sources*, which provide factual information itself rather than referring the user (e.g. Who is who)

- ii. *indirect sources*, lists bibliographic citations referring the user to other works that may contain the information sought (e.g.: biography Index)

Another categorization of biographical sources can be made based on time as,

- i. *current*, those about living persons
- ii. *retrospective*, those about persons from the past.

We may obtain biographical information from varied sources like, biographical dictionaries, almanacs, dictionaries, directories, encyclopedias, literary handbooks, manuals, obituaries in newspapers, periodical and newspaper indexes, etc.

Important biographical sources with examples are given below.

- a) Current Biographical Dictionaries: e.g. Current biography (1940-, New York), Contemporary newsmakers (1985-, New York), India Who's who (1969-, New Delhi)
- b) Retrospective Biographical Dictionaries: Webster's biographical dictionary (1972-, Massachusetts), Dictionary of national biography (1972-, Kolkatta), National biographical dictionary of India(1972-, Delhi), The International who's who (2000, London), Dictionary of American biography (1996-, New York)
- c) Biographical Directories: Who's who (1849-, London), Who's who in America (1899-, Chicago), American men and women of science (1906-, New Providence, NJ)
- d) Professional and Subject Biographical Sources: Directory of American Scholars (1974- New York), Directory of Libraries and who's who in library profession in Delhi (1964, Delhi), Who's who in Indian writers(19610, New Delhi)

Atlases

An atlas is a volume consisting of a collection of maps. They can be divided in to three groups, (i) current atlases are needed for p-to-date information on geographical and political changes in the world, e.g., The Times Atlas of the World. 10th ed., (1999, New York). (ii) historical atlases depicts boundary

changes, military campaigns, early exploration and similar topics, e.g., The Times Atlas of World History.4thed 1999, London) and (iii) thematic or subject , atlases, emphasize a specific subject or region. e.g., National Atlas of Canada. 5thed (1997-, Ottawa).

Yearbooks

Yearbooks is known as ready reference sources which provide concise factual information about current and historical events; organizations, people, places and things; and statistical trends. These help the user to locate concise facts and summaries quickly.

Scope

The following kinds of information are normally found in yearbooks

- i. Chronological list of the important events of the year
- ii. Summaries of the political, social and cultural events of the year
- iii. Major developments and trends in various fields (science and technology, economics, sports, etc.) during the year
- iv. Short biographies and obituaries
- v. Information about organizations, associations
- vi. Statistical information (population, prizes, awards, sports events, etc)

A yearbook/annual is an annual compendium of the data and statistics of a given year. The basic purpose of a yearbook is to record the years' activities by country, subject or specialized area. The essential difference between a yearbook and an almanac is that the almanac will also include considerable retrospective material, material which may not be in the average yearbook. Yearbooks regularly index personal names , while almanacs, in book format, index personal names sparingly. Yearbooks contain longer descriptions of events and more analysis and evaluation, and articles are almost always signed.

Yearbooks are of two types (i) *general yearbooks*, which covers the past year's activities and (ii) newspaper indexes, which are most up to date with well-

organized formats and the brief annotated stories (e.g. New York Times Index, National Newspaper Index)..

Examples: Europa World Yearbook (1959- , London), Statesman's Yearbook, 1864- New York), India: A Reference Annual (1953-, New Delhi), Manorama Yearbook (, Kottayam), World of Learning (), Demographic Yearbook (1948- , New York), McGraw Hill Yearbook of Science and Technology (1962-, New York).

Directories

Directories are used to locate organizations, institutions and people and to verify the details. The ALA Glossary of Library and Information Science defines a directory as “a list of persons or organizations, systematically arranged, usually in alphabetic or classed order, giving address, affiliations, etc., for individuals, and address, officers, functions, and similar data for organizations.”

Scope

Directories present information in an orderly, clear manner with a limited type of information. The coverage is extended to organizations of different kinds, learned bodies, scientific societies, professional bodies, trade associations, etc. with variety of factual information. Directories form a rich source of biographical information.

William A. Kats divides directories into,

- i. *Local Directories*, issued for a particular locality (e.g., Telephone and city directories)
- ii. *Governmental directories* are guides to government institutions (e.g., Worldwide Government Directory (2000, Washington D. C.)
- iii. *Institutional directories* are lists of schools, colleges, universities, foundations, libraries, hospitals, museums and similar organizations. (e.g., World of Learning(1947-, London), the American Library Directory (1923-, New York), Indian Library Directory (1938-, Delhi), Commonwealth universities Yearbook:

A directory to the universities of the Commonwealth and the handbook of their Association (1914-, London)

- iv. *Investment services*, gives detailed reports on public and private corporations and companies.
- v. Professional *directories* are lists of professional organizations (e.g., Europa World Yearbook (1959-, London), Yearbook of the United Nations (1947/47-, New York), Encyclopaedia of Associations: National Organizations of the U.S. (1964-, Farmington Hills)
- vi. *Trade and Business directories*, are lists of manufacture's information about companies, industries and services.(e.g., World Chamber of Commerce directory (2000, Loveland), Million Dollar Directory (1998-, New Jersey).

Directories of directories provide listings and descriptions of various directories (e.g., Directories in Print).

Bibliographical tools

The term 'bibliography' was first used by Louis Jacob de Saint Charles in his *Bibliographia Parisiana* (1945-'50), and derived from two Greek words, "biblion", means "book" and "graphein", means "to write". A bibliography is a list of materials (not only books) used to identify sources of information on particular topics. Bibliographies may be current or be composed of past editions of published materials (retrospective).

According to D. W. Krummel, "the term bibliography can have two definitions: there is bibliography itself, an activity, and there is a bibliography, the product of this activity".

Scope

The scope of the bibliography is related to the domain of items to be selected for inclusion.

Features and categories

Regardless of form a bibliography is used primarily for three basic purposes: (i) to identify and verify, (ii) to locate, and (iii) to select.

Bibliographies can be broadly divided into three branches,

- (i) *systematic or enumerative bibliography*, is the systematic listing of individual items with minimum details for reference and study;
- (ii) *analytical or critical bibliography*, deals with a physical description of the book like authorship, edition, date, place of printing and perfection of the copy, and
- (iii) *historical bibliography*, the study of books “as objects of art”, concerned with the art of writing, printing, illustration and binding.

We will discuss about systematic bibliography, the most common and easiest of all, to understand the concept better. The objective of systematic bibliography is to collect and list information about individual books and related material in a logical or useful order. Such bibliography is usually enumerative in nature. Bibliographies are not necessarily limited to books. There may be list of other forms of information like images, audio, video, software, database records, websites, etc.

Following are some common types of bibliographies.

- a) *Universal bibliography*: Universal bibliography, theoretically consists of, everything published, issued, or created in the field of communications from the beginning through the present to the future. It is not limited by time, country, language, subject, or form and may be achieved by combining all online national bibliographies, which are the exhaustive listing of information sources produced in one country.

Example: Bibliotheca universalis

- b) *National bibliography*: Limited to materials published within a country. The scope may be enlarged to include works written about the country or in the language of the country. A national bibliography is often a product of the government and will set itself limits of time, form and origin.

Examples: Indian national bibliography, British national bibliography

- c) *Trade bibliography*: Produced by commercial publishers and serve to provide the information necessary to select and acquire recently published materials.

Examples: Books in Print (BIP), Cumulative Book Index, Indian Books in Print, American Book Publishing Record

- d) Subject bibliography: List of materials that relate to a particular topic, intended for researchers and specialists.
Example: Guide to reference books, Information sources in science and technology, Bibliography of Indology
- e) List of periodicals and Newspapers: Lists of current and retrospective periodicals and newspapers. *Example:* Ulrich's international periodicals directory, American Newspapers, Gale Directory of Publications and Broadcast Media
- f) Author bibliography: List of materials limited to a particular author. *Example:* Chaucer: A bibliographical manual
- g) Bibliography of Bibliographies: A listing of bibliographies. *Example:* Bibliographic Index: A Cumulative Bibliography of Bibliographies
- h) Library Catalogues: Serve the users of particular library by listing the holdings and location of materials in that library, often through the Online Public Access Catalogue (OPAC).
- i) Union Catalogues: Identifies the material held in the collection of more than one library, through a shared cataloguing network. *Example:* OCLC, RLIN

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Chapter 4

Computer Applications in Libraries: Basics

Unit 1

Computer Hardware for a Library: Concepts

1.1 Introduction

With the advent of Information and Communication Technology, the scenario of library operations has been changed in Indian librarianship. Now electronic and digital documents have replaced a good count of traditional print documents. At the same time the library housekeeping activities have also been changed from traditional manually operated system to computerized/automated systems. Due to such major change, the internal seen of library collection and operations has received a new look in the form of ICT enabled practices. In this chapter, we will discuss about various computer hardware components and peripherals for acquainting students with the ICT based environment of libraries.

1.2 Desktop computer

A desktop computer is type of a personal computer which is commonly made for use over a single location like desk or table. Desktop system includes a computer monitor, keyboard, mouse and other internal components like power supply, motherboard, hard drive and optical drive etc. It is also known as home computer and workstation.

1.2.1 Characteristics:

Main characteristics of a desktop system are:

1. Desktop computer occupies considerable space due to its big size.
2. Desktop system is a combination of monitor, keyboard, mouse, power supply and some other internal devices etc. Therefore it is not an easily portable device.
3. Desktop is heavy in weight.
4. It is easy in use.
5. It is good for office use.

1.2.2 Computer Hardware:

Computer hardware is the tangible part of a computer. In the computer world, it refers to the physical components that make up a computer system. It includes keyboard, monitor, mouse

etc. The modern computers are much better in processing speed and have an enough memory status. Computer is made of different physical parts inside it and this is known as the hardware. Some important computer hardware components are:

1.2.2.1 Central Processing Unit(CPU):

Central Processing Unit is the main part of the computer. It represents the working power of computer system and is also known as computer brain. All processing works of a computer system are performed by its CPU. CPU is also accountable for performing and controlling the works of the others parts of a computer system. It's able to transfer the data on to the motherboard.

1.2.2.2 Motherboard:

A motherboard is the mother of all hardware components of a computer system. All other parts of a computer system are attached to motherboard. Motherboard is a part of the computer hardware that is hidden inside its CPU.

1.2.2.3 Hard Disc:

Hard Drive is the store house of a computer system. It is the place where all programs of computer including its basic data are stored. When you save any file, it goes to the hard disc; also you are able to retrieve a specific file through its unique path, which is allotted and stored for each document.

1.2.2.4 Random Access Memory (RAM):

The Random Access Memory is the computer's volatile memory. It is used to store the information in the computer that needs to be accessed often and quickly. RAM consists of some integrated circuit (Chip) and is attached to the motherboard of the computer system. Due to sufficient RAM, computer system works faster and processes the information and data quickly.

