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Editorial

Since the publication of the second volume (1997) of the Vidyasagar University Journal of Library and Information Science (VUJLIS) one year has rolled by. We have achieved a lot during this year. The important one is the organising a national seminar on "Information Technology Applications in Library and Information Centres" (March 24-25, 1998). Over the last few years, we have been experiencing a great deal of computerisation including the networking of libraries in our country. To-day, the Internet, available as a result of R & D efforts in computers and telecommunication, with hypertext-based navigating tools like World Wide Web (WWW) giving access to multimedia information, has opened out tremendous opportunities for rendering better information services. We consider that the aforesaid seminar has been organised at a very opportune time and it has provided an opportunity to share the views and experiences on this new technology, when obsolescence of technology is very rapid and the 21st century is at our door step. We have been able to get papers from most of the parts of the country. Participants have been benefited greatly from the deliberations and discussions on the various aspects and facets of the theme of the seminar.

Our IT Laboratory is also growing very fast with the support and encouragement of the University authorities. At present, the IT Laboratory of the department is equipped with one Multimedia, one Pentium, three PC 486 and one CD-ROM drive. Two more PCS and one laser printes are likely to be added this year.

Some selected papers presented in the aforesaid seminar form the major contents of this volume along with other invited papers of research interest. We have also included the writings in Bengali language in response to the requests received from different quarters. We trust that this volume of VUJLIS will lead the readers to a high degree of professional fulfilment. we gratefully acknowledge the constant eneouragement and necessary fund provided by the University authorities for the publication of this volume of VUJLIS. Finallly, We are grateful to the authors whose ideas form the contents of this volume.

Juran Krishna Sarkhel
Editor-in chief

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Information Technology Applications in Libraries and Information Centres*

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1 Introduction

I have been assigned the task of delivering the keynote address on the occasion of the inauguration of the National Seminar on Information Technology Applications in Libraries and Information Centres, organized by the Department of Library and Information Science, Vidyasagar University, Medinipur. So, what is going to be delivered by me, I would very much expect it to be accepted as the keynote address pertaining to the theme of this National Seminar. A keynote address or speech, as it is well known to all of you, is an address designed to present the issues of primary interest to an assembly, and often to arouse unity and enthusiasm. To start with, such an address used to be a monopoly of politicians addressing political conventions. However, nowadays, it has been adopted by all scientific professional conventions as the very purpose of such an address has remained one and the same. In the matter of arousing unity and enthusiasm relating to the use of information technologies in libraries and information centres, there are, of course, several isssues that warrant professional considerations. One such issue is the lack of adequate clarity about the essentiality of their use in information service centres including libraries, especially in terms of appropriate logic behind it. This inadequacy is simultaneously responsible for some doubts on the one hand and some sort of over enthusiasm on the other. Neither doubts nor over enthusiasm are welcome in this matter of our primary professional concern. This presentation does not claim to be comprehensive so far as the target issues are concerned. On the contrary, it is only a restrictive presentation. It simply intends to establish a logical foundation as to the essentiality of using information technologies in information service centres. The question it intends to answer in logical terms is: " Why is it essential to use information technologies in information service centres ?"

2 Information Service Centres

To start with, I would like to clarify my concept of " Information Service Centre". I have used it in place of "libraries and information centres" as used by the organizers of this Seminar. This is only for the sake of convenience in making my point clear in relation to the issue as specified earlier. When we say " Information Centres" it becomes amenable to several interpretation. This is so, because such a centre my be of several distinct types

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depending upon their respective ultimate purposes. For example, such a centre may be any one with the ultimate goals as follows :

(1) The generation of new information by using existing information, or by capturing information. This is done by research. Fortunately, such a centre is called a "Research Centre".

(2) The dissemination of primary information to help its prospective users. "Primary Information" refers to information generated by research. This is done by the primary publications, such as, primary periodicals, research/technical reports, papers in conference proceedings, patents, and standards and specifications.

(3) The transmission of information from one point to another through telegraph, telephone, e-mail, Fax, postal service, courier service, etc.

(4) The collection, processing, storage, dissemination, retrieval and providing access to information about sources of information - documentary, institutional, and human to help the prospective users of information in meeting their respective information needs.

Each one of these purposes is directly related to information. Therefore, each centre with its specific objective is an information centre. Just to distinguish the centres dealing with " information about sources of information", I have used the term "Information Service Centres". I know that this is not a very happy term. But in the absence of anything more suitable, I have preferred to use this term for the time being. One obvious convenience of using this term is that it can conveniently comprehend the following kinds of centres :

(1) Libraries;

(2) Indexing Service Centres;
(3) Abstracting Service Centres; } conventionally known as Documentation Centres

(4) Information Clearing Houses; and

(5) Information Analysis and Consolidation Centres.

The purpose of bringing them together is that the ultimate goal of each of these centres is one and the same. That part of the issue will be dealt with later. " Information" is the message conveyed or intended to be conveyed by a systematised body of concepts or its accepted or acceptable substitutes. This definition of " Information " applies universally to all kinds of information centres. Information generated by research is called primary information. In this sense, a piece of information see copy cannot exist unless a piece of primary information exists. In fact, all the information service centres deal with information about sources of information. For this reason, it is logical to say that what these information service centres do are all secondary information work and service.

I have not included the " Technical Information Service Centres". This is because, conventionally still today, this service is rendered by subject specialists. But for carrying out their task they depend heavily on the services rendered by information service centres.

3 Systems - View of Information Service Centres

Any information service centre is a man-made production system. A man-made production system is always a complex made up of functionally and structurally related components (parts) of different orders. It has to function in a well-recognized environment of its own in order to achieve a well-defined objective. This definition comfortably accommodates any information service centre within it. The primary components of a man-made production system are as follows:

(1) The "Infrastructural Sub-system";

(2) The "Input Sub-system" made up of

- Manpower,
- Material,
- -Machines and Equipment,
- Time, and to ensure all these,
- Money;

(3) The "Throughput" (Process) Sub-system;

(4) The "Output" (Products) Sub-system;

(5) The " Marketing" Sub-system;

(7) The "Feedback" Sub-system; and

(8) The "R&D" (Research & Development) Sub-system.

The "Environment" is not a component of the production system. But the relationship between them is extremely strong. Any change in the environment affects the system and vice-versa.

A little bit of imagination would immediately suggest that any information service centre fits in very well in this generalized framework of any man-made production system. From all points of view, an information service centre is a man-made information service production system. The consideration of any aspect of a man-made information service production system must take into account its "systems-view" as furnished earlier. The benefit of this view lies in the following universally accepted fact:

> Any man-made production system has to consider as a priority the aspect of enhancing its productivity in terms of efficiency and effectiveness without affecting its economy. The only means for this purpose, as it has been universally adopted, is the use of appropriate machines and equipment for this purpose. It was this realization which led to the industrial revolution.

An information service centre is a typical man-made information service production system. Just like any other production system, it is equally concerned with the enhancement of its productivity in terms of efficiency and effectiveness. The use of appropriate machines, equipment, and technological infrastructural facilities is imperative for the achievement of its ultimate objectives to the satisfaction of its clientele. In a concrete sense, this is what is referred to as the "Use of Information Technologies in information service centres."

4 Technology

It would definitely be appropriate to get our conception of "Technology" clear at this point. A body of knowledge sytematized by using intellectual processes, such as, organization, association, integration, and consolidation, that is amenable to learning (through reading, understanding, practising, and preaching), to teaching, to analysis and consolidation, and to research, is a discipline. The term "subject" in a specific sense, is often used to refer to "discipline". "Technical" is used as an adjective to refer to anything relating to a practical discipline (subject) organized on scientific principles. "Technology" essentially refers to the totality of the means including the use of machines, equipement and appropriate infrastructural facilities, and technical methods employed to achieve a practical purpose, or to provide objects necessary for human sustenance and comfort (in other words, to provide objects to meet human needs and wants).

In the light of this definition of "Technology", let us consider any man-made product, for example, a "Computer". For the purpose of manufacturing a computer, the major technical operations involved are as follows:

(1) Designing;

(2) System structuring (organizing);

(3) Staffing;

(4) Developing prototype;

(5) Manufacturing(producing);

(6) Quality controlling;

(7) Marketing;

(8) Using;

(9) Collecting feedback; and

(10) Carrying out R & D activities.

their common ultimate goal efficiently and effectively to the satisfaction of their clientele. The basic argument in favour of the use of information technologies is clearly reflected in this statement; and it is the achievement of the common ultimate goal of information service centres both efficiently and effectively. It would be quite in place to take note of this common ultimate goal at this point.

The common ultimate goal of any information service centre is :

> To ensure and promote the utilization of existing information for the betterment of the society by taking all necessary steps
>
> (1) to provide access to right sources of information to every right user of information, and
>
> (2) to find the right users for every right source of information,
>
> keeping in mind that only timeliness of information service adds value to information supplied.

It has to be noted here that providing information services in the manner as specified above is extremely difficult and complicated. This difficult situation arises because of the phenomenon that the Universe of Information is ever growing in many dimensions. This phenomenon has given rise to a considerable number of barriers that stand between the right users of information and the right information they need. The next section is devoted to those barriers, and to the means of overcoming those barriers.

But one important point here is to take note of the uses of information that can ensure the betterment of society. Some of such uses are the following :

(1) For generating new information through research;

(2) For understanding and evaluation of existing information and known phenomena;

(3) For decision making at all levels of personal, corporate, and social activities;

(4) For enhancing productivity in the production of commodities and services;

(5) For education and training.;

(6) For interactive communications; and

(7) For emotional satisfaction.

6 Barriers and Means of Overcoming

Each information service centre is established and organized centring round a well defined disciplinary (subject) interest. The totality of this disciplinary interst, for the sake of convenience, is amenable to a kind of classification, such as the follwing:

(1) Umbral region of interest (core areas);

(2) Penumbral region of interest (peripheral area); and

(3) Alien region of interest (outside peripheral area).

Corresponding to each of these major operations, it is possible to recognize a set of means and technical methods involved in carrying out each of those. As a result, we can identify technologies, such as the following:

(1) Designing technology;

(2) System structuring (organizing technology) technology;

(3) Staffing technology;

(4) Prototype developing technology.

(5) Manufacturing (production) technology;

(6) Quality controlling technology;

(7) Marketing technology;

(8) Use technology;

(9) Feedback collecting tehchnology; and

(10) R&D technology.

In the matter of using appropriate machines, equipment, and appropriate technological infrastructural facilities, it is essential to be clear as to what technology is to be used to carry out the work and services of an information service centre. For example, today, an information service centre has to go for using the following information technologies to achieve its objectives:

(1) Computer technology;

(2) Telecommunication technology;

(3) Network technology;

(4) Large-scale storage technology;and

(5) Reprographic technology.

The machines, equipment, and appropriate technological infrastructural facilities that an information service centre is obliged to use, it is only their use-technologies that it is primarily concerned with.

It is only this fact which should regulate its decision about adopting the appropriate information technologies to achieve its ultimate objective. This condsideration, again in turn, should regulate the decisions about the course-contents for developing professional manpower at different levels.

5 Ultimate Goal of an Information Service Centre

The professionals engaged in secondary information work and service today, have no doubt in their minds that it is essential to use appropriate technological information technologies in their respective information service centres if those centres have to achieve

Two or more information service centres, at the levels, such as, local, regional, national, and international, is quite expected to have their disciplinary (subject) interests overlapping each other's. In such a case they form an informal alliance which has to be strengthened by an agreement for coordination in acquisition and cooperation in service to the extent feasible by mutual understanding. This is the essential first condition to be of coordination and cooperation for a very long time but the means of implementing it has all along been extremely restrictive. As a result, the question of efficiency and effectiveness of such cooperative ventures has never been up the expectation.

Today, the situation has changed dramatically. The means of implementing the agreement of coordination and cooperation between and among the partners of informal alliance are perhaps one of those varieties which can be considered as most efficient and effective and this is what we refer to as information technologies. Let us take note of the role of information technologies in the matter of overcoming the barriers referred to earlier. Where there is a need for coordination and cooperation, the use of information technologies can be the most useful means to overcome the barriers warranting it.

Let us take note of the inividual barriers that stand between the right users of information and the right information they need:

(1) The barrier of "Large Number" of sources of information in any discipline big or small. No information service centre can even think of a comprehensive collection on a discipline. No, none can afford it, even the Library of Congress. The solution lies in developing a representative collection is selective areas of umbral interest. An agreement of coordination in acquisition and cooperation in with the partners in the alliance is a must and it must be supported by a well-formulated acquisition policy document developed cooperatively. Such an agreement can be implemented satisfactorily only be using information technologies. The remarks made in relation to the barrier of "large number" are analogously applicable to overcome all other universally identified barriers, such as the folowing:

(2) The barrier of "Vast Volume". A small piece of relevant information is always found to be buried in a vast mass of information. The professional techniques and their associated tools are to be used to overcome this barrier. In the matter of improving these professional techniques and their associated tools, the role of the use of information technologies is now world-wide acknowledged. Obviously, without the cooperation of the partners in the alliance, this kind of professional activities have to suffer from all sorts of inadequacy. Cooperation together with the use of information technologies is a must to overcome the barriers as mentioned below.

(3) The barrier of "Language"

(4) The barrier of "Distance-in-Space"

(5) The barrier of "Distance-in-Time"

(6) The barrier of "Inadequate Financial Support"

This, is turn, creates the following barriers:

- the barrier of "Inadequate Manpower",
- the barrier of "Inadequate Materials",
- the barrier of "Inadequate Machines, Equipment, etc", and
- the barrier of "Inadequate Time for Work and Service"

(7) The barrier of "Physical Accessibility" to the source of information.

7 Conclusion

The line of thinking as reflected in this address, is a humble attempt to establish the logical and practical elements of the arguments in favour of the use of appropriate information technologies in information service centres. To what extent it could claim to be a keynote address would depend upon the extent of unity of considered opinion and enthusiasm that it would generate. It may not be immediately measurable. So, let it be left in the lap of the near future.

One important point that may conclude this address is that it had been this line of thinking that made me go out of the way to establish a captive "Computer Cell" in DRTC specially for research and training. It was established in 1985; and it happens to be the first of its kind in India. Before this we were buying computer time from Indian Institute of Science.

I should like to take this opportunity to express with gratitude and sincere thanks my appreciation of the honour bestowed upon me by having invited me to deliver the keynote address to this National Seminar. My special thanks are due to the Department of Library and Information Science of the Vidyasagar University, Medinipur.

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Designing IT Curriculum for Lis Students in Changing Environment

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Abstract

IT is playing an important role in the management of libraries and information centres. A new breed of professionals are needed to meet the new challenge posed by this fast emerging IT based environment. To face the situation successfully, change is needed in the LIS course curricula. Few LIS schools in the country have already incorporated IT components in their syllabi at different levels of courses. The author has disscussed the nature of course component, size of IT component in it and the infrastructural facilities needed for the course. An attempt has been made to draw a broad outline of IT components in LIS syllabi which may serve as basis for the developing course curriculum in different LIS schools.

1 Introduction

Serving the right information to the right user at the right time is the goal of every library and information centre. The successful achievement of this goal largely depends on the tools and techniques used for the purpose. During the last few decades, there has been enormous rise in the flow of information on the one hand and greater demands for information due to acclerated research activities, on the other. The traditional tools and techniques of information retrieval are being found inadequate in the face of this double pressure, making it imperative to find new and more effective tools and techniques which can withstand this onslaught and help to achieve the goal. At this juncture, information technology (IT), with its enormous capabilities has come as a boon to the libraries and information centres [1].

1.1 Impact of IT

With the emergence and increasing application of IT, many age old techniques employed in communication, multiplication, storage and retrieval of information have been replaced by newer methods as illustrated below [2]:

	Technology	
Work	Old	New
1 Communication	Personal travel Postal Communication	Teleconferencing Teletext Satellite transmission

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2 Inputting text (Primary format)	Oral presentation Writing and typing	Word processing Optical scanning through computers
3 Multiplication	Printing and near printing process	Computer visuals Display terminals Video discs and cassettes Computerised photo-printing
4 Storage	Book shelves Pamphlet cabinet Microform storage	Computer based storage
5 Information retrieval	Browsing through the surrogates and through the shelves	Browsing databases through online terminals

1.2 Role of IT

Obviously, IT can play an important role in overall management of the libraries and information centres and effectively satisfy the Fourth Law of library and information science 'Save the time of the reader and its corollary "Save the time of the staff". More specifically, it can help in [3]:

-- supporting clerical functions associated with acquistition, technical processing and circulation work (library automation)

-- supporting information storage, retrieval and dissemination systems

-- supporting 'management information services' for librarians, specially analysing library statistics

-- maintenance of services

-- enhancement of services, such as, the provision of CAS, SDI, multiple copies of catalogue throughout the library system, more efficient reservation system

-- Cooperation -- in the sharing of resources through the operation of such schemes as shared acquisition, shared cataloguing and interlending arrangements.

2 Indian Scenario

The initial inhibition and resistance being over, the IT is now making its way vigourously into the libraries and information centres in the country. Though exact figures are not available, at least 50 per cent of the university libraries are in different stages of

computerisation and more than 90 per cent of the special libraries in the private sector have already automated their libraries. The National Library, Calcutta, and several state central libraries have also introduced computers, while many college libraries are planning to do so. Another important development is that several computerised library and information networks are being developed locally and nationally. Besides, facilities for access to Internet and other international information systems and databases are growing fast. Evidently, the environment of libraries and information centres are changing rapidly and drastically.

3 Manpower Needs

A new breed of professional workers of different levels are obviously needed to met the new challenge posed by this fast emerging IT based environment. Such workers should have the following competencies :

-- using computers for house-keeping jobs

-- designing and developing sophisticated IR systems and networks

-- designing, creating and managing bibliographical and non-bibliographical databases

-- managing and accessing local, national and international information systems and networks, including Internet

-- accessing national and international databases, including hypertext databases

-- handling of multimedia

For gaining such competencies, they should also develop sufficient knowledge of computer hardware and software, programming algorithm and languages, networking topology, formulation of search strategy and application of artificial intelligence and expert system. Not only new workers with such competencies and knowledge are urgently required, but there is also immediate need of retraining of the existing professional workers through continuing education programmes since in the new environment, such workers with their previous training and experience in traditional librarianship may find themselves alien and lose interest in their work.

4 Existing curricula

At least 85 university departments in the country today conduct Bachelor degree courses in LIS, while about 50 of them also conduct Master degree courses. Some colleges have also started Bachelor degree course with university affiliation and some universities have started distance education courses in the subject. In recent years, two-year integrated courses leading to master degree have been introduced by some LIS schools. Besides, Birla Institute of Technology (deemed university), Ranchi, runs two-year master of science in information science and INSDOC, New Delhi, and DRTC, Bangalore, conduct courses leading to

associateship, which are recognised as equivalent to master degree. There are also some lower level courses run by library associations, polytechnics and other organisations. Facilities for M Phil and Ph D are also available in some universities.