1.2.2.5 Visual Display Unit (VDU):

Visual Display Unit is popularly known as monitor. It is the most popular hardware device for display and presents data in soft forms as output. A Monitor is associated generally to a keyboard and together they form a video display terminal which is also a

hardware. Now a days, basically two types of monitors are in use – Cathode Ray Tube (CRT) and Liquid Crystal Display (LCD).



Figure 8.1: Monitor (Source: http://en.wikipedia.org/wiki/Computer_monitor accessed on 08.03.2014 at 01:40hrs IST)

1.2.2.6 Keyboard:

Keyboard is a most commonly used input device. Keyboard is a part of computer system which is used to key in the letters and instructions to the computer system for initiating a task. Today the most popular keyboard uses 101 keys and is known as QWERTY keyboard.



Figure 8.2: Keyboard (Source: <http://grardnr.wordpress.com/category/week-12/> accessed on 09.03.2014 at 11:40hrs IST)

1.2.2.7 Mouse:

A computer mouse plays a vital role in the computer system. It is a most popular point and draw device. A mouse is made up of two or more buttons on it and a wheel too. When the mouse is moved, it moves the cursor on monitor's screen. The functions of a computer

mouse are multi faceted, as it performs various functions like click, copy, paste, drag, drop etc.



Figure 8.3: Mouse (Source: <http://it.wikipedia.org/wiki/Mouse> accessed on 08.03.2014 at 01:40hrs IST)

1.2.3 Advantages of a desktop computer:

1. Desktops are more powerful in terms of hardware.
2. Generally they have a larger screen and that makes it easier to read.
3. Desktop has a large storage capacity.
4. Desktops are cheaper than laptops.
5. Desktop computers are easy to upgrade.

1.2.4 Disadvantage:

1. Desktop is not an easily portable device.
2. Desktops occupy a lot of space.
3. Desktop requires a separate monitor.

Server

A server is a system that refers to the combination of both hardware and software applications or program, which manages access to centralized resources or services in a network. Depending upon its functionalities, servers are of different types, some important of them are such as; **web server, proxy server, application or database server, dedicated server** and **cloud server**. All these above servers are working on following two models of architectures namely **Client-Server based model** and **Peer-to-peer based system**. The client server model is based on a computer network architecture in which each computer on the

network is either a client or a server. The server computer system is managing all applications such as disk drives, printer, traffic, etc., to run the various applications within any workstation (or client) computer over a network. Whereas peer to peer model is decentralized in nature, which enables each computer works as client and server both, mean all computers have equivalent capabilities and responsibilities. Today, both models are in wide use depending upon their business requirements.

1.3 Printers

Printer is the most commonly used output device in computer technology. It is used for producing text and graphics on paper. Printers are attached by a printer cable or a USB cable to a computer system which serves as a document source and instructor. On the other hand, in modern printer can directly attached to electronic media like a memory card, scanner, digital camera etc.

1.3.1 Types of Printer

Printer can be categorized in various types on basis of their work and architecture. There are mainly two types of printer as follows:

1. Impact Printer
2. Non- Impact Printer

1.3.1.1 Impact Printer:

Impact printer works by massive head or needle against an ink ribbon to make a mark on the paper. In other words, this printer works when the ink ribbon is contacted with the paper.

Example- Dot-matrix printer, Chain printer, Drum printer etc.

1.3.1.1.1 Dot–Matrix Printer

Dot–matrix printer prints one character at a time. It follows two directional way of printing, thus the print head run from left to right and again right to left. Dot-matrix printer is an impact printer as it works by moving a pin head over the inked ribbon to give ink impressions on the paper through the impact of the head. It can produce various sets (copies) of printouts by using carbon paper. Dot–matrix printer is a noisy printer as when the head and ink-ribbon stroke together on the paper, voice is produced.

Normally the printing speed of dot–matrix printers is less. Mostly these types of printers are used by individuals and institutions for printing, where printing speed and quality are not important.

1.3.1.1.2 Drum Printer:

Drum printer is a type of line printer, it prints the entire line at a time. The drum printers have a set of hammers in front of the drum in a manner that an inked ribbon and paper can be accommodate between hammers and drum. The total number of hammer is equal to the bands on the drum. In the drum of the drum printer is made up of metal. This drum is expansive in nature and cannot be changed easily. Drum printer has small flexibility in the size of character set and their description. Although printing speed of drum printer is faster than a dot-matrix printer, but it is not suitable for commercial or fast printing assignments.

1.3.1.2 Non-Impact Printer:

Non–Impact printer does not work by striking a head against the ribbon. In other words, it produces the print (text and picture) without actually contact with the paper.

Example- Inkjet printer, Laser printer, etc.

1.3.1.2.1 Inkjet Printer

Inkjet printers are also a character printer. Inkjet printer's print head include up to 64 nozzles. It can be warmed in a moment by an integrated circuit resistor. When the resistor warms up, the ink flows and is ejected via the nozzles making an impression on the paper in front of the print head.



Figure 8.4: Printer (Source: <http://computer.howstuffworks.com/inkjet-printer.htm> accessed on 10.03.2014 at 11:40hrs IST)

An Inkjet printer produces better quality result in comparison of impact printers. Its print resolution is also better. Its result is based on the tiny dots of pattern.

1.3.1.2.2 Laser Printers:

Laser printers are non-impact printers, they do not create noise. A laser printer works through the patterns generated by laser beam. The printing quality of these printers is very high at the same time the printing speed is very fast. But this printer is more expensive comparison than other types of printers.

Laser printer is a page printer, it prints one page at a time. A laser printer works through following parts:

1. A laser beam source
2. A multi-sided mirror
3. A photoconductive Drum
4. Toner

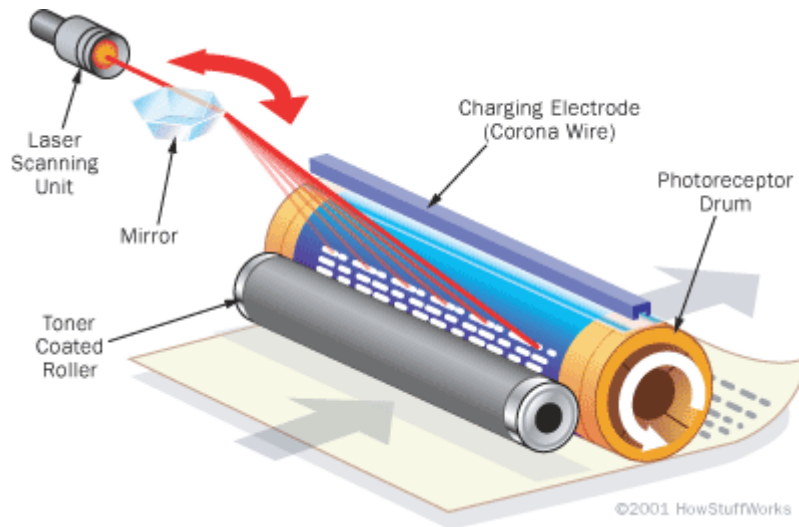


Figure 8.5: Fax (Source: <http://www.thnt.com.vn/may-fax-may-in-muc-in.html> accessed on 10.03.2014 at 11:45hrs IST)

1.4 Scanners:

Scanners are computer support devices/peripherals, used to capture information from print sources and to convert that captured information in the computer readable digital form. With the help of scanners, one can save his/her time in feed in / input data in the computer system.

1.4.1 Types of scanners:

Presently there are various types of scanners. One can use any specific type of scanner according to his/her specific requirement, based on the type of print source. Some of the common types of printers are as follows:

1.4.1.1 Flatbed scanners:

These are suitable for all types of photographs, transparencies, negatives and pages up to A3 size and that may be laid absolutely flat. They are not suitable for bound volumes,

glass plates, mounted slides, documents larger than A3. As these scanners use very bright light, anything that is in danger of fading is not suited for these scanners.



Figure 8.6: [Website of kenrockwell](http://www.kenrockwell.com) (Source: [Website of kenrockwell](http://www.kenrockwell.com) accessed on 10.03.2014 at 11:40hrs IST)

1.4.1.2 Drum Scanner

These are used by reprographic houses. Whilst they produce very high quality results they are expensive and the originals have to be fastened around a drum, which means that the print document needs to be very flexible and unmounted.



Figure 8.7: Scanmaster (Source: Homepage of scanmaster accessed on 10.03.2014 at 11:40hrs IST)

1.4.1.3 Hand Scanners

A Hand scanner is a manual device that is dragged on the face of the image to be scanned. It requires a steady hand, to avoid uneven scanning rate that would produce distorted images.



Figure 8.8: Largescanner (Source: Homepage of largescanner accessed on 10.03.2014 at 11:50hrs IST)

1.4.1.4mm scanners

These would seem to be ideal for collections made up of slides only. However, many of them are aimed at the domestic market and will not be robust enough for any reasonable sized collection. They often struggle to produce up to 18 Megabyte files of a good dpi.



Figure 8.9: [mm scanners](http://uk.shopping.com) (Source: <http://uk.shopping.com> accessed on 10.03.2014 at 11:59hrs IST)

1.4.1.5 Digital cameras

Digital cameras come in a variety of standards. To be suitable for digitization work these must be of a professional standard and capable of 18 Megabytes plus, with interchangeable lenses and accessories.



Source: website of new digital photography

Figure 8.10: Digital camera (Source: website of new digital photography accessed on 10.03.2014 at 12:59hrs IST)

Bar code Technology

Barcode technology plays an important role in automating various activities of a library. The application of bar code technology increases the speed and accuracy in library operations. Barcode Technology provides a simple and inexpensive method of encoding text information that is easily read by inexpensive electronic devices. A bar code consists of a series of parallel, adjacent bars and spaces. Predefined bar and space patterns are used to encode small strings of character data into a printed symbol. A bar code reader/scanner decodes a bar code by scanning a light source across the bar code and measuring the intensity of light reflected back by the white spaces. The pattern of reflected light is detected with a photodiode which produces an electronic

signal that exactly matches the printed bar code pattern. This signal is then decoded back to the original data by inexpensive electronic circuits.

1.7.1 Bar Code Reader:

Bar code reader is a device which is used for reading bar coded data. It may be a hand held scanner or embedded in stationary scanner. It scans a bar code image and converts it into an alphanumeric value that is then fed to the computer. Its uses laser beam scanning technology.



Figure 8.15: Bar Code Reader (Source: http://en.wikipedia.org/wiki/Barcode_reader accessed on 11.03.2014 at 12:20hrs IST)

1.7.2 Bar Code Writer:

Bar code writer is a type of computer printer which prints bar codes on the slips or sticker role. These bar codes are generated by bar coding software against specific record of the stored database.