4.1 IT component

A close look into the course contents of Bachelor degree and Master degree courses of different LIS schools reveals that besides the courses of BIT, INSDOC and DRTC, in which IT gets good weightage, the course curricula of very few LIS schools incorporate IT component to the extent necessary for gaining the required competencies and that too only at the master degree level. Even where IT forms part of the syllabi, the students often do not get enough practical exposure to the technology due to infrastructural limitations. In short, the type of training imparted in most of the LIS schools hardly makes the students ready for working in the new environment confidently and effectively.

5 Change in Orientation

There is, therefore, an urgent need to revise and reorient the present LIS courses to meet the aforesaid need. This, however, does not mean that all the traditional subjects now being taught at different levels of LIS courses should be discarded. This is neither possible nor advisable in view of the fact that the traditional system of organisation of documents and provision of services will continue in a large number of libraries in the country for many more years to come. The LIS courses in our country, in the present context, should have an optimum blend of traditional and new techniques [1]. However, while revising the curricula the utility and efficacy of each component of the courses should be carefully evaluated and, if found redundant, should be replaced by a more uselful new component. Even the traditional components should be taught keeping in view the new context and environment.

6 Prelusory Issues

Though apparently a definite pattern of LIS education is visible in the country, there is, in fact, a lot of variations not only in course contents, but also in levels, duration, integration, infrastructure, examination system and even orientation. All these may have direct impact on the implementation of any course curricula that may be designed. Hence some issues need to be settled before actually designing a course suited for the changed environment.

6.1 Appropriate level

There may be differences of opinion about the appropriate level of LIS course in which IT should be introduced in the course curriculum. Experience, however, shows that the introduction of the new technology only at the master degree level, as is the current practice, is not sufficient. When IT is introduced in a library all professional and semi-professional workers have to be involved in the process though their degree or level of involvement

may differ. As such it is felt that IT should be introduced even at lower level course. But the course structure should be carefully designed keeping in view the level of the course, course objectives and the level of the trainees [1].

6.2 Duration and integration

As indicated earlier, several levels and systems of education are now in vogue in the field of LIS. At the master degree level, both the traditional one-year course after bachelor degree in LIS as well as two-year integrated course are running parallelly. Similarly, regular and distance education courses of the same level are running parallelly. Even the same university sometimes are running regular and distance courses of the same level simultaneously. There is neither any integration among the courses, nor is it a prerequisite for a candidate to have passed the examination of the lower level course in the subject to get admission in a higher level course, except in case of one-year master degree course, where possession of a bachelor degree in LIS is essential for admission. Such differences in duration, integration and teaching-learning system makes designing of any IT curriculum difficult. This also makes it necessary to repeat some of the curriculum areas at different levels.

6.3 Nature of course component

Another pertinent issue in this regard is whether IT should be included in the curriculum as a core component or as an optional component. Though it is true that a large number of libraries in the country are yet to come into contact with IT, looking at the trend it can well be foreseen that they will not be able to remain untouched or uninfluenced by the new technology for long. As such, possibly there is no second opinion about its status as a core component. The Curriculum Development Committee (CDC) set up by the University Grants Commission, has also, in its report, recommended that IT should be a core component at both bachelor degree level and master degree level. The CDC has also recommended to set up a Workshop cum Information Processing Laboratory for each LIS department and has identified different units for the proposed laboratory. What is wanted in implementing such a programme is not merely to put the recommendations for consideration, but to provide fund for the same. Hence, CDC's recommendation that the UGC should "issue guidelines to universities to treat LIS department along with Science departments for allocation of equipment grants" and should provide "lumpsum grant to each department of LIS for acquiring basic equipment" is note worthy [4]

6.4 Size of IT component

Keeping in view, the requirements of trained personnel of different categories and their needed competencies, it may be said that the size of the IT component in the overall course curriculum should not be less than at least a half paper of 50 marks at the certificate level, a full paper of 100 marks at the bachelor degree level and two full papers of 100 marks

each at the master degree level or three papers of 100 marks in case of two-year integrated course, with ample scope for practical training in each case.

6.5 Infrastructural facilities

Successful implementation of any course curriculum largely depends on the infrastructural facilities available, both in terms of teaching faculty and other facilities like library, laboratory and equipment. Unfortunately, the country is at present witnessing a quantitative rise in the number of LIS schools without such rise in infrastructural facilities. There is immense dearth of faculty with adequate training in IT. Most of the LIS schools, which have introduced IT in their syllabi, have to depend on outside experts, who often do not have any idea about the application of IT in library and information services. Similarly, only a few LIS schools have been able to set up their own IT laboratories and that too with limited computer facilities. If the situation cannot be improved, perhaps proper implementation of any advanced IT curriculum will not be possible.

6.6 Distance education

Special mention may be made here about the accute limitation of facilities for LIS students opting for distance mode of learning. The universities running such courses have not set any limit for admission of students so far as number is concerned. Such students either do not have any practical exposure to IT, or have very limited or insufficient exposure, though IT does form a part of their course curricula. The desirability of conducting professional courses like LIS should be seriously considered, more so in the context of changing environment and manpower needs.

7 Course Contents

An attemp has been made below to draw a broad outline of IT components in LIS syllabi which may serve as basis for developing course curricula in different LIS schools.

7.1 Certificate/Diploma level

At the certificate or diploma level the course should aim at making the trainees capable to input the given date, obtain required output and compose notes, letter, etc. through wordprocessor. The trainees at this stage are not expected to do complicated manipulation of date. To fulfil this aim the following course contents are suggested.

Module-1 : Theory

1 General introduction to computer and its functioning

2 Common computer terminology

3 Introduction to hardware, software and peripherals

4 Introduction to PC operation

5 Elements of word processing

Module-2 : Practice

1 Inputting of data

2 Printing of records

3 Word-processing of sample notes, letters, etc.

7.2 Bachelor degree level

At this level the trainees are expected to pick up the skill of doing house-keeping jobs, design and manage databases, do simple data manipulations like sorting, merging, etc., searching of required data or information and giving computerised services, like providing documentation lists, SDI, etc and compose and edit notes, letters, reminders, etc. In view of the above, the course contents of IT at this level should include the following :

Module-1 : Theory

1 Computer : types, chracteristcs, units, functions, advantages and areas of application in libraries and information contres

2 Computer terminology

3 Hardware, software and peripherals, including different storage media

4 Operating system, specially DOS and UNIX

5 Input, manipulation and output of data, including printing

6 Databases : types and characteristics, management of DB

7 Application software, specially CDS/ISIS

8 House-keeping work using computer

9 Processing, searching and servicing of information

10 Word-processing, composing and editing

Module-2 : Practice

1 PC operation using DOS commands

2 Data manipulation like sorting, merging of records

3 Database designing and creation of records

4 Word-processing, composing and editing of texts

5 Searching and servicing of information

7.3 Master degree level

Training at this level should enable a student to supervise computerised house-keeping work, utilise different communication media, organise files and make complicated data

manipulation, prepare or get prepared suitable programmes, handle different DBMS and library packages, participate in networking activities and organised computerise storage and retrieval work. As such the curriculum at this stage should incorporate the following :

Module-1 : Fundamentals of IT & prelimineries

1 IT overview

2 IT terminology

3 Need, advantages and application of IT

4 Main areas of IT

-- Communication technology

-- Computer technology

-- Printing and graphic technology (including electronic publishing and DTP)

-- Multimedia / Hypermedia

5 Information superhighway (Internet)

6 Hardware

-- Telephone, telex and fax machines

-- Computer hardware and peripheral

-- Modems

-- Acoustic couplers

7 Electronic exchange of message

-- Electronic mail

-- Teleconferencing (audio and video)

-- Computer conferencing

8 Legislative and regulatory issues

-- copyright

-- Intellectual property right

-- Trans-border data flow

9 Standards relating to IT

Module-2 : Communication technology & networking

1 Communication systems : electronic and optical
2 Transmission of signals
3 Transmission media : wire and cable, microwave, satellite and optical
4 Transmission devices : telephone, telex, fax, etc.
5 Gateways and switching systems.
6 Networking : models/architechture/topography
7 Protocols and exchange formats
8 Telecommunication networks and satellite networks
9 Local, national and international networks

Module-3 : Electronic data processing & library automation

1 Computer basics
2 Data structure and data models
3 File organisation and file security
4 Software and programming
-- Basics of programming : algorithm and flow-charting
-- Programming languages
-- Program writing by a language suitable for Library related activities
5 Data storage
-- Databases : bibliographical and non-bibliographical; on-line and CD-ROM
-- Creation and maintenance of databases
-- DBMS packages
6 Data/information processing
-- on-line and batch processing
-- Data manipulation : sorting, merging, etc
7 Searching and dissemination of information
-- Search strategies and techniques
-- On-line and off-line searching
-- CD-ROM searching

-- Current and retrospective searching

-- National and international database searching services

-- Documentation list compilation

-- Selective dissemination of information

8 Library automation

-- Automated models for various library operations

-- LIS related packages

9 Text processing (including word processing)

Module-4 : IT practice

1 Exchange of message through telex, fax and E. Mail

2 File organisation

3 Creation and maintenance of databases

4 Data processing and manipulation : sorting, merging,export, import

5 Writing library oriented program using any suitable language

6 Use of DBMS and LIS packages

7 Information searching through databases and networks

8 Multimedia handling

9 Drafting and editing notes, letters, reminders, etc using a suitable word processing software

It may be mentioned here that the above modules have been drafted keeping in view the one-year master degree course. In case of two-year integrated course, an additional module covering the contents of the module suggested for the bachelor degree course may have to be added as the students of the two-year course are not expected to have any exposure of the computer basics.

8 Conclusion

It is true that most of the LIS schools in the country have genuine constraints, like lack of funds for setting up computer laboratories and purchasing machines and non-availability of teachers having expertise in IT. This often deters some from introducing the technology in their course curricula. Even those who have introduced the technology are facing problems in imparting effective training. This is certainly very discouraging. However, a few schools like BIT, INSDOC and DRTC have been able to produce such professionals who have successfully competed with computer professionals. This should be our aim and

we should make allout efforts to promptly and seriously meet the challenge as otherwise persons from outside our profession having expertise in IT may replace the professional workers in libraries and information centres. And if this happens, our profession will be demoralised, divided and possibly doomed.

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A Prototype LAN Model for Indian Universities

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Abstract

Discusses about the Local Area Network (LAN) - its necessity, technologies, topologies, different components, operating systems etc. A model for campus network is given with brief notes on different components of the network. For Indian universities, it is high time to build campus network, because ERNET has been developed with the objective to provide Internet connectivity to the Educational and R& D institutes. At the same time, INFLIBNET is also being developed though at snails pace - its objective is to interconect all the university libraries and R & D centres. Hence, LAN is now must for university campuses.

1 Introduction

A Local Area Network (LAN) is a network of servers, workstations and peripheral devices in a single geographical area connected together to optimize resource sharing. The geographical area can be a building to that of a University Campus. A server is a system where the application software and common data are stored to provide accessibility to the workstations. Workstations are systems (generally PCS) that access servers to get data or software. These are also called clients. Hence, the client/server architecture. However, it should be noted that client/server architecture is extended to operating systems and application programs, where the software can handle requests from client software. Peripheral devices like printers, tape drives can also be part of a LAN, so that they can be shared by the systems in the network.

2 Why Local Area Networks

The architecture of LANs is some what different from that of multiuser systems like mainframes and mini computers. (It should be noted that these systems can be used in LANs as servers). In a multiuser environment, the main system is connected to dumb terminals (not PCS - just a terminal and a key board), using serial ports. These terminal provide Input/Output access to the multiuser systems and do not contain Central Processor

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Unit (CPU) of their own. Whenever a user attempts to invoke a program, the request is communicated to the multiuser system then the program is excuted on the main system and the output is passed on to the terminal. One of the disadvantages of communicating with serial port is that both the system and the terminal should be in very close proximity. The serial port cannot transmit, if the cable is more than 50 feet and transmission speed is 19,200 bits per second. The length of the serial port cables and the speed are serious limitations and paved the way for emergence of LANs. The following table brings out the broad differences between multi-user system and Local Area Networks.

	Multiuser System	*LAN*
Server Operating system	UNIX	UNIX, Novell NetWare, Windows NT
Client Operating System	None	Any OS
Clients	Dumb terminals	PCS/Workstations
Cables	Serial ports	Coaxial, twisted pair, optical fibre
Geographical area	A large room	A large building to a big campus
Application Software	Runs on the main system	Runs on the client

3 Technologies of LANs

Broadly, the LAN technologies can be grouped into the following

1. ARCNET
2. Ethernet
3. FDDI
4. ATM

3.1 ARCNET : Although ARCNET is the least expensive of the LAN technologies, it is becoming out dated. ARCNET can use coaxial cables or fibre optic lines of length upto 2,000 feet per segment with a total network span of 20,000 feet. The speed of transmission is upto 2.5 Mbps. ARCNET uses a Token-bus Scheme for line sharing among workstation and other devices on a LAN.

3.2 Ethernet : Of the LAN technologies, this is most widely used technology. Originally from Xerox and further improved by Xerox, DEC and Intel. Ethernet uses either coaxial cable or varieties of twisted pair cables and can transmit messages from 10Mbps to gigabits. Ethernet uses Carrier Sense Multiple Access with Carrier Detection protocol. Although the most popular Ethernet is 10BASE - T, Fast Ethernets or 100BASE - T are gaining popularity as they can transmit information at 100 Mbps.

3.3 FDDI : Fibre Distribution-Data Interface can transmit data on a LAN ranging upto 200 kms. As the name suggests, it uses fibre optic lines and can support thousands of users, offering a transmission speed of 100 Mbps. It can be used to interconnect LANs. However, this is a very expensive LAN technology.

3.4 ATM : Another technology that has become a competitor to other is ATM (Asynchronous Transfer Mode). ATM can transmit data at one billion bits per second (1 Gbps) using fibre optics cable. ATM is basically is switching technology that carries signals in 53 byte cells as packets. In this technology a cell is processed asynchronously relative to other related cells and is queued before being multiplexed over the line.

4 LAN Topologies

A network topology discribes the arrangement of the systems/devices on LAN conceptually and pictorially where the servers, workstations, cables, peripheral devices and other network devices are indicated. Following sections describe the most important network topologies mentioned bellow.

1. Star topology
2. Bus topology
3. Ring topology.

4.1 Star Topology : In star topology the workstations are directly connected to the server, which is typically the case with multiuser mainframe or minicomputer environment where the dumb terminal are connected to the main system. The star topology requires more wiring as dedicated line go from the main system to the workstains. Arcnet basically uses star topology although it can use bus topology. The 10Base-T Ethernet can operates in Bus-based Ethernet using a Star-wired configutation using unshielded twisted pair. Using repeaters or hubs with this topology can cover area by creating cascaded star topology, where a cable from a hub can be connected to another hub. For example, a 8-port hub can connect 8 workstions to the hub. In a cascaded star one of the 8 ports is connected to another hub, leaving the rest of 7 ports to the workstations. It should be noted that all the ports can be connected to 8 hubs.

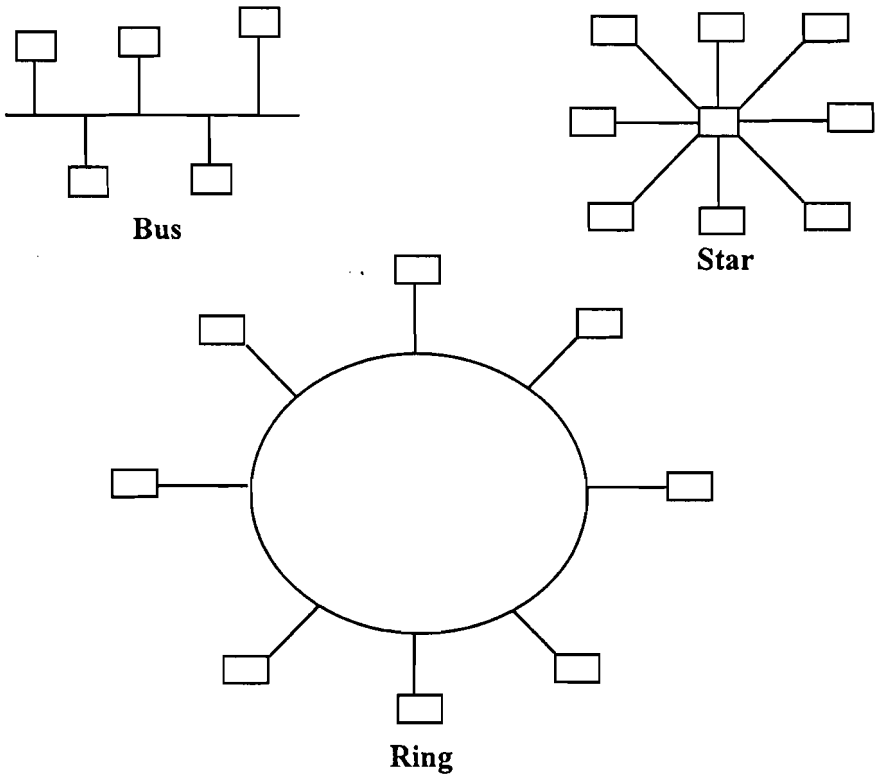

Figure 1 : LAN topologies

4.2 Bus Topology : In a bus topology all the systems and devices on the local area network are attached to a line directly and all signals pass through each of the devices. Each system or device has a unique identity and accept the signal intended for it or signal meant for other systems/devices. It works similar to that of the familiar transport Bus stops, at every bus stop the passengers are either dropped or picked up. Bus topology of LAN is not to be confused with the bus technology used in mother boards of systems. Although the concept works on similar lines the latter is intended for data transmission among hard disks, CD-ROM drives, printers etc, within a single computer system. This topology is fairly popular and is implemented using hubs.

4.3 Ring Topology : In ring topology the systems/devices are connected along a path, where the last system/device is connected to the first, forming a ring (of course, the first or last device has no meaning in ring). The data transmission in a ring is unidirectional and a controlling device intercepts and manages the flow of data transmission. The best examples of this topology is that of Token Ring networks.

5 Cabling

There are broadly three types of cabling used for connecting systems on a LAN viz coaxial, twisted pair, fibre optic lines.

5.1 Coaxial Cables : These cables are widely used by cable TV operators to provide number of channels and are also used by telephone departments. This cable consists of a physical channel carrying signals and this is surrounded by another physical channel, both running along the same axis. The outer layer is used as a ground.

5.2 Twisted Pair : Twisted pair cable, as the name suggests consists of two copper wires, where each is insulated to reduce electromagnetic induction. To transmit a signal both the copper wires are used. Sometimes the twisted pair cable is enclosed in a shield that works as a ground. These cables are called Shielded Twisted Pair (STP). The twisted pair that is not shielded is called Unshielded Twisted pair (UTP). As it is less expensive than coaxial cable, this is the most widely used cables in LANs. There are two categories of twisted pairs cable - cat -3 and cat -5. On fast Ethernet cards, it is essential to use cat - 5 cable.

5.3 Fibre Optical Lines : These lines are made of glass or plastic wire or fibre and the data transmission takes place as light impulses. The advantages of this cable over others are a) the transmission speed is high as signals travel at the speed of light, b) volume of data is high and c) is not prone to electromagnetic disturbances. However, its very costly as it requires expensive protective outer layer and installations is more labour-intensive.

This technology offers the fastest transmission as the speed can range from 155 Mbps to 622 Mbps as this technology can be implementable by hardware rather than software.This technology has lot more promise in the future as it is expected to reach the transmission speed of 10 Gbps.

6 Other Components of LAN

6.1 Hubs : A Hub is similar to a junction box in home electricity, the difference being the data transmitted to-and-fro. A hub consists of a main circuit from which a number of systems are connected using cables mostly twisted pair cables. Generally the hubs are available as 6,8,12,16,24 port hubs.

6.2 Switch : The distinction between hubs and switches is that the hub is the place where data comes together and the switch is what determines how and what data is forwarded from the place where data comes together.

6.3 NIC : A Network Interface Card is a circuit board that is installed on a computer. Both servers and clients are required to have NICs. In an Ethernet based network technology, they are called Ethernet Cards. NICs are connected to the network cable, just as a serial port is connected to a peripheral device like mouse, or printer. In a TCP/IP based network each Ethernet card is assigned an IP address. Sometimes the servers may be fixed with more than one NIC.

6.4 Servers : Broadly servers can be classified as application servers and file servers. The application servers run the programs requested by clients, where as in the case of file servers, the files containing the software are retrieved from the server and loaded onto the clients CPU. In addition, a file server can store common files of all the clients. For example, in a database environment, the database files shared by clients can be stored on the servers and the server takes care of the security measures with regard to read/write permissions. Many operating systems treat peripheral a device as a file. This feature allows the users in a LAN to share peripheral devices like printers, as they are nothing but files to the operating systems.

As many of the Personal Computers have Pentium chips, they can be used as servers. However, it is always expected that a server should have a higher configuration. Of the Intel Chips, Pentium Pro and Pentium II based machines are designed to be used as servers. These servers can be loaded with any of the LAN Operating systems. Other UNIX based Servers are from DIGITAL (Alpha Chip based), SUN Micro Systems, IBM, Silicon Graphic International (SGI), HP. As a general rule the servers should have faster chip, more cache memory, high disk capacity, faster Bus (like EISA bus).

6.5 Network Operating Systems (NOS)

A local area network can have a variety of platforms having different systems. In addiition, a server can act as a client to another server. A machine designated as a client, however, cannot be a server. There are many operating systems that can be used as NOS.

UNIX : UNIX was introduced in 1969 by AT & T Bell Laboratories. As the major part of the operating system was written in C (high level language), it became the first open operating system that could be loaded on to any platform from PCS to Super computers. Unfortunately, this advantage of UNIX led to many variations in UNIX. There are about 18 major flavours of UNIX -- SCO-UNIX, Solaris, UNIX-OSF/I, LINUX etc. UNIX is a highly priced operating system. However, LINUX, a product of the Internet buffs, is freely available on Internet or CD-ROM for a paltry price.

In UNIX based LAN environment, the TCP/IP is used as the network protocol. Each system on the network is uniquely assigned a four-byte IP address, just as in the case of Internet, which uses mostly TCP/IP. The clients, if they are not UNIX machines, use TCP/IP clients. One such program for DOS based PCS is PC-TCP/IP, a freeware from National Centre for Supercomputing Application. However, to use X-windows based programs one has to have an X-emulator on PCS like X vision or Deskview. As network underactivity is with TCP/IP, UNIX can be extended to be on Internet. In fact, UNIX is the most popular OS on Internet, where the servers can be used as LAN and Internet servers.

NETWARE : This product is from Novell Incorporation. Originally Netware was designed to support a network of DOS machines. Recent versions of Netware allow a wide variety of Operating Systems on the LAN, and is extended to be an Internet server. The latest version Netware 5 supports Novell's own IPX protocol and TCP/IP. Its strong competitor is Windows NT.

Windows NT : Windows NT from Microsoft is gaining popularity basically for two reasons. It provides windows environment and it.is cheaper. Of late, it is gaining popularity over Novell Netware, although a feeble contended to UNIX.

7 A Model for Campus Wide Local Area Network

Generally, Universities have a number of departments. In addition, there are a few units which provide a common facility to the entire University, like the library, Computer Centre etc. The departments may be very small and quite large. In case of larger departments, library and Computer Centre, they can have a separate LAN of their own. It is presumed that the campus wide network is having access to Internet.

7.1 Central Computer facility : It is expected that this Centre hosts a large number of systems and is connected to the Internet using a leased line. As far as network design is concerned, it is recommended a Cascaded Star topology with fast Ethernet using Fibre optical line or Thick Ethernet Cable as backbone using TCP/IP protocol.

For Internet connectivity, the Centre requires

a V.35 modem

b a Router

c Primary Domain Name Server

d Secondary Domain Name Server

e a Switch

V.35 Modem : The most widely used Internet connectivity is using 64 Kbps Leased lines from Department of Telecommunication. The DOT provides two pairs of lines and these are connected to the modem. The purpose of the modem is to translate the digital signals of computer to analog so that they can be transmitted over analog telephone lines (modulation) and translate the analog signals it receives form telephone line to digital signals (demodulation) to be passed on to the digital computers.

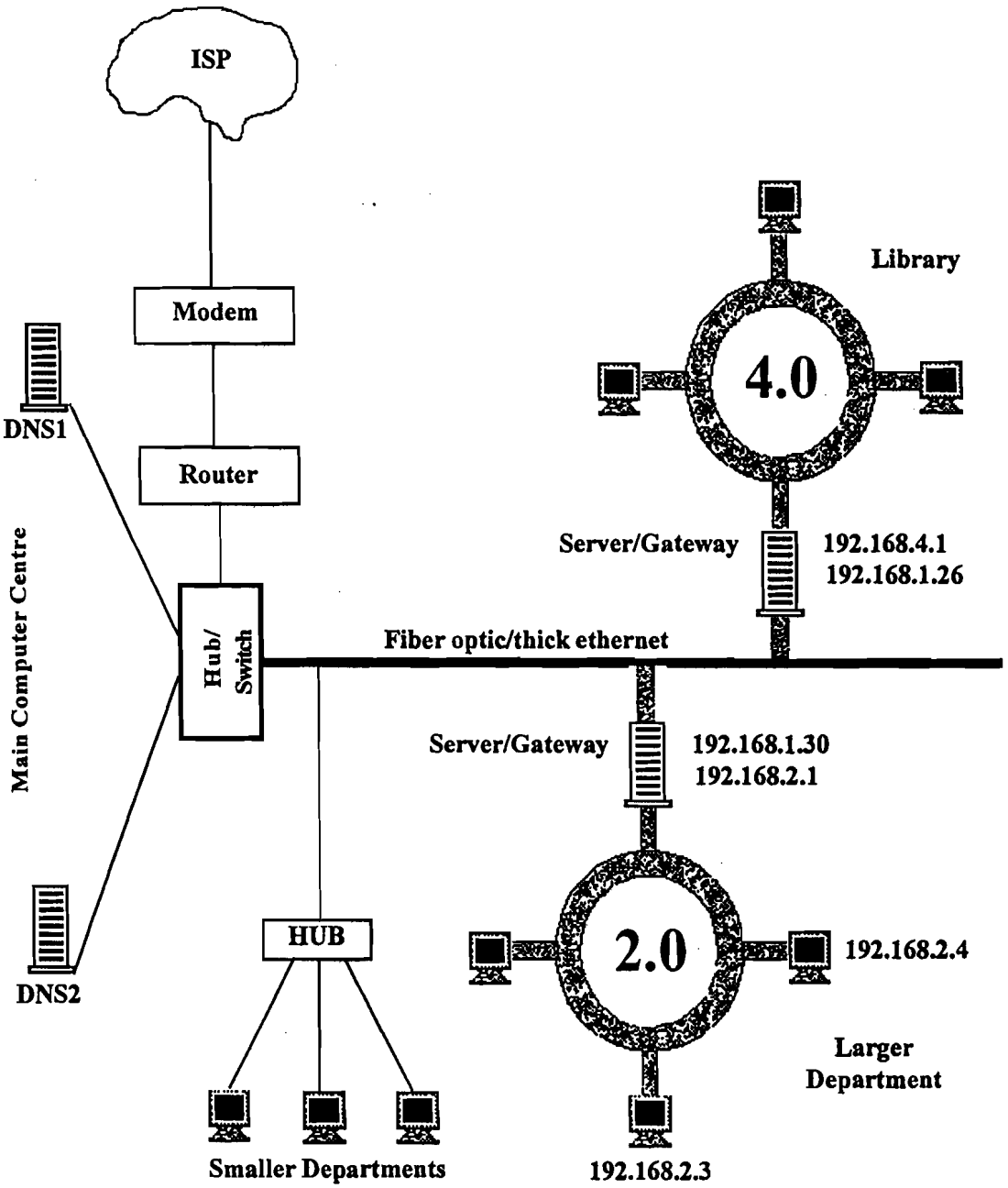

Figure 2: A model for University Campus wide LAN

Router : If Internet connection is used only for one system, a router is not required. However, if the University wishes to provide Internet access to the system on the LAN, router is essential. A router is a device which decides the next network point to which the data (in packets) is to be forwarded. A router consists of a table of the available routes and uses this information along with the best route for a given packet. Typically, a packet may go through a number of networks with routers to reach the destination. In a University network, it can be located at any junction of networks. It is possible to use UNIX machines as routers, however, it is always better to have dedicated routers.

DNS (Domain Name Server) : If one has Internet connectivity to the LAN, the University should have two Domain Name Servers, the first as primary and the second as secondary. The DNS serves the purpose of translating an alphabetic IP address to a numeric address. For example, the alphabetic address of isibang.ac.in gets translated into 202.54.37.80. Both the DNSs ideally should have internal IP addresses.

Cables : The main campus should ideally have a fibre optic cable as a back bone, running across the campus, whereas the departments and library, a twisted pair (Cat 5) cable should be good enough to connect the systems on a department LAN. If the campus is small, thick Ethernet line (coaxial cables) can be used as back bone.

NIC : As fast Ethernet are becoming cheaper and popular, it is advisable to fix a fast Ethernet card on each individual system on the LAN. Each Ethernet card is assigned a unique local IP address. However, the server can have two Ethernet cards one having the local IP address and the other having Internet IP address. That means, these servers can be accessible to others on Internet i.e. from any where in the world these can be accessed.

IP addresses : The IP addresses are allotted by the Internet Service Provider like VSNL or ERNET. The RFC (Request For Comments) 1995 suggests IP address to be allotted for internal use. The university can choose any of the following address systems for their LAN systems

10.0.0.0	to	10.255.255.255
172.16.0.0	to	172.31.255.255
192.168.0.0	to	192.168.255.255

The above numbers are not used by Internet. This is to ensure that no conflict would occur.

However, the IP address of DNS servers and routers is different. For a 64 Kpbs leased line, the Internet service provider allots 16 IP addresses. For example, if the ISP allots 202.54.37.80 - 95, one can use 202.54.37.80 as the shared IP address, the 202.54.37.82 as the address for the DNS1 and for DNS2 one can assign 202.54.37.83. whereas the router

is assigned 202.54.37.81 for Internet purpose and 192.168.1.1. as the LAN IP address, so that each PC on the network recognizes the router as a device on the LAN. In a way the router is used as a default gateway for each PC on the LAN. For this reason, the PC should have PC TCP/IP software or an operating system like windows 95 in which TCP/IP is bundled.

7.2 Library LAN : It is strongly advised that the library should have a server, which should work a LAN server and as an Internet server, so that the library can offer its Online Public Access Catalogue (OPAC) not only to its users and to other libraries on the Internet. This is even more essential as university libraries would be part of INFLIBNET. The server can be Wintel (Windows on Intel Chip) or UNIX depending on the library automation software that is being used.

In addition to the server, the different units in the library like the Acquisition section, Circulation section, Public access catalog, Reference section can have windows 95 based PCS.

Summary : The following lines briefly present the model.

Servers : Unix (Linux) or Windows NT
Clients : PCS with Windows 95
Topology : Cascaded Star
Network Technology : Ethernet
NICs : Fast Ethernet
Backbone Cable : Fiber optical cable or Thick Ethernet Cable
Cable within the departments : UTP Cat-5 cable

For the Internet :

V.35 Modem
Router
Primary DNS server
Secondary DNS server
24-port Switch

8 Conclusion

The ERNET (Education, Research NET work) objective is to provide Internet connectivity to the Educational and R&D institutes, which lays emphasis on the importance of accessing information available world wide. Although, the INFLIBNET is going on at snails pace, it

objective of the network to interconnect all the University libraries and R&D centres. It is imperative that the University Campuses should build their own Local Area Network, laying emphasis on the Library. The model presented should provide a broad picture of the various network technologies, topologies etc and we hope they would serve the purpose of a starting if not it is implemented intoto.

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Information Services in University Libraries Through Intranets

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Abstract

Attempts to draw the attention of university libraries to set up simultaneously an Intranet, Institution's private network using Internet technology, for their own campuses while they are going for establishing LAN with the financial support from INFLIBNET. Discusses the usefulness of Intranet to meet the Librarian's necessity of accessing digitized information from his desk. Defines Intranet with a brief history behind the origination of the concept including its differences with the Internet. Emphasizes on implementing Intranet in university libraries stating the required components in detail. Describes also the hardware and softwares requirement for implementing Intranet facilities in universities. Suggests steps to be followed for establishing Intranet. Identifies the scope of information services to be rendered through the Intranet to the users community of any university. Recommends strongly the university authorities to come forward for providing financial support in implementing Intranet by the university libraries to ensure effective and efficient information services.

1 Introduction

In the age of information explosion, the effective and efficient information services of libraries attached to the institute of higher learning like universities can be rendered through computer network i.e. some interconnected PCs with an intention of sharing resources like files, information, peripherals etc. The INFLIBNET, a nation wide Information and Library Network, is also insisting libraries attached to research and academic institution to develop local area network (LAN) among various sections / departments under the pioneership of central library within their own campuses. In fact, INFLIBNET is a major programme of the UGC initiated in 1991 with an objective to automate and network libraries in Academic and R & D system to facilitate resource sharing at different levels and promote scholarly communication among academicians and researchers in India. Initially started as a project, INFLIBNET became an Inter-University Centre (IUC) of UGC in May 1996. The program is being implemented in phased manner. INFLIBNET has already extended financial support to a good number of universities in India for

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establishing computer facilities in libraries, promoting library house keeping activities and developing computer communication among libraries and information centres.Till now, 87 universities have been funded by the UGC under this program for automation and networking. Remaining universities have been given funding for creating core facilities to enable them to access information. It is expected that most of the remaining university will be covered under this program by the end of the ninth plan period. Very soon, INFLIBNET will have an independent VSAT based captive network covering nearly 170 universities and institution facilitating speedy access to information. Further they (INFLIBNET) have come forward to provide all sort of technical assistance and other support for participating in the Internet. Through the process some of the universities have developed LAN to establish easy communication among academic and administrative departments, sections of libraries etc.

Due to advancement of technologies, it is now easier to co-ordinate and control works / services of all sections / subsections by librarians from his desk over LAN. It is a matter of few minutes, a librarian switches on his PC which starts up the single application available on it but able to interface with all data-sources of his requirement. A single front end that lets him, at a click of a mouse, access information, reports and data generated by different sections that he will use in his decision making process. Instant flow of information, specially among Librarian, Deputy Librarians and Assistant Librarians having responsibilities in different levels, is essential for improving the work and service quality. Intranet has solved the problem of accessing computerised information from their own desk using web handling techniques.

2 Intranet : What it is ?

Some people bear the wrong impression that the 'Intranet' essentially means an in-house website. Just like, Internet does not consist of WWW (World Wide Web) alone, Intranets accumulate many facilities of new technology with lower cost. PCs starts up the single application available on it that interfaces with all the data sources one need to refer. At a click of mouse, a single front end helps to access information. Some information are used by users against their queries whereas some information are strictly used by the top personnel for their decision making process. If librarian wants to know the figures to judge the performance of any section, to review the receipts and non receipts of books and or library materials against the placed orders, to review the utilisation of fund allotted department wise, to review the user services etc, he can have these information at once with a mouse click. All these were possible using technology that first evolved on the Internet, but very quickly moved into closed perimeters of the library premises or campus which is known as Intranet. So, it can be defined as the private network of libraries/ information centres developed using technologies similar to Internet or any other similar technology.

2.1 Origin of Intranet

To understand the historical development of Intranet we must first look at its origin — the Internet, the mother of all networks. Though many presume the Internet to be a fairly recent phenomenon, it actually started off in the late 1960s, and has been growing ever since. But until the early 1990s, a very few actually used the Internet for anything.In 1993, things changed a lot with the introduction of a new technology called WWW. In fact, this technology was not really new - it just bound together existing technologies into a new form. It was 'human - compatible' and could be used by just about anyone without any formal training. And the required components were a computer, a mouse, Internet connection and the Web Browser (i.e. one single application that allowed access to all the information that made the Internet, the biggest information sources in history). To navigate the web, this was sufficient - even the keyboard became an optional accessory of rare usage. It was entirely possible to search for, and find useful information on the web without so much as touching the keyboard. The total scenario seemed to change ridiculously that no one had thought of it before. Some top ranked professional, who so far had shied away from using computer themselves in the office, happily set up and used computer at home to access the Internet.

Now people started to think why they could not implement such technology earlier through which information would be so easy to find, access, download and use. Simultaneously, the need for accessing available information from the everywhere within an organisation was felt as it worked for Internet. Slowly a new field has come into picture - the use of Internet technology to deliver internal information over LAN. Hence the concept of Intranet is born. Intranet is getting popularity among institutions having a large number of users and / or with remote locations distributed over wide geographical areas to facilitate dissemination of information efficiently and effectively.

2.2 Differences between Internet and Intranets

Going to find the difference between Internet and Intranet is more or less an exercise of searching a needle in the haystack. These two use the same technology, the same application, and the same concepts - one could say that they are identical twins, born a few years apart. The Intranet's universe is a particular institution whereas the Internet's universe is the whole world. However, there are purely technical subtle differences among them. The bandwidth used for internet connection is not sufficient, things just do not seem to move fast enough when number of users increased. Whereas Intranets generally have more than enough bandwidth which proves its speedy communication capability.

3 Components of Intranet

For building an Intranet in university libraries, librarian has to think about some essential

components for it. However, most of the cases some of these components will already be available as existing facility, remaining components must be incorporated.

3.1 LAN

A Local Area Network (LAN) is to be treated as essential transport medium of Intranet. In case, the library has existing LAN system having TCP / IP (Transfer Control Protocol / Internet Protocol) server and clients, that will be good enough for building Intranet. However, if existing operating system (OS) is not compatible then it is advisable to add a separate intranet server running a totally different operating system which will support Intranet facilities.

3.2 Protocol

Protocol is a predefined set of rules, basically the language spoken by machines, to communicate with one another. For machines to be able to communicate with each other, they must be running the same protocol. TCP / IP is the protocol of the internet, and by extension, for any Intranet. So TCP / IP should be installed and configured on all servers and clients which are the part of Intranet. However, if it is felt that one or two computers (nodes) are to be kept out of Intranet, that can be done by not implementing TCP / IP on them.