Figure 8.16: Bar Code Writer(Source: <http://b2binformation.blogspot.in/2013/05/barcode-printers-features-and.html> accessed on 12.03.2014 at 12:20hrs IST)

1.7.3 Basic Requirements for Bar code Application:

For implementing bar coding in library applications, following hardware and software are required:

1. Personal computers
2. Barcode Scanner
3. Decoder
4. Printer
5. Printing Software
6. Database of Library Holdings
7. Library Automation Software and
8. Membership Database

1.8 RFID - Radio Frequency Identification Technology

Application of Radio Frequency Identification technology in libraries make library operations easier for visitors and librarians both. RFID is the latest technology which is used in library for

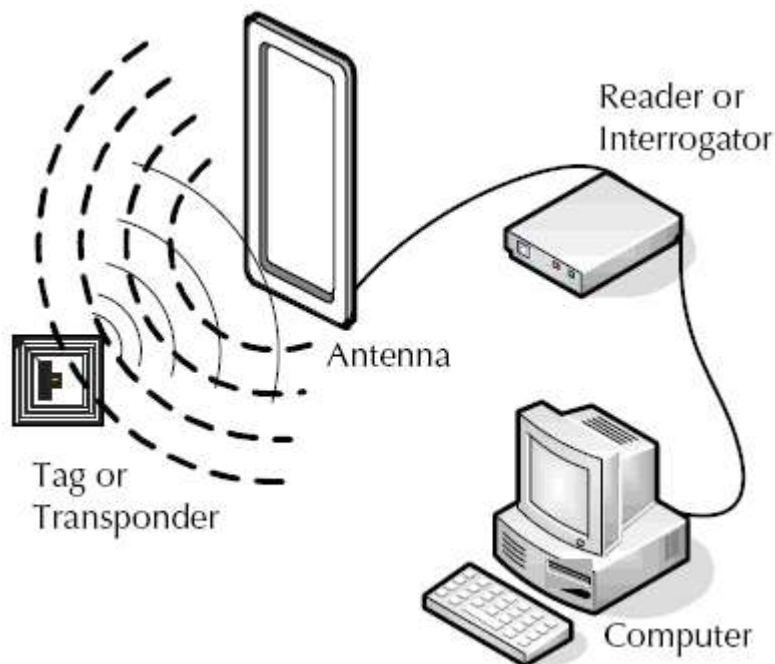
implementing theft detection system. RFID based systems facilitate easier and faster charging and discharging system.

RFID system is developed with support of two technologies- radio frequency based technology and microchip technology. Microchips in the form of tags are used for storing information and are affixed on library materials, while this information is read with the help of radio frequency technology. The devices used for circulation and inventorying are usually called “readers” while the device used at the library gate are usually called “sensors”.

1.8.1 Components of an RFID System:

A comprehensive RFID system has four components:

1. RFID tags that are electronically programmed with unique information.
2. Readers or sensors to query the tag.
3. Antenna
4. Server on which the software that interfaces with the integrated library software along with the appropriate database.



RFID system components

Figure 8.17: RFID(Source: <http://www.epc-rfid.info/rfid> accessed on 12.03.2014 at 12:30hrs IST)

1.8.2 Advantages of RFID in Libraries:

Main advantages of implementing RFID system in libraries are as follows:

1. RFID provides the self charging and discharging support.
2. It facilitates high level of reliability.
3. The life of RFID Tag is quite long.
4. RFID has changed the Circulation system; it provides very fast circulation activity.
5. It simplifies the process of stock verification.
6. It is quite supportive in theft detection.
7. It facilitates high level of security.
8. Misplaced documents inside the stack may be easily identified.
9. RFID tags are very simple to install/inject inside the books.

Modem (Modulator and Demodulator)

Modem is an important device of a data communication system. Modem is used for communication among various computers through telephone line. A modem converts digital signals received from a computer into analog signals for transmitting them over a telephone line and on other end receives analog signals and converts into digital signals for a computer system. Thus modem is the common parts of the communication process. A modem is used to carry out the modulation and demodulation process. The word modem made of two words – Modulator and Demodulator. Modulator words derive from word ‘Modulate’ which means ‘*convert*’. So, a modulator is a device which used to converts the digital information into analog information for a telephone line. While the other word demodulator changes the analog signals to digital signals for a computer system. Thus a modem allows two computers to communicate over a telephone line.

1.5.1 Types of Modem:

On basis of their structure and design, there are mainly two types of modem:

1. Internal Modem
2. External Modem

1.5.1.1 Internal Modem:

Internal modem is in the forms of a detachable card and placed inside the system unit. It is an optional add-on circuit board that may be attached in one of the computer expansion

slots. It is inbuilt with the computer system. It takes power from computer's expansion bus.



Figure 8.11: Internal Modem (Source: <http://alioting.blogspot.in/2013/04/definition-of-internal-and-external.html> accessed on 11.03.2014 at 12:59hrs IST)

1.5.1.2 External Modem

External modem is attached outside the system unit. It is connected to the mother board through a port. It has its own power supply and its front panel displays the connection status. An external modem is connected with a computer through a port. These are more expansive.

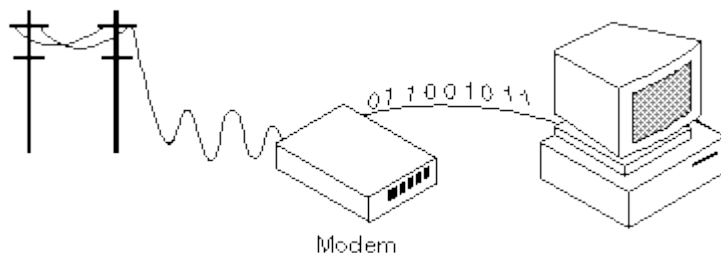


Figure 8.12: External Modem (Source: http://www.webopedia.com/TERM/E/external_modem.html accessed on 11.03.2014 at 12:59hrs IST)

1.5.2 Usage of Modem

In the early days, modems were used to communicate between data terminals and a host computer. Later the use of modems was extended to communicate among end computers. Now-a-days modem is used for performing various activities including transferring data to

remote systems where it is not possible to lay down network cable and telephone lines are easily available. And thus provide a cheap networking solution.

1.6 Wi-Fi

Wi-Fi allows to connect the network through a wireless router or access points. Wi-Fi stands for Wireless Fidelity. Here, wireless network utilize radio waves in the form of communication channel between computers. Wireless computing systems communicate by modulating radio waves or pulsing infrared light. Wireless communication is linked to the wired network infrastructure by stationary transceiver. The area covered by an individual transceiver's signal is known as a cell. Cell sizes vary widely. For instance, an infrared transceiver can cover a small meeting room, a cellular phone transceiver has a range of a few miles and a satellite beam can cover an area more than 400 miles in diameter.

1.6.1 Wireless Technology:

Some of the most popular wireless technology applications are as follows:

1.6.1.1 2G and 3G Technology:

The second generation of wireless networking technology is known as 2G technology; that was digital, circuit based and narrowband but comfortable for voice and limited data communications. While the third generation wireless networking technology is known as 3G technology that is suitable for voice and advanced data applications, including online multimedia and mobile e-commerce.

1.6.1.2 Wireless LANs:

Wireless Local Area Networks (WLANs) are like traditional LANs having a wireless interface to enable wireless communication between the devices that are part of the LAN. The component of a wireless LAN is the wireless interface card that has an antenna. Wireless LAN has limited area and is made to be used only in Local Area such as a room or building.

1.6.1.3 WIMAX

WIMAX stands for Worldwide Interoperability for Microwave Access. WIMAX provides the wireless data communication over long distances in different ways,

including point to point link and full mobile cellular type access. WIMAX operates in the frequency band between 3.3 to 3.4 GHz.

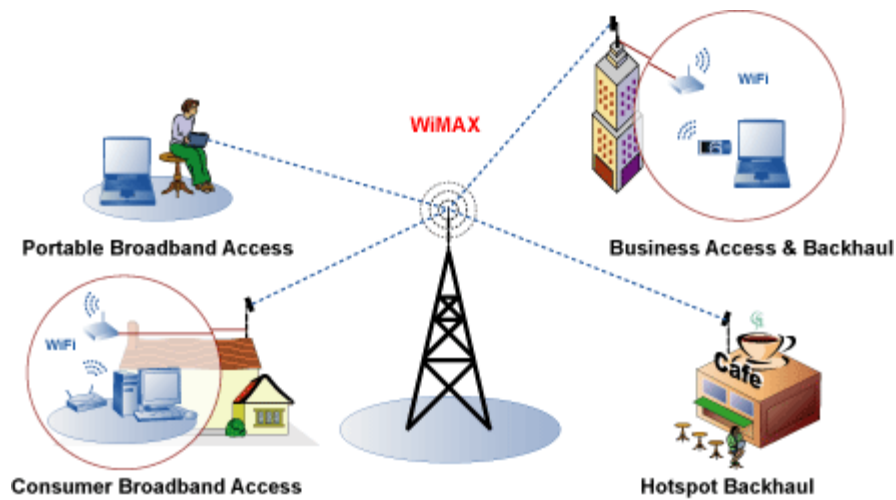


Figure 8.13: Wimax (Source: <http://www.rfwel.com/shop/WiMax-Outdoor-CPE-2.496-2.69-GHz.html> accessed on 11.03.2014 at 12:09hrs IST)

1.6.1.4 Radio Router Technology:

Radio router technology uses a radio transmission framework for packet based, broadband, IP wireless communications. It is an emerging wireless technology designed to make links in an IP network.

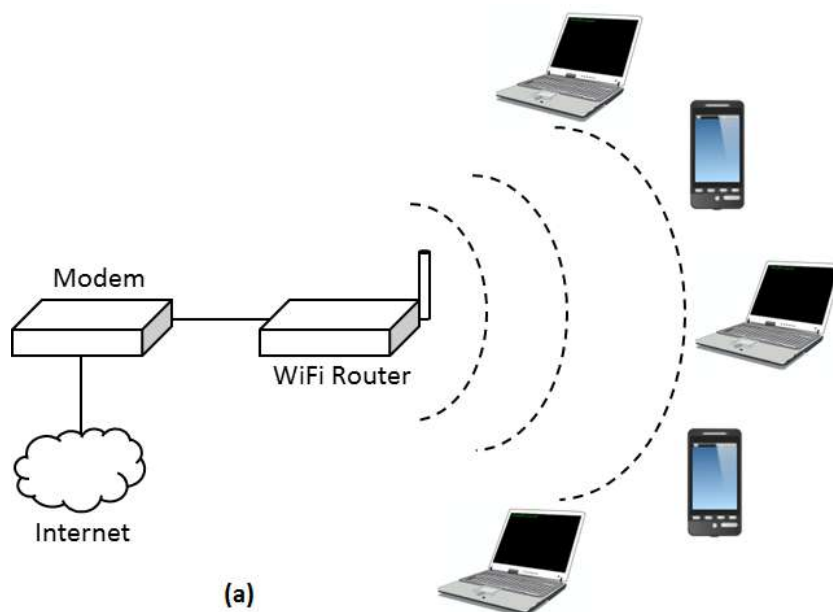


Figure 8.14: Radio Router Technology (Source: <http://www.thelifenetwork.org/about.html> accessed on 11.03.2014 at 12:02hrs IST)

Switches

A network switch is a computer networking device which is used to connect many computer devices each other over a network. Switches in network are also known as switching hub, but a network switch is more advanced than a network hub, as a switch sends only those messages to the device which are demanded. A network switch is a multi-ported network bridge that processes and forwards data at the data link layer of the OSI model. Some switches have additional features, including the ability to direct the packets. These switches are commonly known as multilayer switches. Switches exist for various types of networks including Fiber optic, Asynchronous Transfer Mode, Ethernet etc.



Figure 8.17: Switches (Source: <http://www.indiamart.com/maa-trading-co/networking-products.html#router-cable> accessed on 12.03.2014 at 12:40hrs IST)

1.9.1 Types of Switches:

There are four main types of network switches which are available for connecting devices. These are as follows:

1. Managed Switches
2. Unmanaged Switches
3. Smart Switches
4. Enterprise managed Switches

1.9.1.1 Managed Switches:

A managed switch is a device whose software gives permission to the user for modifying and updating the settings of the switch. This type of the device needs a sophisticated user to change the setting of the switch according to the user need.

1.9.1.2 Unmanaged Switches

An unmanaged switch is another type of network switch; it is the cheapest option to connect devices. Unmanaged switch performs the main functions of managing the data flow between a connected device and multiple computers. This type of switch is basically used in the small office and business organization.

1.9.1.3 Smart Switches

Smart switches carry the both type of the network switch (Managed and Unmanaged) character. It provides the user interface of web based and popular default settings.

1.9.1.4 EnterpriseManaged Switches

An enterprise managed network switch provides a wide range of adjustable settings; to allow customized use within the campus. These are usually managed by network specialists and are constantly monitored, due to the size and complexity of the network.

1.10 Router

Router is a device that sends the data along networks. Routers are located at gateways, the places where two or more networks connect, and are the critical device that keeps data flowing between networks and keeps the networks connected to the Internet. This networking device filters the data and manages the data flow between computer networks. A router is connected to two or more data lines from different networks.

Data breaks in part; in to header and trailer and it flow in packet among network. When packets come in one of the lines, the router reads the address information in the packet to determine its ultimate destination. Then, using information in its routing table or routing policy, it directs the packet to the next network on its journey. Routers work a like “traffic police” on the Internet.

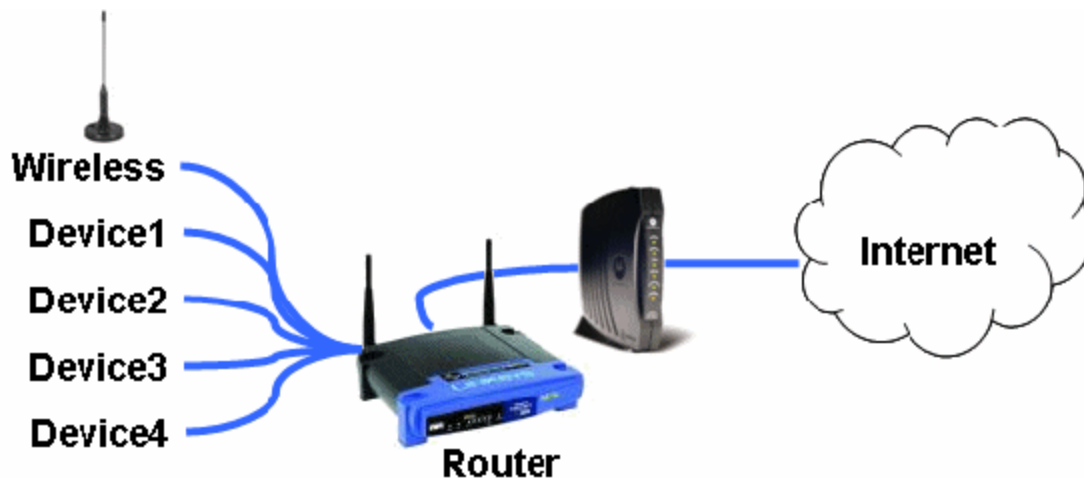


Figure 8.18: Router(Source: <http://voipstuff.net.au/routers/> accessed on 12.03.2014 at 12:45hrs IST)

The most popular type of routers are home and small office routers that simply pass data, such as web pages, email, IM, and videos between the home computers and the Internet. An example of a router would be the owner's cable or DSL modem, which connects to the Internet through an ISP. More sophisticated routers, such as enterprise routers, connect large business or ISP networks up to the powerful core routers that forward data at high speed along the optical fiber lines of the Internet backbone.

1.10.1 Types:

There are following types of router:

1.10.1.1 Brouter:

Brouter is the short form of Bridge Router. It is a networking device that serves as a bridge and a router in parallel manner.

1.10.1.2 Core router:

A core router is a router in a computer network that routes data within a network, but not between networks.

1.10.1.3 Edge router:

An edge Router is a router in a computer network that routes data between one or more networks.

1.10.1.4 Virtual router:

A Virtual Router is a backup router used in a Virtual Router Redundancy Protocol (VRRP) setup. VRRP is defined as a protocol used with routers that helps prevent network downtime. In the event of a router failing, the backup or virtual router would become the master router.

1.11 Summary

In this chapter we have discussed all possible ICT components which are essential for computerized and automated library and information centre. We have discussed about their utility and functions for improving the functionality of modern libraries.

1.12 Exercise

Short questions

1. What is the role of CPU in a computer system?.
2. Discuss various advantages and disadvantages of a desktop system..
3. What is the difference between an Impact printer and Non-impact printer?
4. Which type of printer produces fast and quality output and why? Explain.
5. What is the use of a printer in a library?
6. What do you mean by a scanner?
7. Discuss various types of scanners.
8. What is the difference between a flatbed scanner and a digital camera in terms of utility?
9. What do you mean by a Modem?
10. How does a Modem work?
11. Discuss the role of a Modem in information transfer over a network.
12. What do you understand by Wi-Fi?
13. Discuss various wireless technologies.
14. What is the difference between cabled and Wi-Fi connection of a network?
15. What do you mean by a Bar code?
16. How Bar code technology supports in library automation process?
17. Discuss various requirements of bar code applications in libraries.
18. What do you understand by RFID?

19. Discuss various components of RFID system.
20. Point out various advantages of RFID application in libraries.
21. What is the role of a switch in a computer network?
22. Discuss various types of switched.
23. Differentiate managed switch with an unmanaged switch.
24. What are the basic functions of a Router?
25. Explain various types of Routers.

Long questions

1. Discuss various components of a desktop system.
2. Explain the utility and requirement of scanners in a modern library.
3. Point out various benefits of Wi-Fi network over cabled network.
4. What is the use of printers in a library? Discuss it with the context of its various types.
5. What is the role of bar coding and RFID in automating library operations? Explain.

1.13 Reference

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1.14 Glossary

Bar code: Bar code consists of a series of parallel, adjacent bars and spaces. Predefined bar and space patterns are used to encode small strings of character data into a printed symbol.

IP: Internet Protocol

RFID: Radio Frequency Identification technology. It is the latest technology which is used in library for implementing theft detection system.

Router: Router is a device that sends the data along networks. Routers are located at gateways, the places where two or more networks connect, and are the critical device that keeps data flowing between networks and keeps the networks connected to the Internet.

Switch: A network switch is a computer networking device which is used to connect many computer devices each other over a network.

WIMAX: WIMAX stands for Worldwide Interoperability for Microwave Access. WIMAX provides the wireless data communication over long distances in different ways, including point to point link and full mobile cellular type acces

Unit 2

Library Automation: Concepts and Applications

1.1.Introduction:

The library automation means applications of computer and communication technology in library operations and activities to eliminate/reduce the manual work to serve the library needs of the users. It enhances the access to the library resources and also fosters the routine work. Automation of library operations avoids repetitive jobs, duplication of work; enhance the speed of library functions, and increase the optimal use of library resources. It may apply to all library functions such as acquisition, technical processing, serial control, circulation and reference service. Automation of the functions saves the precious time of both library staff as well as the users.



The term automation has derived from the Greek word ‘automose’ which means, a system having potentiality of spontaneous motion or self-movement. The term ‘automation’ was first coined by D. S. Harder in 1936, who was then associated with the General Motor Company in the USA. He used the term for handling parts between progressive production processes. Since its inception, the concept has been defined by different sources or scholars differently depending

upon the field of application. The definition of the term automation as defined in different reference sources are as given below.

The **Webster's Third New International Dictionary of English Language** defines 'automation' as "the technique of making an apparatus, a process, or a system operate automatically; the state of being operated automatically; automatically controlled operation of an apparatus, processor system by mechanical or electronic devices that takes the place of human labor".

The **Kent's Encyclopedia of Library and Information Science** defines the term as "automation is the technology concerned with the design and development of process and system that minimize the necessity of human intervention in operation".

Likewise, you can find several other definitions of the term in different sources. On the basis of above definitions, we can say that "the automation is a process of making a system based on mechanism and machinery to reduce human intervention in getting the work done".

Now let's understand concept of library automation. The phrase library automation defined in the **Kent's Encyclopedia of Library and Information Science** as "the library automation is the use of automatic and semiautomatic data processing machines to perform acquisition, cataloguing, circulation and other library operations.

Hence, the library automation is a process of developing a library system with the help of a mechanism and machines to get its work done automatically or with less human efforts. The place of mechanism and machines has been taken by information and communication technology.

1.2.Need and Purpose

The information is playing a vital role in all walks of human life today. All of us need faster and accurate information to achieve academic, professional or recreational goals. The automated

library systems satisfy the expectations of the society better than the manual system hence, automation of the library is the need of the hour. Some of the basic needs of library automation are:

- **Accuracy and Reliability:** It is evident that during the manual processing human can do any sort of error, while the computer performs all set of data processing in error free and reliable manner? Library automation removes the possibility of data error and yields the user a reliable service. Hence improve the efficiency of library staff.
- **Time saving:** It saves the staff time in doing the manual work and speed up the process of all in-house activities and saves the times of user in finding needed materials within as well as outside the library.
- **Statistics generation:** Automated in-house activities generate numerous data, which assist to generate multiple statistics. Statistics help us to formulate policies to manage the library and information services.
- **Library service:** It helps to give better access to resources within library and elsewhere and improve the quality of library services. The automated library can provide bibliographic search facility through OPAC to its users. If the catalogues are made accessible through internet then, the user can search the resources anytime irrespective of location.
- **Resource sharing:** It makes resource sharing possible as data of the library becomes sharable among libraries.
- **Dissemination of information:** The wider dissemination of library information with the help of communication technology like internet, telecommunication, etc., becomes possible. The automation provides capability to disseminate information about the resources and services of the library through web. Such dissemination mode saves the time and efforts of the users as they are able to access required information remotely with the help of computer, laptop, smart phone, etc.