3.3 Hardware and Softwares

As far as hardware is concerned, it may be mentioned that there is no fixed type / configuration. But one machine with latest configuration dedicated to hosting Intranet is always preferred. This will act as a separate server for Intranet application. Server means an application or work-station that provides services, resources, or data to a client application or work-station.

For software, a webserver and a mailserver is needed. In fact, the webserver will host the web pages and dish them out to every one whereas the mailserver will run internal mail system.

(i) *Mailserver :* In case of university libraries, where Intranet is to be implemented, it may be considered that queries from clients (nodes) come in the form of mail. So mail will in all probability be the major application on intranet. Users from all community will be using this application which is able to produce the most immediate results in terms of increased productivity from reducing time and costs. In fact mail is one of the easiest services to implement on intranet. So it is often a good idea to start intranet with just in-house e-mail facility, and then slowly work towards implementing the rest of the facilities.

(ii) *Webserver:* Though it may not be essential in beginning, but the most visible

part of any intranet will be the webpages put up in near future. And to get them up, a webserver is must. They ranges from personal webservers to heavy duty ones. Selecting the webserver mainly depends on the volume of webpages, those are expected to be put up and number of clients those will be accessing them. Now-a-days network operating systems (NOS) come with bundled web servers, e.g. IIS (Internet Information Server) is attached with Windows NT. However for a small setup, Microsoft Personal Webserver for Windows 95 is good enough to start with.

A proposed configuration for server / nodes are given in Appendices.

3.4 Web Browsers and Editors

Browsers are web access softwares which act as the interfacing tools for browsing information on the Internet. Now-a-days the browsers are becoming a universal front-end for many things including mail. The two heavy weight browsers Netscape Navigator and Internet Explorer, come with bundled e-mail front-ends. However, they go much beyond displaying webpages and reading mail. So Intranet, Internet and local hard disks, all merge into one and user can navigate them as in the same way that people do to navigate webpage. Moreover, Netscape Navigator has become communicator and integrates Web Authoring, Conferencing etc. Thus there are compelling reasons to go for one of these two heavy weight browsers.

For creating any web document, an editor is needed. An HTML editor makes things more elegant in respect of designing the pages. HTML coders are getting popularity as they supports WYSIWYG (What You See Is What You Get) techniques which emphasizes on content and layout. However organisation of pages is the most important issue, which is to be done very carefully so that users become more interested to use it. In this respect, librarian's experience, knowledge on handling professional tools and techniques will be better than any other experts.

3.5 Web-ware Productivity tools

The important point to bear in mind that the HTML editors are to be used only for getting the ground work done. For regular work, web-ware productivity tools - word processor, spreadsheets, presentations package - can be used to publish to Iintranet. All three suites - Corel Perfect Office 7/8, Lotus Smart Suite 97, and Microsoft Office 97 are webware and can be used for Intranet publishing.

3.6 E-mail Front-ends

E-mail front-ends are used to handle e-mail services through Intranet. Today e-mail front ends are bundled with different operating systems. E-mail front-ends is a part of Internet Explorer of Windows 95. Pine of Unix running machine can also be accessed for this purpose by telenetting to the Unix host. Microsoft Office 97 offers a front-end for e-mail through its outlook services.

3.7 Proxy Server

Universities, generally, suffer from financial limitations, leaving the dream to have more than one Internet connection single connection is treated as good enough for universities. A single internet dial-up connection to the Intranet can be shared by multiple users installing a proxy server. A proxy server is a piece of software installed on the PC that dials up to the Internet. When that PC connects to the Internet, other users on the local network can access the Internet through proxy server. That means they can access the web, read mail, ftp, telnet and do any thing else as if each of them has a live connection through a separate modem and phone line. Of course, if everyone's finally sharing one phone line and 33.6 kbps modem connections, things begin to slow down as more user come online. But it is still a dramatically effective way to share an Internet connection among many users. However installation of fast leased line will provide a better result.

To provide Internet services through Intranet, a proxy server is must. The proxy server dials in to Internet connection (TCP / IP) and all the nodes on the network can access the Internet through the proxy.

4 Setting up an Intranet

Library and Information Centres deal with DBMS package mainly and some office management packages a very little. For providing effective information services, developing LAN system slowly becomes mandatory. Considering the university library has existing LAN facilities, steps to be followed for setting up an Intranet system are discussed here. It would be easier to implement intranet, if a working LAN system is existing in the university.

4.1 Planning for Intranet

Efficiency of intranet depends on its planning. So this beginning step has importance and must be worked out carefully. If necessary, already existed Intranet of other organisation

must be visited to share ideas, also experts opinion can be sought for technical support in this regard. Decision has to be taken regarding to what extent Intranet will be available to its users, whether personal pages will be allowed, guidelines for layout of the pages, who will administer the site etc. Also other decision like whether the Intranet would be connected to Internet either through leased lines or dial up lines; whether this connections would be just for e-mail or would be allowed to browse web.

In case of university libraries, it may be assumed that at least one node will be provided for each sections. In fact there must be some nodes dedicated for user services. Depending on the type of work / services to be carried out by the nodes, a strong decision has to be taken for providing facilities. Accordingly interface programs to different applications are to be chosen.

In fact, to administer Intranet a committee is to be formed. Decision on Intranet styles and content should mostly be defined by that committed. And these decisions are to be taken on the basis of convenience of user group within broad frameworks to be established by the mechanism that are normally followed in the library concern.

4.2 Organising Intranet

This step may also be known as system structuring. Intranet planning to be fruitful needs its sound organisation, which means that such a structure is to be established which is capable of achieving the set goals. It includes addressing for Intranets. Computers (nodes) on an Intranet will know each other by the IP address assigned to interfaces / network cards. A computer may have more than one / network cards and so each of them will be assigned different IP addresses. An IP address is a number to represent a network card uniquely on the Internet or on the Intranet. In an IP based Intranet, every machine on the same physical networks sees all the data packets sent out on the network. As the number of nodes on a network grows, network traffic will grow many fold, bringing down performance drastically. In such a situation, proper organisation is needed. The total Intranet has to be divided into different subnetworks to minimise the traffic across the different subnetworks. Interconnection between the different subnets would be provided by routers, which will only transmit data meant for another subnet across itself.

4.3 Selecting Hardware and Softwares

Selection of hardware and softwares is the crucial step where anticipated future has to be considered with the present existing system. The computer world is ever changing. In

this situation a concrete decision is to be taken regarding the configuration of server and nodes. The server machine will depend on the size of the Intranet, number of nodes to be added in future. It is always preferable to go for latest configuration available in the market. For example, Pentium II microprocessor of 333 MHz is the latest model today, so this can be selected with Ultra Fast and Wide SCSI Hard disk and 64 MB RAM or more. Now-a-days, most of the softwares come on CD ROM, so CD drive is essential. For taking back ups regularly, backup devices like CTD (Cartridge Tape Drive), DAT (Digital Audio Tape) drive etc must be added. For future expansion, suitable provision must be kept. However, a proposal on configuration for hardware is given in the Appendix I.

Presently, INFLIBNET is providing some financial assistance to university libraries for their computerisation. In fact, they have suggested some configuration also in the point of view that university libraries may develop LAN. It would be better idea for university authority to add some extra fund with that and going for developing campus Intranet on the basis of need.

4.4 Developing Prototype Model

It is not a good approach to provide access to all users from the very beginning. Rather this can be implemented for a very few selective clients to test and to stabilize the system. In case of a large campus university, different academic and administrative departments are situated in different places individually or two / three departments are placed in separate buildings. While planning to set up Intranet in such a situation, there may be accumulation of Bus, Ring and Star topological architecture and also those are organised mostly by dividing them into different subnetworks. Each subnetwork is formed by connecting some of the departments / sections. So it is always preferable to implement Intranet facilities in individual subnetwork one by one to observe its efficiency. Finally, total Intranet system will be implemented.

4.5 Manpower Development

Manpower development implies making people knowledgeable about handling the new technology. The personnel of the university library must be well trained on how to work with Intranet and specially how to combine professional tools and techniques with the facilities available in Intranet. This can be arranged by inviting experts to the library or sending personnels to specialised institutes who are arranging such training course.

4.6 Quality Controlling in Productivity

In case of university, implementing new technology is very difficult, unless it could be proved that the new system is really more productive in the sense of its usefulness. And university authority must be convinced, otherwise they will become the constraint. So it is the duty of Librarians / Deputy Librarians / Assistant Librarians to make the system more productive with high quality. User satisfaction is one of the parameters to judge the system's quality. Librarians has to have keen watch on the total system to improve the quality of works and services of different sections.

4.7 Collecting Feed Back

Collecting feed back from the user as well as from the personnels is the best way to know the effectiveness of services rendered from different sections. While implementing new technology, it can not be expected that the system will bring full satisfaction to its users from the very beginning. Always there must be a scope of collecting feed back mainly from users. Frequent meeting with all professional staff also will provide some suggestion to overcome difficulties and dissatisfaction.

4.8 Carrying out R & D Activity

For the betterment of the activities of the system where new technology has been implemented, there must be a scope of rethinking and restructuring. So the librarian can constitute a small R & D cell having a few interested professionals who will able to contribute their ideas. On the basis of outcome of their meeting, new things may be implemented for testing. If it works well, then that particular feature can be added to the Intranet for ever. Slowly this R & D activity will prove the efficiency and effectiveness of the new technology which will help to increase faith on the library professionals.

5 Information Services and Intranets

Due to severe financial constraint the university libraries were suffering a lot. Thank to INFLIBNET for taking initiative to help university libraries and give them a new life. All traditional services can be rendered by implementing Intranet. As it has already been mentioned that Intranet works in the line of Internet, knowledge of web authoring is required for working with the Intranets. Mainly knowledge of editing HTML document using any well known Web editor (e.g. Frontpage 98) and browsing them is essential. There is enormous scope of providing fruitful information work and services through Intranets. However, few are enlisted here.

(a) Reference Services : Reference Section is one of the most essential and important sections for university libraries. Users from their own desk can put reference queries in a specific web page built for reference services and in response of which the Reference Librarian (i.e. Assistant Librarian of Reference Section) can reply in the same way. Besides with the advent of Compact Disk (CD) and multimedia technologies, now-a-days, reference tools like atlases, dictionaries, encyclopaedias, manuals, year books, directories are available on CDs. If these reference tools are mounted on jukebox and connected as CD network being a part of Intranet, users will be allowed to access these at a time through Intranet.

(b) Current Content Service : Current-contents, the most popular Current Awareness Service (CAS) , can be provided through Intranet. Contents pages of received journals can be published as "CURRENT CONTENTS" webpage on the Intranet either by key-in through keyboard or by scanning with scanner. User will browse the corresponding webpage to access information.

(c) New Arrivals Information Services : Most of the university libraries are maintaining a separate stack named as "NEW ARRIVALS" where latest additions like books are displayed first. This also can be done through a dedicated "NEW ARRIVALS" webpage of Intranet. Cover pages and title pages of those books can be scanned , stored as image files and linked them through the respective webpage which will help user to find documents, if any, of their Internet.

(d) Periodical Subscription Information Services : For the periodical sections, a webpage may be developed containing information about journal subscriptions. It should able to generate a report on various points like title of the journal, volume, issue number, publisher, ISSN, subscription rate, period for which subscribed, date of receive, last issue received etc. In fact, this will help user to know the availability of a particular issue as well as the librarian to send an intimation for missing issues.

Only four information services are illustrated here. However, other services like Online Catalogue, Online Circulation, SDI etc will also be possible through Intranet. Besides these information services librarians will able to perform some administration works over Intranet. For example, generally book ordering is done only after selection of books by academic departments in universities. So librarian can serve a notice to departments

requesting to select books mentioning the amount allotted for respective departments over Intranet. In response to which departments can also send the list of selected books to be procured to the librarian over the same Intranet. Similarly all other administrative works and servises like sending correspodences, memorandum, reminders etc will be performed successfully by the librarian using Intranet.

6 Conclusion

Intranet is the latest technology which has added the new dimension to the effective and efficient information services in the automated and network environment. The Intranet based resources and services are valuable and slowly becoming popular. Intranet is able to provide information on queries as and when needed.With the financial support of INFLIBNET, university libraries are going for developing LAN. Hence it is a right time for librarians to convince the university authority about the usefulness of Intranet so that it can be implemented to enhance efficiency of information system to have user satisfaction. Also university authority should encourage librarians and extend support to introduce Intranet.

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APPENDIX - I

Hardware and Peripherals

A proposed configuration of Computers (Server / Nodes) for developing an intranet in a University campus.

Sl. No.	Specifications
1	**Server**
	Pentium II Server
	CPU :Pentium II @ 333 MHz
	Cache :512 KB (Write Back)
	RAM : 64 MB SDRAM ECC, Upgradable to 384 MB
	Hard Disk :10 GB Ultrafast and wide SCSI, Upgradable to 36 GB Hot Plugability
	CD-Drive :32 X
	Floppy Drive :2.88 MB (3.5 inch)
	Ethernet Card :32 bit PCI (100 MBPS)
	Key Board :PS / 2
	Monitor :Color 21 inch SVGA (1024 X 768 pixel)
	Mouse :Microsoft

DAT :4 /8 GB on SCSI controller

Windows 98 bundled

Machine to be Windows 98, Windows NT, SCO UNIX, Novell Netware certified.

All controllers to be 32 bit.

2 Proxy Server

Pentium II Desktop

CPU :Pentium II @ 300 MHz

Cache :512 KB (Write back)

RAM :64 MB SDRM ECC

Hard Disk :4 GB Ultrafast and wide SCSI

CD-Drive :32 X with Multimedia Kit

Floppy Drive :2.88 MB (3.5 inch)

Ethernet Card :32 bit PCI (100 MBPS)

Key Board :PS / 2

Monitor :Color 21 inch SVGA (1024 X 768 pixel)

Controller :AGP with 4MB

Mouse :Microsoft

Windows 98 bundled

Machine to be Windows 98, Windows NT, SCO UNIX, Novell Netware certified.

All controllers to be 32 bit.

3 Nodes

Pentium II Desktop

CPU :Pentium II @ 300 MHz

Cache :512 KB

RAM :32 MB SDRAM, Upgradable to 64 MB

Hard Disk :4.3 GB UDMA

CD-Drive : 32 X

Floppy Drive :2.88 MB

Ethernet Card :32 bit PCI (100 MBPS)

Key Board :PS / 2

Monitor :Color 14 inch SVGA Card with 2 MB RAM

Mouse :Microsoft

Windows 98 bundled

Machine to be Windows 98, Windows NT, SCO UNIX, Novell Netware certified.

All controllers to be 32 bit.

4 **Printers**

a)Epson 24 pin, 136 Column, 330cps LQ 2070 + DX Printer

b)HP Deskjet 890C Printer

c)Laser Jet Printer HP LJ 6L (600dpi, A4 size, 6PPM)

5 **Hubs** :UTP Hub - 16 Port and 8 port

6 **Modem** : 33.6 Kbps modem with Leased line telephone connection

7 **Barcode Scanner** :CCD Scanner with Windows based Barcode Generating Software

8 **Color Scanner** :HP Scanner SJ 6100 C

9 **GIST cards**

10 **CD Towers**

APPENDIX - II

Softwares

1 Windows 98

2 Intranetware from Novell

a) Novell Web Server 3.1

b) Internet Access Server

c) Intranetware FTP Server with client access licence

or

MS Windows NT 4.0 (Internet Information Server 3)

a) Option pack

b) MS Windows NT Server Client Access License

3 Frontpage 98

4 MS SQL Server 6.5 with Client Access licence

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Universals in Information Languages : Psycho-Linguistic Evidences

*Subal Chandra Biswas**

Abstract

Communication of information is the major concern of information science; language is the primary vehicle for communication of information. An 'information language' (IL) is a means of communication of information about documents to the potential users of those documents in an information system. In their search for universally valid general principles of ILs, information scientists have looked into many fields of study including linguistics and/or psychology to establish their theses. This paper attempts to evaluate the works of information scientists belonging to the above categories. Concludes that psycho-linguistic explanations are not enough to prove the claims of universality of ILs

1 Introduction

Communication of feelings and information have intergral and indispensable aspects of life not only of the human beings, but also of the large number of members of the animal kingdom since time immemorial. As a result, scholars have spent lot of time to find out the intricacies of the communication process in general and human communication process in particular. Human communication process involves *language*, which is the spectrum from *thought* through speech, encompassing the auditory, visual tactile, and gestural modes. Linguistics is the science of language, where as psychology is the science that explains the human thinking processes. Thus it can be said with confidence that human communication process is essentially a psycho-linguistic one and knowledges of both psychology and linguistics are required to get into the heart of the process.

2 Information Languages

Languages are of two basic kinds, viz, natural languages (those people use in their day-to-day communication) and artificial languages (like those used in computers, music, indexes, etc). The essential ingredients of natural language (NL) are : (i) the elements/vocabulary,

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(ii) the semantics, describing those *a priori* relationships between the elements, and (iii) the syntax, prescribing those *a posteriori* relationships followed during formulation of admissible expressions.

Information systems are concerned with the communication of information about documents to the potential users of those documents. The means of communication are the 'information languages" (ILs) of information systems, which also belong to the category of aritificial languages. ILs are alternatively known as 'information retrieval languages', 'documentary languages', etc. An IL has been defined as any set of symbols used for expressing certain characteristics of data on which data processing is performed, in whatever field. The data are frequentlty verbal data. Generally ILs are organised on the semantic plane in the manner of a classification system. Furthermore, these languages possess some form of organisation on the syntactic plane through rules permitting valid combination order. There is a general agreement among the great majority of writers on ILs that they are genuine language systems and that similar descriptions in terms of vocabulary, syntax and semantics are appropriate. However, there are some marked differences between the two as well (cf. 5). Classificatory languages using notations such as the classification schemes and verbal indexing languages like subject heading lists, thesauri, etc. are the two major sub-categories of ILs.

3 Universals in Information Languages [1]

The history of classification theory is to a large extent the history of a search for the general principles of organization and arrangement that can form the foundations of universally valid and acceptable systems of classification. The search is a natural outgrowth of the basic purpose ILs, the normalization and standardization of communication : the more nearly the fundamental structural principles of ILs conform to the mode of thinking, writing and understanding of the majority of their users the better they can perform their founctions.

With these aims in mind classificationists have searched for universals in many fields of study: from logic and biological taxonomy are derived most of the basic principles of classification (such as, the 'whole-part' relation, the 'genus-species' relation), from the philosophy of science many ILs have taken the skeleton of the main classes (e.G., Dewey Decimal Classification from the Baconian Scheme), from general systems theory the Classification Research Group (UK) has adopted the 'theory of integrative levels' (18, 4), in developmental psychology Farradane (15) has found the basis for his relational indexing. In searching the 'hidden roots of classification', Ranganathan (26) suggested that there may be an " Absolute Syntax" for subject descriptions: a sequence in which ideas "arrange themselves in the minds of a majority of persons" regardless of with ordinary human language they speak.