- **OPAC:** The Online Public Access Catalogue provides the facility to search bibliographic information of the Library resources which helps in locating her/his desired publication/material.
- **Enhancement of library management:** It enhances the library management as reports and statistics become available with the click of mouse. The automated system gives the management input and feedback on various services and also monitors the human resources of the library effectively and efficiently.

Review Questions

1. What is library automation?
2. What is the need of library automation?
3. Why do we need integrated library management system?

1.3.Planning Library Automation

Planning is an important function of management for successfully achieving the goal with optimum utilization of resources. The Business Dictionary defines the planning as “the planning is a basic management function involving formulation of one or more detailed plans to achieve optimum balance of needs or demands with the available resources. The planning process (1) identifies the goals or objectives to be achieved, (2) formulates strategies to achieve them, (3) arranges or creates the means required, and (4) implements, directs, and monitors all steps in their proper sequence”.

Hence, a team of professionals having expertise in the field of library management and knowledge of available technology should be given the responsibility of planning. The team may include the librarian, experts of information and communication technology and the members of library authority or committee for effective planning and further implementation.

Before initiating the project of library automation, the planning team identifies the needs and the area of the automation. While planning, the planner undertakes a survey of the technology available in the market, needs of the library, special skills required for handling the technology and the initial as well as the running cost of the system. The planner should have awareness of

the general advantages and disadvantages of the technology and related machines and equipment available in the market.

In the process of selecting hardware and software, the libraries should first select the software and then procure the hardware accordingly. It helps in identifying the requisite machine and equipments to run the automated system. The criteria to evaluate the advantage and disadvantages, described by Reynods (1985) in his book on library automation are: (i) Initial cost (ii) Continuous cost (iii) degree to which software can initially be customized to meet library needs (iv) level of computer expertise required on the part of the library (v) Control over system performance (vi) Control over hardware upgrade (vii) Control of software enhancement.

While planning the library automation, the planning process should cover following aspects:

- (i) Identification of the library functions to be automated
- (ii) Feasibility study
- (iii) System requirements
- (iv) Budget
- (v) Training

(i) Identification of functions for automated: The identification of the library functions to be automated provides the base to whole process of the automation. All the activities under each functional area should be documented and possible adjudged whether needed to be automated or not. This provides base to select the technology and mechanism for the automation process. For example, to automate the circulation of a library barcode or RFID technology may also be adopted depending upon the need, fund and other factors of the library.

(ii) Feasibility study: It is a process of determining the proposed library automation, achievable on the parameters of i.e needs of the library, functions to be automated, and technology to be used, infrastructure required, and whether the library is capable of investing in the process. Once, such study is done it is easier for a library to adopt automation process.

- (iii) **System requirements:** System requirements depend upon the technology adopted for the library automation. It covers software, hardware, supporting machines and equipments, and infrastructure required for running the automated system. The Library Automation Software has been discussed in the Chapter-2 of this book. Depending upon the software and the technology adopted for automation hardware are finalized. Minimum hardware required may be listed as (a) Web Server, (b) Desktop Computers, (c) Printer, (d) Scanner, (e) Barcode Printer and Scanner, and Data Collection Unit (incase adopting barcode technology) (f) RFID Tags, RFID Activator and deactivator, RFID Sensor and Gate Reader, etc. (in case of adopting RFID technology) (g) Networking equipments and High Speed Internet Connection to server, etc. It may vary
- (iv) **Budget:** It is the most important aspect of Planning As mentioned above, the investment in purchasing hardware, software and other equipments may be high. Creation of bibliographic database of the books and other information resources and database of members also needs finance. Apart from these initial investments, the provision for running cost of the automated system should be made. Otherwise the library may become useless if the running cost is not be provided.
- (v) **Training:** The functioning of automated library system is different from the manual library system. For running the automated system the staff and members of the library both should be provided training for getting maximum benefits out of this new system.

The training programme for the staff should be based on the operations of software, hardware, machines and equipments for in house functions as well as providing the services to the members.

The members should be provided training on availing the services through the automated library system. Such training to the members would make them self-dependent in getting maximum benefits out of the system.

Review Questions

- a. What is library automation planning?
- b. Who should plan library automation?
- c. What are components of the library automation planning?

1.4.Implementing Library Automation

The implementation of library automation process is converting planning into action. As per planning, the required software, hardware and equipment should be acquired by the library as well as necessary infrastructure for the automated system should also be created. Once the machines and equipments are in place and the required staff is ready the creation of different database may be started. The operations of the library should be automated step by step.

There two different groups of operations in the library may be automated. Those are:

- (i) House-Keeping operations
- (ii) Library services

Introduction:

According to the fifth law of library science of Dr. S.R. Ranganathan, Library is a growing organism. In the form of growth , a library holds a natural characteristic of change. This change may be reflected in the form of improvements, modifications or advancements. As Information and communication technology has revolutionised all fields of public or individual life, the library systems could not keep themselves away from this technological advancement. In this regard automation was first and foremost process which was invited by the library professionals in the form of remedy against traditional problems of library practices. After implementing automaton, libraries have not only improve the quality of existing library operations but also introduced new and better library services for the ultimate satisfaction of its users.

The Encyclopaedia of Library and Information Science defines it as “Automation is the technology concerned with a design and development of the process and system that minimize the necessity of human intervention in their operation.”

Swihart Stanley S and Hefley Beryl F have defined the term library automation as “the processing of certain routine clerical function in the library with the assistance of computer or other mechanized or semi automatic equipment”.

Therefore, we can conclude that “library automation is the process where we try to perform all library housekeeping operations with the help of library automation software in an integrated environment and with least human interference.

2.2 Need for library automation

Although modernization of organizational practice is a natural process for all systems but being a service institution, it becomes essential for libraries to provide quality support for the maximum satisfaction of their users. In present scenario, there are following reasons which compel us for automating the library system:

- Information explosion
- Increase in library collection
- Inability to explore unlimited literature
- Advancements in Telecommunication technology
- Wastage of user’s precious time in locating information
- Inability to facilitate wider access of resources in libraries and elsewhere
- For improving the quality in library service
- For promoting Cooperative efforts for better library services

2.3 Areas of Automation in Libraries

In the process of automating any organization, ideally it becomes obvious to automate each and every activity of the same. But for designating a library and information centre automated one, it becomes essential to automate at least housekeeping activities of the library. Such library housekeeping activities along with their major or minor works are:

1. Library administration
 - Activities related to:
 - Office work
 - Letter writing
 - Report writing

- Accounts
 - Preparation of budget
 - Receipt of services
 - Other works
2. Library acquisition
 - Selection of documents
 - Placing orders
 - Checking receipt
 - Forwarding bills
 3. Library cataloguing
 - Generation of catalogue cards using any catalogue code
 - CCC
 - AACR II
 - Any list of subject heading
 - Sear's list
 - Library of congress list of subject heading
 4. Library circulation
 - Issue
 - Return
 - Reserve
 - Record keeping
 5. Library serials control
 - Selection and acquisition
 - Receipt and control
 - Indexing of article
 - Circulation and routing
 - Renewal of subscription
 - Binding
 - Searching
 6. Other library services
 - Current awareness services
 - Selective dissemination of information
 - Document delivery service

- Bulletin board services
- CD-ROM search services
- On-line information retrieval services

2.4 Problems in implementing automation:

According to Dr Ranganathan “library is a living organism” which is surrounded by ‘Books’, ‘Staff’ and ‘Users’. More over it is also abound with all of other activities which are common in other government institutions. Keening in view of all such characteristics, we can identify following issues which creates hurdle

- Institutional finance
Being a social institution a library cannot generate its own finance in the form of profit making. Thus it is fully dependent on its parent organization or funding body for satisfying its financial requirements. For the purpose of automating its practices, library require a good amount of financial support for procuring hardware, automation software and developing infrastructure.
- Technical know-how
For implementing a successful automated system, the automating process not only requires an expert leadership but also it requires well acquainted subordinate staff of the library system. In absence of such support, it is not possible to implement a useful automation solution in a timely manner.
- Fear of new technology
Due to lack of training and awareness of new technology i.e. ICT, it may be possible that the staff members of the library do not express their willingness to adopt it. For avoiding it we should make them aware about the benefits of library automation and thus motivate them about the forthcoming solution.

2.5 Criteria for choosing library automation software

After taking a decision for moving towards an automated library system, we must be very much careful while finalizing the automation software for our library. Once we implement any specific software, library staff and the users are bound to take support of it while providing and receiving service from the library. A wrong decision on software selection may waste our efforts or finance. Therefore, we should take care of following issues before taking the long lasting final decision:

- General issues
 - Acceptability of the software
 - Cost
 - Applicability in the library system
 - Reputation of software designer
 - Reputation and goodwill of software supplier
- Technical issues
 - Language of the interfaces
 - Operating system
 - Requirement of hardware configuration
 - Additionally required software for implementing all supports
 - Data storage capacity
 - Easy to use
- Support provided by the software developers
 - Availability of Documentation of the product/software
 - Support for software installation by the supplier
 - User training facility from the supplier/developer
 - Obtainability of further future based modifications
 - Obtainability of new versions in future
 - Club/group of existing software users for discussing issues
- Legal
 - Registration/copyright of the product
 - Acceptable provisions of Warranty statement

Summary

Being a service institution library bound us to update our library services for providing best, fastest and most convenient information support while exploiting latest technological advancements. After going through the above mentioned concepts it is now obvious that we can facilitate better library support in an automated library system. We can conveniently manage various problematic issues like increasing workload, information explosion, limited staff and even limited recurring financial support. We have also discuss about some of the quality library automation software for developing better understanding.

2.8 Exercise

Short questions:

1. Define the concept of Library Automation.
2. Why automation is required in any organization?
3. Discuss the need of Library Automation.
4. What are the barriers in automating a library?
5. Point out various areas of automation in a library.
6. What type of support libraries expect from the software developer?
7. Point out some essential technical issues to be considered while selecting automation software for library.
8. Discuss various prominent features of E-Granthalaya.
9. Write a short note on Libsys.
10. Write down a short not on the development history of E-Granthalaya.
11. Discuss various features of SOUL.
12. Point out various activities of SOUL's circulation module.
13. Write a short note on KOHA.
14. Point out various modules of E-Granthalaya.
15. Discuss various information searching supports of the OPAC of SOUL software.

Long questions:

1. While defining library automation, discuss the need of automating a library for providing quality information support.
2. Discuss various modules of SOUL along with their functions and activities.
3. Discuss various issues to be considered while selecting suitable automation software for library in detail.
4. How a library can provide better information services in an automated environment? Discuss it in detail.
5. Write an essay on the library automation software while discussing any two of them.

2.9 References

1. HARAVU (L J). Library automation design, principles and practice. 2004. Allied Publishers, New Delhi.
2. INFLIBNET. Software for university libraries user manual. 2003. INFLIBNET, Ahmedabad.

3. RAJARAMAN (V). Introduction to information technology. 2007. Prentice-Hall of India, New Delhi.

2.10 Glossary

KARDEX: It is one of the library furniture which support as a tool for maintaining serials control in the library. It was developed by Remington Rand.

RFID: Radio Frequency Identification technology. It is the latest technology which is used in library for implementing theft detection system.

CCC: Classified Catalogue Code: With additional rules to Dictionary Catalogue Code

AACR II: Anglo-American Cataloguing Rules, Second edition

CAS: Full form is Current Awareness Service. This is a generalized service for keeping all users aware about the advancements, updation and events in their respective library.

SDI: Full form is Selective Dissemination of Information. This is a specialized service for keeping a specific user aware about the addition of information of his/her interest in his/her respective library.

Unit 3

Use of web based Communication system

Internet

Internet is a global network defined as the network of networks. It is spread globally over countries and continents and is the largest communication network throughout the world. It allows all types of networks from all over the world to get connected and share or exchange data with any other system or network faster than any other communication system. Internet follows TCP/IP (Transmission Control Protocol/Internet Protocol) which provides end-to-end connectivity. The salient feature of Internet is that due to its global coverage, it is not in control of a single body or organization. Hence, anyone can get connected or disconnected on their own or as and when required.

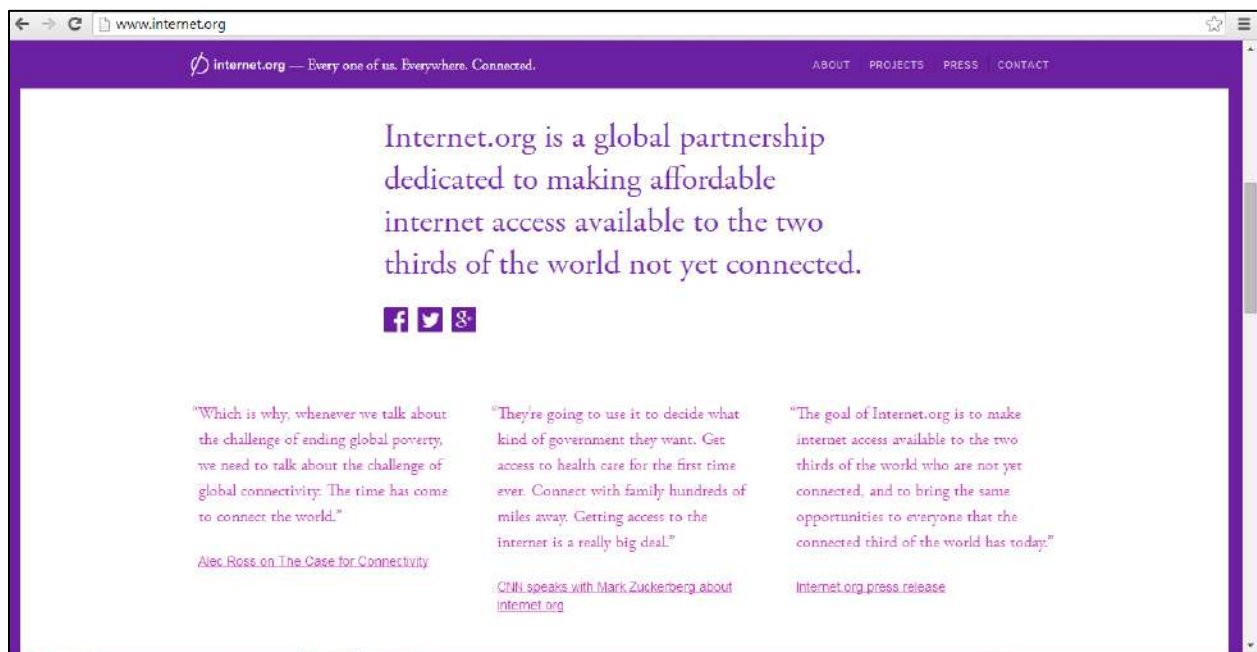


Figure 3.3: www.intenet.org

History of Internet

In 1960s a project was undertaken by the U.S. Defense Advance Research Projects Agency (DARPA). It was in fact looking for some technology that could enable it to maintain its strategic military-based communication worldwide in case of a nuclear attack. This can be said as the main conception of the Internet.

Later, these developments led to the establishment of the Advanced Research Projects Agency Net (ARPA Net). The main interest of this was looking for a technology that could link computers in various locations by using a new technology called Packet Switching Technology. This new technology enabled several users to simultaneously share a single communication line. This technology was then used by U. S. National Science Foundation (NFS) to create its own network and called it NSFNET. The project met with a large success in achieving its objectives.

Since, the users were mostly scientists and researchers, the demand went on increasing endlessly. The NSF found it unable to cope with the demand. In 1990, a non-profit organization Advance Networks and Service (ANS) created by MERIT, MCI and IBM took over the NSFNET, upgraded it to the speed of 45 MBPS and formed ANSNET. Now the network become commercial and opened to the public. The ANSNET worked for five years and later sold to America Online. By the time, several companies started to offer IP services. Today in fact, anybody with a number of devices as computer, tablet, smart phone, etc, can access Internet with the help of some service provider

Some salient features of internet are:

- It is a network of networks, can be called as Internetworks.
- It is the largest communication network in the world.
- It uses TCP/IP protocols to communicate with other systems.
- It is a collection of LANs connected by a WAN.
- It can transmit data from one part of world to another part in real time.
- Anyone with individual device or any network can get connected or disconnected at any time.

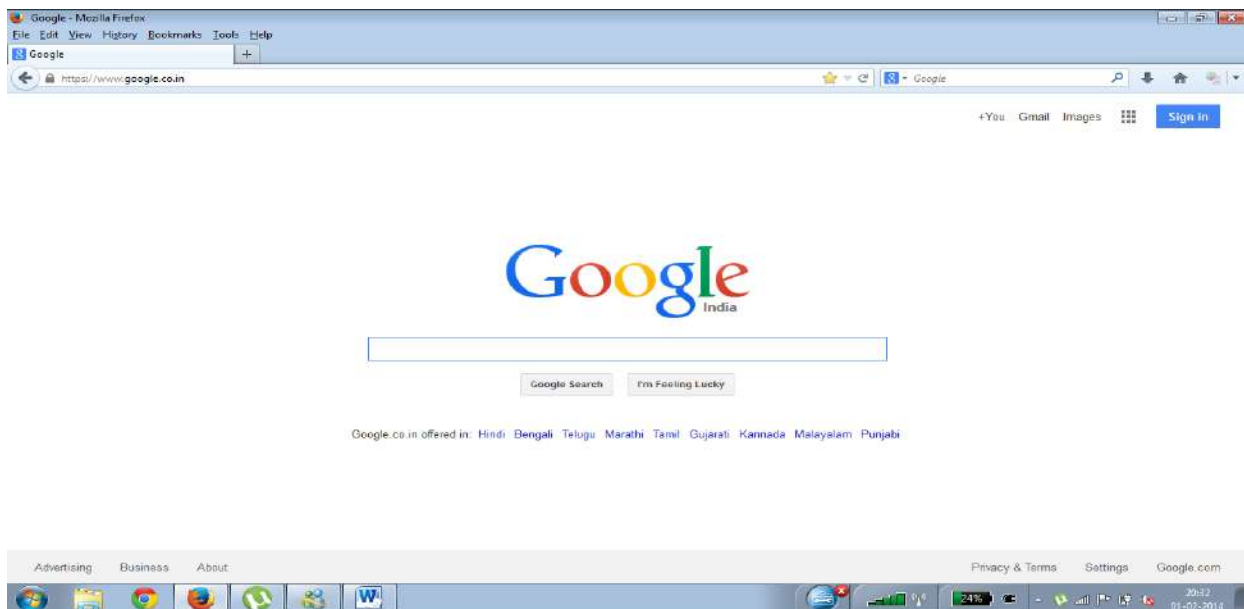
3.4. Internet and Intranet

Internet should not be confused with Intranet. Intranet is a private network within a company or an organization using internet technology within the network. It can be understood as private network using all the protocols used on internet for the operation of organization. It uses the same kinds of software that you may find on the Internet. Internet essentially used to exchange

confidential information between the officials at certain levels, information that is not meant to share with others in the rest of that organization's overall network. Such network is created for security reasons. For example, within the organization Microsoft Outlook can be used for E-mail and Messaging among the staff.

6.1.1 Search Engine

Search Engine is a computing based application software or program, which enable users to search information on the web. It is basically having program, called crawler or spider. It helps in locating information, index those information and produce result for the users for the submitted search query. There are a number of search engines available on internet. Some of the search engines, popular among user communities are Google, Bing, Yahoo, etc.