4 Linguistic Universals in Information Languages

Although, many ILs use NL words for their purpose (such as, majority of indexing languages), information scientists have rarely looked for universals in natural language. But this is ture only of surface forms in NL. Many linguists believe that at a 'deep' level there are universal features of NL. If this is so, then there are obvious implications for the construction of ILs having some claim to universal validity.

In recent years, there have been several attempts to prove or disprove the theory that, search for universals in ILs is essentially parallel to search for universals in NLs. The issue is a multi-faceted one. First, there are those 'non-believers', who assert that an IL differs from NL to such an extent that one cannot expect linguistics to provide adequate explanations of the ways in which IL functions. The group, itself, is divided into two sub-groups, according to the reasoning they provide. One group believes that "Language (NL) is not a medium of expression developed specially for exact and consistent transmission of meaning (as required in ILs)" and these "inconsistencies of language present a formidable barrier" to the forming of universally acceptable structure of ILs (14, p. 298). NLs are so varied that, "the number of Linguistic Syntaxes for the name of a subject, in the different natural languages all taken together, can become as great as factorial *n*, where *n* is the number of kernel terms in the name of the subject" (26, p. 409). The workers in this group support the use of traditional library classification schemes using symbols, to represent concepts and their interrelationships rather than ambiguous NL expressions. In contrast, the other group regards linguistic explantions as over-refined for the purpose of IL description. They are especially concerned with automated language processing and/or automatic indexing. Workers involved in these researches (e.g., Sparck Jones, Kay, Salton, Montgomery, etc.), feel that the link between linguistics and information science remained unexploited, because "an explicit knowledge of how human beings receive and transmit information was practically unnecessary so long as information processing operations such as indexing were performed by humans" (24, p. 195).

Second, there are those few 'faithfuls', for whom it is a plausible assumption that, should universals of language exist, they may be more easily detectable in an IL than in NL, because, ILs in general are highly structured and condensed (9).

In between comes the third group, whom we can call the 'moderates'. According to this group, the ways in which subject statements (e.g., titles, subject headings and index entries) convey their meanings cannot always be entirely explained through paradigms developed for the analysis of NL. Two main arguments were put forward to support this view (3, pp. 130-131):

(a) the linguist is concerned with a wider spectrum of expressions than those found in subject headings, indexes, etc. The latters are actually formalized subsets of NL, or paralanguages. Consequently, some but not all linguistic theories have relevance for the documentalist;

(b) more strongly, subject statements should not be regarded as a kind or subset of NL utterances, but need to be seen as expressions of different kind, constructed in accordance with their own rules, and therefore requiring their own explanations.

The works of Lynch, Coates, Austin, etc., can be cited as examples of indexing languages subscribing to this line of thinking.

Among ILs, the classificatory languages seem to be least dependent on NL principles, if only because concepts are expressed by symbols rather than words. Class- and hierarchy-builiding and establishment of categorical relationships among concepts were the preoccupation of classificationists, rather than organizing the concepts deliberately into NL syntagms. But, it is possible to trace certain elememts of NL construction (e.g., in its passive declarative sentence form) in classification schemes too (as in Vickery's (29) "Standard order" -- Thing (Product) - Constituent - Property - Patient - Action - Agent), especially when schedules deal with concepts relatable as object, action, etc. To Many classificationists this may appear to be nothing but nostalgia. On the other hand, indexing languages such as, post-coordinate indexes, have given priority to semantic relationships, implied in the terms acting as retrieval keys. Boolean functions (e.g., AND, OR, NOT) are used to link terms at the search stage, which are best regarded as logical rather than syntactical relationships. Despite the fact that, such systems performed fairly well in natural and physical sciences (where the relations are fairly straightforward), problems arose when attempts were made to use them in the social sciences, where a set of concepts can be interrelated in several meaningful ways. Solutions in the form of role-indicating words (e.g., EJC (Engineers Joint Council) and WRU (Western Reserve University) 'Roles'), attachable to indexing terms, were introduced. Some saw these roles as parallels to case marking systems in NLs (11). But, it should be kept in mind that, for both classification schemes and post-coordinte indexes, these are examples of post hoc explanation, not the description of any ad hoc attempt.

The other category of indexing languages, viz., pre-coordinate indexes, try to resolve the ambiguities faced by post-coordinate indexes, by organizing terms into meaningful subject statements, so that their entries come closer to NL. Therefore, it might be conjectured that, they are the systems (apart from automated indexing systems) most likely to benefit from the application of linguistic universals, if any. Here again, most systems have possibly evolved in a pragmatic fashion, without an obvious need for explicit reference to general linguistic principles. But, it could be observed that, intuitively, workers were applying linguistic tools (e.g., word order in passive sentences, prepositions, conjunctions,

punctuation marks, etc.) in the formulation of index entries. Coates (10) proposed the use of propositions as tests of concept relationships during the stage of subject analysis, especially in systems where the order of nouns in index entries is intended to reflect their relative significance. His table of twenty dyadic relationships, each accompanied by its commonest English preposition, has been used in British Technology Index to determine the order of terms in index entries. Lynch and others (1, 23), in devising the Articulated Subject Index in Chemical Abstracts, noted the importance of, firstly, the formal order of noun or noun phrase components, for the quality of entries; and, secondly, that of prepositions, connectives and punctuation marks in marking the boundaries of these components in such a way that the parts can be easily re-arranged into a single title-like phrase. Austin's PRECIS was also developed during the late sixties in an attempt to avoid the fallibility of the then existing schemes of general classification for consistent retrieval of information and their unsuitabiltity for computer manipulation. All these came into light due to the Classification Research Group's (UK) work to review the need for a new general bibliographic scheme during 1964-68 and the involvement of British National Bibliography (absorbed into the British Library in 1974) with the UK-MARC project (17, p p.254). There was no doubt in Austin's mind about PRECIS' legacy to classificatory principles, especially to faceted classification, when he says "PRECIS is a direct descendant of faceted classification", and "the design of an indexing system which is based upon organized word strings must take some account of the principles which have been developed to regulate the citation order in faceted classifications" (2, p.53). But, certainly, "this is not to say that these principles can be applied with equal effect to strings of terms selected from natural language". Later, partly due to the success with which PRECIS was applied in non-English languages and partly to avoid suggestions from some quarters (22) to establish its resemblance with faceted classification schemes, led Austin to seek a new basis for explanation of the general principles working behind PRECIS. As Austin (3, p.1) himself said,

> "a third important factor which has frequently been overlooked by writers on indexing and classification, ...was an increasing tendency, from the earliest trials with PRECIS, to abandon what might be called a classificatory approach to the organisation of terms in index entries and adopt instead an order which calls for *an explanation in terms of grammatical categories and relations"* (italics added).

5 Evidence from Theoretical Linguistics

Language (or linguistic) universals can be defined as aspects of language which are common to all languages, no matter whether these be universals of structure or of the meaning content of a language. The question, whether there are universals in natural language or not, has generated considerable controversy among linguists in the past. Some linguists even deny the existence of the so-called linguistic universals and claim that human languages have no distinguishing characteristics as such (21, p.143).

Most of the attempts to date to discuss universals have been syntactically-based studies. In the past three or so decades, there has been a discernible trend towards recognising that such universals as may exist would necessarily be semantically-based. That is, it is the meaning, or more abstractly, the conceptual processes which are being discussed (6, p.55). A notable exception to this generalization are the many Soviet linguists, who have a unique tradition in lexicology and related semantic studies equally as important as phonology and grammar. Here again, there is an ongoing debate over the role of syntax versus that of semantics in the explication of universals, and the two sides have been conveniently labeled as 'Transfor-mationalists' and 'Lexicalists' (24, p.210), respectively. The issue remained a much-debated and un-resolved one for a long time (30, p. 85).

The first step towards the recognition of general linguistic principles is usually traced to Ferdinand de Saussure, who introduced and anticipated a number of important distinctions in linguistics. One such distinction he introduced, is between syntagmatic and paradigmatic relationships. He also anticipated distinction between the notions of 'deep structure' and 'surface structure' of language, proposed by later linguists. The development of an 'ideal language' in which each simple idea is represented by a single symbol and an algorithm provided for their combination to represent complex ideas was, a cherished dream of Leibniz. In his classic work on language, Whorf stated that, every language contains terms that have come to attain cosmic scope of reference that crystallize in themselves the basic postulations of an unformulated philosophy, the examples of which are words, such as reality, substance, matter, space, time, past, present, future, etc.

However, the true beginning of the searh for linguistic universls began with the school of transformational-generative (TG) grammar, led by Chomsky (12,13). Chomsky postulated that what is common in a language structure is the underlying meaning of a sentence. That is, all sentences have a fundamental 'deep' structure upon which transformations can be performed in order to create variant surface forms of sentences. To explain this phenomenon, Chomsky quoted an insightful remark by Humboldt, who suggested, in 1836, that language "... makes infinite use of finite means". For example, the sentence "The librarian gave the book to the reader" can be transformed by the appropriate rules into the passive form, the question form and so on. Chomsky further speculated that humans are born with the ability to perform these transformations, and that there is a genetic programming for this aspect of language. As supporting evidence for this view, he cited the human ability to learn so rapidly to use language, and, what is more important, to comprehend language. In addition, humans, from the earliest days of speech, are endlessly creative in language terms. We can, at will, both produce and comprehend sentences never before spoken or heard. Thus, the universal here is that of the innate knowledge of the deep stucture of language and the ability to perform transformations on it. Names like, Katz, Fodor and Postal, easily come to mind as members belonging to this school.

McNeil commenting on Bailey's work says: "Since innate ideas are not arbitrary, deep structures are universal among languages. In Bailey's theory child and adult speech converge beautifully at the most crucial level -- at the level of the deep structure where meaning is organised -- and diverge elsewhere, at the level of sound". Birnbaum suggested a multi-layered syntactic structure between the deepest of the deep structures and the surface structure.

In Chomsky's TG grammar, categories in sentences are named, e.g., verbs, nouns, verb phrases, noun phrases, and the like. A number of linguists held that Chomsky's theory did not go far enough in providing for the semantic element in language. The introduction of 'deep cases' as linguistic universals is usually attributed to Fillmore (16), who accepted TG grammer as his starting point, but pointed out that transformations cannot be explained adequately without reference to inter-concept relationships more specific than those between noun phrases and verb phrases. According to Fillmore, it is the relations among words (phrases) in sentences which are of prime importance. If sentences are analysed for deep structure, then the case relationships appearing in the deep structure are considered central. An example may clarify this: "The teacher distributed the course-work among the students". In this sentence, the deep structure involves the four words, viz., teacher, distribute, course-work, students. The central action is the verb ' distribute' around which the rest of the sentence revolves (Fig. 1). The object of the action distributing is 'course-work', the agent is the 'teacher', while the benefactor (recipient) of the action is 'students'.

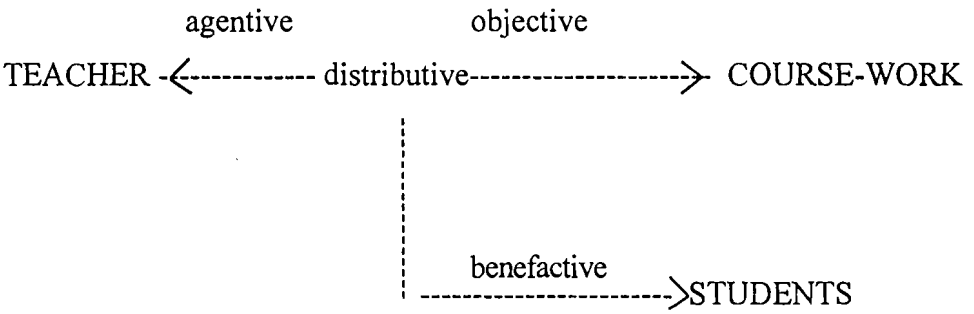

Figure 1 : Case Relationships

Fillmore introduced the term 'deep case' as a generic to cover a range of syntactical situations which may not be manifested as surface cases. He offered a basic set of deep cases as linguistic universals, the more important of which, from an indexing point of view, are agentive, instrument, dative, factitive, locative, objective, benefactive. This theory is fundamental to a linguistic explanation of Austin's PRECIS.

6 Cognitive Aspects of Language Processing

Both of the previous theories (i.e., Chomsky's, TG grammar and Fillmore's case grammar) have concentrated more on the syntactic than the semantic level, despite Fillmore's intent to extend the 'meaning' aspect of TG grammar. A whole range of inquiries from areas such as, artificial intelligence, machine translation, cognitive psychology and linguistics, have given rise to the prevalent notion that the cognitive aspects of language processing need to be taken into account in attempting to develop any further theories of language. A central question in psychology (and to some extent in linguiistics) and one which has been argued extensively in the history of philosophy, is this: is meaning pure thought, and is the rest the formal language we speak? Several attempts have been made to answer this question during the second half of this century.

Ideas are largely products of intellectual activity, which is known to be controlled by brain. There is considerable similarity in the structure, and therefore, in the functioning of the brain in a majority of normal human beings. Thus, a majority of normal human beings have more or less a similar mode of thinking and learning -- that is, in forming ideas and in combining them to build knowledge-structures. It is further stated that ***biologically*** man has not changed to any appreciable extent since the emergence of ***Homo sapiens'***; for, the structure of the genetic material has not appreciably changed since then -- that is, for some 500,000 years -- although we have changed culturally. Therefore, the probability of a sudden change -- that is, a mutation -- in the mode of thinking and learning of a majority of normal human beings in the immediate future is quite low (25, p. 325). Hence, if the cognitive processes are biologically simiilar and expression of thought into some kind of deep structure of language can be modelled, then the resulting universals might be better suited for application into ILs. What follows is an ouline description of some such theories.

6.1 Approaches to Thought and Language

Object-referent theory: This is one of the oldest theories of meaning. It's invalidity is rather easy to demonstrate. It is evident that there are many names for things which area easy to see: libraries, students, book-mobiles, and so on. In attempting to generalize about NLs, a referential theory of meaning inevitably runs into difficulty for the reason that many words lack real-world referents. For instance, it is difficult to imagine what is named by abstract words such as, attitude, skill, efficiency, etc., since these correspond to no physical entities in the real world. According to Svenonius (28, p.74), "To meet criticisms like this those who endeavour to maintain a consistent referential theory of meaning are obliged to invent perceptual or conceptual constructs to serve as referent for abstract words -- in effect, a Platonic heaven".

Behaviourist approach: Psychologists belonging to this group believed that, thought is the movement of vocal musculature. If one cannot speak, ***ipso facto*** one cannot think. However, tests carried out on volunteers, immoblized by a certain drug injected in their body, reported

that they were able to think and mentally complete several pre-assigned problem-solving tasks. This theory, in terms of language, and by extension, of meaning, would hold that the meanings of words are acquired through imitation, practice, and reinforcement. Children do imitate some of the sounds they hear, but, at the same time, they also produce many of their own which has no parallel in adult speech. But the behavioural theory has failed to explain the reason behind the child's ability to produce and understand sentences which he/she has never heard before.

The cognitive development viewpoint: In this view, held by Piaget, Bruner, Vygotsky, among others, language and thought influence and reflect one another. Thought, however, is the pacemaker, which is integrated through the developmental process. Piaget and Inhelder pointed out that "It is possible to show the similarity between Piaget's description of sensory-motor structure and Chomsky's deep structure of language". But, the major difference is that, Chomsky believes that humans are born with a genetic programming for certain language universals, and thought and language are entirely separate processes. Piagetians believe that language is grafted on to thought and there is nothing such as innateness of language. Many linguists and psycholinguists concerned with the interconnections between language and thought, hold an amalgamation of both the views. Psycholinguists take an experimental approach, as opposed to Chomskyans who are fundamentally theorists, as we have mentioned in the previous section.

6.2 Experimental Theories of Meaning

Semantic features and related hypotheses: Among the experimental theories of psycholinguists, the most widely known hypotheses are those relating to semantic features. It requires division of a word into sub-units. The meaning of a word is not considered an indivisible unit; for instance, the word 'bat' is ambiguous. It can mean either that which is used to hit the ball in cricket, or a small, flying, furry animal. Once qualified with cricket -- cricket bat -- the ambiguity is eliminated. But, if one says, "I saw the bat", the meaning is ambiguous. According to Clark, the child gathers information through his perceptual system to which he relates possible meanings of words. Children seem to acquire simpler concepts (those with less features) first, and, conversely, tend to assume simpler meaning when using the more complex term. A number of related studies evolved after the semantic features hypothesis. Their findings may be summarized as:

(a) terms develop in children systematically as a set, rather than as individual words, i.e., the words do not exist in isolation;

(b) particular concepts are central to the development of terms;

(c) focal colours are defined by unknown, as yet, percepual and cognitive factors common to all human beings; and

(d) the actual or proposed development of hierarchies is dependent on the features of words however they may have been obtained.

Sentence processing (information processing) approach: Theories involving semantic features, while perhaps considering an overall cognitive development, concentrate on the whole on individual lexical items. But, a radically different approach was followed by Bransford and others. They conducted a number of experiments which involve processing of information from sets of sentences, rather than words. Results so far seem to indicate that information is stored in human memory in a non-linguistic fashion as the 'gist' of the sentence(s). The results hold for both adults and children. One such experiment showed that, subjects are most confident that they heard a sentence which combined all the ideas of the initially presented several short sentences. This produces the evidence that some sort of abstraction of the gist of the sentence takes place in the human brain.

The two theories mentioned above do not necessarily contradict one another. It may be that stored in the 'memory' are features and relationshiips between words; it may be that actual sentences are stored in an abstracted fashion in some other area, and in some other way. The state of our knowledge in this area is still in flux.

6.3 Artificial Intelligence Approach

Investigators in aritificial intelligence have used a different aproach, that of simulation or model-building, to represent the process of concept formation in human brain. They assumed that, it is more than structure, perhaps more than meaning, that needs to be tapped in order to devise an automated method for dealing with language. Following are some of the work carried out in the area of modelling of conceptual processes:

Quillan's semantic memory model: Quillan's central concern is how semantic information is stored within a person's memory. He proposed a complex model of what can be termed a 'spreading-activation' network. Words do not exist in isolation, but are part of an interrelated network, parts of which are variable. Quillan initially constructed a small system consisting of a network some 60 terms. These terms were empirically defined and quasi-hierarchically structured. A series of experiments confirmed that there are levels of relationship within a network, which prove that, information which is stored directly with a term, is recalled at a faster speed, as opposed to that information which is stored in a remote location. A very typical example quoted to explain this point is that one can respond faster to a question such as "Is the canary yellow?" than to a question such as " Is a canary mammal?".

Epsodic memory model: The model proposed by Norman and Rumelhart is more comprehensive than Quillan's and relates the existence of 'episodic' memory stores. An episode is a series of events or actions. Episodic memory lacks universality, that is, all persons are liikely to have unique experiences which are stored in a holistic manner in the memory.