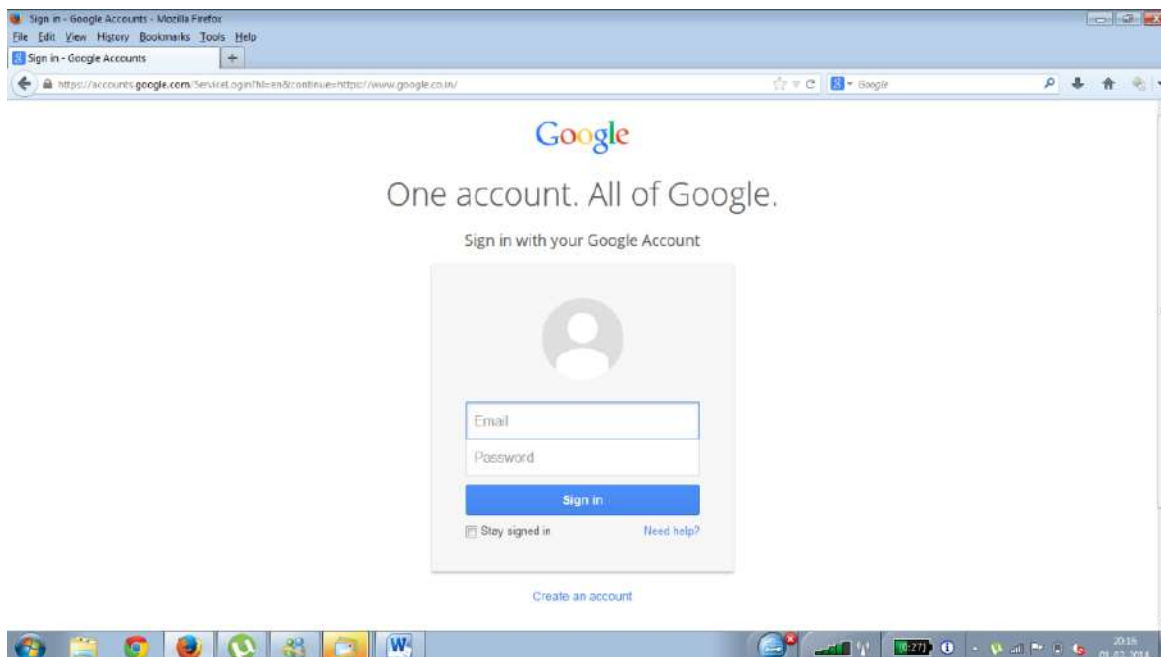


6.3.2. Email

The electronic mail is an internet protocol which allows computer users to exchange messages and data with other e-user via internet. All the email system having common application of e-messaging system such as inbox, sent folder, compose mail editor, attach documents, which

allow users to send, receive, forward and store messages. It is faster, reliable; provide privacy setting and more convenient than other mode of information communication. Despite of these above features, still it is having issues like spam mail, hacking of security and privacy, if user unknowingly replay back to spam mails which are sent by undisclosed sender. For this, the user must know the basic functions of email tools and their use to protect their mail from such spam.

Creating an email account is a very easy two step process. First step is to sign up and fill necessary personal information like user name, password, personal details, etc. After completion of this process, a specified email account is being created. Then, a confirmation email is being sent to the secondary email account of the user. With the help of the confirmation email, one can control the privacy setting like, changing of user password further, etc. In case of opening first email account; the confirmation code may be sent to the mobile phone of the user. Secondly, the owner of the email account has to sign in (log in) to the account with user ID and password during the first step. The email account looks at<user name>@<server name>. For example xyz@gmail.com. Here “xyz” is the user name and gmail.com is the server name, the “@” character is used as a separator, it separates the user name from server name. Now a day, so many email providers are available on the internet with more advances feature and tools. For Example Gmail, Yahoo mail, Rediffmail, Hotmail etc. All most all above example are having feature like chat box, video chat, e-messaging groups, share photo, video and so on.



1.2.1.2. E-Database

An e-database is an organized collection of information, on a specific subject or multidisciplinary subject area. The information of an e-database can be searched and retrieved electronically with the help of personal computers, tablets, mobile phone, etc. The type of database on the basis of its content may be:

- Bibliographic Database
- Full-text Database
- Numerical and Statistical Databases
- Images Database
- Audio Database
- Video Database
- Multimedia Database

Bibliographic Database

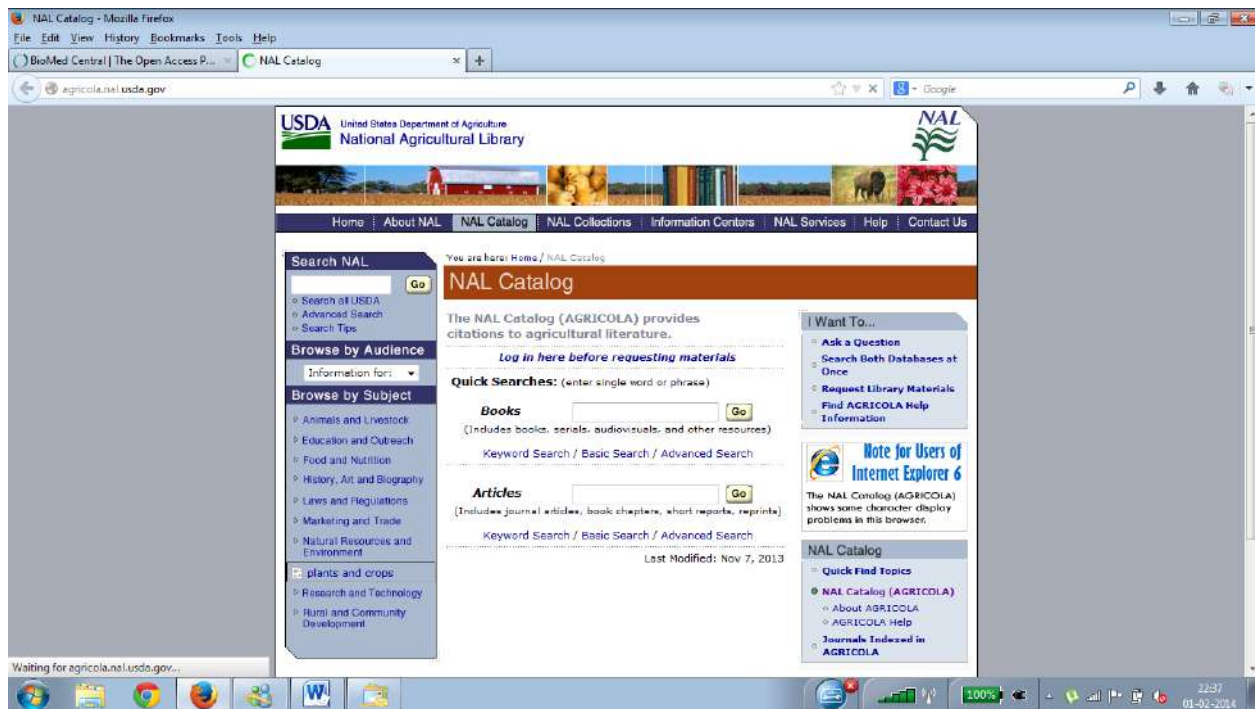
Bibliographic database is a database of bibliographic records, an organized digital collection of references to published literature, including journal and newspaper articles, conference proceedings, reports, government and legal publications, patents, books, etc. In contrast to library catalogue entries, a large proportion of the bibliographic records in bibliographic databases describe analytics (articles, conference papers, etc.) rather than complete monographs, and they generally contain very rich subject descriptions in the form of keywords, subject classification terms, or abstracts.

The Indexing and Abstracting Databases is one of the categories under the bibliographic databases. The database provides bibliographic information along with the abstract of the articles, published in different journals. Such databases are usually subject specific. There are a number of such databases in different subject area. For example, LISA i.e. Library and Information Science Abstract is an international database in the field of Library and Information Science, which index journals, conference proceedings, book reviews, and research reports of the subject from more than 68 countries and in 20 languages. In the field of biomedical science, the National Library of Medicine, United States of America maintains such database known as

Medline. It is available on internet as PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>). You can search the database and see the references. It is free of cost.

Examples:

- INDMED: Index to Indian Biomedical Journals (<http://indmed.nic.in/>) the ICMR-NIC Centre for Biomedical Information (Indian MEDLARS Centre) has designed and developed a bibliographic database from Indian biomedical literature. To start with 75 prominent Indian journals, have been selected to build up the database entitled IndMED. The coverage of database is from 1985.
- ISID Index to Indian Social Sciences Journals (<http://isid.org.in/>) indexes around 125+ Indian Social Science journals enabling users to search for references on the basis of string (series of characters) either for author's name, or words in titles for selected journals. Most of the journals are indexed from the first volume. Also indexes press clippings taken out from 14 India's English dailies. Access is free with simple registration. [Click on Databases to go to login page]
- AgEcon (<http://ageconsearch.umn.edu/>) search collects, indexes, and electronically distributes full text copies of scholarly research in the broadly defined field of agricultural economics including sub disciplines such as
- Agribusiness, food supply, natural resource economics, environmental economics, policy issues, agricultural trade, and economic development.
- Agricultural Online Access (Agricola) (<http://agricola.nal.usda.gov/>) is an index to all aspects of agricultural sciences.

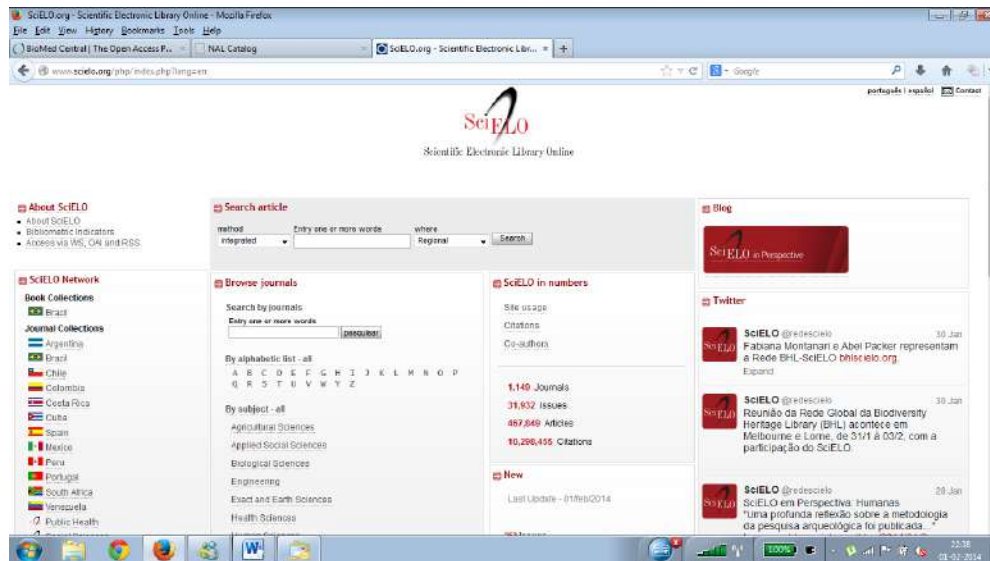


Full-text databases

The Full-text databases are databases that provide full text of articles published in the journals that they index. The availability of full-text articles depends on whether they are open access (free) or on the Library's subscription agreements with each publisher or aggregator.

Examples:

- Economic History Encyclopedia Index (<http://eh.net/encyclopedia/>) here search can be made for high quality full articles related the area of Economic and Business History.
- Scientific Electronic Library Online [SCIELO] (<http://www.scielo.org/>) is a model for cooperative electronic publishing of scientific journals on the Internet. Especially conceived to meet the scientific communication needs of developing countries, particularly Latin America and the Caribbean countries, it provides an efficient way to assure universal visibility and accessibility to their scientific literature, contributing to overcome the phenomena known as "lost science".



Numerical and Statistical Databases

The numeric and statistic database contains the numeric data based on some characteristics. For example database census of a nation, database of accounts of an organization, database of the results of an experiment, etc. such databases are needed for reference, planning and decision making, analyses, etc.

Example:

Census of India (<http://censusindia.gov.in/>): The database is created and maintained by the Office of the Registrar General and Commissioner, India.

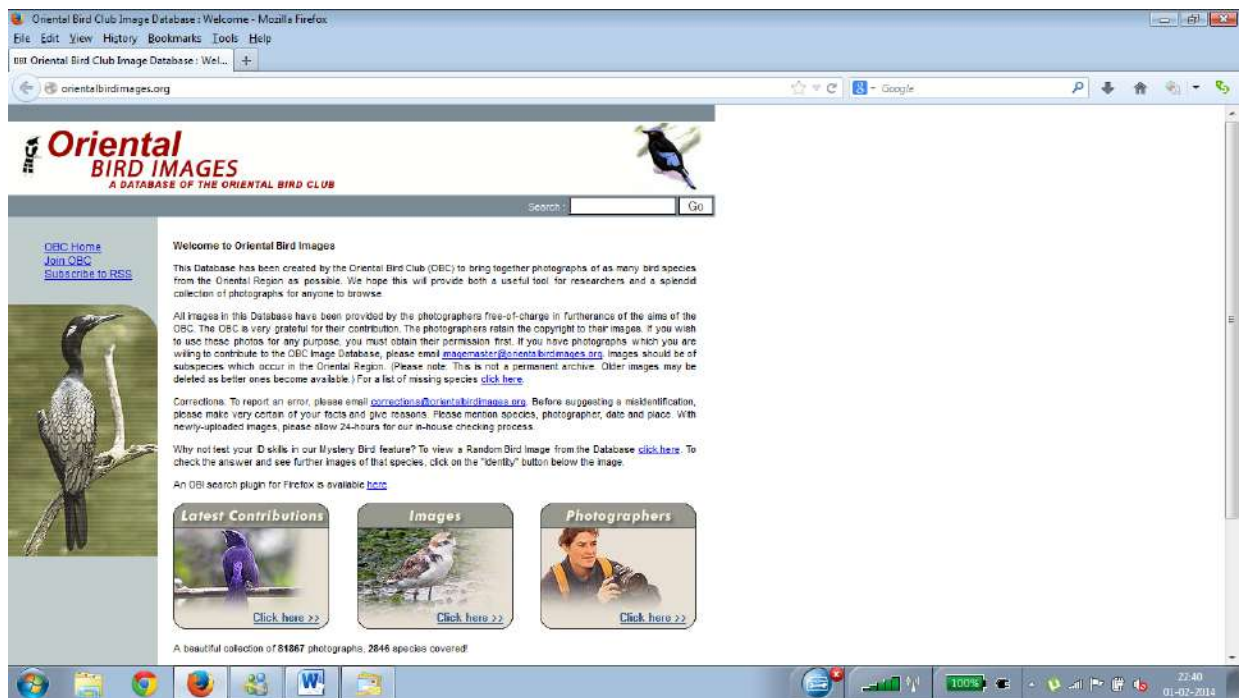


Images Database

The image database is a collection of images in digital form along with the description about the images. Such databases are being created on the basis of some characteristics and purposes. For example, the database of the images of slides, writers, leaders, sports persons, famous personalities, etc. Some of the libraries also maintain such databases for the members or official use.

Example:

- Kamat Research Database-Old Photographs of India(http://www.kamat.com/database/content/old_photo/)
- Families in British Indian Society, Image Gallery (<http://www.gallery.fibis.org/>)
- Oriental Bird Images-a database of the Oriental Bird Club(<http://orientalbirdimages.org/>)

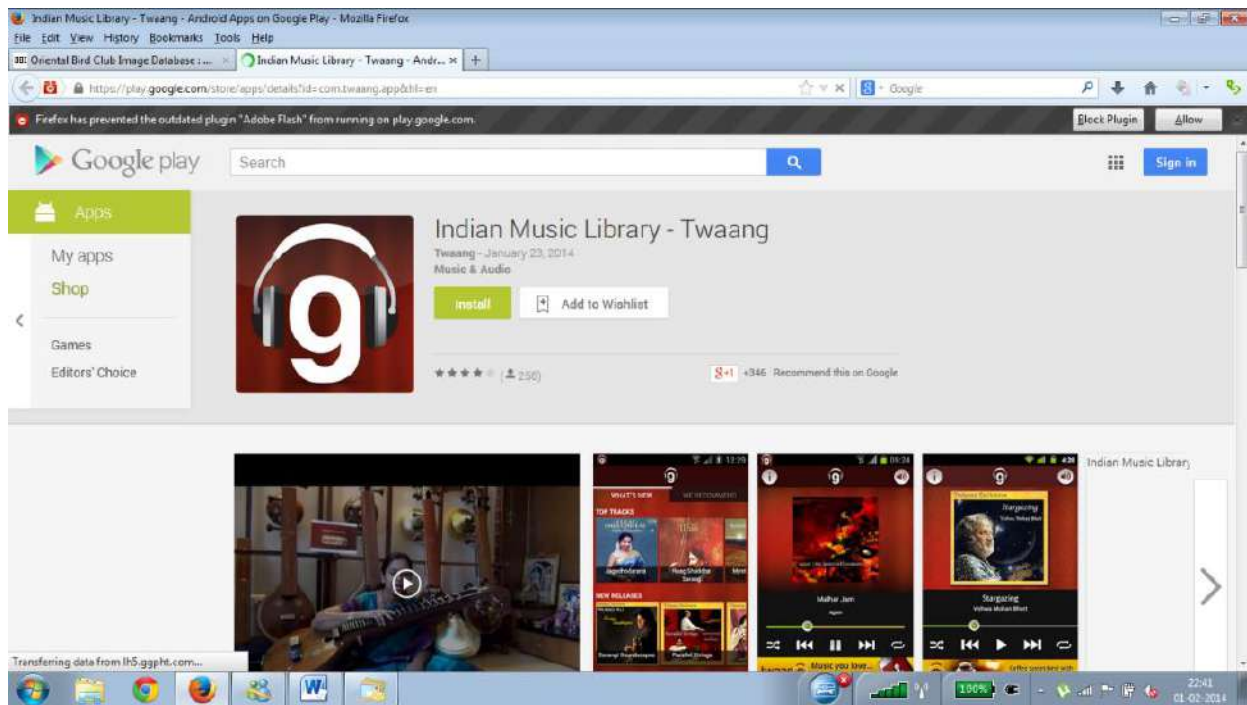


Audio Database

The audio database is the collection of audio materials as songs, sound of instruments, speeches of leaders, thinkers, scientists, etc, audio books and so on. Each and every record is being created with full details so it can be searched and retrieved from the database. You would oftenly downloading songs from the internet. The organizations providing downloading facilities, maintains the songs in the form of database with complete descriptions as in case of songs from movies then, lyricist, composers, singer, title of the movie, the song filmed on the characters, etc.

Examples:

- Indian Music Library-Twaang- a database of Indian Music maintained by the Google play and is freely available for listening. (<https://play.google.com/store/apps/details?id=com.twaang.app&hl=en>)

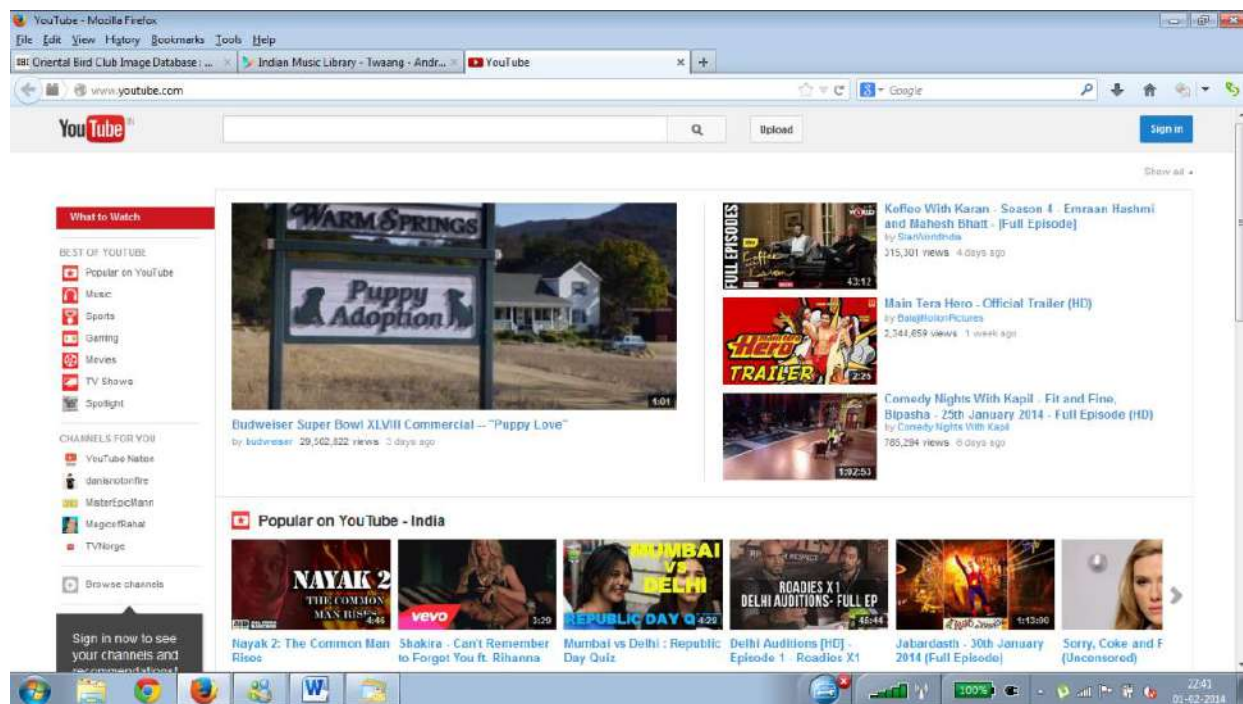


Video Database

The video database is the collection of videos with descriptions and search ability. You might have seen, and uploaded as well downloaded video from internet. There are a number of organizations to create, maintain and provide access to video databases. For example, a database of Hindi films, documentaries on different subjects or themes, education ware, etc.

Example:

- YouTube (www.youtube.com)



Multimedia Database

The multimedia is such a content or document which uses media as audio, video, animation, text, images, graphics, drawings, etc. Some of these or all of them may be fused for the purpose of creating content on a topic or subject. The database of such contents known as Multimedia database. Especially in education sector, such databases are created and provided for engaging students in better way. For example, the Indira Gandhi National Open University and National Council of Education Research and Training, create and maintain such database in the field of education. You can also get such content on www.youtube.com.

Review Questions

1. What do you mean by E-database?
2. What do you mean by bibliographical databases?
3. What do you mean by full text database?