Frame theory: The various studies in linguistics, cognitive psychology and artificial intelligence outlined so far, have one way or another attempted to derive some form of universality in either human thought processes or languages, or both. But in Bivins' (6, pp. 58-59) opinion,

> "the meaning of word is more than its structural relationship, more than its case relationship, and more than a collection of components or features. It consists of word 'meanings' certainly, in a dictionary sense; it also consists of facts, information, experiences, in an encyclopedic sense; furthermore, it also consists of what might be called 'action sets' which are performed by persons as a ritual of a sort (say, greetings) ... Finally (although the list is probably not complete), one might need, as part of a total meaning, such as problem-solving approaches and other types of heuristics. What these notions involve, as a whole, is a type of conceptual frame".

The frame theory can be seen as a further extension of case grammar, but owes its origins to artificial intelligence. In contrast to the word and/or sentence-based theories of Chomsky and Fillmore, the frame theory is contextually based. Words do not have meanings in isolation, but depend, for their meaning, on their experimental context. It is difficult to single out the universal aspect of a frame theory, but one might postulate the existence of a prototypical, 'universal' frame which would be common to all humans, e.g., the best instance of a 'dog'. Though, Bivins (8) seems to be aware of the obvious flaws of this method, she thinks that something akin to frame theory is needed in furthering informatiion retrieval development.

But the artificial iintelligence approach has its share of criticism too. In Sparck Jones' (27) opinion, artificial intelligence meaning representations are different in kind and not merely in degree from document retrieval descriptions and that in current information retrieval it is correct to think in terms of 'aboutness' distinct from meaning representation. She believes that, more sophisticated information retrieval systems will depend on linguistic techniques of meaning representation.

7 Conclusion

It is interesting to note that, despite all these efforts towards searching of linguistic universals by linguists, and attempts made by some information scientists in seeking refuge in linguistics and/or psychology for finding universals in ILs, the case is inconclusive and still continuing. For the present, the idea of an IL with truly universal features appears to be a mirage. Works of information scientists like, Austin, Bivins, etc. have revealed that neither purely linguistic nor even psycho-linguistic explanations are enough to establish the claims of universality of ILs. Nevertheless, as a result of these efforts, our knowledge of IL structure and functions have improved considerably.

Note

The discussion in this section and ensuing sub-sections own their origins primarily to the works of Hutchins (20), Austin (3), Bivins (7), Neelameghan (25) and Foskett (19).

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Treatment of the Basic Class Anthropology in Dewey Decimal Classification (DDC) Scheme

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Abstract

Shows the terminological development, enumerated and non-enumerated subjects, changes of class numbers of the subjects under the basic class 'Anthropology' in the different editions of theDewey Decimal Classification scheme.

1 Introduction

Different anthropologists may concentrate their attention upon different typical characteristics of societies. Some are concerned primarily with "biological or physical" characteristics of human populations; others are interested principally in "cultural" characteristics. Hence, there are two broad classifications of subject matter in anthropology : physical (biological) anthropology and sociocultural or cultural anthropology. Some anthropologists consider archaeology and linguistics as sub-disciplines of cultural anthropology, even though they are academic disciplines in their own right. So the academic discipline of anthropology, which is also known as general anthropology, includes four main sub-disciplines : sociocultural, archaeological, biological, and linguistic anthropology. Again, the American Anthropological Association, has formally acknowledged a public service role by recognizing a fifth sub-discipline. This is applied anthropology.

Treatment of the subject anthropology differs from scheme to scheme in general library classiffication. Again arrangement of books on the shelves on the subject anthropology also scatter due to the characteristics of the sub-disciplines of the subject and also to the treatment of those sub-discipline in library classification schemes. As a result users have to face problems to find out their books from the shelves. The present study is an attempt to show the treatment of the subject "Anthropology" in different editions of Dewey Decimal Classification (DDC) scheme. However, the analysis is based on 5th ed, 8th ed, 11th ed and 15th to 21st edition of DDC scheme.

2 Purpose

Anthropology is a developing subject. In passing the time different sub-disciplines of the subject emerged out. It is the duty of the classificationist to take adequate steps so that newly developed sub-disciplines should be included in its new edition without disturbing earlier arrangement of enumerated subjects. However this paper will enable us to show the following:

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(a) Sub-disciplines and other related or near-related subjects of anthropology which have included in different editions of DDC.

(b) Development and use of terminology of sub-disciplines of the subject anthropology in DDC.

(c) Changes of class number and treatment of different subjects of the host subject anthropology in DDC.

(d) How far the classification scheme able to include the sub-disciplines of the subject in the schedule.

3 Results and discussions :

3.1 Sub-disciplines of anthropology included in DDC

Treatment of different sub-disciplines of the subject Anthropology in different editions of DDC are not same. Inclusion and exclusion of sub-disciplines of the subject in different editions of DDC is an inherent feature of the scheme. However sub-disciplines or concepts relating to the subject Anthropology which have ever been included in any one or more of its editions may be grouped by their primary basic subjects as follows:

Philosophy

(a) Philosophical Anthropology (soul, mind, attitudes, emotion, human action and experience, love, life and death etc);

(b) Mind and body anthropology (mental physiology and hygiene, mental derangement etc);

(c) Parapsychology and occultism (magic, witchcraft, demonology, palmistry, spiritualism, dreams, mystic traditions etc).

Religion

(a) Human evolution

(b) Philosophy of religion

(c) Humankind

(d) Theological anthropology

(e) Anthroposophy

(f) Biblical archaeology

(g) Doctrine of man and his soul

(h) Anthropomorphism

Social science

(a) Social interaction (communication between groups or within groups etc);

(b) Social processes (coordination, leadership, customs, social change, conflicts etc);

(c) Social behaviour (human ethnology or anthropogeography demography etc);

(d) Social groups or cultural ethnology (social classes, religions or other classes);

(e) Culture, cultural process and institutions. Cultural anthropology (cultural process, social change, community organisation, social organisation and institution, marriage and family, sex communities etc);

(f) Criminal anthropology;

(g) Anthropological theory of folklore.

Life sciences/Biology. Arehaeology

(a) Human races or physical ethnology (origin and physical characteristic of races, causes of physical differences. Specific races, geographical distribution of races etc);

(b) Physical anthropology (evolution and genetics of humankind, prehistoric man, pigmentation, environmental effects on physique etc);

(c) Anthropometry

(d) Craniology

(e) Archaeology

(f) Linguistic anthropology

(g) Anthropogeography

3.2 Development and use of terminology of the subject

Development of terminology of the sub-disciplines of the subject Anthropology in different editions of DDC is much important. Treatment of this subject has been found broadly in four major subjects - Philosophy, Religion, Social sciences and Biological Sciences in DDC scheme. It was found that one particular subject may or may not be treated under the same class number in its different editions or in other words a given class number may not reflect always the same subject. Again the terminology of the subject has also been changed from edition to edition. This pattern of change of terminology has found much in case of sociology and biology rather than that of philosophy and religion. This is because of the treatment of cultural / social anthropology and physical anthropology, the main two sub-disciplines of the subject, in sociology and biology respectively.

However this study reveals (see table 1) that the inclusion of the term "Anthropology" has been found first time in sociology in its basic class in 20th edition in the form "301 Sociology and Anthropology" and 21st edition of DDC has also followed the same pattern. Except in case of DDC-18 no other editions also clearly specify the sub-discipline "Social / Cultural Anthropology", though it was treated as "culture" or "culture and social change or culture and cultural process" in its earlier editions and "culture and instituions" in its later editions. Again, development of terminology and inclusion of the subject "Anthropology" in the basic class "Biology" has also seen a peculiar experience. Only DDC-16 has combined the subject with Biology and termed it as "570 Anthropological and Biologiical Sciences" but all other editions either mentioned the subject as either "Biological Science" or "Life Sciences".

In case of another sub-discipline Archaeology, terminological development has also taken place. Here, upto 17th edition the terminology of the sub-discipline was "571 Prehistoric Archaeology". From 18th edition to 20th edition it was represented as "573.2 Evolution or organic evolution and genetics of man or humankind". Again in 21st edition it has been treated under "599.938 Evolution".

Here the scheme simply avoids to use the familiar term "Prehistory" or "Archaeology" or "Prehistory archaeology"

3.3 Changes of class number and treatment of the subject

As discussed earlier, different sub-classes under the basic class Anthropology has been treated broadly under four main subjects--Philosophy, Religion, Social Sciences and Biological Sciences in DDC. Again, the four sub-disciplines of the subject has been treated either under social sciences / sociology or under Biology. From that point of view emphasis has been given in this study to the above mentioned two subjects.

Study reveals that (see Table 2) more or less all subjects has changed its class number under the host class sociology. Again, this study also reflects that same pattern of classification of different components, or subjects of Anthropology are found in editions 15, 16, 17, and 18 of DDC, where subjects are treated under one class "301 Sociology / Social sciences". Classes from '302-309' are either absent or they are simply specify 'Handbook', 'Dictionaries', 'Organization', 'Study and teaching', 'History' etc of the subject.

From edition 19th of DDC and onwards the representation of subjects as found under the class "301 Sociology" has totally changed. The forms of documents like "Dictionaries" etc "Essays lectures etc", "periodicals", and "organizations", "study and teaching", "collection" etc previously treated under the classes "302-309" were totaly ignored and the classes already treated under the class "301 sociology" are distributed over "302-309".

3.4 Classes not included in DDC

Two broad subjects - Physical Anthropology and Social / Cultural Anthropology have been emerged out from the subject Anthropology due to the structure of the subject studied from two different angles : biological and social or cultural aspects of the subject. Development of another two sub-disciplines archaeological and linguistic anthropology are also emerged out due to the gradual development of the subject. However, to find out individual classes under each of these four sub-disciplines which have developed till date but which are not included even if in the 21st edition of DDC is also one of the objective of this study. Hence, after analyzing different editions of DDC scheme the following subjects are identified which are not included in any edition.

Physical anthropology : Paleoanthropology, Embryology and growth, Body composition and body build, Dentition, Medical anthropology, Nutritional anthopology, Ecological anthropology, Comparative anatomy, Molecular anthropology, Physiologiical anthropology, Applied physical anthropology.

Social / Cultural anthropology : Cognitive anthropology, Symbolic anthropology, Urban anthropology, Structural anthropology, Applied social anthropology etc.

4 Conclusion

In view of the overall study on the different editions of Dewey Decimal Classification scheme it is concluded that due to the development of the field of Anthropology, terminology of a class to repersent the subject has been changed in many respect. Again, in case of social / cultural anthropology major changes of the class number has been taken place in the 19th edition and a minor change has been found in its later editions. But class numbers in different subjects in physical anthropology are more or less similar except in case of 21st edition where class number of physical anthropology has totally changed.

Though DDC - 21 enumerates some newly developed subjects from four major sub-disciplines but there are so many subjects which are not included neither in DDC - 21 nor in its earlier editions. Again, many enumerated subjects are not specified by name rather than represented by simply idea or term of the subject which creats problems in many respect.

Table 1 : Development and use of terminology of the subject Anthropology in different edition of DDC

Class No.	5th edition (Abr)	8th edition	11th edition (Abr)	16th edition	18th edition	21st edition
130	Mind and Body	Mind and body Anthropology	Paranormal phenomenon and arts	Field of psychology	Popular psychology, para psychology, occultism	Parapsychological and occult methods for achieving well-being, hapiness succ-ess.
133	Occultism, Witchcraft	Occultism, Witchcraft, Magic	Parapsychology and occultism	Occult sciences	Parapsychology and occultism	Parapsychology and occultism
301		Sociology : Philosophy, theories	Sociology	Sociology	Sociology	Sociology and Anthropology
302		Compends outlines	Sociology	Handbooks and outlines of the social sciences	Unassigned	Social interaction
570	Biology Archaeology	Biology	Life sciences	Anthropological and biological sciences	Life sciences	Life sicences Biology
571	Pre-historic archaeology	Pre-historic archaeology	Pre-historic archaeology	Pre-historic archeology	Unassigned	Physiology and related subjects
572	Ethnology Anthropology	Ethnology Anthropology	Human races	Anthropology Ethnology	Human races	Biochemistry
573	Natural history of man. Somatology	Natural history of man. Somatology	Physical Anthropology	Physical Anthropology	Physical Anthropology	Specific physiological systems in animals

Note : Edition 15, edition 17, and edition 19, edition 20 have been omitted due to their similarities with edition 16, edition 18, and edition 21 respectively.

Table 2 : Changes of class number and treatment of sub-classes of anthropology in different edition of DDC

Subjects	Ed 5	Ed 8	Ed 11	Ed 16	Ed 18	Ed19	Ed 21
Humankind (Philoso-physical Anthropology	-	-	-	-	128	128	128
Social/Cultural Anthropology	-	-	-	301.2	301.2	306	306
Human ecology Anthropogeography	-	-	-	301.3	301.31	304.2	304.2
Social cultural change	-	-	-	301.24	301.24	303.4	303.4
Culture and institution/ Social organization and institution	-	-	-	301.4	301.5	306	306
Population/Demography	-	-	-	301.32	301.32	304.6	304.6
Physical anthropology	-	-	573	573	573	573	599.9
Prehistoric Archaeology	571	571	571	571	573.2	573.2	573.2

Note : Edition 15, Ed 17 and Ed 20 have been omitted due to their similartities with either earlier or later edition.

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গ্রন্থাগারের প্রজা

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বিংশ শতাব্দীর অন্তিমলগ্নে শতাব্দীর অবদান নিয়ে নিশ্চয়ই হিসাব নিকাশ শুরু হয়ে গেছে। হিসাবের খাতায় দুটি পরিবর্তনের ধারা উল্লেখ করা অপ্রাসঙ্গিক হবে না। প্রথমটি জীবন ও জটিলতা। এর পটভূমি উনবিংশ শতাব্দী, শুরু দ্বিতীয় মহাযুদ্ধ, আত্মপ্রকাশ শতাব্দীর তৃতীয় অধ্যায়ে। জীবন এখন কবিতার ছন্দে চলে না। সময় মহামূল্যবান-বিলাসিতার বস্তু নয়। বাক্ চাতুর্যে বশীভূত করা যায় না প্রতিবেশীকেও। কারণ জীবন এখন বাস্তবমুখী ও প্রশ্ন নির্ভর। গণতন্ত্র, সমাজতন্ত্র, শিক্ষা, আত্মকেন্দ্রীকতা, উন্নত জীবন যাপনের প্রয়াস ও প্রতিযোগিতা সমাজ জীবনের সর্বস্তরে। পেশায় ও জীবিকায় বহুমুখী গতি। জ্ঞানের রাজ্যে একদিকে বিভাজন আর বিভাজন অপর দিকে হাইব্রিডের ফসল। ফলে জানার আগ্রহ, গ্রহণের আগ্রহ। অতএব জানাবার দায়িত্ব কাউকে নিতে হবে। এই দায়িত্ব শিক্ষক মন্ডলীর উপর এসে পড়ে। কিন্তু শিক্ষকরা জ্ঞানের বিস্ফোরণে নিজেরাই শত বিভক্ত। ব্যক্তিগত ভাবে কেউ সমাগ্রিক জ্ঞানের ধারক, বাহক ও প্রচারক হতে পারে না। একমাত্র সুপরিকল্পিত, সুসংগঠিত কার্যকরী সংগঠন বা প্রতিষ্ঠান এই দায়িত্ব নিতে পারে। সমাজ ও রাষ্ট্র গ্রন্থাগারগুলির উপর এই দায়িত্বভার ন্যস্ত করেছে।

দ্বিতীয়টি একটি নিঃশব্দ বিপ্লব— 'রাজার জীবন সন্ধ্যা; প্রজার জীবন প্রভাত'। এই প্রজারা ছড়িয়ে আছে গ্রামগঞ্জে, শহরে নগরে। প্রজাদের অনেক নাম হরেক জীবিকা। কৃষক, মজুর, শ্রমিক, কামার, কুমোর, ছুতোর, হকার, বেকার প্রজাকুলের বৃহদাংশ। সংগঠন ও প্রতিষ্ঠানে প্রজাদের ভিন্ন ভিন্ন ভূমিকা। হাসপাতালে রোগী, শিক্ষায় ছাত্র, পরিবহনে যাত্রী, গণপরিসেবায় গ্রাহক, আদালতে বিচার প্রার্থী এবং সর্বোপরি গণতন্ত্রের রথের দড়ি যাদের হাতে তারাই প্রজা। এই প্রজারা এখন অনেক আত্মসচেতন ও সংঘবদ্ধ। জাগ্রত প্রজাদের সর্বত্র একই দাবী— 'হয় কাজ কর নয়তো গদী ছাড়'।

গ্রন্থাগার একটি প্রতিষ্ঠান। এই প্রতিষ্ঠানের প্রজা তারাই যাদের জন্য গ্রন্থাগার। এদের পরিচিতি ডাক নাম পাঠক। কথাটা যথার্থ নয়। সংবাদপত্র, শারদীয় সংখ্যার পাঠকও পাঠক; গঙ্গাঘাটে ভক্তজন পরিবৃত্ত হয়ে যিনি ধর্মকথা শোনান তিনিও পাঠক; পাঠক বেতার ও দুরদর্শনের সংবাদ পরিবেশনকারীও। পাঠকের ব্যাপ্তি বিস্তৃত, গ্রাষ্থাগারের পাঠক সীমাবদ্ধ। ডাক নাম যাই হোক পোষাকী নাম অনেক : ব্যবহারকারী, অনুসন্ধানকারী, সদস্য, কাস্টোমার, পেট্রন, ক্লায়েন্ট এবং আরো অনেক। শ্রেণীমুক্ত সমাজের স্বপ্ন উনবিংশ শতাব্দী দেখিয়েছিলো, বিংশ শতাব্দী স্বপ্ন বিজ্ঞানীদের কাছে তাদের ব্যাখ্যা চেয়ে কালহরণ করেছে। থাকছে স্থিতাবস্থা। ফলে গ্রন্থাগারের প্রজারাও শ্রেণী বিভক্ত ঃ

বিদ্যায়তন ঃ ছাত্র, শিক্ষক, শিক্ষাকর্মী, শিক্ষাপরিচালক, গবেষক, আংশিক সময়ের গবেষক, বিশেষ অনুমতিপ্রাপ্ত বহিরাগত সামাজিক ও প্রশাসনিক প্রতিনিধি।

গবেষণা ভিত্তিক প্রতিষ্ঠানের গ্রন্থাগার ঃ গবেষক, বিজ্ঞানী, বৃত্তিকুশলী বিশেষজ্ঞ মন্ডলী।

পেশাগত সংস্থা ও বিদ্বজ্জন সভা ঃ শিল্পী, সাহিত্যিক, বিষয় ও ভাষাভিত্তিক ব্যবহারকারী ও পন্ডিত সমাজ।

গ্রন্থাগার ও তথ্য কেন্দ্র ঃ সাধারণ শিক্ষিত মানুষ থেকে শুরু করে প্রশাসক, পরিকল্পনাবিদ, আইনবিদ, সাংবাদিক, প্রযুক্তিবিদ, ব্যবসায়ী, জনপ্রতিনিধি এবং বুদ্ধিজীবি সম্প্রদায়।

জন গ্রন্থাগার ঃ সর্বস্তরের বিশেষ করে সমাজের দুর্বলশ্রেণীর মানুষ, যেমন শিশু, কিশোর, গৃহবধু, বৃদ্ধ, প্রতিবন্ধী, নব সাক্ষরিত্ব বেকার এবং স্বল্পবিত্তের জীবন ও জীবিকাধারী নাগরিক।

জাতীয় গ্রন্থাগার ঃ সব গ্রন্থাগারের সমন্বয়ে যে কোন নাগরিক।

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* অধ্যাপক, গ্রন্থাগার ও তথ্য বিজ্ঞান বিভাগ, বিদ্যাসাগর বিশ্ববিদ্যালয়

গ্রন্থাগারের প্রজাদের সঙ্গে পরিচয় হোল। এবার প্রজাপালন পদ্ধতি দেখা যাক। জন সংখ্যার প্রায় এক তৃতীয়াংশ শিশু ও কিশোর। বর্তমান প্রজন্মে এদের অধিকাংশ অক্ষর জ্ঞান পরিচিত। বিদ্যালয় স্তরেই এদের গ্রন্থাগারের সংস্পর্শে আসার কথা। কিন্তু বিদ্যালয়ে পড়ুয়া আছে, পাঠচর্চা আছে, পাঠে উৎসাহ দেওয়ার লোক আছে কিন্তু গ্রন্থাগার নেই। বিদ্যালয়ের এই সব ভবিষ্যতেরা সমাজের বঞ্চিত পাঠক। শিক্ষা জীবনের পরের স্তর কলেজ। এখানে গ্রন্থাগার আছে, আছে পাঠক ও বিদ্যাচর্চা। কিন্তু কলেজ গ্রন্থাগার নিয়মিত ব্যবহারকারীর সংখ্যা খুবই সীমিত। শিক্ষকরা গ্রন্থাগার ব্যবহার করেন পরোক্ষভাবে। গ্রন্থাগারের ভালো ও সদ্য প্রকাশিত বইগুলি তারা বাড়ীতে নিয়ে যান; গ্রন্থাগারে এসে এবং বসে নিজে পাঠকক্ষ ব্যবহার করে ছাত্রদের পাঠে উৎসাহ দেন এখন শিক্ষকের সংখ্যা খুবই কম। ছাত্ররা শিক্ষকের চেয়ে বড় নয়। তাদের দৃষ্টি কয়েকটি নির্দিষ্ট বইয়ের উপর। তথ্যের গভীরে প্রবেশ করার কোন তাগিদ তাদের নেই। সম্প্রতি জেরক্সের অবদানে পাঠকক্ষ প্রায় পরিত্যক্ত। সহপাঠীর তোলা বই অন্য সহপাঠীরা ব্যবহার করে গ্রন্থাগারে আসার প্রয়োজন বোধ করে না। গ্রন্থাগারের প্রশাসন ও কর্মীরা 'মহাকরণ কর্ম সংস্কৃতির' অবিচ্ছেদ্য অংশ। এ বিষয়ে বিংশ শতাব্দীর শুরু ও সমাপ্তিতে কোন পরিবর্তন নেই। গ্রন্থাগার বিজ্ঞানের একজন অভিজ্ঞ শিক্ষক আর জি প্রসার এই বিষয়ে সমীক্ষা করে বলেছেন—

— ছাত্ররা কলেজ লাইব্রেরীর সম্পদ সম্পর্কে ওয়াকিবহাল নয়

— কি করে গ্রন্থাগারের বই সাজানো থাকে, অধিকাংশ ছাত্র তা জানে না

— রেফারেন্স বই ও তথ্যগ্রন্থাদির তথ্য-উৎস সম্পর্কে প্রায় অজ্ঞ

— কলেজ থেকে বিশ্ববিদ্যালয় গ্রন্থাগারে এসে প্রায় সবাই অসহায় বোধ করে।

বিশ্ববিদ্যালয়ে স্নাতোকত্তর পর্যায়ে অবশ্য গ্রন্থগার ব্যবহার হয়। ছাত্র-শিক্ষক ও গবেষকদের কাছে এই গ্রন্থাগার অপরিহার্য। গ্রন্থগারের সংগ্রহ ভালো এবং নিয়মিত। এখানে সব শ্রেণীর পুস্তক ও তথ্যগ্রন্থাদি থাকার কথা। কিন্তু ব্যবহারকারীরা গ্রন্থাগারে রক্ষিত সব সম্পদের খবর জানে না বা রাখে না। কতজন পাঠক আছেন যারা Book, Text book ও Monograph এর পার্থক্য বোঝেন ? তারা কি জানেন কত ধরণের periodical, encyclopedia, dictionary রয়েছে ? Handbook, Treatise, Mannual, Directory, Gazetteer ও Census report ও প্রাপ্ত তথ্যাদি ? শিক্ষক মন্ডলী Indexing periodical, abstracting periodical, Guide to literature বিভিন্ন ধরণের গ্রন্থপঞ্জী, গ্রন্থপঞ্জীর গ্রন্থপঞ্জীর সাহায্য কতটা গ্রহণ করেন ? গবেষকদের একাংশ এখন এ সবের সাহায্য নিচ্ছেন কিন্তু অধিকাংশ শিক্ষকমন্ডলী উদাসীন। শিক্ষাকে আধুনিকীকরণ ও শিক্ষাদান পর্ব উন্নততর করেতে এ সবের প্রয়োজন রয়েছে। প্রকৃত পক্ষে জ্ঞানের ক্ষুধায় এখানকার পাঠক সম্প্রদায় টিফিন খান, আহারে অরুচি। ফলে ব্যবহারকারীরা তথ্য অপুষ্টিতে ভুগছে।

রাজস্থান বিশ্ববিদ্যায় কেন্দ্রীয় গ্রন্থাগারের এক সমীক্ষায় জানা গেছে ঃ

— গ্রন্থাগারে ব্যবহৃত বিভিন্ন terminology পাঠকেরা বুঝতে পারে না

— ক্যাটালগ ব্যবহৃত হয় খুব কম

— পাঠকরা রেফারেন্স বই সম্পর্কে বেশ অজ্ঞ

মাদ্রাজ বিশ্ববিদ্যালয়ের খবর সেখানে গ্রন্থাগার কর্মী ও পাঠক পরস্পরকে খুবই কম চেনে। সম্বলপুর বিশ্ববিদ্যালয়ের ছাত্ররা গ্রন্থাগারের কাজ কর্মে অসন্তোষ প্রকাশ করেছে। সমীক্ষার ফল কোথাও আশাব্যঞ্জক নয়।

শিক্ষা প্রতিষ্ঠানের বাইরে আর এক ধরণের উচ্চ শ্রেণীর পাঠক আছেন। এরা গবেষণা কেন্দ্রে, তথ্যকেন্দ্রে, পেশাগত সংস্থায় ও তথ্যসমৃদ্ধ গ্রন্থগারে প্রতিষ্ঠানিক বা ব্যক্তিগত প্রয়োজনে নিয়মিত বই, পত্র-পত্রিকা, গবেষণা পত্র ব্যবহার করেন এবং বিভিন্ন ধরণের তথ্য-উৎসের সন্ধান রাখেন। এরা বিজ্ঞানী, গবেষক, প্রযুক্তিবিদ, প্রশাসক, সাংবাদিক এবং বিভিন্ন পেশার মানুষ। গ্রন্থাগার ও তথ্য বিজ্ঞানের যা কিছু উন্নতি হয়েছে বা হচ্ছে এদের কেন্দ্র করেই। এই সব ব্যবহারকারীদের সংখ্যা সমগ্র জনসাধণের এক অতি নগন্য অংশ মাত্র।

গ্রন্থাগার পরিসেবার প্রকৃত স্থান জনগ্রন্থাগার যা পাবলিক লাইব্রেরী নামে সুপরিচিত। সমাজের সব শ্রেণীর মানুষ বিশেষ করে দুর্বলতর শ্রেণীর জন্যই এই গ্রন্থাগার। প্রথাগত শিক্ষায় বঞ্চিত, বেকার, শিশু-কিশোর-বৃদ্ধ, প্রতিবন্ধী, গৃহবধু, নবসাক্ষরিত ব্যক্তি এবং স্বল্পবিত্তের জীবন ও জীবিকাধারীরাই প্রধানতঃ এর প্রকৃত ব্যবহারকারী। এই গ্রন্থাগারের অন্য বৈশিষ্ট্য— বয়স, ধর্ম, শিক্ষা, জাতি, বর্ণ, অর্থ, রাজনীতি গ্রন্থাগার ব্যবহারে কোন বাধা সৃষ্টি করতে পারে না। সারাজীবন ব্যাপী শিক্ষা, আত্মশিক্ষার এটাই একমাত্র সামাজিক প্রতিষ্ঠান। প্রকৃত গণতান্ত্রিক কাঠামোয় এই সব প্রজাদের এই ধরণের গ্রন্থাগার প্রয়োজন একথা সামাজিক ও রাষ্ট্রীয়ভাবে স্বীকৃত। ভারতে পশ্চিমবঙ্গ সহ দশটি রাজ্যে 'গ্রন্থাগার আইন' প্রচলিত। এই আইনের ফলে সরকার গ্রন্থাগার স্থাপন, পরিচালন ও সম্প্রসারণের দায়ে দায়বদ্ধ। পশ্চিমবঙ্গে ছোট বড় প্রায় ১০০০০টি জন গ্রন্থাগার আছে। এর মধ্যে প্রায় ৩০০০ গ্রন্থাগার গ্রামে, শহরে, নগরে ও মহানগরে গ্রন্থাগার আইনের অধীন। সরকারী খরচ বার্ষিক প্রায় ২৫ কোটি টাকা। ব্যবহারকারী? কোন পরিকল্পনা মাফিক তদন্ত বা সমীক্ষা এ যাবৎ হয় নি। বিদ্যাসাগর বিশ্ববিদ্যালয়ের গ্রন্থাগার বিজ্ঞানের ছাত্র-ছাত্রীরা মেদিনীপুরে প্রায় ১০০টি গ্রন্থাগার সমীক্ষা করে দেখেছে গড়ে ২৫০ জন পাঠক এবং পাঠক বৃদ্ধির হার খুবই কম। জন গ্রন্থাগারে স্বতঃপ্রবৃত্ত হয়ে কিছু পাঠক অবশ্যই আসেন কিন্তু দোলাচল, অনিয়মিত ও নির্লিপ্ত পাঠকের সংখ্যাই বেশী। ব্যবহারকারী, আংশিক ব্যবহারকারী, পরোক্ষ ব্যবহারকারীর সংখ্যা জন সংখ্যার পাঁচ শতাংশও নয়।

কেন এই অবস্থা? জনসংখ্যা বাড়ছে, শিক্ষার হার বাড়ছে, জানার আগ্রহ অনেক বেশী তবু গ্রন্থাগারের সুযোগ নিচ্ছে না কেন লোকে? পর্যবেক্ষণ ও গবেষণায় যে সব ত্রুটি ধরা পড়েছে ঃ

— গ্রন্থাগারের সুযোগের অভাব

— দূরত্ব

— গ্রন্থাগারের কার্যকালীন সময়

— পাঠকের সময়াভাব

— গ্রন্থাগারের নিয়মাবলী ও শুল্ক প্রথা

— দৈহিক ও সামাজিক প্রতিবন্ধকতা

— রাজনীতি

— প্রয়োজনীয় বইয়ের অভাব

— উৎসাহিত করার লোকের অভাব

— দূরদর্শন, ভিডিও, ক্যাসেট এর প্রভাব

— গ্রন্থাগার ভীতি

উপসর্গ হিসাবে এদের প্রত্যেকটিই গুরুত্বপূর্ণ কিন্তু প্রকৃত ব্যাধি ভিন্ন জাতের। আমরা স্থায়ী পাঠক সৃষ্টি করতে পারাছি না। প্রথাগত শিক্ষায় শিক্ষার্থীরা বই পড়তে বাধ্য। এরা পড়ুয়া কিন্তু পাঠক নয়। শিক্ষা জীবনের বাইরে যারা গ্রন্থাগার ব্যবহার করেন তারাই প্রকৃত গ্রন্থাগারের পাঠক।

প্রজাদের মধ্যে গ্রন্থাগারের প্রজারা দুর্বলতর। সুঠাম মনের অধিকারী কিন্তু অন্যমনস্ক, প্রতিবাদী মন কিন্তু আপোষকারী, ভোজনবিলাসী কিন্তু স্বল্পাহারে তুষ্ট, বন্ধুবৎসল কিন্তু নিঃসঙ্গ। এই দুর্বলতার সুযোগ নিয়েই রাজপ্রতিনিধিরা নিজ নিজ সুবিধামত গ্রন্থাগার ব্যবহারের নিয়ম, কর্মসূচী, কার্যকালীন সময় পাঠকদের উপর চাপিয়ে দিয়ে আসছে। জাগ্রত প্রজাদের ক্রমোচ্চারিত জয়ধ্বনী এই সব প্রজাদের বিচলিত করে তুলেছে। বিচলিত হয়েছিলেন বিগত শতাব্দীতে আমেরিকান মেলাভিল ডিউই এবং এই শতাব্দীতে ভারতীয় গ্রন্থাগার দার্শনিক রঙ্গনাথন। গ্রন্থাগার পরিচালক ও কর্মীদের সতর্ক করে দিয়ে তারা বলেছিলেন—

'পাঠকদের জন্য ভাব। পাঠকের জন্য কাজ কর; পাঠকের সময় বাঁচাও।'

'বাঁচাও এবং বাঁচ' এই তত্ত্বে বিশ্বাসী আরও কিছু গ্রন্থাগার বিজ্ঞানী ও কর্মী সংগঠন নানা সভায়, সম্মেলনে, সেমিনারে বিভিন্ন ভাবে বিষয়টির গুরুত্ব তুলে ধরার চেষ্টা করেছেন। তত্ত্ববিশ্বাসীদের সংখ্যা ক্রমেই বাড়ছে। এই সঙ্গে সামাজিক অনুশাসন যুক্ত হলেই গ্রন্থাগার বিপ্লব। জীবনের জটিলতা, প্রজার উত্থান আর বাঁচার তত্ত্ব প্রয়োগে পাঠক সৃষ্টির দিকগুলি ভাবা যেতে পারে :

(১) পাঠক সৃষ্টির উর্বরতম জমি বিদ্যালয়। শিশুও কিশোরদের গ্রন্থাগারমনা করে গড়ে তুলতে পারলে সোনা ফলবে। প্রয়োজন বিদ্যালয় গ্রন্থাগারের। প্রয়োজন বই পড়ার আগ্রহ সৃষ্টি করানো। পাঠ্যসূচীর সংস্করণ, শিক্ষক মন্ডলীর সহযোগিতা আর সমাজ সচেতন গ্রন্থাগারিকের যৌথ প্রয়াসে এই কাজ সহজতর হবে। গ্রন্থাগার আইনের সংশোধন ও পরিবর্তন করে বিদ্যালয় গ্রন্থাগার ও জন গ্রন্থাগারের মধ্যে বাধ্যতামূলক সেতু বন্ধন ঘটালে এই কাজ দ্রুত ও ফলপ্রসু হতে বাধ্য।

(২) উচ্চমাধ্যমিক এবং কলেজের প্রথম বর্ষের ছাত্রদের জন্য Library Orientation Course চালু করা একান্ত জরুরী। স্বল্পমেয়াদী এই কোর্সে ছাত্ররা (প্রয়োজনে শিক্ষকরাও) গ্রন্থাগার ব্যবহারের নিয়মাবলী, ব্যবহার পদ্ধতি, বিভিন্ন রেফারেন্স বইয়ের সঙ্গে পরিচিতি, তথ্য-উৎস ও নোট লেখার পদ্ধতি শিখিয়ে দেওয়া হবে। এই কোর্স অবশ্যই বাধ্যতামূলক ও পরিকল্পনামাফিক হবে।। কোর্স পরিচালনার জন্য অভিজ্ঞ শিক্ষক ও বিশেষজ্ঞ গ্রন্থাগারিক দায়িত্ব নেবেন। ছাত্রদের অন্য গ্রন্থাগার পরিদর্শন করিয়ে আনাও এই প্রশিক্ষণের অঙ্গ। এক আকর্ষনীয় ও শিক্ষনীয় পদ্ধতির মাধ্যমে ছাত্রদের মামুলী পাঠক থেকে মূল পাঠকে পরিণত করা সম্ভব। আগ্রহ ও আকর্ষণ বাড়াতে অন্য পদ্ধতিও রয়েছে। INSDOC ছাত্রদের জন্য 'Let us find out' নামে একটা Slide/Tape বার করেছে। এতে গ্রন্থাগার ব্যবহার পদ্ধতির নানা দিক তুলে ধরা হয়েছে। আর একটি বিকল্প প্রস্তাব এসেছিলো National Council of Educational Research and Training এর কাছ থেকে। উচ্চমাধ্যমিক স্তরে এবং কলেজের পাশকোর্সে গ্রন্থাগার বিজ্ঞানের একটি পত্র সিলেবাসের অন্তর্ভূক্ত করার পরামর্শ এসেছিল। একমাত্র উড়িষ্যা সরকার প্রস্তাবটি আংশিক ভাবে গ্রহণ করেছেন। অন্যরা নিশ্চুপ। তথ্য ভিত্তিক সমাজ ব্যবস্থার দিন আর দেরী নেই। প্রস্তাবটি আবার ভেবে দেখার সময় এসেছে।

বিশ্ববিদ্যালয় স্তরেও প্রশিক্ষণের প্রয়োজন রয়েছে। বিদেশে কোন কোন শিক্ষা প্রতিষ্ঠানে কোর্সের শুরুতে নবাগত ছাত্র-ছাত্রীদের স্বাগত ভাষণ দেন প্রতিষ্ঠানের গ্রন্থাগারিক। ভারতে S N D T Women's University এবং J N U'র কোন কোন বিভাগ Tape / Slide এর সাহায্যে ছাত্রদের গ্রন্থাগার ব্যবহারে সহযোগিতা করে। কিন্তু জটিলতা বাড়ছে অন্যভাবে। Xerox, Computer, Multimedia র ধাক্কায় স্বাভাবিক পঠন-পাঠন বিঘ্নিত। একদিকে শিক্ষার ও জানার পরিধি বিস্তৃত হচ্ছে অপরদিকে প্রদীপের নীচেই অন্ধকার। শিক্ষা অপূর্ণ, অসম্পূর্ণ থেকে যাচ্ছে। গ্রন্থাগারের বই পড়ে, পাতা ঘেঁটে যে মননশীল মন তৈরী হয় তার কোন বিকল্প হতে পারে না। এই অবক্ষয়ের প্রতিশেধকহিসাবে ভারতের কয়েকটি কৃষি বিশ্ববিদ্যালয় দৃষ্টান্তমূলক কর্মসূচী গ্রহণ করেছেন। যেমন Punjab Agricultural University তে user education একটি অবশ্যকীয় অঙ্গ। সেখানকার Syllabus এ রয়েছে :

Library as source of information and reference organisation of knowledge in libraries, library catalogues, Union catalogues, bibliographies, abstracts, indexes and how to use them. Organisation of knowledge. Norms for bibliographical citation and abbreviations, Bibliographical style and technical paper compilation. Style manual of various Universities and organisations.

G.B Pant University of Agriculture & Technology র Syllabus এ দেখা যায় :

The scientific literature, problem of enormous amount, languages, scatter, scientific publications, forms, types, the sources of information : primary, secondary, tertiary, bibliographical control of scientific literature, information retrieval, current awareness. Writing theses; compilation of bibliographies.

ইংলান্ডে ওখানকার ইউ-জি-সি নিয়োজিত প্যারী কমিটি (১৯৬৭) বিভিন্ন কলেজ ও বিশ্ববিদ্যালয় গ্রন্থাগার পরিদর্শন করে দেখেছিলেন ছাত্ররা যথাযথভাবে গ্রন্থাগার ব্যবহার করে না। লাইব্রেরী ক্যাটালগ ব্যবহার অবহেলিত এবং তথ্য-উৎস সন্ধানে অজ্ঞ থেকে যাচ্ছে। Abstraching ও Indexing Journal -র মত সর্বাধুনিক তথ্য সম্পদ ব্যবহারকারীর সংখ্যা খুবই কম। তাই প্যারী কমিটি তাদের সুপারিশে বলেছিলেন —

"Recommend that the students should be given preliminary guidance on the layout of the library, its regulations and procedures. At a later stage, seminar should be held and lectures be delivered on the use of bibliographical tools and on guidance to the literature of the student's own subject..."

সরকার রিপোর্টের অন্য সুপারিশগুলির সংগে এই সুপারিশও গুরুত্ব সহকারে গ্রহণ ও কার্যকরী করে।

বলা বাহুল্য এভাবে শিক্ষা লাভের পর শিক্ষার্থীরা প্রকৃত পাঠকে পরিণত হবে। যান্ত্রিক সভ্যতার যান্ত্রিক বিশেষজ্ঞে পরিণত হবে না। জাতিগঠনে, উচ্চতর শ্রেণীর পাঠক সৃষ্টিতে উপরের দৃষ্টান্তগুলি বিশ্ববিদ্যালয়, শিক্ষাদপ্তর, হায়ার এডুকেশন কাউন্সিল ও বিশ্ববিদ্যালয় মঞ্জুরী কমিশন বিবেচনা করে দেখতে পারেন।

(৪) পাঠক সৃষ্টির আদর্শ কুটিরশিল্প জনগ্রন্থাগারে। শিল্প বিকাশের দুটি অমূল্য সম্পদ - একটি প্রাকৃতিক অপরটি অপ্রাকৃতিক এদের হাতেই। এরা শিশু ও নবসাক্ষরিত ব্যক্তি। শিশুদের জন্য শিশুগ্রন্থাগার এদেশে নামমাত্র। কিন্তু আইনভিত্তিক জনগ্রন্থাগার ব্যবস্থায় শিশু বিভাগ এক আবশ্যকীয় অঙ্গ। শিশুদের উপযোগী পাঠসামগ্রি, পরিবেশ, সময় এবং গ্রন্থাগারিক মনোবিজ্ঞানীর যৌথ প্রয়াসে স্থায়ী পাঠক সৃষ্টি করা সম্ভব। শিশুরা পাঠ্য পুস্তকের তাড়নায় গ্রন্থবিমুখ। সেই ভয় ভাঙিয়ে রূপরাজ্যের রাজধানীতে নিয়ে যেতে পারলে জাতির ভবিষ্যত উজ্জ্বল। মনে রাখতে হবে দেশে গ্রন্থাগার আছে, গ্রন্থাগার আইন আছে, প্রশিক্ষণ প্রাপ্ত গ্রন্থাগারিক আছেন। তবে কেন শিশুরা এখনো অবহেলিত? নিছক কৈফিয়তেই কি খুশী হবে জাগ্রত প্রজারা? নবসাক্ষরদের গ্রন্থাগারের আঙিনায় টেনে আনার দায়িত্ব শুধু গ্রন্থাগারের নয়। সাক্ষরতা প্রকল্পের অঙ্গ হিসাবেই এটা গ্রহণ করার কথা। স্পেশালিষ্ট মনোবৃত্তিতে কাজের ফারাক থেকে যাচ্ছে। গ্রন্থাগারের সঙ্গে জড়িয়ে পড়া নবসাক্ষরদের জন্য বিশেষ কর্মসূচী নিতে হবে। এতে গ্রন্থাগারের স্বার্থই বেশী। 'পাঠক চাই পাঠক' -এই হাহাকার প্রতি জনগ্রন্থাগারে। নবসাক্ষরদের জন্য আদর্শ পরিবেশ, স্বতন্ত্র সময়, উপযোগী পাঠসামগ্রী সংগ্রহ, A-V Aid, উৎসাহী পরিচালন জনজীবনে অবশ্যই সাড়া জাগাবে এবং গ্রন্থাগারের অন্তর্নিহিত আশা পূরণে সহায়ক হবে।

জনগ্রন্থাগারগুলি গতানুগতিক প্রথায় গল্প, উপন্যাস পড়িয়ে আর পাঠকদের আকর্ষিত করতে পারছে না। দূরদর্শন এবং অনুসঙ্গের পাল্লা আপাততঃ ভারী। বৈচিত্র্য আনতে এবং কালোপযোগী করে গড়ে তুলতে হবে জনগ্রন্থাগারের কার্যাবলী। এমন সব ব্যবস্থা রাখতে হবে যাতে গ্রন্থাগার ব্যবহারকারীর সংখ্যা ক্রমেই বাড়ে। এই কাজে সহায়ক হবে Community Information Service. স্থানীয় জনগণের জীবন ও জীবিকার কথা, তাদের সমস্যার কথা — ছাত্র, কৃষক, শ্রমিক, মজুর, কামার, কুমোর, ছুতোর, বেকার, অভিভাবক সকলের কাজে লাগে এমন তথ্য গ্রন্থাগারে সংগৃহীত, সংরক্ষিত ও তথ্য সরবরাহই জনগণকে গ্রন্থাগারমুখী করতে বাধ্য। এই CIS কর্মসূচীতে গ্রন্থাগার স্থানীয় জনগণের জীবন-জীবিকা-তথ্যচাহিদা সমীক্ষা করে বিভিন্ন ধরণের ফাইল তৈরী করবে, যেমন শিক্ষা সংক্রান্ত তথ্যাবলী। এই ফাইলে থাকবে — শিক্ষাপ্রতিষ্ঠান ঃ প্রাথমিক, মাধ্যমিক, উচ্চমাধ্যমিক এবং কলেজের ঠিকানা, পাঠক্রম, ভর্তির নিয়মাবলী, ছাত্রসংখ্যা, বেতনাদি। উচ্চতর শিক্ষা ও প্রতিযোগিতামূলক পরীক্ষার জন্য প্রতিষ্ঠান, ঠিকানা, ফোন নম্বর, কোর্স, ভর্তির নিয়ম, প্রতিযোগিতার বিষয় ও সময়, আবেদন ফর্মের কপি। বিদেশের শিক্ষার সাধারণ নিয়মালী। এমন কি স্থানীয় গৃহশিক্ষকের নাম, ঠিকানা, বিষয়, পারিশ্রমিকের খবরও তথ্য সংরক্ষণের আওতায় আসবে। এইভাবে স্বাস্থ্য, ব্যবসা, কর্মসংস্থান, যানবাহন, পর্যটন, স্থানীয় ইতিহাস, প্রশাসনিক ও জনপ্রতিনিধির পরিচয়, স্থানীয় থানা ও আধিকারিকের নাম, ধর্মস্থান, স্থানীয় উৎসব, আইন সংক্রান্ত সাধারণ নিয়মাবলী, পারিবারিক ও সামাজিক অবিচারের প্রতিরোধকারী সংস্থা, ব্যাঙ্ক, জীবনবীমা-শেয়ার-মিউচুয়াল ফান্ডের খবর, ভুয়া সংস্থার খবর, আয়কর, ব্যবসাকর, বাড়ীভাড়া সংক্রান্ত নিয়মাবলী— এসবের জন্য আলাদা আলাদা ফাইল থাকবে। এই তথ্যসংগ্রহের কাজ হবে নিয়মিত এবং পরিবর্তন ও পরিবর্দ্ধন সাপেক্ষ। উপযুক্ত লোককে উপযুক্ত সময়ে সঠিক তথ্য দিতে পারলেই জনগ্রন্থাগারের জনপ্রিয়তা বাড়বে। প্রস্তাবটি বাস্তবে রূপায়ণের সুযোগ থাকছে গ্রন্থাগার আইনের সহযোগিতায়। পশ্চিমবঙ্গে সরকারী গ্রন্থাগার পরিসেবা অধিকার এখন গ্রন্থাগার ও তথ্য পরিসেবা অধিকার। গোত্র বদলে কি আসে যায়? কাজ চাই কাজ।

পাঠক সৃষ্টির স্বপ্নে কিছু বাস্তব কিছু কল্পনা তুলে ধরা হোল। সমাজ জটিলতার ব্যাধিতে ভুগছে। এর কোন প্রতিশেধক নেই। জটিলতার প্রভাব পড়েছে সাহিত্যে, দর্শনে এমনকি বিজ্ঞানেও। প্রকাশিত জ্ঞানরাশি জটিলতার আবর্তে ঘূর্ণায়মান। এই সংক্রামক ব্যাধির সঙ্গে যুদ্ধ করে মানুষকে বাঁচতে হচ্ছে। এখন আর যৌথপরিবার নয়, বাঁচতে হচ্ছে একক সংগ্রামে। তাই প্রত্যেক নাগরিকের চাই সংগ্রাম করার মত জ্ঞানাস্ত্র। প্রজাদের এই দুর্দিনে গ্রন্থাগারকে তার দায়িত্ব পালনে এগিয়ে আসতে হবেই। এড়িয়ে যাওয়ার চেষ্টা করলে সমাজের কাছে গ্রন্থাগারের প্রয়োজন ফুরাবে। ইতিহাসের পাতায় ডাইনোসোরাস আর গ্রন্থাগার অবস্থান করবে পাশাপাশি ও হাসাহাসি।।

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পুস্তক পর্যালোচনা

বাঁকুড়া জেলায় গ্রন্থাগার আন্দোলনের একটি বিশ্বস্ত দলিল

* গৌরহরি জানা

গ্রন্থাগারের ইতিহাস অতি প্রাচীন। গ্রন্থাগার অতীত-বর্তমান-ভবিষ্যতের যোগ-মিলনের অক্ষর-নির্মিত সেতু। প্রাচীন ভারতে বিভিন্ন হিন্দু দেব-মন্দির ও বৌদ্ধ-মঠগুলিতে গ্রন্থাগারের নিদর্শন পাওয়া যায়। নালন্দা ও বিক্রমশীলার গ্রন্থাগার ছিল বিখ্যাত। সেই সব গ্রন্থাগারে ছিল বহু মূল্যবান গ্রন্থ। কিন্তু জনসাধারণের জন্যে কোন কালেই তাদের দ্বার উন্মুক্ত ছিল না। ভারতে আধুনিক গ্রন্থাগারের সূচনা হয় ইংরেজ আমলে। ঊনবিংশ শতাব্দীতে শিক্ষা, শিল্প-সংস্কৃতি ও চেতনার যে বিকাশ ঘটে তার প্রতিফলন বিশেষভাবে লক্ষ্য করা যায় অবিভক্ত বঙ্গদেশে। ঊনবিংশ শতাব্দীকে এক কথায় বাংলায় নবজাগৃতির যুগ বলে বর্ণনা করা হয়। এই শতাব্দীর সূচনা কাল থেকেই বাঙ্গালীর সমাজ জীবনে একটি নতুন প্রতিষ্ঠান হিসাবে সাধারণ গ্রন্থাগারের আবির্ভাব ঘটে। ১৮৩৫ সালে "ক্যালকাটা পাবলিক লাইব্রেরী" (অধুনা "ন্যাশনাল লাইব্রেরী" বা "জাতীয় গ্রন্থাগার") প্রতিষ্ঠিত হবার পর স্থানীয় জনসাধারণের জন্য গ্রন্থাগার প্রতিষ্ঠার একটা প্রবণতা দেখা দেয় এবং কলকাতার বাইরে মফঃস্বল অঞ্চলে বেশ কিছু সাধারণ গ্রন্থাগার প্রতিষ্ঠিত হয়। মেদিনীপুরের রাজনারায়ণ বসু স্মৃতি ধন্য গ্রন্থাগারটি (১৮৫০ খ্রীঃ) আজও সেই প্রচেষ্টার সাক্ষ্য বহন করে আছে। এমনকি অনগ্রসর বাঁকুড়া জেলাতেও এর প্রভাব পরিলক্ষিত হয়।

আমাদের পশ্চিমবঙ্গে গ্রন্থাগারের সেরকম পূর্ণাঙ্গ ইতিহাস এখনও রচিত হয়নি। এই ইতিহাস রচনায় পশ্চিমবঙ্গের প্রতিটি জেলা ও অঞ্চলে গ্রন্থাগারের ইতিহাসের বিশেষ গুরুত্ব আছে। জেলায় জেলায় শিক্ষা, সংস্কৃতি ও রাজনৈতিক কর্মকান্ডের মধ্যে ছড়িয়ে রয়েছে সেই ইতিহাসের উপাদান। তাই বর্তমানে পশ্চিমবঙ্গ সহ বিভিন্ন জেলা ও অঞ্চলে গ্রন্থাগার আন্দোলনের তথ্য ও তত্ত্ব নির্ভর ইতিহাস রচনার প্রয়োজন রয়েছে।

শ্রী গিরীন্দ্র শেখর চক্রবর্তী "গ্রন্থাগারের ইতিহাস এবং বাঁকুড়া" শীর্ষক পুস্তিকাটি রচনা করে সেই গুরুত্বপূর্ণ কাজটি করেছেন। মাত্র ২৭ পৃষ্ঠার এই পুস্তিকাটির প্রথম অংশে রয়েছে পৃথিবীর বিভিন্ন দেশে গ্রন্থাগারের উদ্ভব ও বিকাশের পটভূমিকায় ভারতে গ্রন্থাগার আন্দোলনের একটি সংক্ষিপ্ত রূপরেখা। পরবর্তী অংশে রয়েছে বাঁকুড়া জেলায় গ্রন্থাগার প্রতিষ্ঠা ও প্রসার প্রসঙ্গ। এই জেলায় গ্রন্থাগার আন্দোলনের আলোচনা করতে গিয়ে লেখক জানিয়েছেন যে মল্লরাজাদের পৃষ্ঠপোষকতায় মল্লরাজ্যের বিভিন্ন অঞ্চলে যে অভিজাত ও শিক্ষিত মধ্যবিত্ত শ্রেণীর উদ্ভব হয়েছিল তাঁদেরই উৎসাহে ও প্রয়োজনে গড়ে উঠেছিল গ্রন্থাগার। জানা যায় যে বাঁকুড়া জেলার প্রথম গ্রন্থাগারটি (বসন্ত গ্রন্থাগার) মল্লরাজবংশের যুবরাজ বসন্ত কুমার সিংহদেব কর্তৃক ১৮৭৩ সালে প্রতিষ্ঠিত হয়েছিল (যদিও গ্রন্থাগারটি আজ অস্তিত্বহীন)। এই জেলায় স্বাধীনতা আন্দোলনের দিনগুলিতে গ্রন্থাগার প্রতিষ্ঠার আন্দোলন যে নিরবিচ্ছিন্ন ঘটনা ছিল না তা সুন্দর ভাবে তুলে ধরেছেন শ্রী চক্রবর্তী। প্রাক্ স্বাধীনতা এবং স্বাধীনতা পরবর্তীকালে ষাটের দশক পর্যন্ত এ জেলায় গ্রন্থাগার প্রসারের সংক্ষিপ্ত ইতিবৃত্ত শ্রী চক্রবর্তীর রচনা থেকে জানা যায়। ১৯৭৭ সালে পশ্চিমবঙ্গে বামফ্রন্ট সরকার গঠিত হবার পরে ১৯৭৯ সালে "গ্রন্থাগার আইন" বিধিবদ্ধ হয়। এ রাজ্যে গ্রন্থাগার আন্দোলনের ক্ষেত্রে এটি একটি ঐতিহাসিক ঘটনা। গ্রন্থাগার আইন প্রণয়নের পরে বাঁকুড়া জেলায় গ্রন্থাগার আন্দোলনের প্রসার ও সীমাবদ্ধতা নিয়ে কোন আলোচনা এই পুস্তিকাটিতে নেই।

* কেন্দ্রীয় গ্রন্থাগার। বিদ্যাসাগর বিশ্ববিদ্যালয়। মেদিনীপুর - ৭২১১০২

থাকলে রচনাটি নিঃসন্দেহে পূর্ণাঙ্গ রূপ পেত। লেখক এই পুস্তিকায় বাঁকুড়া জেলার গ্রন্থাগার আন্দোলনের যে সংক্ষিপ্ত বিবরণ দিয়েছেন তাতে হয়তো ভবিষ্যত গবেষকরা ইতিহাসের উপাদান খুঁজে পাবেন কিন্তু সাধারণ পাঠক আরও বিস্তারিত আলোচনা চাইবেন পরবর্তী সংস্করণে। সূচী অনুযায়ী বিষয় বিন্যাসের অভাব পুস্তিকাটির একটি প্রধান ত্রুটি। আশা করি উপরে উল্লিখিত বিষয়গুলি সম্পর্কে লেখক পরবর্তী সংস্করণে যত্নবান হবেন। পুস্তিকাটির শেষে বাঁকুড়া জেলায় সরকার পোষিত সাধারণ গ্রন্থাগারের তালিকা এবং জেলার মানচিত্রে গ্রন্থাগার সমূহের অবস্থান দেখান হয়েছে। এতে অবশ্যই পুস্তিকাটির মর্য্যাদা বৃদ্ধি পেয়েছে। পুস্তিকাটির মুদ্রণ সুচারু ভাবেই করা হয়েছে। প্রচ্ছদটি সাদা মাঠা হলেও রুচিসম্মত হয়েছে। মুদ্রণ প্রমাদও বিশেষ চোখে পড়েনা। সব মিলিয়ে এটা বলা যায় যে গিরীন্দ্র শেখর চক্রবর্তীর এই গবেষণা মূলক রচনা এবং তথ্য সংগ্রহের প্রচেষ্টা অবশ্যই প্রশংসনীয়। বস্তুতঃ এই রচনা বাঁকুড়া জেলার গ্রন্থাগার পরিচয়জ্ঞাপক এক অমূল্য দলিল। এজন্য লেখক অবশ্যই ধন্যবাদার্হ। পরিশেষে ধন্যবাদ প্রকাশক খেয়ালী পত্রিকা গোষ্ঠীকে। আমরা পুস্তিকাটির বহুল প্রচার কামনা করি।

গিরীন্দ্র শেখর চক্রবর্তী। গ্রন্থাগারের ইতিহাস এবং বাঁকুড়া। খেয়ালী পত্রিকা গোষ্ঠী, বাঁকুড়া, ১৯৯৭। ১৪ + ২৭ +১০ পৃঃ। মূল্য দশ টাকা।